

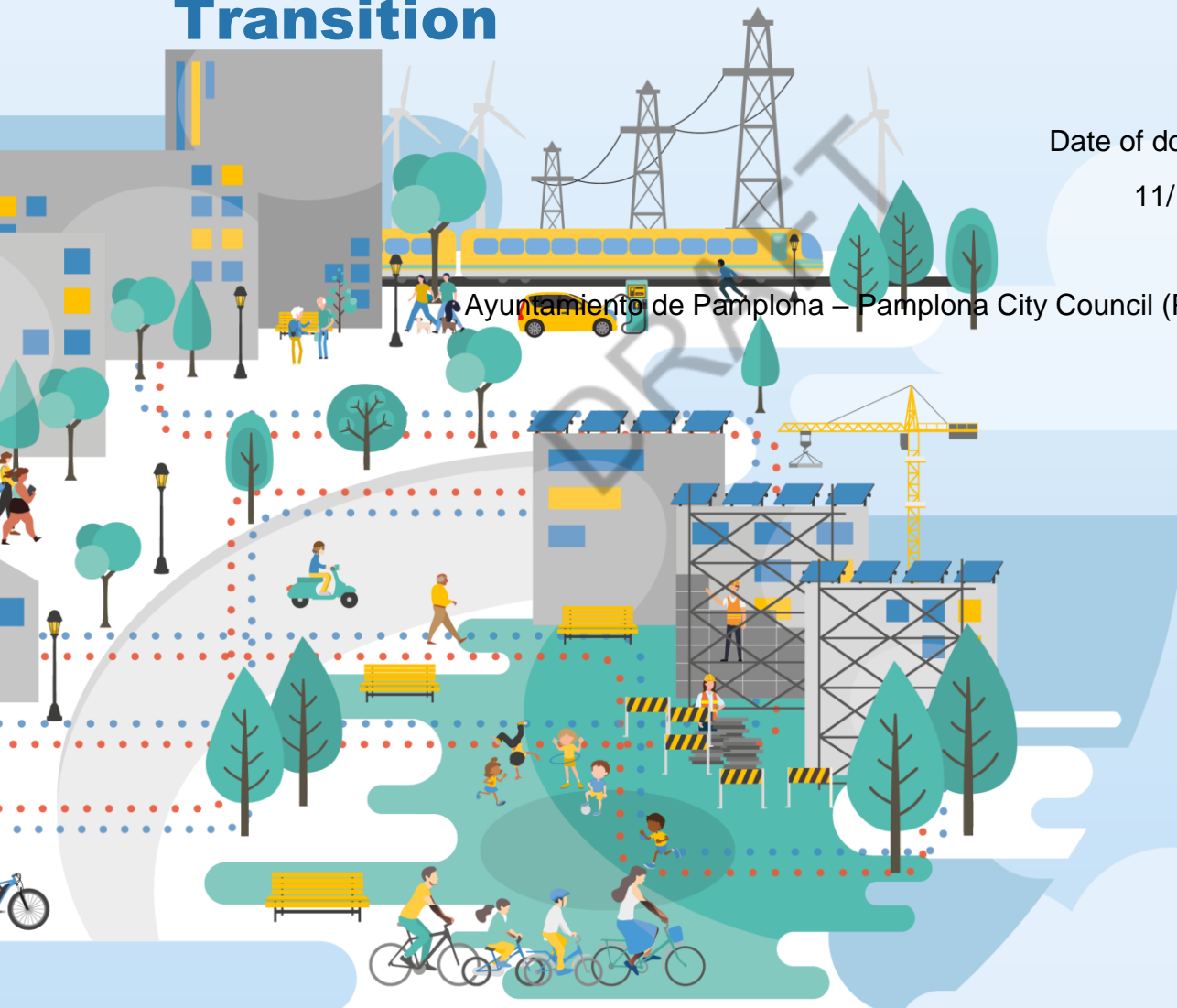
Deliverable 2.3:

Best Practices for Citizen Engagement and Awareness Raising to Facilitate PEN Transition

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Ayuntamiento de Pamplona – Pamplona City Council (PAMPL)



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Abbreviations and Acronyms

Acronym	Description
AOA	Apartment owner association
BAU	Business as usual
BM	Business model
BP	Best practice
EC	Energy community
EU	European Union
EPCS	Energy Performance Certificates
LL	Living Lab
NGO	Non-governmental organisation
OSS	One stop shop
PED	Positive energy district
PEN	Positive energy neighbourhood
RaaS	Renovation as a service
REC	Renewable energy community
RES	Renewable energy sources
ToR	Terms of reference
SMEs	Small and medium-sized enterprises
VR	Virtual reality

Table 1: Abbreviations and Acronyms

Executive Summary

The implementation of a positive energy neighbourhood (PEN) implies a great challenge, and an even greater one if this is to be implemented as a Living Lab. Living Lab methodologies require the involvement of all the stakeholders of the quadruple helix, including the local citizens, for whom PENs and Living Labs are abstract concepts.

There is increasing recognition across the EU that citizens have a crucial role to play in decision-making on public policies, their implementation and co-creation processes¹ [1]. As far as energy transition is concerned, current challenges and long-term objectives (related to emission reduction, adaptation and resilience, and just transition) will not be achievable without the involvement of the citizens. To achieve these goals, it is necessary for citizens to be informed in a clear, concise and simple way. Ignorance or over-information can cause rejection or indifference to a project that is beneficial to society as a whole.

Therefore, it is extremely important to put in place a strategy aimed at raising public awareness, engaging the different agents and stakeholders, disseminating information, educating and training in basic aspects of energy use, as well as defining appropriate tools to develop a co-creation process that engages the citizens.

The **objective** of this document is to offer a guide that inspires and facilitates the engagement of society through a series of examples of best practices (BP) that proved useful in the three Living Labs of the oPEN Lab project.

Knowledge of the social reality of the target area or territory is very important since it will largely determine the success of projects. Therefore, it is highly recommended to have qualified staff with in-depth knowledge of the socioeconomic conditions of each neighbourhood, its customs and uses, and the ways in which people relate to each other. The way in which local citizens are approached will determine the success of each proposal.

Given that the proposed best practices are intended to increase the awareness and engagement of citizens, accurately assessing the degree of success of the actions may be difficult, but it is possible to expect an increase in the number of agents involved, an increase in the number of projects implemented and a reduction in energy consumption in the areas involved² [2].

¹ European Commission, “100 climate-neutral cities by 2030 - by and for the citizens” 22 September 2020. [Online].

² Journal of physics, “oPEN Lab project as an underpin innovation for Positive Energy District solutions in Pamplona”, November 2023. [Online].

1. Introduction

The main objective of the oPEN Lab project is to upgrade the existing buildings and facilities in specific neighbourhoods in the cities of Tartu (Estonia), Pamplona (Spain) and Genk (Belgium) so that they become fully operational positive energy neighbourhoods (PEN) and operate as PEN Living Labs.

A **positive energy neighbourhood** is an energy-efficient and energy-flexible urban area or group of connected buildings that produces net-zero greenhouse gas emissions and actively manages an annual local or regional surplus of renewable energy.

The oPEN Lab project will demonstrate the feasibility of promising technology, processes and social innovations, leading towards PENs and paving the way for wider replication.

The oPEN Lab objective is based on the following **principles**:

- To follow participatory approaches to engage and involve the neighbourhood communities in the creation of a vision for their oPEN Lab PEN.
- To test innovation in an integrated approach combining sustainable design tailored to the local context, the seamless industrial renovation workflow, and the generation of storable renewable energy.
- To accelerate the spread of oPEN Lab PENs by upscaling and replicating the solutions tested within the regions and countries of the Living Labs and across Europe.
- To showcase how the innovative technologies and participatory processes applied in oPEN Lab PENs can best contribute to the implementation of the Renovation Wave and its objective of doubling the renovation rate in the EU.

