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Syn.ikia's newsletter

Summer edition - June 2021



Dear friends and colleagues,

It's already summer and we are completing a 18-month milestone of engaged and inspiring work on the large-scale deployment of Sustainable Plus Energy Neighbourhoods (SPEN).

The policy framework impacting SPENs is an ongoing and dynamic process. The Clean Energy Package, the Renovation Wave including the European Bauhaus initiative and the European Green Deal play a central and supportive role in this. [Our report on barriers and opportunities of plus-energy neighbourhoods](#) gives a snapshot of the current state of the existing legislative landscape, relevant to the development of SPENs and suggests a strong political will.

With the addition of our [new partners in Salzburg](#), we expand our capacity to realize SPENs in continental climate. The construction of a plus energy residential quarter aligned with syn.ikia's concept and methodology will upgrade the entire Salzburg district of Gneis through an integrated construction project focusing on energy, accessibility, mobility, climate change adaptation and social-planning concepts.

In each of the [four demo neighbourhoods](#), with syn.ikia's [evaluation framework](#), we assess and ensure that technical concerns related to environmental and energy performance of the buildings are addressed from the early stages of the design process until the operational phase. Our upcoming report on design and performance prediction of the syn.ikia demonstration projects will share comprehensive results of integrated energy and future proof design.

As every neighbourhood develops its own identity, we are launching our [SPEN community](#) to connect people, share experiences, inspire and co-create sustainable places with respect to the users and the environmental challenges. We believe together we can do more.



DISCOVER THE AUSTRIAN DEMO



Syn.ikia is proud to welcome to the team its newest member, Heimat Österreich, who will develop the Austrian demo neighbourhood

The [Austrian demo case](#) is located in the Geneis District of Salzburg, an alpine town in Austria representing a continental climate.

The construction of a plus energy residential quarter will upgrade the entire neighbourhood through an integrated construction project focusing on energy, accessibility, mobility, climate change adaptation and social-planning concepts. The demo project is led by [Heimat Österreich](#) with the support of [SIR](#) and [ECA](#).

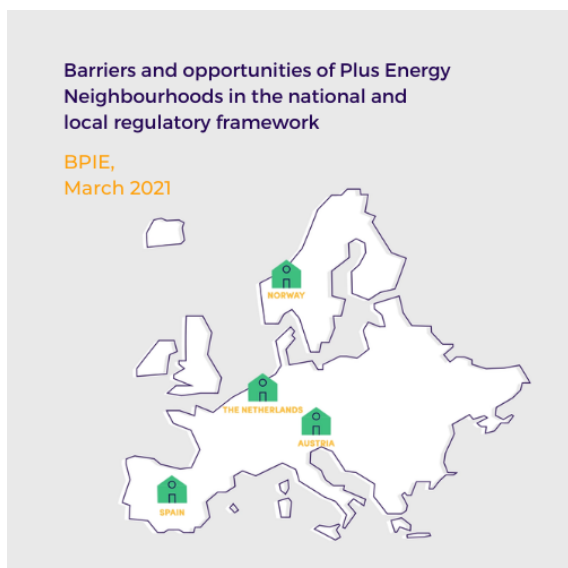
Specificities:

- 230 Housing units
- Kindergarten
- Number of new buildings: 16
- New built area: 28.400 m²
- Heated floor area: 24.200 m²



Find out more about its features!

HIGHLIGHTS



Barriers and opportunities of plus-energy neighbourhoods in the national and local regulatory frameworks

SPENs can have a strategic contribution to achieve climate and energy targets as they tackle larger-scale projects, simultaneously improving community facilities, health, wellbeing, safety and public spaces.

What is the existing legislative landscape impacting the development of sustainable positive energy buildings and neighbourhoods in Europe?

[This report](#) gives an **overview of the EU and national policy framework**, with a special focus on the policy landscape of the syn.ikia pilot countries: Austria, the Netherlands, Norway and Spain.

It also identifies its gaps and weaknesses, providing a robust basis for the ongoing efforts to redefine integrated strategies to the deep decarbonisation of buildings.

