Maximizing the impact of innovative energy approaches in the EU islands

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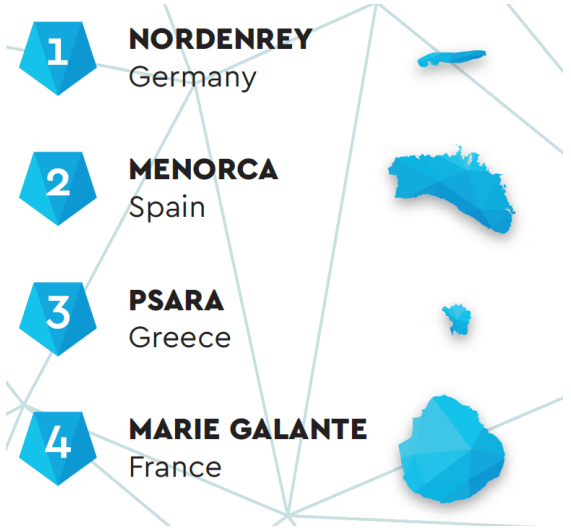
Geographical overview

Lighthouse Islands

Follower Islands



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Technical Overview

IPT

Investment Planning Tool

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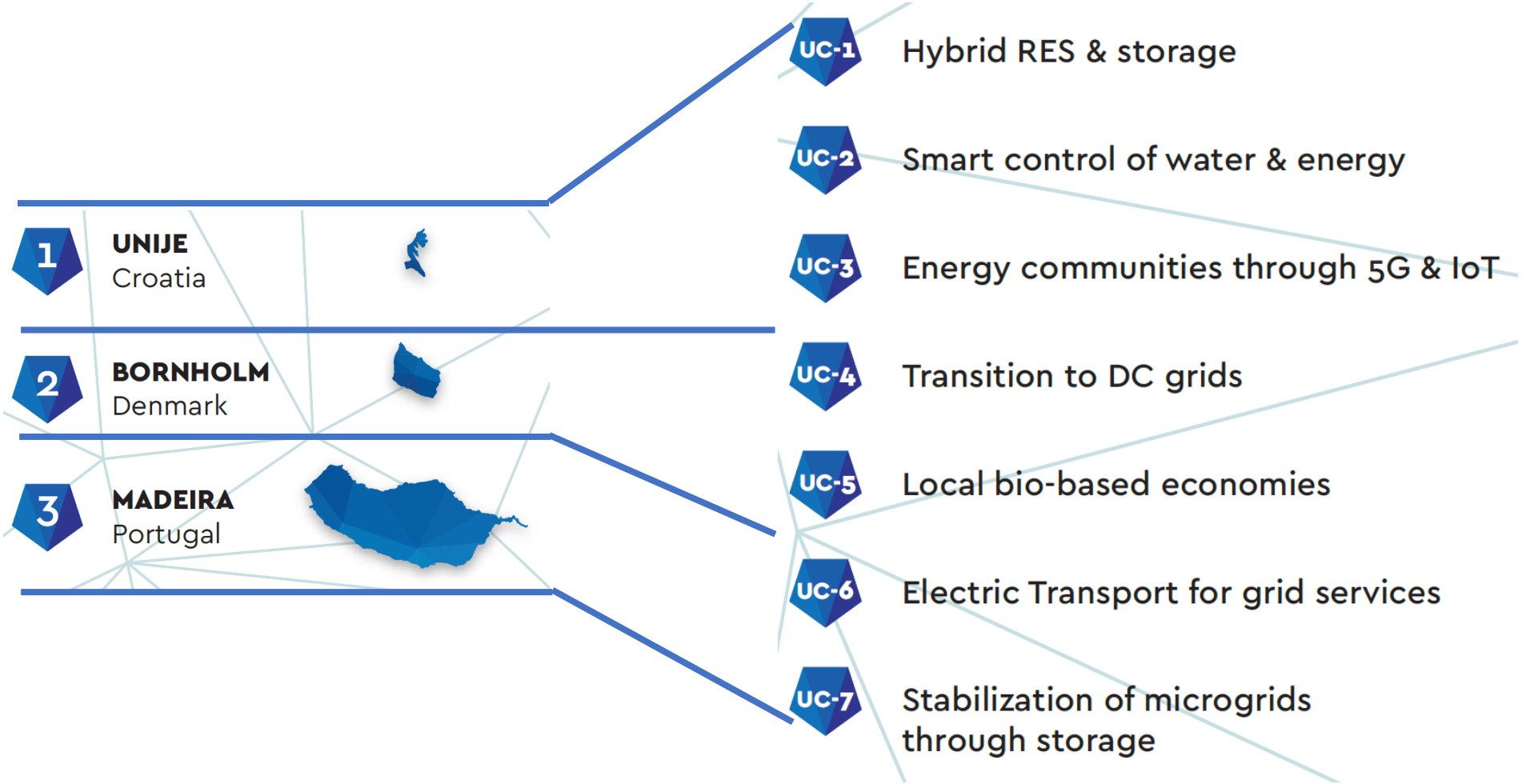
Follower Islands

