



alliance4ECEI

Alliance for energy cooperation in European industries

An introduction

Francesco Peccianti, Fabrizio Guarrasi | 30.09.2021 | Sustainable Places 21, Rome



**SUSTAINABLE
PLACES**



About

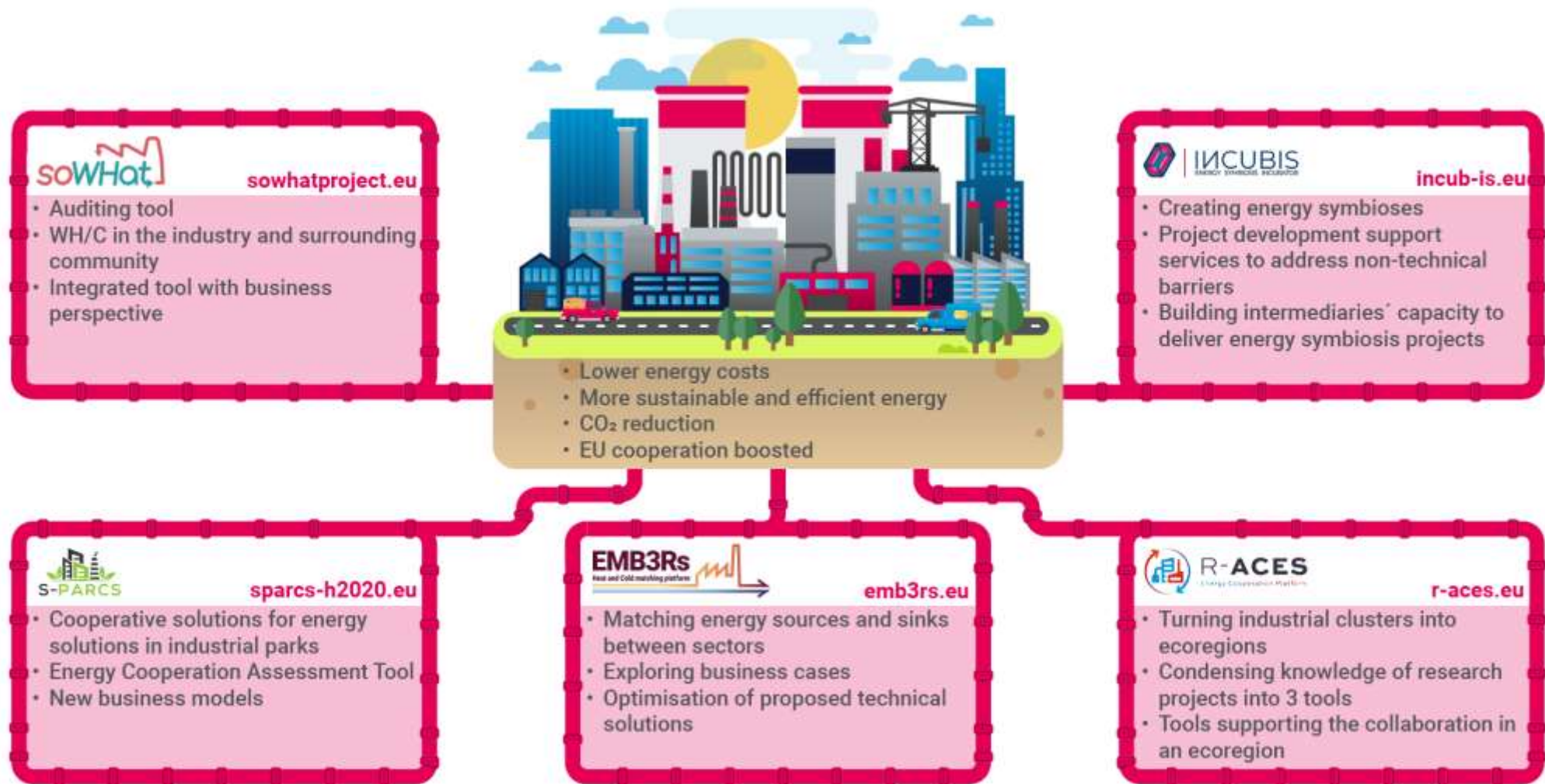
The Alliance for Energy Cooperation in European industries is a collaborative **initiative arranged by five European-funded projects** working on waste heat recovery and industrial energy cooperation: **EMB3Rs, INCUBIS, R-ACES, SoWHat & S-PARCS.**

The five initiatives together combine the efforts of 64 unique partners across 18 European countries, which have received a total of €14.5 million in funding.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)

REUSING INDUSTRIAL EXCESS THERMAL ENERGY





Why this alliance?