The three Living Labs implemented in oPEN Lab are different in nature, and therefore so are the activities implemented locally³ [3]. The objective of this deliverable is to provide an overview of different approaches and methodologies used to promote awareness and social engagement in the implementation of PENs. These best practices are good examples of how to engage the community (citizens) in activities and projects (in this case oPEN Lab) where their participation is required or recommended to get better long-term results. This ensures that the quadruple helix approach is followed, “a model used to identify stakeholders from citizens, government, industry and academia and their relationship to the Living Lab”⁴ [4] (see Figure 1). Twenty examples are provided of best practices carried out in the oPEN Living Labs of Genk, Pamplona and Tartu. Each one describes the activity carried out, the main objective, the target groups, the results obtained, and the lessons learnt.

³ Further details on each of the Living Labs are available on <https://openlab-project.eu/living-labs>.

⁴ oPEN Lab, “Capacity building handbook and mentoring report. For the set up and implementation of Positive Energy Neighbourhoods through a Living Lab Approach”, March 2023. [Online].

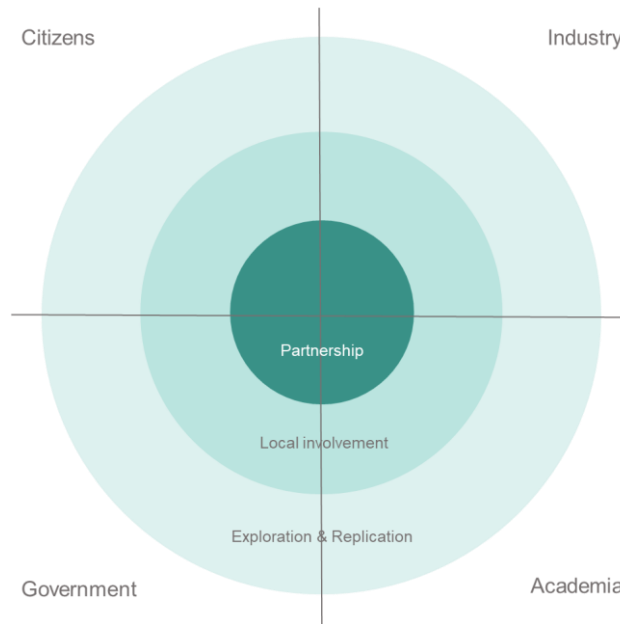


Figure 1: Quadruple Helix Model
(Source: oPEN Lab, D1.4 Capacity Building handbook and mentoring report)

For this purpose, an analysis is performed of the methodology used in the sessions carried out in the three Living Labs, its pros and cons, the achievements and lessons learnt. With this detailed information, a series of recommendations can be made to successfully increase citizen's awareness and commitment to PENs.

2. Best Practices in Living Lab Genk (BE)

The Living Lab initiative in Genk spans the historic Waterschei garden city district and the 'Nieuw Texas' neighbourhood. The Waterschei district, with its heritage value, was originally established to house employees of former mining companies, while Nieuw Texas, built in the 1990s, consists of 85% social housing. A pilot renovation of several single-family homes is currently underway in Nieuw Texas. Figure 2 provides a schematic view of the Genk Living Lab district. This ambitious project aims to transform both areas into a PEN.



**Figure 2: Schematic view of the Genk Living Lab implementation area.
From left to right: Waterschei Garden City, Nieuw Texas Social housing estate
and the KRC Genk football stadium**

To develop a comprehensive renovation solution, a series of co-creation sessions were organised, involving tenants, homeowners, researchers and industrial partners. These are presented below.

2.1. Co-creation sessions with Appreciative Inquiry method

Based on the **Appreciative Inquiry method**, “an asset-based approach to organisational and social engagement that utilises questions and dialogue to help participants uncover existing strengths, advantages, or opportunities in their communities, organisations, or teams”⁵ [5][6] [6] [6] [6] , co-creation sessions were organised by Wonen in Limburg⁶, together with VITO⁷, the City of Genk and Stebo⁸ involving tenants and partners (public sector, industrial

⁵ Organizing Engagement. <https://organizingengagement.org>

⁶ Wonen in Limburg (WiL) is the Social Housing Company of the province of Limburg (Flanders).

⁷ VITO is an independent Flemish research organisation in the area of cleantech and sustainable development. VITO is the overall coordinator of oPEN Lab.

⁸ Stebo is a non-profit organisation that develops and delivers projects, services and initiatives to address social and economic exclusion including access to the labour market, housing and education. This includes supporting entrepreneurs from disadvantaged groups, such as recent migrants, with information services, training, coaching and support with networking and project development. www.stebo.be.

actors and researchers) with the aim of investigating ways of turning a neighbourhood, a street or a house into a positive energy story.

Taking into account the experience and knowledge of all participants, the **objective** was to connect the world of the residents to future energy-challenges. The driving force for this story is the interplay between all those involved, an interplay between daily energy consumption and innovative ideas. This story creates a win-win situation in the neighbourhood and houses.

The **main target group** of the activity were the inhabitants of the Nieuw Texas neighbourhood, although both public and private researchers participated. Industrial partners of the oPEN Lab were also present, to gain a better understanding of what makes the neighbourhood tick.

This engagement activity took place in three co-creation sessions with residents and professional partners, organised according to the following structure:

- Information about the project (what, why, who, where & timeline).
- Review of previous sessions – how to continue in the present session.
- Working sessions in smaller groups.
- Review of results.

This structure was well prepared in advance and included a detailed script, and each part of the session had a defined duration and a clear aim.

Different formats can be used in the session. It may comprise a first part of 10 minutes where participants are asked to have one on one discussions about what a PEN is for them, followed by 15 minutes of small group discussions using post-it notes to summarise, after which the leader of each group is asked to summarise the group discussion for the other groups. Another format that was used was that the participants were asked to visualise their ideas in small groups using pictures and all sorts of craft materials.

A couple of days before using the script in the sessions, it was tested on a small group of about five ambassadors of the neighbourhood to gather feedback on the session format and optimise the timings. These ambassadors were also asked to convince their neighbours to join the co-creation sessions.

These series of sessions took place in the following logical **timeline**:

1. Finding the topic

The **topic** of the sessions was defined, based on project definition, house visits with residents, partners, etc.

2. Session 1 - Discover (19/3/2022)

In this session, the Genk Living Lab team wanted to **discover** what a PEN means for everyone. What were the initial expectations of the residents? A total of 29 residents (22 tenants and 7 homeowners) participated in this session, which resulted in a visual report, as shown in Figure 3.

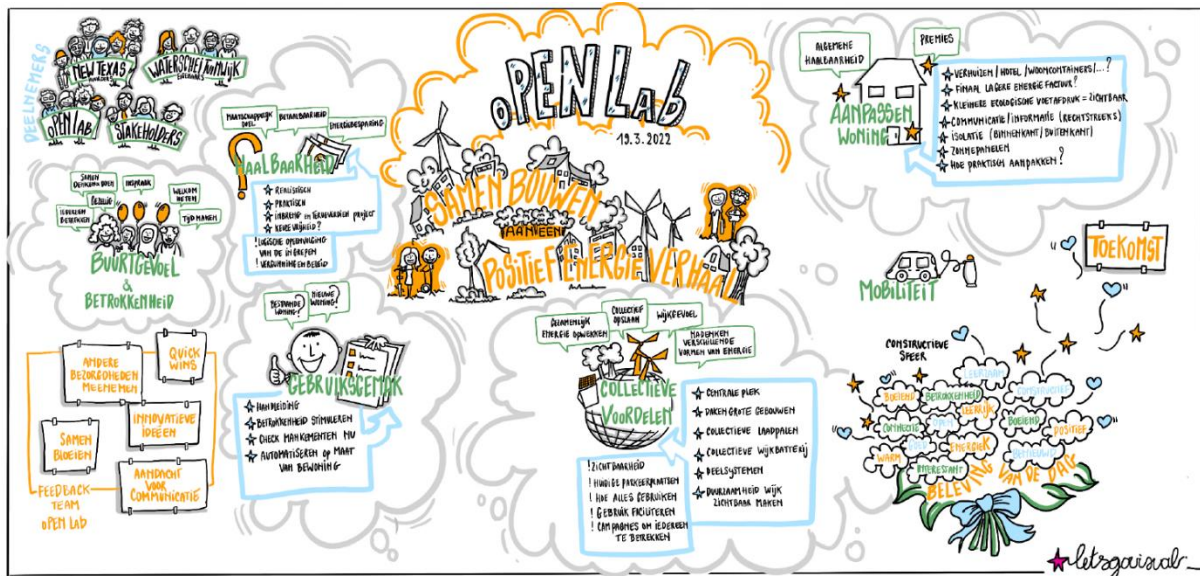


Figure 3: Visual report of the discover co-creation session

3. Session 2 - Dream (23/4/2022)

The idea of the next session was to **dream** about the ideal PEN in the future. What could happen in houses? What could happen on a collective level in a dream-world (out of the box thinking)? A total of 20 residents (13 tenants and 7 homeowners) participated in this session, which resulted in an overview of crafted dreams.

