



syn.ikia

Sustainable
plus energy
neighborhoods

Dear friends and colleagues,

We are approaching the end of 2020 and the completion of syn.ikia's first year.

It feels like time is flying by. Let's take a break to review and reflect.

Throughout these twelve months, an efficient cooperation was established in the project, and a broad list of activities was executed according to our plan. I take this opportunity to thank all the syn.ikia partners for the dedicated effort and awesome teamwork!

The COVID-19 crisis has brought sharper focus on our buildings, our neighbourhoods and their importance for our lives. To help define and achieve the goals of sustainable plus energy neighbourhoods (SPEN) through the design, construction and operation phases, we created syn.ikia's [Methodology Framework for plus energy buildings and neighbourhoods](#). This framework includes Key Performance Indicators (KPIs) for the Energy Performance including Smartness and Energy Flexibility, Indoor Environment Quality, and Social and Economic factors. We also provide practical guidelines on how to calculate and implement the KPIs in the different project phases, from design to operation.

To boost large-scale renovation all over Europe, the European Commission has identified sustainable neighbourhoods as [one of the key areas of intervention and innovation](#).

Two of [our demonstration projects](#), in Uden and Barcelona, are finalising their designs and will soon start the construction phase. We are proud to present some insights from these demos in this newsletter. One key to achieving successful sustainable plus energy neighbourhoods (SPEN) is to work together in an effective integrated design process. This means to establish clear and shared goals for the project, to employ advanced simulation tools early in the design process, and to ensure dedicated cooperation throughout the process. We call it IEDN – Integrated Energy Design for the Neighbourhood Scale, for which the main steps are presented below.

Finally, we are working methodically and continuously to develop and promote our innovative solutions across the European communities. We published ten reports, participated in seven events as the Missions Conference, facilitated synergies with the [ZEN Research Centre](#), exchanged information with our [sister projects](#), and have been referenced in various media.

We remain committed to making green and resilient SPENs.

Happy new year!



What could Sustainable Plus Energy Neighbourhoods look like and how can we get there?



Methodology framework for Plus Energy Buildings and Neighbourhoods

IREC,
September 2020



This [report](#), written by our partner [IREC](#), 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 the Energy Performance including Smartness and Energy Flexibility, Indoor Environment Quality, and Social and Economic factors.

[Download the report](#)

Syn.ikia in a nutshell!

Learn about Sustainable Plus Energy Neighbourhoods (SPENs) and how we aim to increase the share of sustainable neighbourhoods with surplus renewable energy, resilient and affordable living places and communities in different contexts, climates and markets in Europe.

The leaflet is available in:

[English](#)

[Spanish](#)

[Dutch](#)

[Catalan](#)

[Norwegian](#)



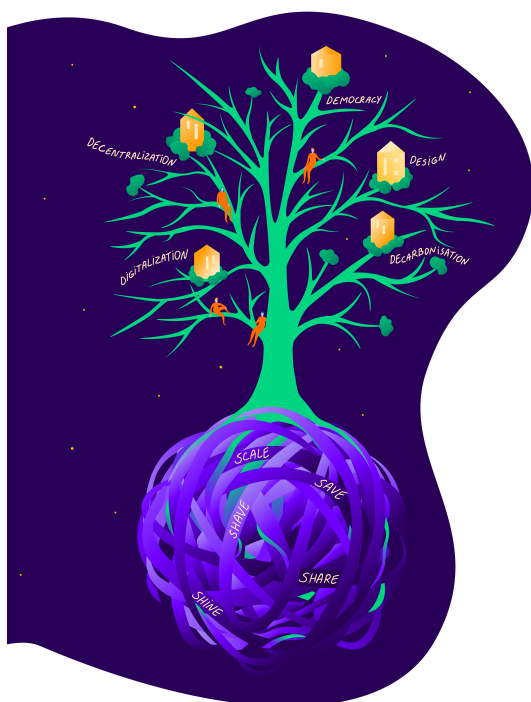
[Download leaflet](#)

We believe syn.ikia's work can pave the way, via four exemplary district renovation projects, to demonstrate the functionality of integrated, participatory and neighbourhood-based approaches, for the rest of Europe. The recognition of participatory neighbourhood-based approaches to building renovation is a great encouragement to develop, within this project's scope, solutions that will actively contribute to meet the European Commission's expectations and goals – **a more sustainable, healthier, inclusive Europe.**



[Read the press release](#)

Join the SPEN 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.