- Potential for **energy cooperation and waste heat recovery** is huge and largely untapped.
- **Energy represents up to 20 % of the total production costs** for energy intensive industries in Europe, and even more for some industrial sectors.
- Despite considerable technical progresses in reducing energy consumption, a **significant amount of the input energy is still lost** in the form of excess heat.
- Improved energy efficiency in industrial processes can lead to substantial primary **energy savings, decarbonisation** of the energy supply and subsequent **reduction of CO2 emissions**.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)





Objectives

- Enhance collaboration to boost energy efficiency in European industries.
- Maximize the impact and improve the quality and the relevance of the outputs generated by each of the projects conforming the alliance.
- Boost industrial symbiosis as well as waste heat and waste cold recovery and reuse.
- Contribute to the 2050 goal of zero net carbon emissions.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



An overview of the projects



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



S-PARCS – What we did



March 2018 – June 2021

OBJECTIVES

1. Increase competitiveness by developing, testing and deploying **replicable instruments for energy cooperation**
2. Develop, test and deploy replicable business **models for joint contracting of energy services** for industrial parks
3. Contribute to the creation of **legal and regulatory frameworks** that accelerate and facilitate the adoption of innovative instruments for energy cooperation
4. **Build capacities** and increase the skills and competencies



ACTIVITIES

1. **State of the art of energy cooperation** in industrial parks – solutions, opportunities and barriers will be identified
2. **Envisioning innovative instruments and business models** that enhance energy cooperation
3. Development of the **Industrial Park Service Initial Assessment Tool**
4. **Support industrial parks** to enhance energy cooperation



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWhat) and N° 785134 (S-PARCS)



SO WHAT

SO WHAT aims to develop and validate an integrated software for auditing industrial process, planning and simulation of waste heat and cold (WH/C) valorisation systems towards the identification of economically viable scenarios where WH/C and renewable energy sources (RES) cooperate to match local demand.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWhat) and N° 785134 (S-PARCS)



EMB3Rs

Follow our journey!

- www.emb3rs.eu
- @Emb3rs_project
- EMB3Rs



Project partners



September 2019 – August 2022



Develop an open-sourced energy modelling platform to identify feasible solutions for the recovery and use of industrial excess HC



Simulate alternative technological and/or business scenarios



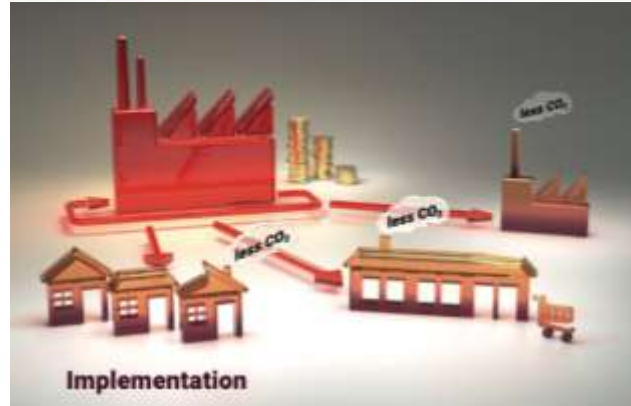
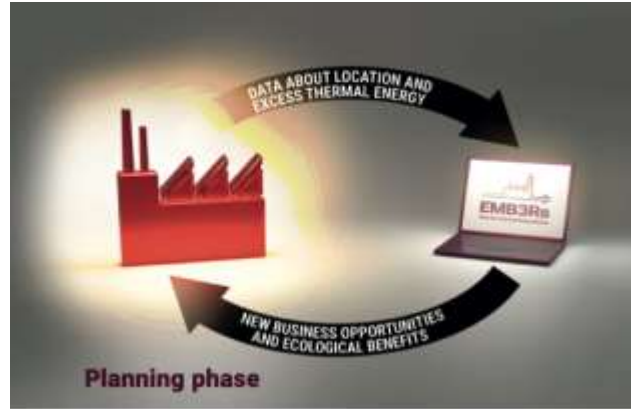
To be independently used by a wide variety of industries and other stakeholders at EU geographies



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWhat) and N° 785134 (S-PARCS)



EMB3Rs – Specific objectives



Identifying users with geographic relevancy for HC supply and demand, and enabling their interlinking



Exploring cost efficient internal and external technology routes for the recovery, conversion and distribution of the available excess thermal energy



Matching quality and temporal profiles of the excess HC available for local supply/demand



Assessing effective business models and policy instruments to overcome barriers to the implementation of the most promising scenarios.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



R-ACES

R-ACES promotes the **transition to a circular economy** model based on **industrial symbiosis** in **energy cooperation**.