4. Session 3 - Design (14/5/2022)

In the last session, the aim was to make ideas feasible: what can be done and where, why, and by whom, etc.?

These inputs formed the basis for the **design** team of the renovations. A total of 23 residents (13 tenants and 10 homeowners) participated in this session. It led to ideas being elaborated on collective initiatives that contribute to the transformation of the neighbourhood into a PEN, starting from street plans of the neighbourhood (see Figure 4).



Figure 4: Designing collective initiatives based on street plans of the neighbourhood.

5. Event - Celebrate (29/6/2022)

Finally, the residents were invited to a neighbourhood party to strengthen the community feeling and **celebrate** the results achieved by the process (see Figure 5). During the co-creation sessions, a great deal of input was gathered regarding improvements that were desired in the dwellings and collective initiatives supported by the inhabitants. This input has been integrated into the renovation design plans of the architects, ranging from minor details such as adding doors to the dwellings to larger interventions such as changing the geometry of windows.



Figure 5: Image of the neighbourhood party

The **main conclusions** and most important **lessons learnt** from these co-creation sessions can be summarised as follows:

- When organising co-creation sessions, **the central topic has to be clear**. In this project, the Genk LL team talked to tenants, homeowners and partners to determine the central topic: starting from discovering the definition of a PEN to designing practical interventions that can be taken to achieve it.
- Preparing a **script for each session** (location, time-management, grouping, working groups, questions) with a test of the script in advance is key for the success of the sessions.
- Addressing/**inviting people personally** increases the participation.
- Working with **ambassadors** works; residents enthuse residents.
- The use of **language appropriate** to the target population (understandable, approachable) is crucial.
- Maximum **heterogeneity of the groups is recommended**.
- For the neighbourhood level, providing **one single contact person for a Living Lab** facilitates bilateral communications.

2.2. Conference ‘Genk is Menschenwerk’

The City of Genk, in cooperation with C-mine and Architectuurwijzer, organised a congress titled "Genk is Menschenwerk" (Genk is People's Work). It included workshops and discussions focusing on four ground-breaking urban renewal projects in Genk, serving as a platform for professionals and experts to exchange ideas and experiences in the field of urban development. An exhibition area was also established in the networking area (see Figure 6).

The **general objective** of the activity related to oPEN Lab was to showcase and discuss innovative approaches to sustainable housing and urban living. Through the oPEN Living Lab Genk project, participants explored the integration of cutting-edge technologies in heating, ventilation, and energy storage systems within both social and private housing sectors in Genk, aiming to inspire similar initiatives in other urban areas.

The **target audience** of the event included urban planners, architects, policymakers, housing experts, researchers, students and members of the public interested in urban development and sustainable living practices. The workshops and discussions were designed to cater for professionals and stakeholders involved in various aspects of urban renewal and housing projects.

The workshops were centred around four key urban renewal projects in Genk, each addressing different aspects of sustainable urban development:

- The revitalisation of the Stiemerbeekvallei green corridor.
- The implementation of innovative technologies in social and private housing through the oPEN Living Lab.
- The renovation masterplan for the Kolderbos social housing district.
- The plans for urban decongestion and softening of public spaces in downtown Genk and along the Evence Coppéelaan.

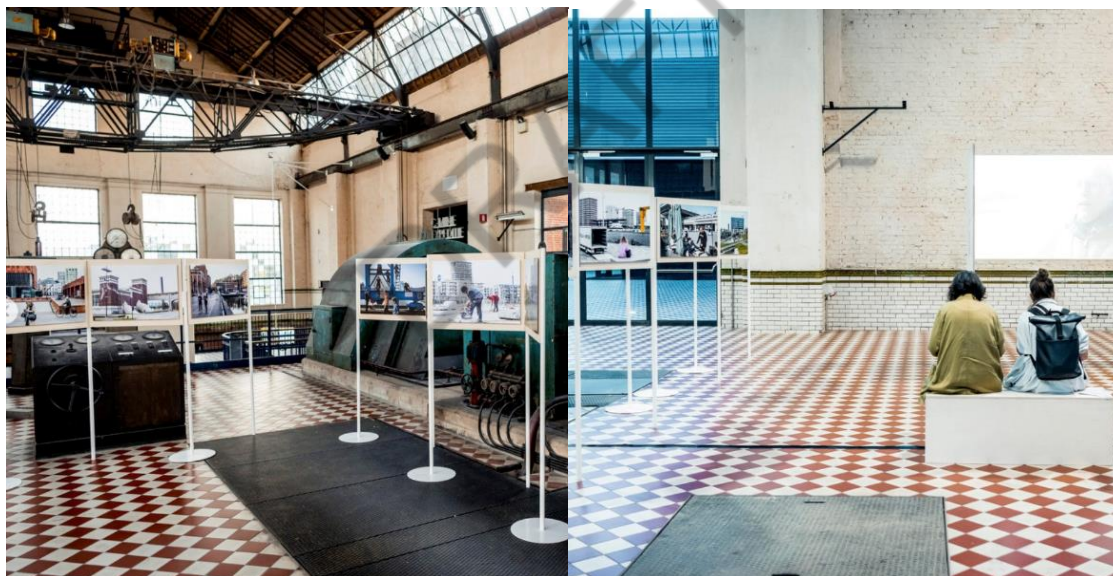


Figure 6: Images of the photographic exhibition at Genk Is Mensenwerk

The **main conclusions and lessons learnt** from this activity can be summarised as follows:

- **Emphasis on interdisciplinary collaboration:** the event underscores the importance of bringing together professionals from fields such as architecture, urban planning, environmental science and social housing to foster innovative solutions for urban renewal.
- **Highlighting local initiatives:** by showcasing specific urban renewal projects in Genk, the event encourages participants to learn from local experiences and adapt successful strategies to their own contexts.

- **Promoting knowledge exchange:** through workshops and discussions, participants have the opportunity to share insights, best practices and lessons learnt from their own experiences in urban development, fostering a collaborative learning environment.
- **Inspiring action and replication:** by presenting successful case studies and innovative solutions, the event aims to inspire participants to take action in their own communities and replicate similar initiatives, contributing to the advancement of sustainable urban development practices across regions.
- The use of **language appropriate** to the target population (understandable, approachable) is crucial.

2.3. Neighbourhood Information Point

To inform on the developments of oPEN Lab-related activities, Nieuw Dak (now Wonen in Limburg) and Stebo, in coordination with the City of Genk, established an information point in the neighbourhoods where construction work is being undertaken (Nieuw Texas and Garden City of Waterschei).

The **objectives** of this Neighbourhood Information Point are to:

- **Provide updates and** information about the oPEN Lab project to inhabitants of the neighbourhood.
- **Answer general questions** about PENS, home renovation, subsidies, energy consumption, etc.
- **Recruit residents as candidates** (test dwellings) for the project.
- **Foster transparency, engagement, and communication** between residents and the project organisers.

The **target population** of this Neighbourhood Information Point in Genk is:

- Nieuw Texas: inhabitants of the neighbourhood, more specifically, tenants of Wonen in Limburg, which has 144 dwellings and approximately 450 inhabitants.
- Waterschei: all residents of the Garden City of Waterschei, with 1.100 dwellings, approximately 4.000 inhabitants.

The **Neighbourhood Information Point in Nieuw Texas** is organised as an open-door session held bi-weekly in one of the dwellings within the neighbourhood.

The **'Wijkloket' (Neighbourhood Information Point) in Garden City** is organised as an open-door session held once a month in the community centre.

Moreover, residents are invited to drop by at their convenience during designated hours to receive updates, ask questions and engage in discussions related to the oPEN Lab project. Project organisers or representatives are available on-site to address inquiries, provide clarifications and gather feedback from residents.