[Download the report](#)

Methodology framework for Plus Energy Buildings and Neighbourhoods

This [report](#) sets out a **joint framework for the evaluation of the performance of positive energy buildings and neighbourhoods**, providing guidance for further implementation of the syn.ikia [demonstration projects](#). It includes Key Performance Indicators (KPIs) for



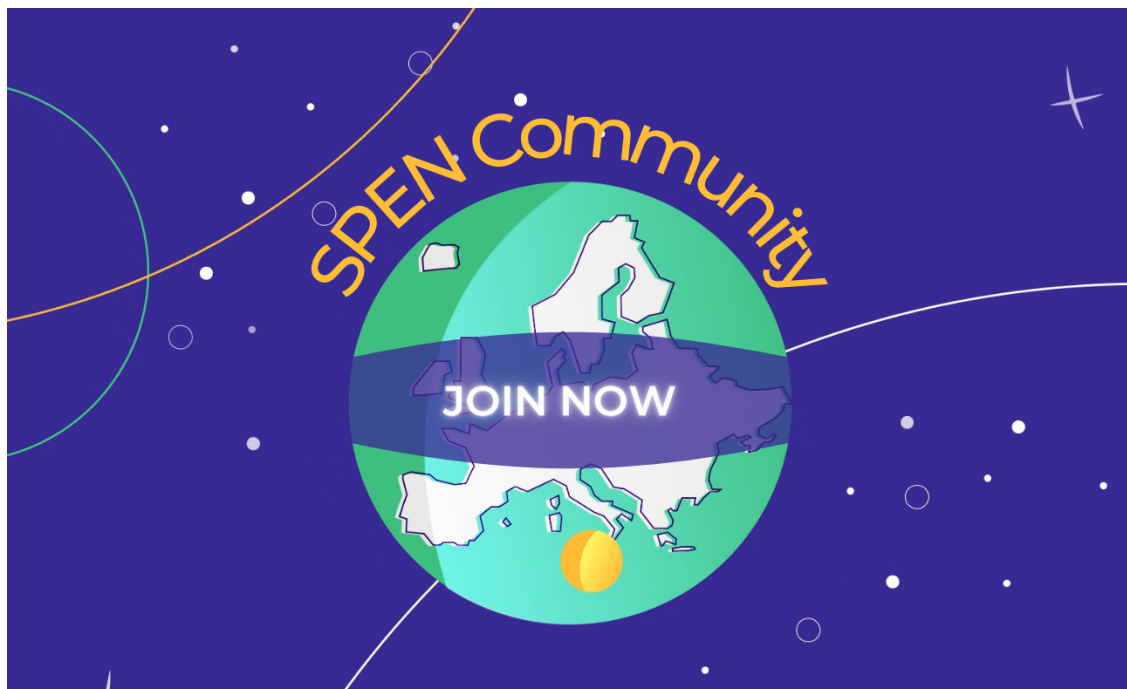
and Social and Economic factors.

[Download the report](#)

The Sustainable Plus Energy Neighbourhood Community

The **SPEN Community** is an online meeting space designed to **connect, inspire and create synergies** among a wide range of stakeholders involved in the development of Sustainable Plus Energy Neighbourhoods.

The community is already active, we are just waiting for you!



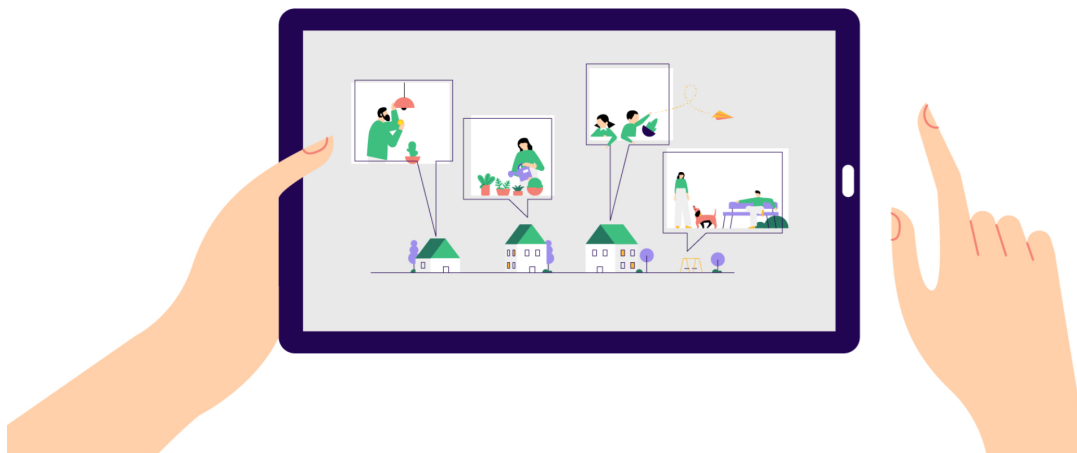
[Join the SPEN community now!](#)

Why join?