1 **UNIJE** Croatia

2 **BORNHOLM** Denmark

3 **MADEIRA** Portugal



UC-1 Hybrid RES & storage

UC-2 Smart control of water & energy

UC-3 Energy communities through 5G & IoT

UC-4 Transition to DC grids

UC-5 Local bio-based economies

UC-6 Electric Transport for grid services

UC-7 Stabilization of microgrids through storage

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Investment Planning Tool

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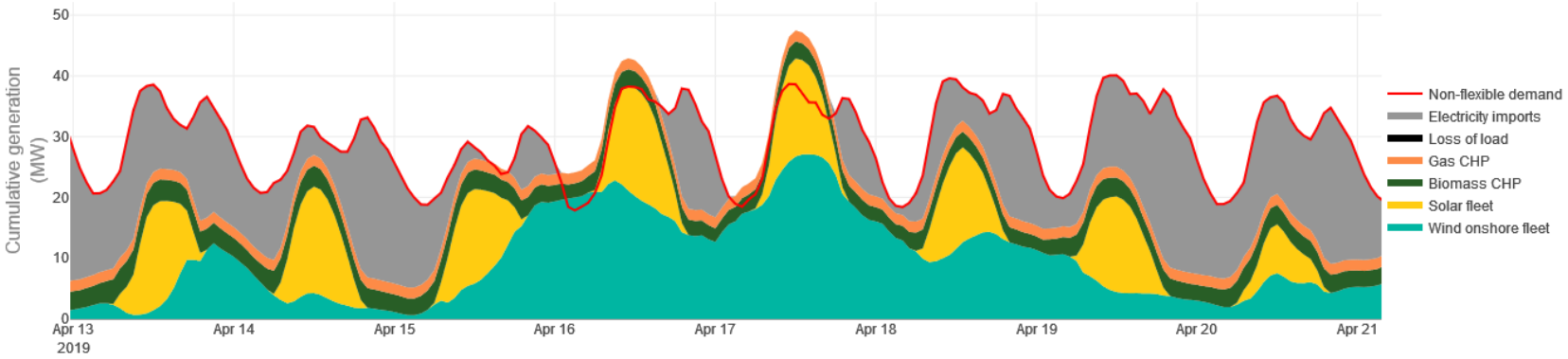
Investment Planning Tool

- The **Investment Planning Tool (IPT)** is a web based software developed by Artelys within the INSULAE project in order to **assist island decision-makers to design energy strategies**, and to monitor their impacts on insular energy systems.

- The IPT is divided in two modules:
  - **The Island Modelling Assistant (IMA)**
    - This module is used to represent the current state of the island energy system.
  - **The Scenarisation Module** :
    - This module is used to represent possible futures of the island energy system, and to investigate the potential benefits of different actions that could be implemented by policy-makers.