While we are getting the community ready, you can already sign up and we will automatically create your member profile once we go live.

[Register!](#)

News from partners

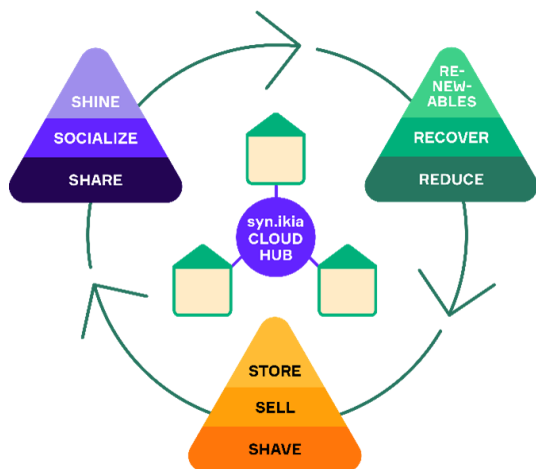
News from [NTNU](#) (Norwegian University of Science and Technology)

- **Making neighbourhoods resilient to future challenges**

What is scenario planning? Generally, scenario planning is used as a way to identify possible pathways towards a vision of the future. For syn.ikia, **scenario planning focuses on understanding how neighbourhoods can perform and navigate changes**, be they energy and power costs, climate change, different user behaviour patterns, policy measures. This is a way of reducing risks for developers, investors, occupants, and the society as a whole.

- **Designing neighbourhoods through an integrated process**

A design process for neighbourhoods with a special focus on energy and environmental performance has been developed. This process is called **Integrated Energy Design Process at the Neighbourhood Scale (IEDN)** and is based on the **Integrated Energy Design process (IED)** for buildings. It ensures that any issues that may have a significant impact on energy and environmental performance are discussed, understood and dealt with from the very beginning of the design process. These issues are followed up continuously as the project evolves.



We have now tested a first version of the IEDN in [syn.ikia's demo projects](#), consisting of 7 steps:

1. IEDN Design Team
2. Boundary conditions and ambitions
3. Quality Assurance
4. IEDN kick-off workshop
5. Design team Workshops, methods and tools used
6. Document Quality Assurance
7. Contracting

News from our Dutch demo neighbourhood – developed by [AreaWonen](#)

The building design of the Dutch demo project is now ready and the necessary permits for construction have been obtained. The contractor has started the demolition of the existing buildings that are still on site and will soon be able to start drilling the soil wells and start the foundation work in the short term.

Together with TNO, contractor and suppliers, AreaWonen is currently working hard to have all measurement, control and monitoring equipment incorporated into the demo project.

News from our Spanish demo neighbourhood – developed by [INCASÒL](#)

INCASÒL analysed the thermal insulation, the absorbance in external walls, the optimal distribution and surface of the windows, the shadowing elements, the blinds and their usage as well as ventilation. When it comes to flexibility, it was concluded that a centralized system based on heat pumps is needed, as well as a hot water distribution system based on 4 pipes, instead of 2. The generation of renewable energy will be maximized with 144 photovoltaic panels covering a roof surface of 244 square meters. These panels will have a generation power of 47 kWp and an estimated annual production of 69.000 kWh.

The novelty for this building lies in the centralization of the energy generation, which allows for more flexibility, efficiency & better energy management. The aim of this pilot building is to show that it is possible to develop buildings which can be energy producers, without excessive cost overruns.

Spanish demo



News from our family projects



[Cultural-E](#) has published 2 reports focusing on the climate, cultural and policy peculiarities related to the building sector which influence building design and energy use of EU residential buildings. The team also conducted a survey to identify the decision-making issues and performance indicators that are meaningful to designers

and stakeholders in the design phase of Plus Energy Buildings. Find the survey results [here](#).

Read the reports:

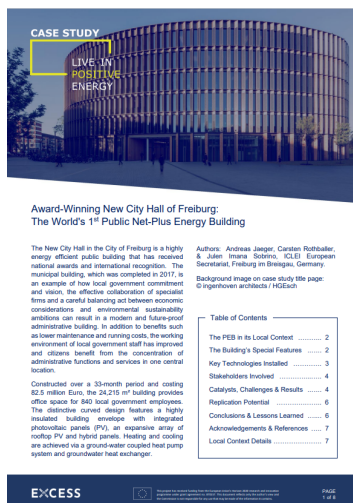
- [Climate and cultural differences in energy use in domestic buildings](#)
- [Local policies and boundary conditions for PEHs](#)

EXCESS

Making PEB concepts part of local authorities planning instruments

[EXCESS](#) published a guidebook with recommendations for local authorities to make positive energy building (PEB) solutions a strategic element in their local energy planning. The report and guide are based on a series of interviews conducted by project partners with local and regional authorities and planning experts from 15 European cities and regions.