Informational materials, such as brochures, flyers and posters, may be displayed or distributed to provide details about project goals, progress, upcoming events and opportunities for involvement.

The atmosphere is informal and welcoming, encouraging residents to feel comfortable sharing their thoughts, concerns and ideas related to the project (e.g. sugar waffles and coffee is

provided). By March 2024, a total of 52 people has been reached by this Neighbourhood Information Point.

The **main conclusions and lessons learnt** in relation to the implementation of the model of Neighbourhood Information Points are:

- The neighbourhood information points serve as a valuable platform for **promoting transparency, communication and community engagement**.
- Direct interaction with residents allows project organisers to **address concerns, gather feedback and tailor project activities** to meet the needs and preferences of the community.
- Regular updates and open communication **build trust and confidence** among residents, fostering a sense of ownership and collaboration in the project.
- The information points highlight the importance of creating **accessible and inclusive spaces for dialogue** and information sharing within the neighbourhood, strengthening social cohesion and community resilience.
- The information points help to **solve apparently small issues** before they become big ones.
- Working with **ambassadors** works; residents enthuse residents.
- The use of **language appropriate** to the target population (understandable, approachable) is crucial.

2.4. Neighbourhood Parties

Nieuw Dak (now Wonen in Limburg), in cooperation with other partners (VITO, City of Genk, LITO and Stebo), organised a neighbourhood party in the central park of the Nieuw Texas neighbourhood, aiming to **celebrate the selection of the tenants** participating in the oPEN Lab renovations.

The main **objective** of this neighbourhood party was to:

- Familiarise residents with the initiative and foster a sense of community spirit.
- Foster excitement about the upcoming project.
- Celebrate and engage with the selected participants of the project area of the European renovation project within the neighbourhood.
- Introduce the artists involved in the Transisthor project (see subchapter 2.5) residing in the neighbourhood to the participating residents.

This party was aimed at residents of the neighbourhood and local community members, stakeholders and organisers involved in the project (see Figure 7).

The party was a vibrant and lively gathering held in an outdoor park in a central location within the neighbourhood. It featured music, food (waffles and home-made food of different cultures by residents), drinks, and various entertainment options suitable for all ages. A total of 82 people participated in this event.



Figure 7: Image of the neighbourhood party

Looking back at the neighbourhood party, the following **conclusions and lessons learnt** could be taken forward:

- The party served as an excellent opportunity to strengthen bonds within the neighbourhood and build a **sense of camaraderie among the selected participants**.
- It highlighted the importance of community engagement and collaboration in large-scale projects, fostering a shared **sense of ownership and responsibility**.
- The event provided another **platform for residents to voice their ideas**, concerns, and aspirations for the upcoming renovation project, facilitating open communication and dialogue.
- It **set a positive tone** for the project implementation phase, creating excitement and enthusiasm among the participants and the wider community.
- Addressing/**inviting people personally** increases the participation.
- Working with **ambassadors** works; residents enthuse residents.

2.5. Project Transistor⁹

In this project [6], the artists of the Luca School of Art¹⁰ aim to create large, eye-catching murals for and with the neighbourhood (see Figure 8). They work with artworks printed on solar panels, which will provide sustainable energy for the district.

⁹ <https://www.transistor.eu/>

¹⁰ <https://www.luca-arts.be/en/node/64321>

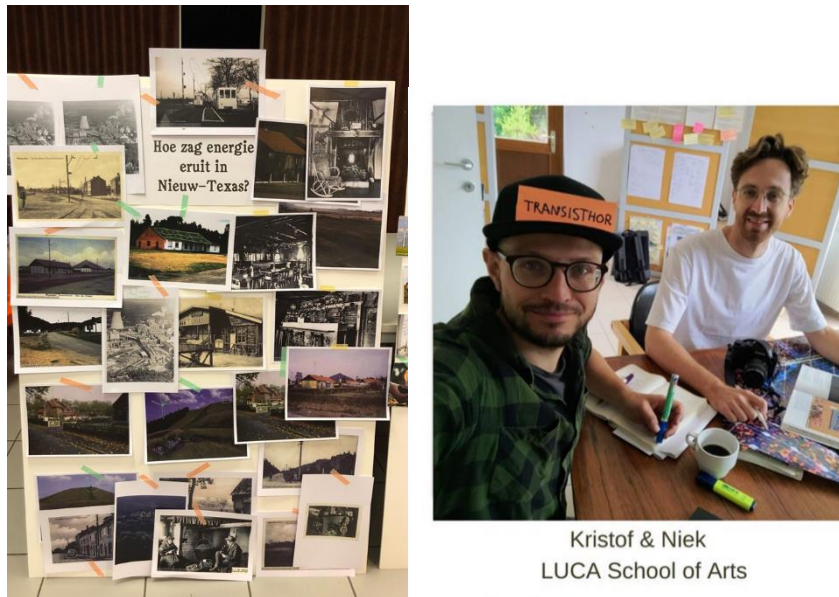


Figure 8: Left - one of the murals created ("What did energy look like in Nieuw Texas?") / Right - two of the artists involved

Luca School of Art and the City of Genk, with the support of SAAMO (a non-profit organization working on housing and social inclusion in Flanders and Brussels) and GIGOS atelier Zwiep, are involving residents of the two neighbourhoods participating in the oPEN Living Lab in designing drawings in 2024.

Together with the residents, they are considering how these images can be meaningful to the community and the message they want to transmit about the neighbourhood's rich energy past and envisaged energy future. This is an ongoing project with the residents.

The **aim** of this arts project is to educate, activate and make a wider audience aware of green and sustainable energy. The process involves tenants, homeowners, local residents and visitors to Waterschei and New Texas. The artists will be active in the two neighbourhoods for about a year.

Several co-creation sessions have been organised as part of the Transisthor project:

In the first session, the process was initiated with the residents, thinking about what energy was like in the past, how energy is experienced today and what energy should be like in the future. They delved into the mining archive and chose the images they wanted to work around.

During the next session, they picked up where they left off in the first workshop and used artificial intelligence (AI) to design new images.

Next, new participants participated in multiple other sessions, adding to the images. Furthermore, possible locations for the solar panels were considered during these sessions (see Figure 9).



Figure 9: Creation of one of the murals

An event was organised to exhibit the collage developed in the sessions where new images could be added immediately by those present at the event (see Figure 10).

The main goal of these sessions was to create awareness and bring about changes in behaviour. In total, 40 people participated in at least one of these workshops during the event.

The main **lessons learnt and conclusions** in relation to Transisthor are:

- Using **artists as bridging figures** works.
- The art approach allowed the **urgency for climate action to be revealed** but **without being pedantic**.
- The process facilitated the **creation of a shared vision for the future**.
- Using **art as a common language** (different from textual language) works.

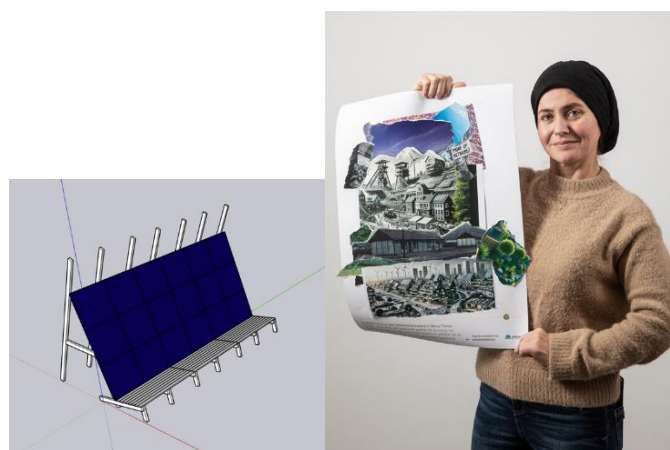


Figure 10: A schematic view of a *solar bench* and mood board to be printed on it.

2.6. Information sessions - test dwellings Waterschei

Stebo, with the support of VITO and the University of Leuven (KU Leuven), organised information sessions with residents of the Garden City of Waterschei, one of the neighbourhoods where the oPEN Living Lab Genk project is being implemented.

