



# IFAISTOS

## Intelligent electroFuel production for An Integrated STOrage System

” *Process-integrated P2G will be able to answer to both short-term dispatching and long-term strategic issues with a high efficiency*

Environmental and energy policies over the last years lead to different and fragmented national energy systems with increasing shares of renewable energy sources. The non-programmability of some of these clean technologies and the limited capacity of the power grid require innovative storage devices to decouple production and utilization and synergies between energy domains to be exploited.

IFAISTOS aims to provide a long-term energy storage solution based on electrofuels that can integrate the electricity from renewables into the whole energy system, from gas to heating, transportation and chemicals, by means of a smart management approach.

The technology will be demonstrated and evaluated in three different contexts fostering its market readiness and proving its integrability in processes with a high carbon intensity.

This activity, together with thorough assessments of the business model and the social acceptability, will provide a solid background for the scalable replication of this solution.

### IFAISTOS

#### Project Duration

01.11.2020 - 31.10.2023

#### Project Budget

Total Budget: € 1,207,400.-

Funding: € 668,740.-

#### Project Coordinator

University of Parma (Italy)

#### Project Partners

- Siram Veolia (Italy)
- Mälardalen University (Sweden)
- Mäl arEnergi (Sweden)
- Flow Ocean (Sweden)

#### Project Website

[ifaistos.eu](http://ifaistos.eu)

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ERA-Net Smart Energy Systems



This project has received funding in the framework of the joint programming initiative ERA-Net Smart Energy Systems. The initiative has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039 and no. 755970.

**ERA-Net  
Smart Energy Systems  
Joint Call 2019  
(MlCall19)**

This project has been awarded funding within the ERA-Net SES Joint Call 2019 for transnational research, development and demonstration projects. EUR 16.5 Mio of funding have been granted to 14 projects active in 15 regions and countries.

## Main Objectives

The main objective of IFAISTOS is to make the Power-to-gas technology a viable solution for long term storage: (i) integrated, by recycling carbon dioxide and exploiting renewable electrical energy, (ii) intelligent, by providing flexibility and efficiency through its optimal management, (iii) interoperable, by bridging electrical energy grid with natural gas networks and transport sector. This can be achieved by pursuing specific objectives such as (i) the digital twin of the system, (ii) the smart controller, (iii) the demonstration site, (iv) the guidelines for system replicability and scalability, (v) the business model, and (vi) the guidelines for fostering social acceptance.

## Expected Key Results

### Technology

- a mathematical model of electrofuels production plant implemented in simulation environment
- a Model Predictive Controller that allows the system to be optimally managed considering the variability of the electrical energy source and the security of the primary process in which the system is integrated
- a set of operating procedures that allow the design of new plants integrated in industrial, energy and tertiary processes and their application to three test cases (two in Italy, one in Sweden)

### Market

- the analysis of the way this system can create value with regard to its role of energy system flexibility provider, of long term storage system and of carbon capture system

### Adoption

- a collection of the main reasons for potential social opposition to this kind of systems, and indications on how to avoid them in order to achieve an easier commissioning phase

**Joint Programming for Flourishing Innovation – from Local and Regional Trials towards a Transnational Knowledge Community**

**[www.eranet-smartenergysystems.eu](http://www.eranet-smartenergysystems.eu)**



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