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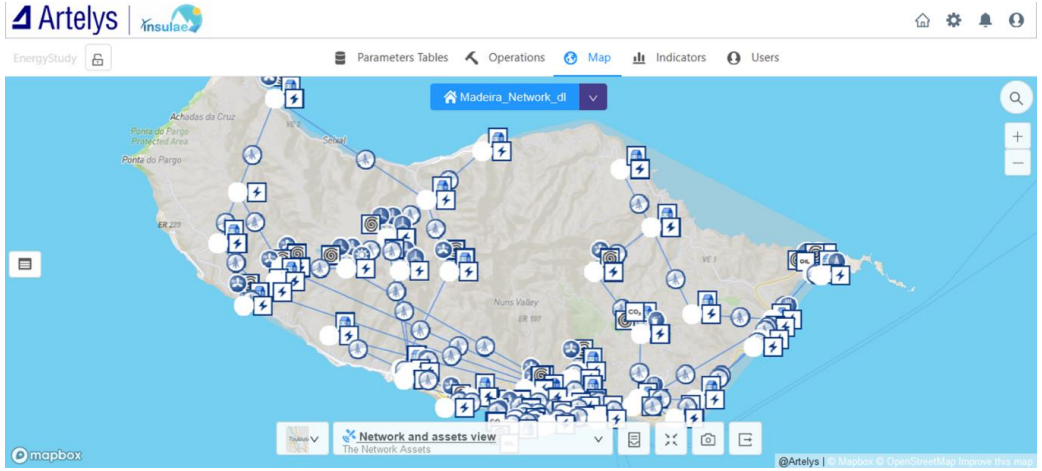
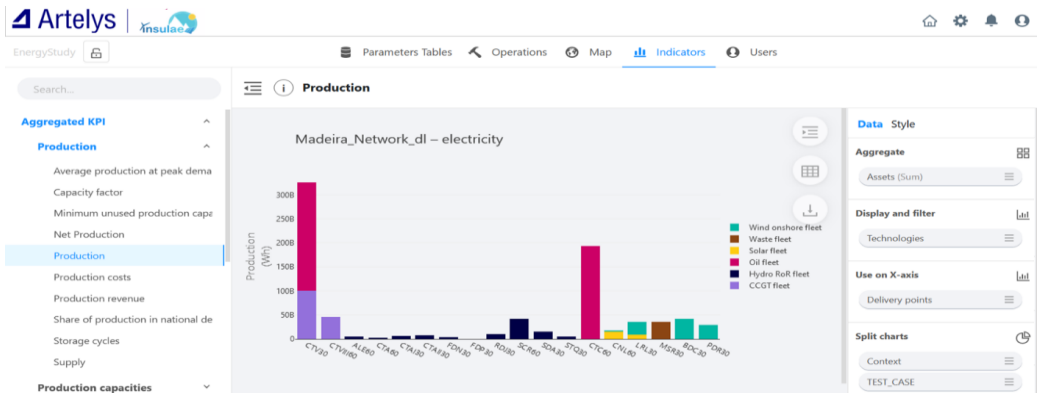
Investment Planning Tool

- ✓ **Model the multi-energy system** of an island:
  - ✓ Detailed representation of the different energy vectors (electricity, heat, gas, petroleum products imports, etc.);
  - ✓ Representation of the energy flows within the island, and import/export with the mainland;
  - ✓ Hourly optimization of the demand-supply equilibrium in order to minimize the total generation costs.
- ✓ **Advanced features** to explore the possible futures of the island energy system:
  - ✓ The IPT includes **a library of "interventions"** (development of electric vehicles, new power interconnection with the mainland, etc.) to create contrasted pathways of evolution;
  - ✓ Possibility to **optimize the investments in power generation capacities** in order to reach a specific **policy target** (minimum share of renewable, carbon neutrality);
  - ✓ Possibility to model the evolution for a single year, or for a full pathway to capture possible bottlenecks at intermediate years.
- ✓ **Analyze the results with Key Performance Indicators** (KPIs) at different scales
  - ✓ **Display indicators on a map** to easily compare different areas of the island;
  - ✓ Use hourly temporal indicators for advanced analysis of supply-demand equilibrium;
  - ✓ **Use aggregated values** to summarize information, and compare different pathways of evolution for the whole island.



Representation of the current power system of Madeira Island in the IPT



Representation of the current power production for each substation of Madeira Island in the KPI view of the IPT

