IANOS "IntegrAted SolutioNs for the DecarbOnization and Smartification of Island"
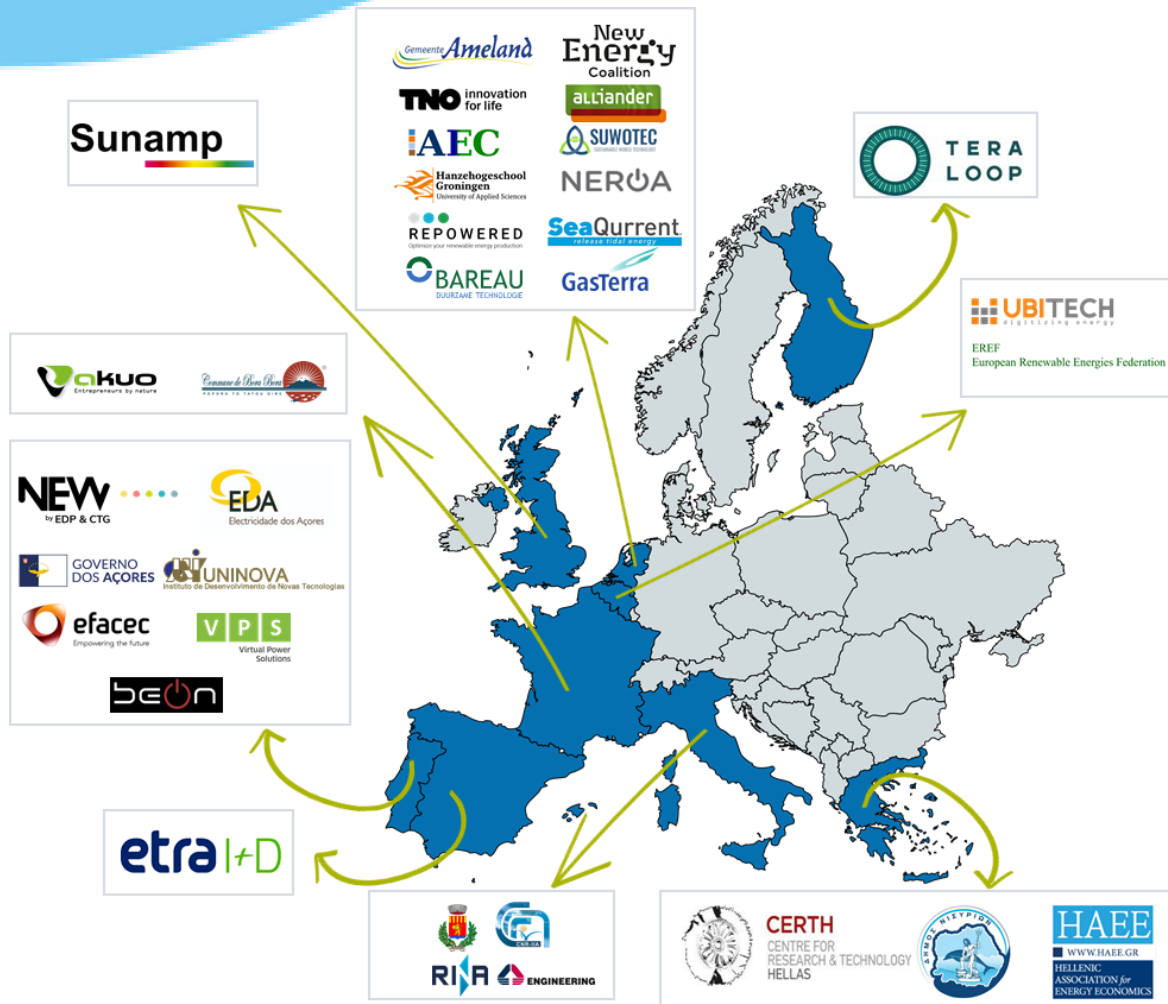
EU GREEN WEEK 2021 PARTNER EVENT

ZERO POLLUTION
#EUGreenWeek
for healthier people and planet

Nikos Nikolopoulos (CERTH)

IANOS – Project Overview

OBJECTIVES

- Demonstrate innovative solution to decarbonize geographical islands in Europe;

- Allow end-users to optimize their energy bill and system operators to integrate more RES and defer network investments;

- Increase geographical islands' overall energy and resource efficiency;

- Decrease the Islands' carbon footprint.