The **objectives** of these sessions were to:

- Examine the technical preconditions of a test house.
- Inform residents about the data monitoring in the dwellings.
- Give residents the opportunity to ask questions.
- Listen to possible concerns of the residents.
- Convince residents to sign up as test-house-candidates.

A total of two information sessions (one before and one after the summer of 2023) were held at SAAMO's community centre in the Garden City during which concrete answers were given to the questions below:

- What does a resident have to do to qualify as a "test home"?
- Which equipment/techniques will be installed?
- Who will install the equipment/techniques?
- How long will the test phase take?
- What are the financial aspects for residents?
- Is there a possible catch?

The first session took place on 29 June 2023 and was attended by 9 residents, the second took place on 25 September 2023 and was attended by 12 residents.

Besides the usual PowerPoint presentations, monitoring equipment was available for demonstration at the sessions. Waffles were distributed among the participants in order to get a relaxed, convivial and informal ambience (see Figure 11).



Figure 11: Flyer announcing the information session and image of the session.

The sessions resulted in four homeowners registering interest for their dwelling to be renovated as part of the oPEN Lab project.

The main **conclusions and lessons learnt** from these sessions can be summarised as follows:

- **Sharing the right technical information at the right moment** in the process is a must (timing is key).
- Get prepared to possible **'sceptical noise makers'** (a type of 'renovation-persona' identified in MUPEDD project¹¹ [7]) that may attend this kind of information sessions. It is very difficult to involve them in a project in a positive way. Preventing them from spreading false rumours and putting the project in a negative light can be done by politely and calmly sharing the correct information (during and after the information session). Be proactive when having to tackle with this profile of participants, ignoring them can have a negative consequence for further capacity building.
- Using **accessible language**, even when dealing with a technical topic is crucial. Taking the necessary time to explain complex terms is needed.
- Creating an **informal ambience** helps.

However, even though all the attending participants were satisfied with the (level of technical) information given, reaching the whole community of the project area of the Garden City of Waterschei (1.100 addresses) proved to be a hard task, even with a broad campaign with different materials (online/offline – visible – individual).

2.7. Kennis en Netwerkdag Energiehuis Limburg (Knowledge and Networking Day)

On 28 November 2023, a Knowledge & Networking Day was organised by Energiehuis Limburg (with Stebo as executing partner), aiming to strengthen collaboration with all actors from the province of Limburg involved in answering citizens' energy queries. The City of Genk, VITO and Wonen in Limburg (WiL) attended as participants and speakers.

The general **objective** of this activity related to oPEN Lab was to **foster collaboration between Energiehuis Limburg and municipalities, to address the energy and renovation challenges of Limburg residents more effectively**. By bringing together representatives from 37 Limburg municipalities, social organisations and other relevant stakeholders, the event aimed to facilitate discussions and the sharing of knowledge, and to explore opportunities for cooperation, including the implementation of innovative solutions such as those demonstrated by the oPEN Lab project.

The primary **audience** for the event included municipal employees, representatives from OCMWs (Public Social Welfare Centres), as well as individuals and organisations involved in providing assistance and guidance to Limburg residents on energy-related matters, renovation, loans and grants.

¹¹ MUPEDD (Managing Uncertainty in Positive Energy District Design) is an innovative research project in the field of PED (Positive Energy Districts) developments, infill and expansion projects. The aim of the project is to conduct beyond state-of-the-art research on techno-economic and social parameters to support the financial, legal and organizational decision-making process of the involved private and public stakeholders. <https://vito.be/en/project/mupedd>.

The event¹² welcomed a total of 109 participants from diverse backgrounds, including local government, social organisations, energy agencies and financial institutions.

One of the breakout sessions was a **guided walking tour** hosted by Stebo in Waterschei (Thor site) during which various relevant stops were made to talk more in detail about different aspects of the oPEN Lab project in the neighbourhood. Altogether, 45 participants took part in the walking tour (see Figure 12).



Figure 12: Participants visiting the various information points

In addition, the event featured:

- A welcome word from the Flemish Minister of Energy followed by two keynote speakers.
- Informative sessions and networking opportunities designed to enhance collaboration and knowledge-sharing among participants.
- Informative sessions covering topics such as energy efficiency, sustainable renovation practices, available loans and grants, and the role of municipalities in supporting residents with energy-related challenges as well as energy sharing and energy communities.

During the Knowledge and Networking Day two evaluations were carried out, covering two different perspectives:

- **Evaluation** of the Knowledge and Networking Day: most common feedback concerned a general appreciation of the insights gained into the vast amount of support on offer today and the persons to be contacted. The event provided a good framework/basis for referring citizens to the relevant organisation, leading to more efficient cooperation.
- **Evaluation of the oPEN Living Lab Genk:** oPEN Lab (aims, methodology, etc.) was highlighted during a guided walk and during one of the sessions (on innovation). This opportunity broadened the Limburg stakeholder network for the project, possibly leading to the upscaling of similar activities in other Limburg municipalities.

Looking back at this event, the following **lessons learnt** were taken forward:

- **Enhanced collaboration:** the event facilitated stronger collaboration between Energiehuis Limburg and 37 Limburg municipalities, fostering a sense of unity and shared purpose in addressing energy and renovation challenges.

¹² <https://energiehuislimburg.be/kennis-netwerkdag/>

- **Increased awareness:** participants gained valuable insights into the resources available, including loans, grants and support services, enabling them to better assist Limburg residents with energy-related inquiries and renovation projects.
- **Networking opportunities:** the event provided a platform for participants to connect with each other, share experiences and forge partnerships, leading to potential collaborations on future projects and initiatives.
- **Knowledge exchange:** through informative sessions, attendees had the opportunity to learn about innovative approaches to energy efficiency and sustainable renovation, gaining inspiration and practical ideas for implementation in their respective municipalities.
- **Empowerment:** by engaging with experts and stakeholders in the field, participants felt empowered to take proactive steps towards addressing energy and renovation issues within their communities, contributing to a more sustainable and resilient future for Limburg.
- The use of **language appropriate** to the target population (understandable, approachable) is crucial.

2.8. Flanders Technology & Innovation Festival

The Flanders Technology & Innovation (FTI) festival was organised as several sessions by VITO with the support of Nieuw Dak (now Wonen in Limburg) and Stebo in March 2024.

This FTI festival **aimed** to increase awareness and support for Flemish innovation and technology through a 10-day event supported by Event Flanders and to showcase the region's innovative capabilities and how they contribute to future readiness.

The **objective** of the oPEN Lab sessions was to showcase ongoing renovation works within the neighbourhood as part of the FTI event, and to provide an opportunity for both the general public (residents of the neighbourhood, local community members and other interested individuals) and construction professionals (architects, engineers, contractors and other industry experts) to witness the renovation process first-hand and engage with experts (see Figure 13).



Figure 13: Visitors of renovated dwelling inspecting the energy box

The FTI festival took place in different locations across Flanders, but the main features in relation to oPEN Lab are summarised below:

- The event featured **guided tours** where participants could observe the various stages of the prefabricated renovation works taking place within the neighbourhood.
- Experts **involved in the project were stationed at various points** along the tour route to provide insights and explanations, and to answer questions from attendees.
- Participants had the opportunity to **interact directly** with the professionals working on the project, gaining valuable knowledge about construction techniques, sustainability practices, and innovation in renovation.
- The activity aimed to create an immersive and educational experience for attendees, **highlighting the importance of innovation and technology** in modern renovation projects.

At FTI Hasselt (off site)

- oPEN Lab was presented as a showcase (one of five breakthrough projects) at the seminar (on accelerating energy transition in urban neighbourhoods and village centres).
- Interactive round table and panel discussions were organised on integrated energy projects on a neighbourhood scale (social, legal, policy, financial and technical).

At FTI Antwerp (off site)

- A **live presentation** of an energy box (one of the solutions developed within oPEN Living Lab Genk) and displays presenting the project helped the public understand its scope (see Figure 14). An expert was always available to offer further explanations if desired.



Figure 14: VITO at FTI Final Festival in Antwerp

The main **lessons learnt and conclusions** from this FTI festival are:

- The event served as an **effective platform for promoting transparency and public engagement** in renovation projects, fostering trust and confidence among stakeholders.
- The festival provided an **opportunity for professionals to showcase** their expertise, share best practices, and inspire innovation within the construction industry.
- Direct interaction **between attendees and professionals** facilitated knowledge exchange and mutual learning, leading to a deeper understanding of the renovation process and its implications.