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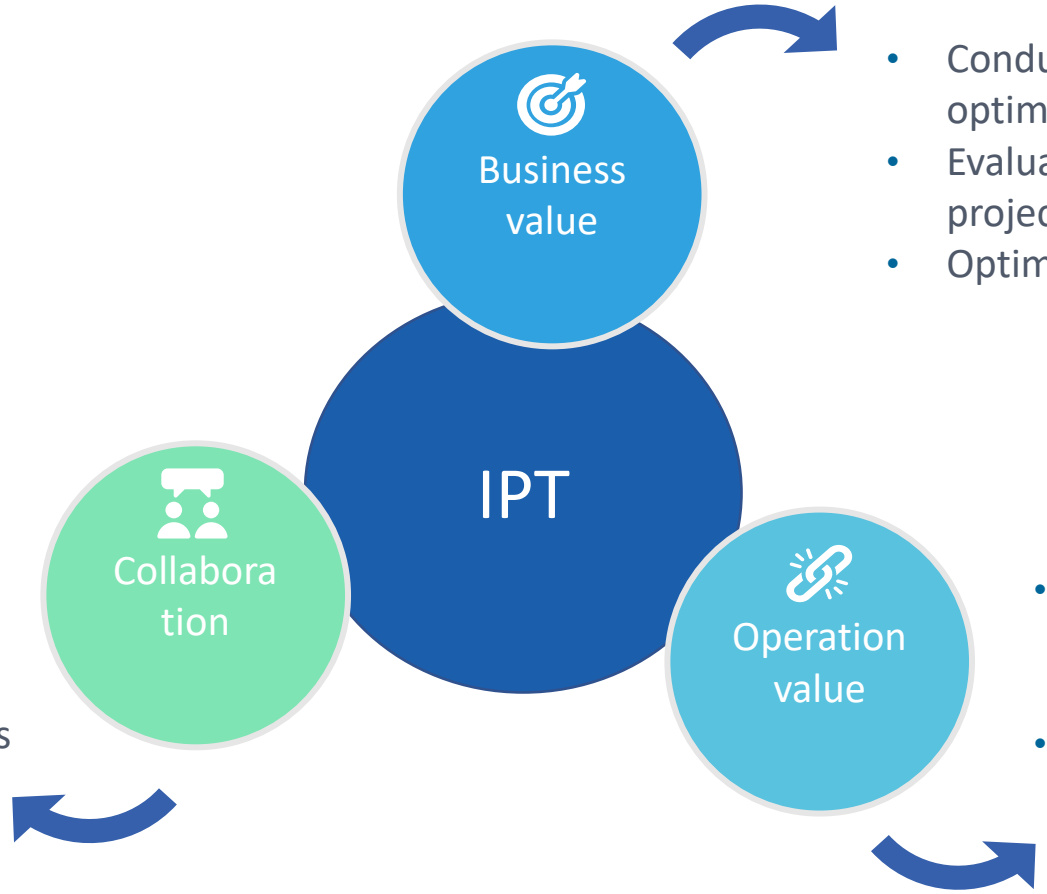
Adressed challenges



- Conduct **Cost Benefit Analysis** to plan optimized investments
- Evaluate **environmental impact** of your project
- Optimize sizing of energy infrastructures

- **Ready to use solution**
- Cloud technology with **high performance computation** to run several instances and compare easily several use cases
- **Multiple user interface** – share your studies and co-construct your models

- **Multi-energy tool** : use one solution to model all your energy carriers (electricity, gas, heat, hydrogen, etc)
- **Anticipate revenues** and assess market design

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Investment Planning Tool

A tool dedicated to prospective analysis for insular systems

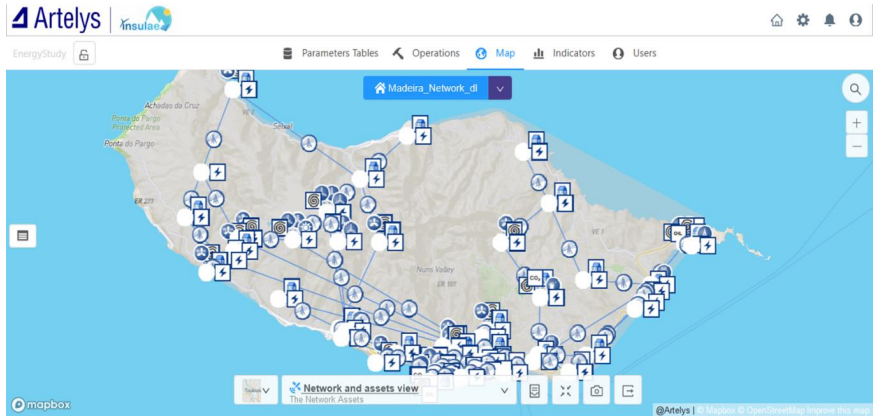
A rich library of assets to model multi-energy insular systems
incl. batteries, solar PV, hydro, flexible generation, interconnections, cogeneration, heat pumps, etc.