KEY FACTS

- Start: October 2020

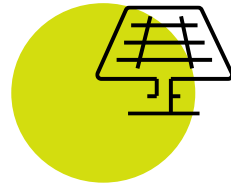- Duration: 4 years

- Overall budget: 8.8 M€

- 34 partners

Why IANOS ?

Context

Almost 3,5% of Europeans citizens live in geographical islands

Energy production costs are up to ten times higher than on the mainland

Road to decarbonization

Large-scale deployment of local renewable energy sources and storage systems brings economic benefits and, at the same time, contributes to decarbonising the energy system of the island
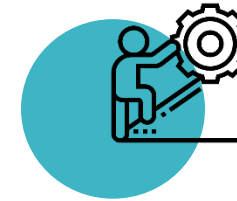
Challenges

Specific energy related challenges are common to the majority of EU islands:

- High dependence on fossil fuels;
- Seasonality of demand;
- Increasing levels of non-controllable RES poses difficulties to system operation.

IANOS' Key Objectives

Facilitate seamless adoption of extremely high RES penetration, by encompassing synergetic operation of energy resources and carriers through a VPP framework, for pro and re-active orchestration of energy flows;

Demonstrate specific technology-driven interventions envisioned through 3 Transition Tracks and 9 Use Cases, towards energy system de-carbonization in 2 LH Islands, validating IANOS solutions up to TRL 8;
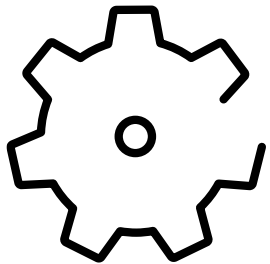
Successfully guide EU Islands decision makers in the design of cost-effective and feasible Action Plans for decarbonizing their energy systems;

Fully engage EU islanders in the transition towards a low carbon economy, considering them as an active player in the energy system;

Ensure high replication potential for IANOS results while reaching on a critical mass of EU Islands and RE stakeholders;

Exchange knowledge within the BRIDGE Initiative working groups, while contributing to the Clean EU Islands Initiative and contribute to homogenize the fragmented island regulation.

2 Lighthouse Islands

Terceira (PT) and Ameland (NL)

3 Fellow Islands

Lampedusa (IT), Bora Bora (FR) and Nisyros (GR)

03/2021	10/2021	12/2021	07/2022	09/2024
System Dimensioning	Deployment Plan and Risk Management	System implementation, Integration and Commissioning	Use Case Operation Performance and stakeholder engagement and monitoring	End of the project

Innovation in 3 Transition Tracks

TT#1: Energy efficiency and grid support for extremely high RES penetration
› Conventional and novel RES integration, further enveloping measures (i.e. Virtual Power Plant & Smart Grid utilization)
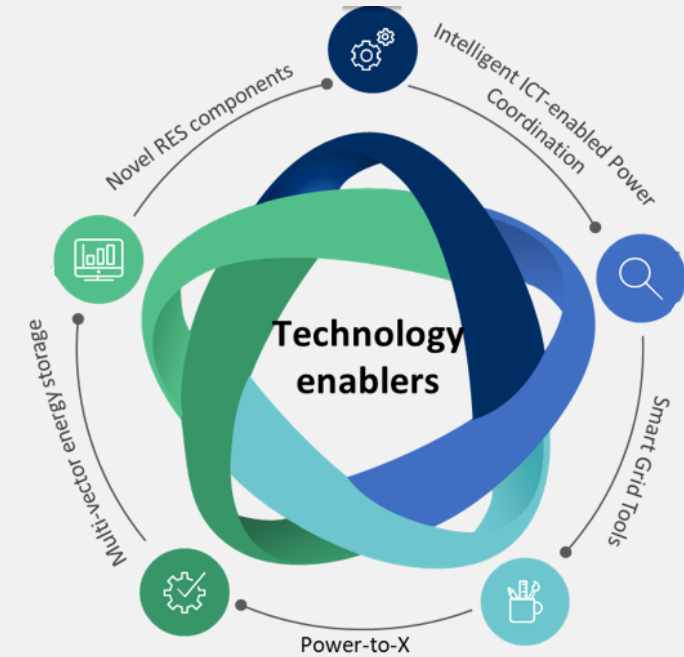
TT#2: Decarbonization through electrification and support from non-emitting fuels
› Cross-resource and energy networks integration at local, community and island-level