- The festival highlighted the **importance of community involvement** in shaping the built environment, encouraging collaboration and cooperation between residents, professionals and decision-makers.
- The use of **language appropriate** to the target population (understandable, approachable) is crucial.

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3. Best Practices in Living Lab Pamplona (ES)

Pamplona oPEN Living Lab can be found in Rochapea neighbourhood (see Figure 15) and includes two main demonstrators, the industrial complex and the San Pedro social housing belonging to Pamplona City Council.

However, the aim is to expand beyond those two demonstrators and open the Living Lab to the full district of Rochapea, a neighbourhood with around 26.000 inhabitants. This calls for different co-creation and awareness raising activities to engage citizens in the energy transition journey.



Figure 15: Rochapea neighbourhood (Pamplona).

The best practices described in this chapter focus on awareness raising, citizen engagement and community building, as well as the identification of potential new initiatives related to a just energy transition and PENS.

3.1. Positive Energy Neighbourhood Office

Background

Efidistrict FWD¹³ (MLEI-PDA / CIP-IEE-2013) [8] was a project aiming at renovating a full neighbourhood in the district of Txantrea district (Pamplona), led by the regional public company NASUVINSA.

The project managed to mobilise private and public investments, and the main results included:

¹³ <https://www.efidistrict.eu/>

- The renovation of 2,333 dwellings in 148 blocks (see Figure 17).
- More than 5,000 people involved in renovations.
- Investments of €59 M (public and private).
- New district heating¹⁴ [9] working with sustainable local biomass.

In Efidistrict, the main success factor was the creation of a district renovation office with a door-to-door approach to engage citizens in the energy retrofitting projects. The office team supported the residents of the neighbourhood (owners of apartments in different apartment buildings) by carrying out different activities, such as:

- Launching architectural contest for renovation project ideas (results were shared with the community in public exhibitions).
- Signing a framework agreement for finance with a bank.
- Door-to-door approach for community involvement in renovations.
- Aggregated tendering processes for choosing the renovation company.
- Support with applying for existing subsidies.



Figure 17: Renovated building in Txantrea district.

PEN Office in Rochapea

The Pamplona City Council opened the Positive Energy District Office in May 2023¹⁵, in the Environmental Education Museum in Rochapea neighbourhood, following the Renovation Office model successfully tested within Efidistrict.

The main **objective** of this office is to inform citizens about the different resources available to them to take action for a just energy transition (subsidies for renovation, PV installation and other RES, information about energy communities, etc.). In addition, advice is provided to the

¹⁴ [Innovative district heating system set to cut CO2 emissions by 80% - Stardust \(stardustproject.eu\)](https://stardustproject.eu)

¹⁵ [oPEN Living Lab Pamplona opened Positive Energy Neighbourhood \(PEN\) Information Office | oPEN Lab \(openlab-project.eu\)](https://openlab-project.eu)

visiting citizens on energy bills, so that they can adjust their electricity and/or gas contract to their actual needs. The office is open to Rochapea inhabitants, shop keepers, local associations, etc.

The key characteristic of this initiative is to employ staff devoted to the project who are based in an office in the district where renovations take place, combined with a door-to-door approach to engage with citizens, associations, traders and other local actors. The objective is to spread the word about the opportunities for participating in the local energy community and to facilitate information about renovation and renewable energy subsidies, the regulatory framework and energy contracts, as a one-stop-shop for energy and renovation, going a step beyond Efidistrict office which focused only on renovation and energy retrofitting, but did not provide other services such as advice on energy bill, support to energy communities of information on public financing on RES.

The Positive Energy Neighbourhood Office of the Pamplona City Council (Rochapea district), started with a one day/week service (see Figure 16). The city employed new dedicated staff to ensure that soon this office fulfils its role as a lever of the energy transition. Thus, the office is an agent that generates activity around energy projects (e.g. energy retrofitting, sustainable mobility, PV installations, building renovation etc.), addressing both individuals and the energy communities, fostering private investments and employment generation.



Figure 16: Headquarters of the Positive Energy District Office in Pamplona

On 25 September 2024 the office was relocated in a more accessible space within the Environmental Education Museum, with the occasion of the reinforcement of the PEN Office team, now composed by two architects, an engineer and a participation expert.

Pamplona City Council aims to achieve significant long-term results thanks to the support and momentum of oPEN Lab.

So far the main **lessons learnt and conclusions** are:

- The **involvement of citizens** is essential to take significant steps in energy transition projects involving apartment owners, as they are the ones that decide to renovate their dwellings and buildings. In low income neighbourhoods this becomes a greater challenge, and specific measures are needed, such as one-top-shops.
- In order to take such decisions, **financing the renovation work is an important issue but not the only one**. As the building needs to be renovated as a whole, the majority of owners must agree with the decision. Besides, the procedures through which citizens apply for subsidies are complex and difficult to understand and manage.
- Public authorities need to support renovation work, not only providing subsidies and financial instruments, but hiring **multidisciplinary teams** with different skills and competences, including architects, participation experts, social workers and other profiles with social psychology skills.
- The creation of district **renovation offices with a door-to-door approach** is a **good investment** for the local public authorities as it can accelerate the renovation of entire neighbourhoods.

3.2. Participation/co-creation of IWER square

The **aim** of this participatory process was to involve the citizens of the neighbourhood in refining the design of the IWER square proposed in the building renovation project by working on specific elements such as vegetation, benches, lighting and paths.

In addition to the representatives of each local oPEN Lab partner (UPV/EHU, AH, Obenasa, CENER, Pamplona City Council), a total of 38 people participated in a workshop in June 2022.

After the presentation of the initial project and the session script, the citizens were divided into randomly created groups and each one could agree on a new proposal for the square. To this end, each group had a map of the space and several elements representing the elements to be used for the design, i.e. pins, coloured cardboard, etc. (see Figure 18). Once the groups finished, each one presented its results in a plenary session. Based on the results, common points and non-consensual aspects were analysed and discussed to settle on a common proposal.



Figure 18: Co-creation workshop for the design of IWER square

After the workshop, the results were synthesized and incorporated into the participatory process by the technical team in charge of the reform process. After months of negotiation with

different technical departments of the City Council, the final proposal was approved, incorporating most of the proposals made by the citizens.

Finally, the **results** were presented during a feedback session with the participation of 18 people.



Figure 19: Original project for IWER square (left) and final project after co-creation process (right)

The main **result** of this participatory process is an improved project proposal for the IWER square in Pamplona. It will be greener and more sustainable. In addition, the process facilitates public acceptance of the urban regeneration work since citizens feel their opinion is taken into consideration.

To support the participatory process, the following materials were developed and used:

- PowerPoint presentation of the original project and the proposed dynamics for the workshop.
- Map of the space over a rigid support.
- Toolbox for co-design (markers, scissors, pens, pins, etc.).
- PowerPoint presentation of the new approved project.
- Display panels comparing the original project with the new one resulting from the co-creation process.

The main **conclusions** of this co-creation activity are:

- The participatory/co-creation approach proved to be very effective.
- The toolbox **facilitated the design process**.
- Likewise, working **in small groups allowed everyone to express themselves** and feel comfortable, preventing opinion leaders from being protagonists.
- The workshop was one of the first processes open to the public within the oPEN Living Lab Pamplona. **This co-creation activity contributed to gaining the trust** of the residents of Rochapea.
- Bureaucracy increased the duration of the approval process of the new project, which tires the citizens and reduces their commitment to participation.
- Working in a coordinated manner in **incorporating most of the citizens' proposals** is considered a very positive aspect in itself and for future actions.

3.3. Gaming tool to reduce energy consumption in primary schools

The **objectives** of this activity are to boost learning about energy use and climate change in schools and inspire behavioural changes in energy use among young citizens, both at school and at home.

In 2020, the Environmental Education Unit of Pamplona City Council developed a gamified tool for energy savings in schools, targeted at primary school students, in the context of the H2020 STARDUST project¹⁶.

The tool, named “Grupo de Acción Contra el Despilfarro Energético” (Action Group against Energy Waste) was tested in the first six months of 2021 in one school (San Cernin) and adjusted according to their feedback.