Download the guidebook



Innovative & award-winning PEB solutions in Europe

EXCESS implementation of new solutions for its four Demo Sites (Austria, Belgium, Finland, Spain) benefits from successful PEB projects and experiences from across Europe. Read up on 10 successful and award-winning PEB innovations in the building sector from Poland to Norway in the case study collection.

10 PEBs case studies



The [ZEN Research Centre](#) (Research Centre on Zero Emission Neighbourhoods in Smart Cities) develops solutions for buildings and neighbourhoods with no carbon emissions. Consisting of a consortium of 33 partners covering the entire value chain, ZEN develops [nine pilot projects](#) where solutions and technologies are tested

to reduce carbon emissions in neighbourhoods.

In a recent publication, ZEN researchers presented a [study on a growing grassroots community phenomenon called Eco-villages](#). You can read about the communities' intentions of reducing the impact on the environment through co-existing and how they are trying to incorporate themselves into urban areas (the recent fourth wave of eco-villages).

[Read the full study](#)

[Learn more about the ZEN Research Centre](#)

Academic publications

- J. Brozovsky, N. Gaitani, A. Gustavsen, [A systematic review of urban climate research in cold and polar climate regions](#), Renewable and Sustainable Energy Reviews, 2020, <https://doi.org/10.1016/j.rser.2020.110551>
- Backe, Stian; Korpås, Magnus; Tomasgard, Asgeir (2021). [Heat and electric vehicle flexibility in the European power system: A case study of Norwegian energy communities](#). International Journal of Electrical Power & Energy Systems. Vol. 125, February 2021.

Events

[Webinar] Developing Positive Energy Districts in Europe: National Strengths and Weaknesses, Housing Europe, October 29th 2020

Syn.ikia's partner Housing Europe gathered a complete overview of the current state of the existing legislation on PEDs/ZEDs in four different countries in Europe (Norway, Spain, Austria and the Netherlands) to validate their functionality.

Focus of the discussion:

- What is the existing policy framework in your country in the areas of district approach, energy efficiency, renewable energy, digital technology and affordable living, health and wellbeing?
- Does it facilitate or prevent the development of PEDs/ZEDs?

Housing Exchanges

A webinar mini-series



Developing
Positive Energy Districts
in Europe:
National Strengths
& Weaknesses

29th October
14:30 CEST



[Online conference]
Multidimensional evaluation
framework for plus energy
buildings and neighbourhoods,
Sustainable Places conference,
October 30th 2020

Syn.ikia's partner [ABUD](#) shared the results of our recent work on the methodology to evaluate the performance and impact of positive energy buildings and neighbourhoods on different areas: Energy and Environment, Economy, Indoor Environmental Quality (IEQ), Society and Smartness and Energy Flexibility.

Watch the recording [here](#).

[Online conference] Syn.ikia at CIES 2020 – XVII Congresso Ibérico e XII Congresso Ibero-americano de Energia Solar, November 3rd 2020

Syn.ikia's partner [IREC](#) participated in the round table "Renewable Energies in Cities: Towards Sustainable Positive Energy neighbourhoods" in the framework of CIES 2020 conference. The round table aimed to discuss the need of cities and neighbourhoods to promote Positive Energy Neighbourhoods in the context of the energy transition.

IREC presented the syn.ikia concept and how the project aims to develop, analyse, optimize and monitor plus-energy neighbourhood demo projects in four different climatic zones.

[Online conference] Missions in Norwegian - Knowledge Base Conference 2020, Norwegian Research Council, November 25th 2020

Missions in research and innovation policy are about setting ambitious, measurable and time-bound goals to solve societal challenges that affect most people, and are central to the design of the EU's new framework program, Horizon Europe.

In this context, syn.ikia's coordinator NTNU (Niki Gaitani), presented syn.ikia as a mission-oriented project that stimulates the interaction between different sectors and contributes to greater public investments in research and innovation.

Learn more about the conference and watch the recording [here](#).



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