TT#3: Empowered Local Energy Communities
› Investment planning and collaborative funding BMs

Novel RES components · Intelligent ICT-enabled Power Coordination · Smart Grid Tools · Power-to-X · Multi-vector energy storage · **Technology enablers**

Comprising 9 Use Cases

T T 1

UC 1 - Community demand-side driven self-consumption maximization

UC 2 - Community supply-side optimal dispatch

UC 3 - Island-wide, any-scale storage utilization for fast response ancillary services

UC 4 - Demand-side management and Smart Grid methods to support power quality and congestion management

UC 5 - Decarbonization of transport and the role of electric mobility in stabilizing the energy system

T T 2

UC 6 - Decarbonizing large industrial continuous loads through electrification and locally induced generation

UC 7 - Circular economy, utilization of waste streams and gas grid decarbonization

UC 8 - Decarbonization of heating network

T T 3

UC 9 - Active Citizen and Local Energy Communities engagement into Decarbonization Transition
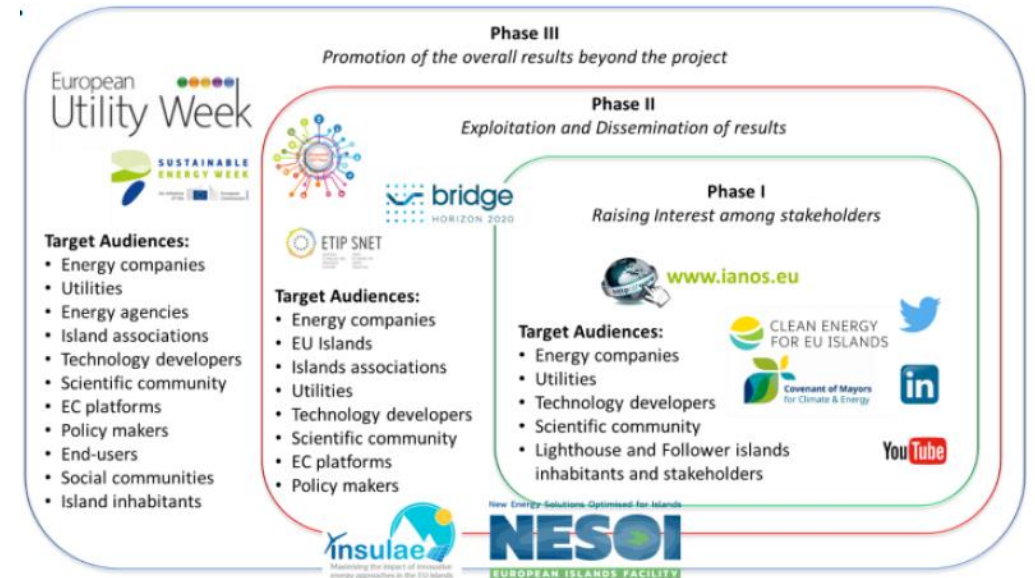
IANOS' ambitions

IANOS will have strong impacts on both its Lighthouse islands:

- **Increase the share of RES utilization**:
  - Terceira from 33,5% to 70%
  - Ameland from 5,1% to 20,1%
- **Reduce the fossil fuels consumption**:
  - Terceira from 66,5% to 30%
  - Ameland from 94,9% to 80,2%
- **Reduce total GHG emissions**:
  - Terceira from 91,930 tCO_{2eq}/y to 41,325 tCO_{2eq}/y
  - Ameland from 95,919 tCO_{2eq}/y to 58,152 tCO_{2eq}/y

While it will also help its fellow islands achieve ambitious targets:

- Lampedusa aims to **cut its CO_2 emissions by 63%** until 2030;
- Bora Bora envisions to **produce 75% of electricity from RES** by 2030;
- Nisyros aims to implement several measures to achieve a total of **more than 800 tCO_{2eq} savings.**