A library of interventions to explore the possible futures of the island
(development of electric vehicles, new power interconnection with the mainland, etc.) to create contrasted pathways of evolution

Analyze the results with Key Performance Indicators (KPIs) Display indicators on a map to easily compare different areas of the island and aggregate values to summarize information, and compare different pathways

A dedicated support
Energy expert available to support you in modelling and simulation

A user community
Interact with other users of the platform, share models and results in order to take benefit from other island situations



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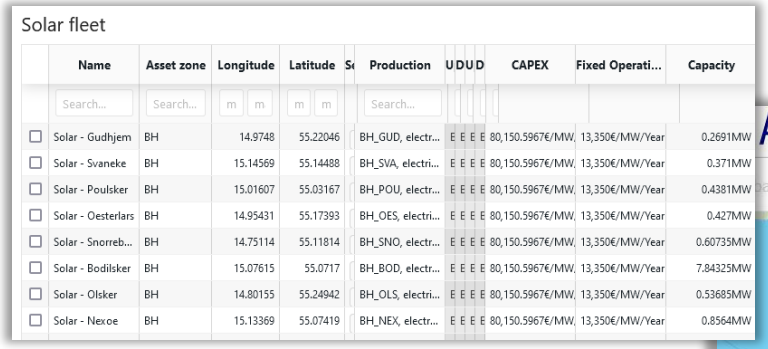
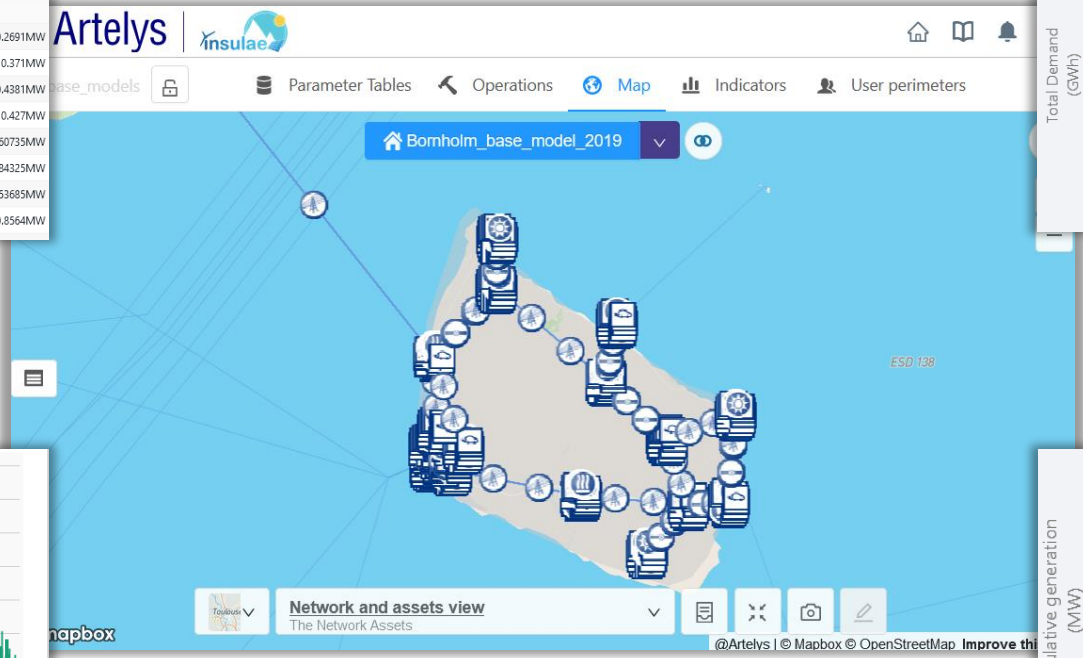
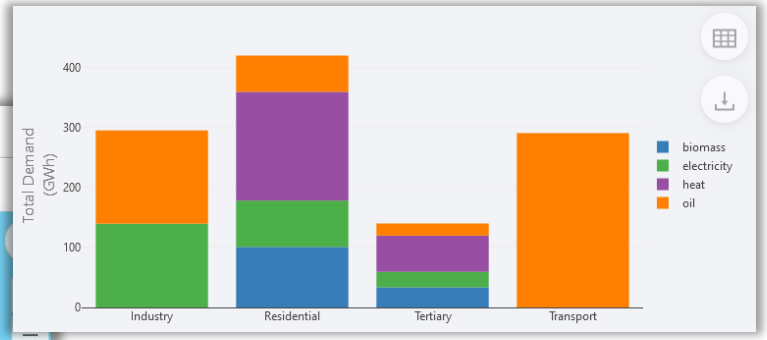
IPT - Island Modelling Assistant