The project supports industrial sites & business parks in becoming ecoregions that **reduce their CO2 emissions by at least 10%**



R-ACES
Energy Cooperation Platform

June 2019 – May 2022



Institute for
Sustainable
Process Technology



Condugo



energy CLUSTER
DENMARK



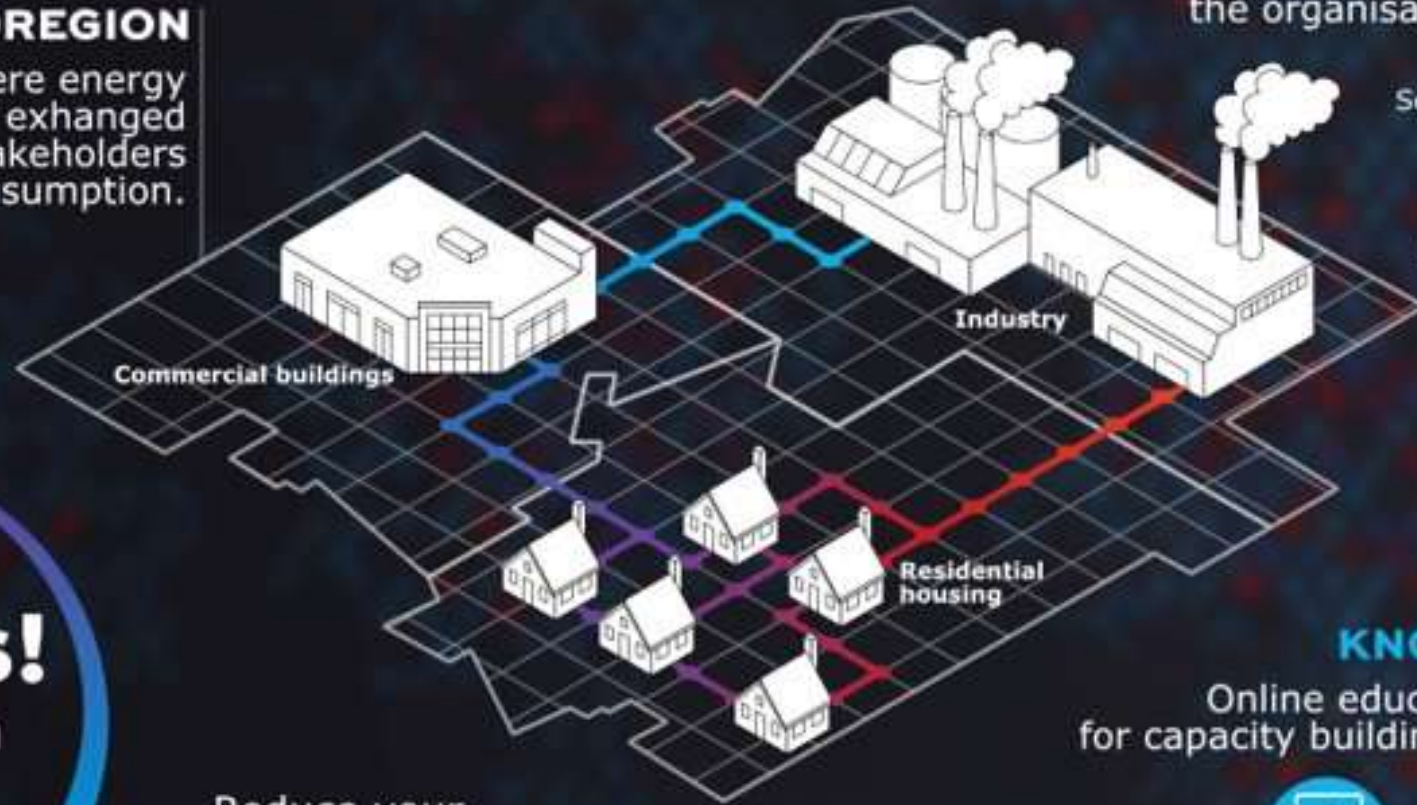
These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



R-**ACES** - Energy Cooperation Platform

ECOREGION

Geographical area where energy & information is exchanged between different stakeholders to reduce energy consumption.



Join us!

Become an
Ecoregion

www.races.eu

Reduce your
CO₂ emission by
at least 10% through
energy cooperation.

TOOLS

Three practical tools support the organisation of ecoregions.