Since October 2021, Pamplona has implemented this tool in different schools, targeting students of the 5th and 6th year of primary school to boost learning about energy use and climate change and to inspire behavioural changes. The tool was published in a freely accessible web page available in two languages: Spanish and Basque.

This **gamified activity is divided into three stages**. First, students learn about energy topics through a series of videos and interactive activities. For example, students learn how energy can take different forms, and the different sources of renewable and non-renewable energy. At the end of this stage the students complete a quiz to test their newly acquired knowledge and receive a certificate.

In the second stage, students learn about how energy is managed across the globe with the help of videos and interactive activities. For example, using a world petroleum map, students compare statistics on petroleum consumption and CO₂ emissions per person across different countries. Videos showcase how dependent we are on energy consumption and how current energy systems can contribute to climate change through our energy behaviour, highlighting the need to adopt energy-saving behaviour whenever possible. Students discover a hidden sentence from the video to proceed to the following stage: “Faced with climate change, reduce your energy consumption”.

The third stage is the most practical, consisting of mapping the energy consumption in the school building and the identification of possible areas where energy use could be improved. Students are divided into groups (“Group of action against energy waste”) and asked to list possible behavioural and technical interventions to improve energy use in the school building. They reflect on the collective and individual responsibility of these interventions: students, faculty and the school management. For example, everyone could be responsible for remembering to turn off lights in class, while changing lightbulbs to more energy efficient ones would be the responsibility of the school management. Students would discuss these interventions with their classmates, prioritise actions and refine a plan of interventions for the school, which would then be shared online. This plan would finalise the activity, with students and faculty being encouraged to enact the energy saving measures elaborated. The school would also receive approval from the City Council and some financial support to help them enact technical interventions, for example changing lightbulbs.

Interesting **results** have been achieved so far, such as:

¹⁶ <https://stardustproject.eu>

- Implementation with the support of Pamplona City Council Environmental Education team: 7 schools have implemented this gaming tool (involving almost 700 students aged 10-13). In the 2023-2024 academic year, the tool was implemented in two schools in the Rochapea neighbourhood, in the context of PEN Lab. In addition, Pamplona City Council is installing a PV panel on the roof of one of these schools, reinforcing the message on clean energy transition to the community, as it will provide energy to the local community fostered within oPEN Lab.
- Open tool: The tool is open and free, via a dedicated [website](https://accioncontraeldespilfaroenergetico.es) (see Figure 20) and any school can use it; in fact, it was presented to all the Municipalities in the region of Navarra in the context of a SECAPs meeting.
- Transferable: the tool was transferred to at least two Italian cities (Trento and Parma) in the context of H2020 STARDUST and the Interreg Europe POTenT¹⁷ [\[10\]](https://projects2014-2020.interregeurope.eu/potent/) projects.

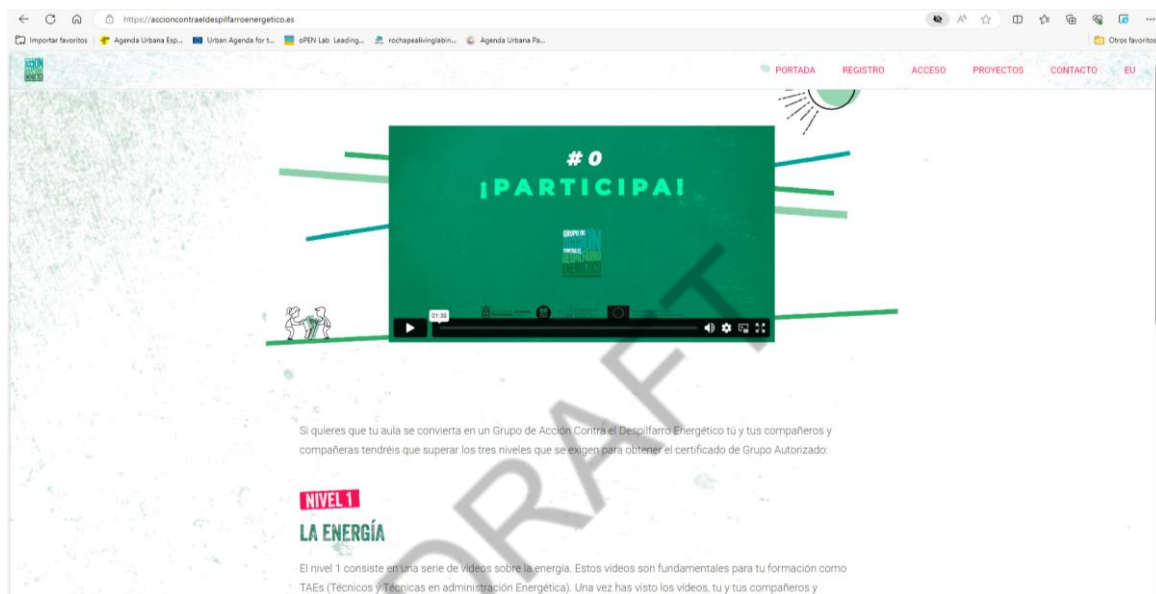


Figure 20: Website of the Gaming tool (<https://accioncontraeldespilfaroenergetico.es>)

The main **lesson learnt** is that the big effort made to develop the tool, in cooperation with a company expert in gaming, was worthwhile as the tool is now available and open to all interested schools free of charge. The activity enables pupils to learn about energy issues in a user-friendly way as it is based on a gaming approach and group work.

3.4. Virtual reality

Within the oPEN Lab project, the Pamplona City Council is renovating a public apartment building in the San Pedro neighbourhood (Rochapea district). Once renovated, the apartments will be inhabited by elderly people who have difficulty accessing housing. The **aim** of this activity was to involve elderly people in improving the interior design of the dwellings before the construction phase through the use of virtual reality (VR) technologies. The main focus was the type of furniture and wall colours, but additional free contributions were also collected. Finally, the experimental aspect was also analysed (i.e. how VR can help on citizen engagement).

¹⁷ <https://projects2014-2020.interregeurope.eu/potent/>

For the development of this co-creation process, virtual reality technologies were used to facilitate the understanding of the space. The VR tool was developed by oPEN Lab partner UPV/EHU, and Pamplona City Council collaborated in the organisation of the sessions in April 2023.

The co-creation process involved two working sessions (see Figure 21). After the experimentation of the first session, where eight people were present at the same time, and considering that immersion in VR is individual, the second session was structured in two meetings, with four people participating in each one so that the participants did not have to wait too long while others experienced VR.

In each session, after the explanation of the dynamics, the individual immersions took place, guiding the people in it. Each immersion lasted about 10 minutes, and the participants could change the type of furniture and wall colours in the virtual apartments. At the end of the immersion, they were asked a series of questions aimed at evaluating their experience. Each session concluded with a plenary session during which, in addition to other open questions, they were asked about the usefulness of the tool for understanding the space.