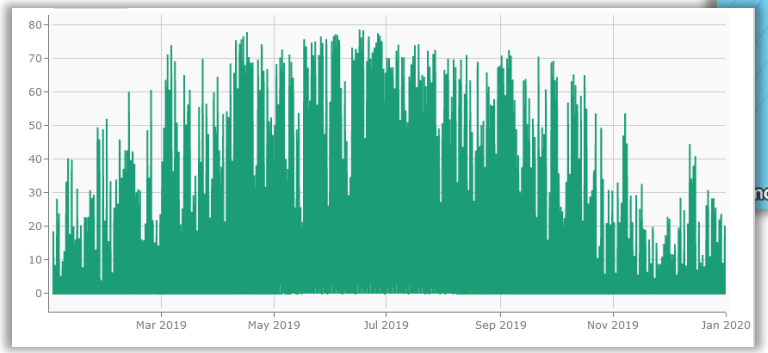
Use the parameter table view to adapt your model



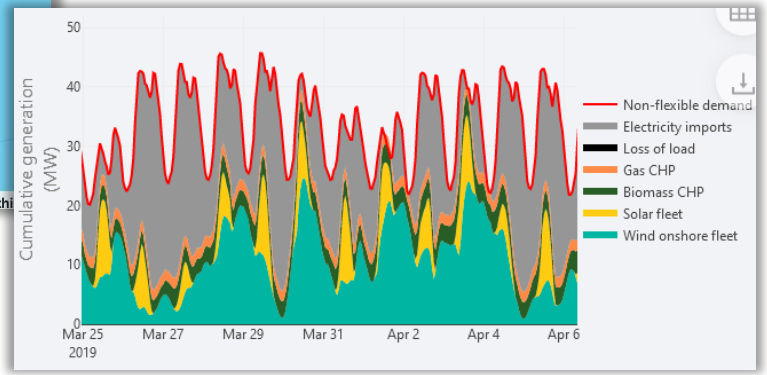
Map view of the IPT



Various KPIs are available to analyse your island's energy system



The IPT handles hourly data to take into account the variability of renewables



Use hourly KPIs for advanced insights on power demand/supply balance

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IPT – Scenarisation Module

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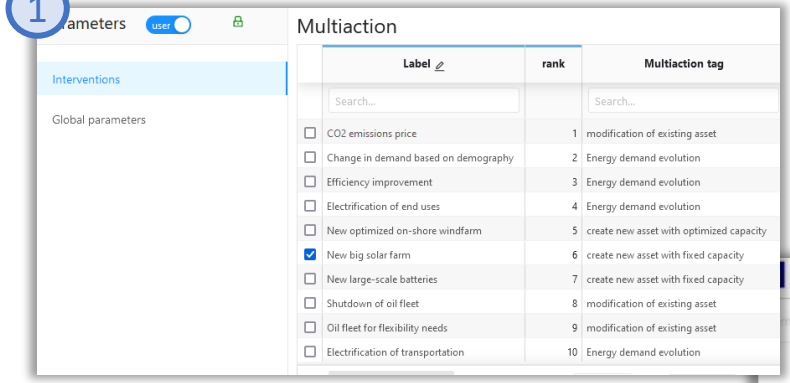
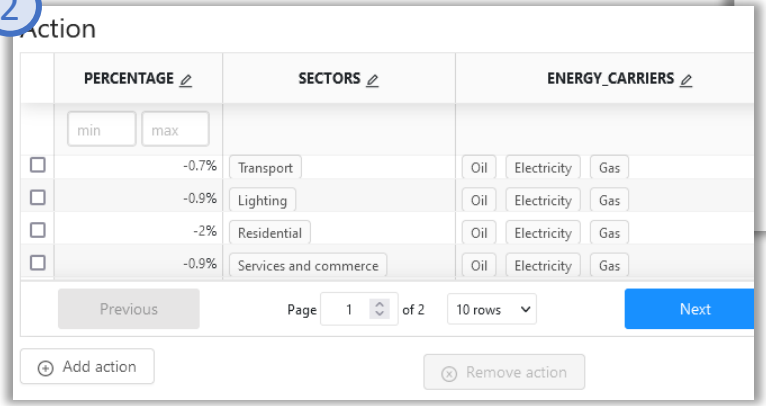
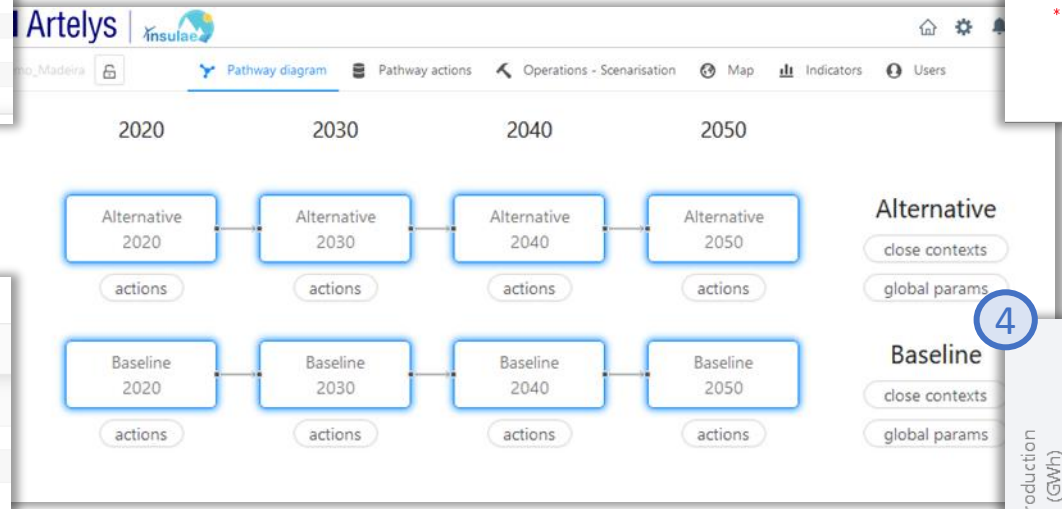