Self-assessment
Tool



Legal Decision
Support Tool



Energy
Management
Platform



KNOWLEDGE HUB

Online education environment for capacity building of stakeholders.



Training
Courses



Serious
Board Game



Use Case
Library



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



INCUBIS

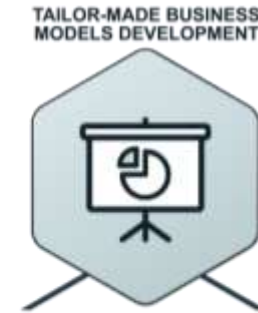


INCUBIS

ENERGY SYMBIOSIS INCUBATOR

Energy Symbiosis: The exploitation of energy efficiency opportunities found across industries and sectors.

Barriers	Problem	Solution
High risk of energy symbiosis project development activities	Energy Symbiosis projects often get stuck and/or fail in the project development stage	An intermediary (facilitator) that can overcome barriers, manage risks, and deliver projects
Low risk tolerance for investments in waste/byproducts		
Lack of skills/capacity to properly assess and manage those risks		



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)

May 2020 – April 2023

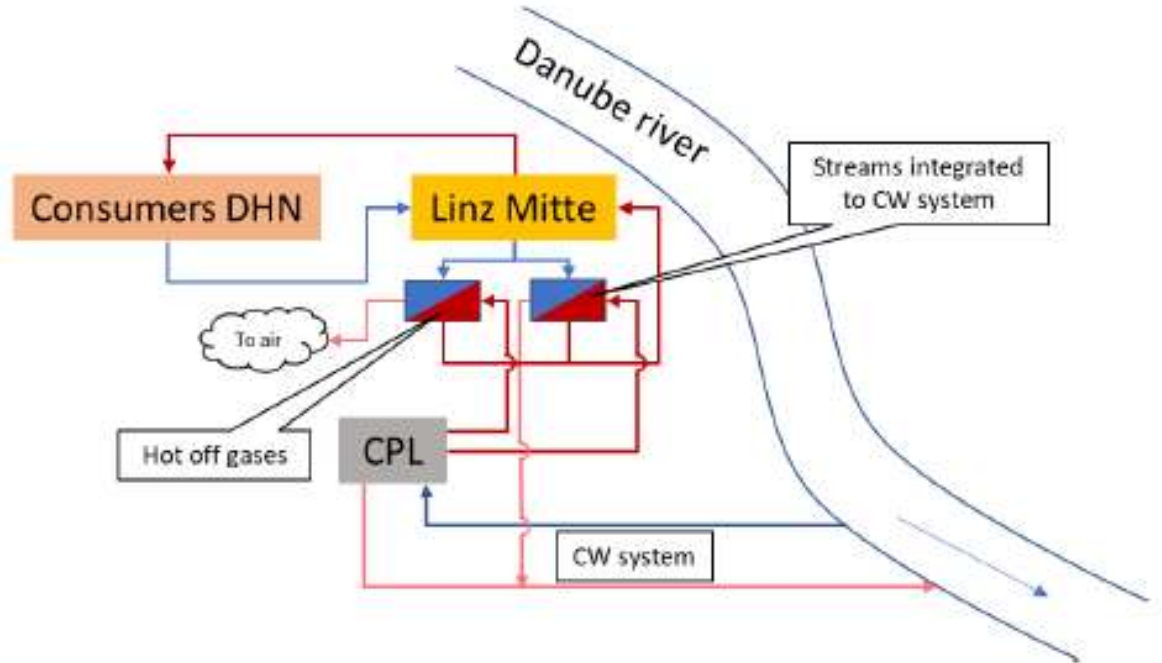


Chemiepark Linz

The available waste heat has been calculated after a careful examination of the most suitable extraction points in the system for size and location.

The identified **waste heat sources amount to several megawatts** with a temperature level being sufficient for the DHN throughout most times of the year.

Two scenarios were evaluated: **feed-in for building heating throughout winter time** and an additional demand during summer, as **heat-to-cold technology and district cooling** is enforced by the local DHN, which provides a good opportunity to utilize waste heat during summer time.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



IMERYS Graphite & Carbon

Today almost no heat is recovered, a district heating network would make the site **significantly more sustainable and futureproof**. As a matter of fact, during the process of Carbon Black, a mixture of H_2 and CO is formed, max total of 30MW.



In order to valorise the waste gas stream, a study has been performed looking into different industrial options ranging from **electricity production, over carbon valorisation via the production of chemicals such as methanol or paraffines, as well as heating circuits**.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



Heat-exchange within an industrial park in Greece

The 2nd Industrial Zone of Volos has ~**50 active industries** located within its perimeter.