All of this while ensuring a strong collaboration and dissemination strategy!
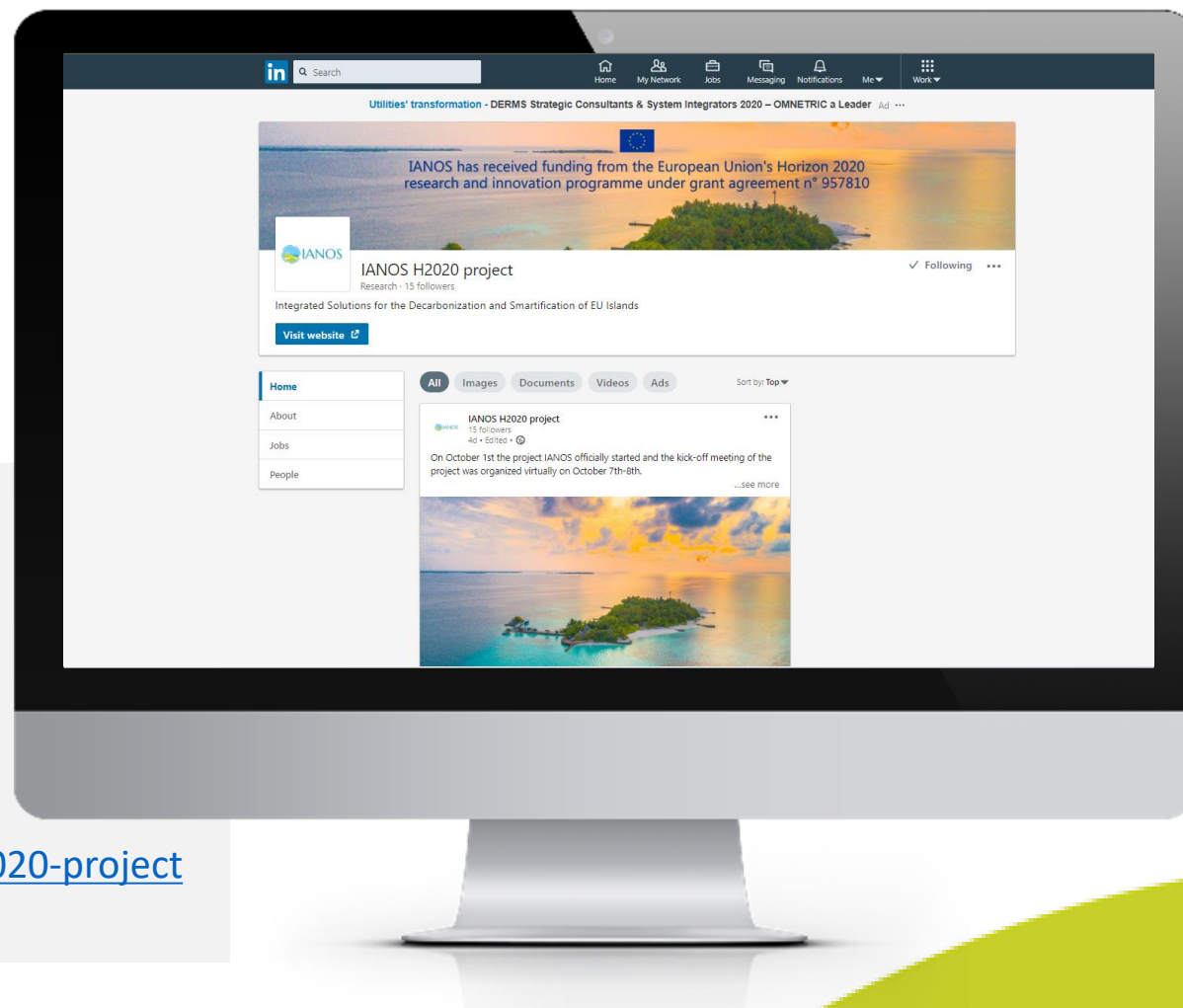
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SUSTAINABLE SOLUTIONS
for islands' decarbonisation