Use the intervention library to build the pathway of evolution of your island

2

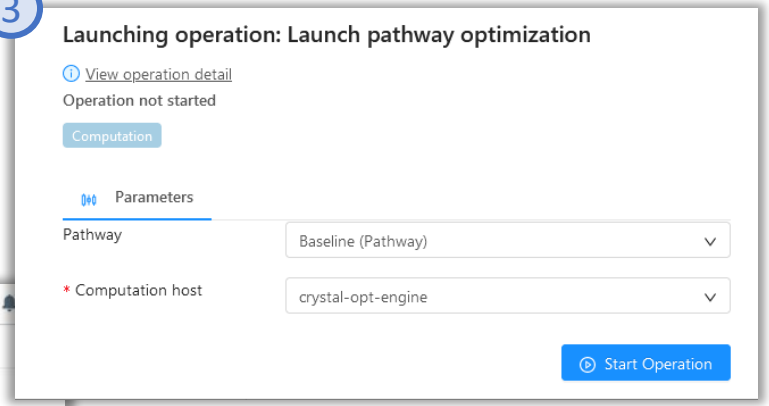


Configure each intervention with the appropriate parameters



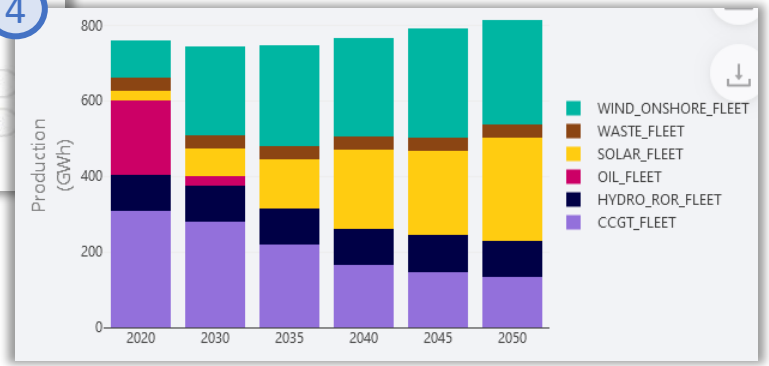
Pathway diagram view of the IPT

3



Apply your interventions and optimise investments in new capacities

4



Use dedicated KPIs to analyse pathways of evolution of your island's energy system

Thank you !

http://insulae-h2020.eu/

H2020 Insulae Project

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