10 of the industries (20%) expressed an interest to participate. Six industries proved to be **sinks** and four to be **sources**.

Important output we expect from the simulation:

- **Economic feasibility** of the project (i.e. capital cost and payback periods).
- **Heat storage requirements** due to the variation in the operating hours, days and months of the sources and sinks (e.g. iron and steel works, town of Agios Geogios etc.)



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



Lombardy ecoregion

First results: feasibility study underway for connection of **Cartiera CA-MA (paper mill)** with its **600 kW of waste heat** not currently used. With R-ACES we are working to allow that this heat is used by the new DHC



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)





Requirements for other projects to join

- To be an EU-funded project, a non-profit organization or an association/organization based in Europe.
- To work towards the decarbonization of the industrial sector, for example, through the recovery and use of excess thermal energy, or the integration of renewables in industrial processes.



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)





Further activities

- Joint dissemination channels (<https://www.alliance4eeci.eu/>)
- Cross-contamination of results and possibly analysis of use cases and sites
- Joint participation in the EU Sustainable Energy Week (EUSEW).

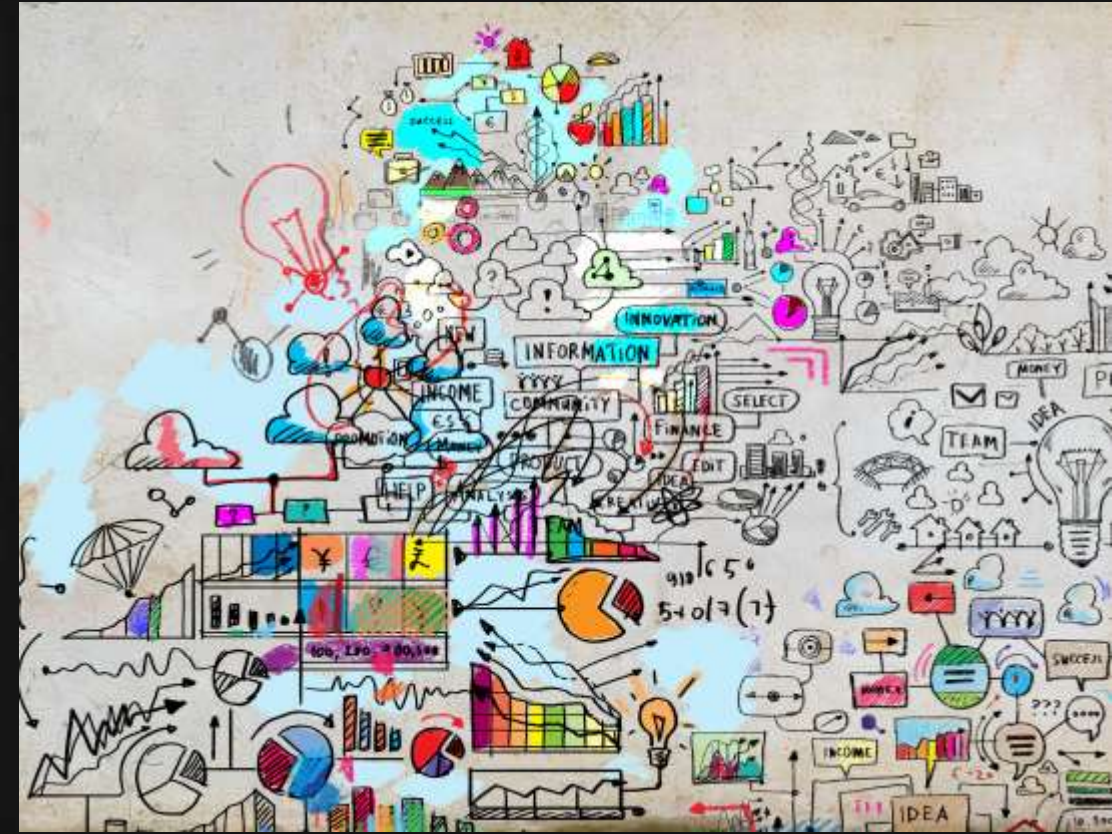


These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



**SUSTAINABLE
PLACES**

Questions?



These projects have received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N° 847121 (EMB3Rs), N° 894800 (INCUBIS), N° 892429 (R-ACES), N° 847097 (SoWHat) and N° 785134 (S-PARCS)



alliance4ECEI

Thank you!

Contact:

info@alliance4ecei.eu



Alliance4ECEI



@alliance4ecei

www.alliance4ecei.eu