- **Network** with other SPEN experts across Europe

much more

- Look at existing **SPEN solutions, methods and technologies**
- Engage in syn.ikia's activities and stay alert on **upcoming events**
- Learn more about the community and what you can get out of it [here](#)



News from our family projects & partners



Introducing the Cultural-E 2CAP-Energy Atlas: A European Climate and Cultural Atlas for Plus Energy Building Design

[Cultural-E](#) is mapping built-environment-related climate and cultural differences that have a direct link with building energy consumption. This process entails an innovative approach that looks at the building's socio-cultural context and its boundary conditions to define appropriate solutions. Cultural-E project has developed a dedicated online tool designed with the scope of sharing the knowledge and results developed in the project with designers, policy makers and researchers. [Read more](#) and watch the trailer [here](#).



Designing Plus Energy Buildings: what architects have to say

EXCESS

Technology performance tests wrapped up for demo sites

The [EXCESS project](#) completed a first performance stress test of the innovative energy technology solutions to be implemented at four positive energy building [demo sites](#) in Helsinki (FI), Graz (AT), Granada (ES) and Hasselt (BE). The tests focused on demonstrating the reliability, resilience, safety and seamless integration of multiple technologies of the advanced energy solutions to demo site owners, building developers and end-users. Technical details and results are available [here](#).

[Check the results](#)



The state of Housing in Europe in 2021

After a year into the global health pandemic, Housing Europe's '[State of Housing 2021](#)' report provides a first analysis of the impact the COVID-19 crisis has had on public, cooperative, social housing and our communities. The flagship publication produced by the Federation's Housing Observatory illustrates the alarming housing reality in 21

[Read the full report](#)

The New European Bauhaus: The crossroad where arts and housing affordability must meet

Isn't the New European Bauhaus an opportunity to have post-COVID social housing that also helps to decrease the number of 700,000 people in Europe who sleep rough every night? The initiative can certainly deliver what it promises because the mix of inclusive, beautiful, affordable housing with thriving communities is something we see developed by [Housing Europe](#) members daily. [Read the op-ed](#) of our Secretary-General, Sorch Edwards for the spring edition of FEANTSA's magazine 'Homelessness in Europe'.

[Read the op-ed](#)

Academic publications

- Christian Ankerstjerne Thilker, Henrik Madsen, John Bagterp Jørgensen, [Advanced forecasting and disturbance modelling for model predictive control of smart energy systems](#)
- Meril Tamm, Joana Ortiz, Jordi Pascual, Jarek Kurnitski and Martin Thalfeldt, Jaume Salom. [Primary Energy Balance driven Integrated Energy Design Process of Positive Energy Building](#).
- Johannes Brozovsky, Arild Gustavsen, Niki Gaitani, [Zero emission neighbourhoods and positive energy districts – A state-of-the-art review](#).

Events

IREC at the Cold Climate HVAC and Energy 2021 conference, April 21st.

IREC presented its recent paper: "Primary Energy Balance driven Integrated Energy Design Process of Positive Energy Building" at the [Cold Climate HVAC and Energy 2021 conference](#).

The paper analyzes the primary energy balance differences between the syn.ikia and the Spanish Building Code criteria: assessment boundaries; exported energy considerations in the primary energy balance; and its impact on different building design alternatives for PEB. The work is based on the [Mediterranean demonstration site of syn.ikia](#).

Project syn.ikia

► **Horizon 2020** research and innovation programme

► The project aims at achieving:

- more than 100% energy savings
- 90% renewable energy generation triggered
- 100% GHG emission reduction
- 10% life cycle costs reduction

compared to the 2020 nearly zero-energy buildings.

Positive Energy Balance: (weighted exported energy) – (weighted imported energy) > 0

Figure: SPEN neighbourhood overview framework within syn.ikia project.

