



# AGRO-SOFC

## Sector coupling with SOFC technology in the agro-industry

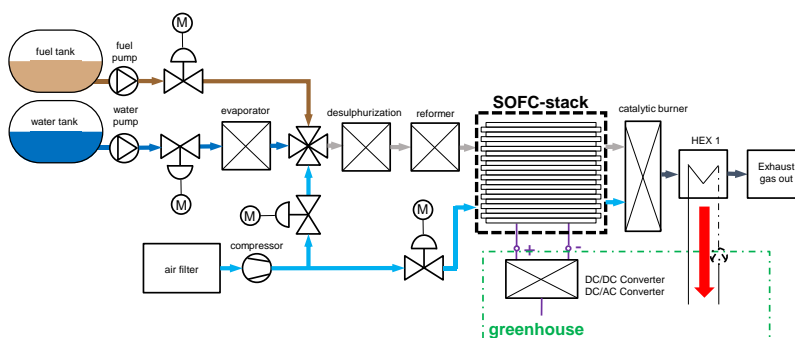
“Optimal SOFC operation can counteract degradation, but real measurements are missing so far. AGRO-SOFC is intended to drive this development forward.”

AGRO-SOFC aims to reduce the energy consumption by at least 10% through load shift and sector coupling using solid oxide fuel cells (SOFC) and intelligent control strategies in greenhouses.

As part of the project, a highly efficient and ecological system is being developed and demonstrated, which connects the agricultural industry as a “need owner” with SOFC technology.

The SOFC system enables the generation of electricity power with an electrical efficiency of more than 65%, which reduces energy consumption and ensures process reliability. The waste heat from the SOFC is used to heat the greenhouse. Such a system can include run on renewable hydrogen and biogas (common in the agricultural industry). The load shift and the sector coupling must not have a negative impact on the operation or the process if these effects cannot be compensated. The intelligent operating strategy of the SOFC should enable energy-efficient and low-degradation operation. Here, the optimal operating conditions are first determined in the laboratory so that these operating properties can also be achieved later in the pilot system with appropriate control devices and with the help of machine learning.

The end consumers also benefit from the reduction in energy demand since the energy demand has a significant impact on the production costs of the greenhouse products.



### 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.

### Project Duration

01.12.2019 - 30.11.2022

### Project Budget

Total Budget: € 1,049,614.-

Funding: € 789,083.-

### Project Coordinator

4ward Energy Research GmbH (Austria)

### Project Partners

- Institute of Thermal Engineering, Graz University of Technology (Austria)
- ENEXSA GmbH (Austria)
- Reiterer & Scherling GmbH (Austria)
- Inkoa Sistemas S.L. (Spain)

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ERA-Net  
Smart Energy Systems  
Joint Call 2018

This project has been awarded funding within the ERA-Net SES Joint Call 2018 for transnational research, development and demonstration projects. EUR 33.4 Mio of funding have been granted to 23 projects from 16 regions and countries.

## Main Objectives

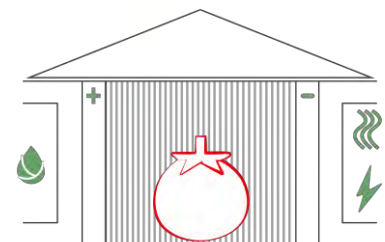
- Analysing the load flexibility of different sub-systems within the agro-industry
- Increasing the energy efficiency by integrating SOFC technology as a more efficient, decentralized, flexible and comprehensive alternative
- Reduction of the energy and heating supply in the pilots (> 10 %)
- Reduction of the CO<sub>2</sub> emissions generated
- Ensuring and increasing the security and resilience of the energy system

## Expected Main Results

- Creation of a roadmap to use SOFC technology within the agro-industry
- Reduction of the production costs of the agro-industry to improve the food security in Europe and worldwide
- Increasing the competitiveness of small producers through the development of more efficient and low-cost technologies
- Launch of sector coupling in the agro-industry by SOFC technology while ensuring process reliability

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

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



**AGRO SOFC**



**ENEXSA**



Ingenieurbüro - Unternehmensberatung