Info Q&A Media

11:15 - 11:30

Primary Energy Balance driven Integrated Energy Design Process of Positive Energy Building

Meril Tamm, Joana Ortiz, Jordi Pascual, Jarek Kurnitski, Martin Thalfeldt, Jaume Salom

1: Catalonia Institute for Energy Research, Catalonia, Spain; 2: Tallinn University of Technology, Estonia

Cold Climate HVAC & Energy

2020-01-01 April 2020, Tallinn, Estonia

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Plus Energy Homes and Neighbourhoods, moving beyond the traditional building energy assessment.

23 June 2021 / Undefined

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Multidimensional Analysis

Indicator categories

- Energy & environment
- Smartness & flexibility
- Economical
- Social
- IEQ

syn.ikia | Sustainable plus energy neighbourhoods

The COVID-19 crisis has brought sharper focus on our buildings, our neighbourhoods and their importance for our health, work and learning. It is no coincidence that the European Commission has placed positive energy districts – the ability of homes and neighbourhoods to save more energy than they use and omit greenhouse gas emissions – at the heart of the [Renovation Wave strategy](#) as a key leading action to decarbonise the buildings in Europe.

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6 lessons learned about social performance in Sustainable Plus Energy Neighbourhoods (SPEN)

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What to consider when designing indicators for social sustainability?

How do we measure social performance and why is it important when developing Sustainable Plus Energy Neighbourhoods (SPENs)?

What's coming next for syn.ikia?

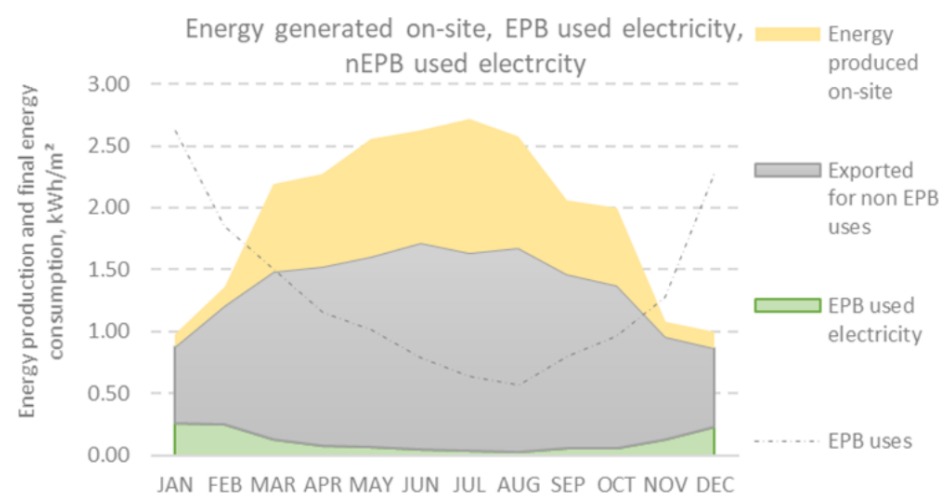
How to design sustainable plus energy neighbourhoods in different climates?

The report on design and performance prediction of the syn.ikia demonstration projects is coming soon, and here is a sneak-peak of the main results.

The overall aim of the report is to show how to design sustainable plus energy neighbourhoods in different climate and contexts. In doing this, we are answering the following questions:

- How can local renewable energy sources and storage be utilized most efficiently?
- How robust are the designs with respect to future scenarios of changing weather patterns, different user behaviour, and energy/power tariffs?
- How can flexibility measures be implemented to respond to the various scenarios?

The figure below shows an example of monthly energy performance for the Spanish demo case. The figure illustrates different important characteristics of the project, e.g. that the local energy generation (by photovoltaics) exceeds the energy need (EPB uses) from March to October.



The team tested a range of different technologies and design strategies, and analysed their consequences in terms of energy performance, costs, and indoor environment. Design strategies included different insulation levels, solar shading types and controls, natural ventilation, utilization of thermal mass, and different ways of integrating renewable energy systems such as BIPV and ground source heat pump systems. Sharing of energy between apartments, buildings, different types of storage systems, and EVs in the neighbourhood, were also explored.

Considering the most 'optimistic' and 'pessimistic' future scenarios and the range of different innovative energy technologies and strategies, the demonstration projects were designed to be the best compromise between environment, economics, and user satisfaction. In doing so, the syn.ikia demo projects are designed to be 'future-proof', i.e. to be robust with respect to environmental changes.

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