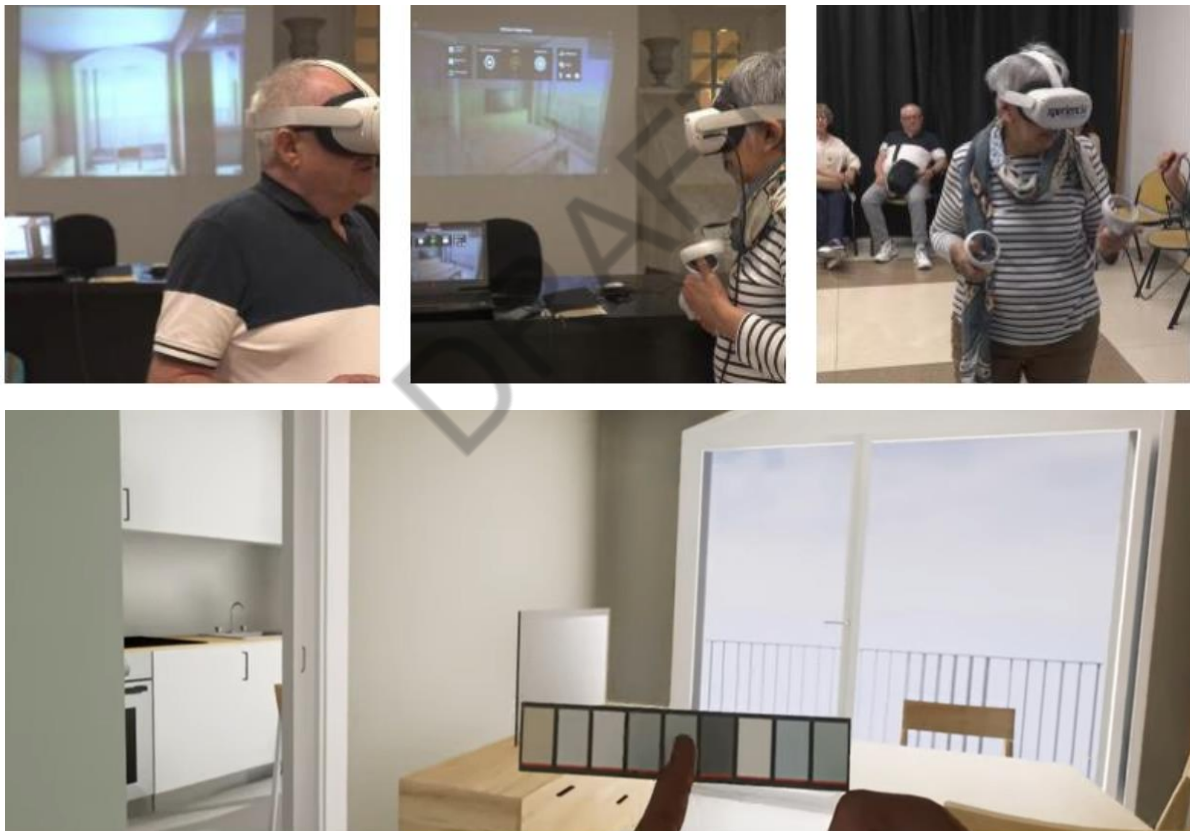


Figure 21: VR session (top) and image of the renovated apartment in VR

For this activity, the number of participants was defined in advance to obtain a representative sample (16 people took part in total, of whom 12 live alone and 3 live with a partner).

Prior to this, on the basis of the refurbishment project, the virtual space was redesigned, and a catalogue of furniture and colours was prepared based on those normally used by the city council in this type of flats.

The experimentation itself and the feedback received by the group of participants made it possible to validate the usefulness of virtual reality as a tool for facilitating the understanding of space and architectural projects and improving the quality of the contributions. All the participants reported feeling comfortable, although some felt a little dizzy at first, especially some women. The oPEN Lab team (representatives from UPV/EHU) supported the participants with the handling of the controls during their immersion, as some difficulties were detected initially. Although the number of participants in this case was predefined and limited, the participation of women and people who live alone is considered satisfactory, compared to the reference sample (i.e. all the people living in public apartments for the elderly in Pamplona).

After closing the two sessions, and as a gesture of gratitude, all the participants were invited to visit the new apartments (once completed) so that they can experience the new environments in real life and see how their contributions have been taken into consideration.

This last aspect has proven to be strategic since almost all participants acknowledged that they were very grateful for the opportunity given to them to contribute with their knowledge and experience to improve the quality of these dwellings and, therefore, the quality of life of future residents.

The **main lesson learnt** is that, although the people were fascinated by the experience, they need time to become familiar with the virtual reality tool. Moreover, given the individual character of the immersion, it is important to propose some group activities with the other participants to prevent them from being mere spectators.

The **result** of this VR experience was the feedback offered to the City Council in relation to some aspects of the renovation works and the procurement of the furniture.

3.5. Engaging schools in energy transition through crowd mapping

oPEN Lab partner UPV/EHU (University of Basque Country) designed a crowd mapping tool (interactive maps) **aimed at** collecting contributions from citizens about their experiences on issues related to energy and comfort in their homes, their mobility patterns and needs. Adopting co-creation processes, UPV/EHU strengthened the relationship with local agents by involving them actively and creatively in the dissemination process of the crowd mapping, the exploitation of the data collected and in the identification of neighbourhood improvement projects to be further developed.

La Compasión-Escolapios school is facilitating the dissemination of the tool and the exploitation and analysis of its results. The UPV coordinates this co-creation process with the support of a group of teachers at the school. These teachers and a group of students created a steering group which is responsible for disseminating the tool among other students and their families and will soon launch the exploitation of the data. The final objective is to identify, through the result maps, potential projects to be developed to improve the neighbourhood through co-creation processes.



Figure 22: Street event to promote the interactive maps in Rochapea district

To date, different actions aimed at providing information have been taken, such as:

- Street events (see Figure 22).
- Public presentations (see Figure 23).
- Dissemination among students and their families.
- Creation of a podcast and video tutorial.
- Social media dissemination, social chats such as Telegram and publication in the oPEN Lab project Pamplona Living Lab website and local paper.



Figure 23: Public presentation of the interactive maps in Rochapea district

Even though this crowd mapping tool is still under development, over 1.500 entries and 335 users have already been registered (May 2024).

The main **conclusions** from this co-creation process are:

- Collaborative work with local agents, developed with proximity and neutrality, is essential to generate an active network and to devise, design and develop innovative projects.
- Engaging schools proves to be a way to engage other local agents that joined the challenge, and further local projects are being outlined that will involve other agents as part of a progressive process of expansion and strengthening of the local social network.

3.6. Climate Action Group

The Climate Action Group¹⁸ [11] is an initiative of Pamplona City Council's Environmental Education team that brings together a group of 15 people (neighbourhood residents and local association representatives, see Figure 24) on a monthly basis with the **aim** of empowering citizens to address the environmental crisis. The monthly activities have a workshop format with different themes: energy, food, consumption, mobility, etc.



Figure 24: Members of the Climate Action Group (Pamplona)

The main objective of these monthly activities is to raise awareness of climate change and its negative effects, as well as to encourage changes in habits to reduce energy consumption and the negative effects of climate change.

During this process, the participants have taken on collective and individual challenges and disseminated these challenges within their immediate environment. Since the Climate Action Group was established, it has undertaken 42 individual and 18 collective challenges.

As a **result** of the initiative, the participants committed, among others, to the following:

- Participation in an energy community.
- Investment for financial savings in an energy community.

¹⁸ <https://educacionambiental.pamplona.es/grupo-de-accion-climatica>

- Membership in a local organic food consumption group.
- Participation in a food sovereignty NGO.
- Reducing heating hours in a neighbourhood community.
- Participating in an e-car sharing cooperative.

The following aspects have been evaluated in relation to this Climate Action Group: content of the sessions, methodology, organisation and general degree of satisfaction. The participants of the Climate Action Group rated these aspects with a high degree of satisfaction and identified the following opportunities for improvement:

- Organise workshops for people who do not intend to attend the full course yet (all the monthly sessions).
- Provide information about the content before the sessions.
- Ensure that the suggestions of the group reach the relevant decision makers in the city council.
- Extend the sessions since there are very broad topics that are difficult to cover completely in one session: energy, food, etc.
- Address the topic of the environmental footprint of new technologies in the discussions: apps, multiverse, social networks, etc.
- Learn on Climate Change effects on developing countries.
- Organise more groups and gather information from similar initiatives in other cities.
- Propose a challenge to be undertaken by this group.

It is therefore **concluded** that, besides its initial objective of raising awareness of the problem of climate change, this activity proved to have an additional positive impact on society: the group, with its personal commitment and engagement, influences its environment and acts as a catalyst in raising social awareness at a higher level.

3.7. Training sessions to support the creation of an Energy Community

The City Council of Pamplona developed a participatory process to foster local energy communities. It comprises a series of sessions to train the participants in different aspects related to energy in general and energy communities in particular.

The **objectives** of these series of activities are to engage citizens and local agents (associations and SMEs) in the creation of a Renewable Energy Community (REC) in the neighbourhood and to co-create the process of implementation and management of energy communities.

The series of sessions starts with five training sessions (see Figure 25) offered to neighbourhood citizens and local agents:

0. Presentation of the initiative. Informative Session.
1. Operation of self-consumption and energy communities.
2. Governance and legal form.
3. Examples of best practices in REC.
4. Energy walks through REC infrastructures.



Figure 25: Information session on Energy Communities in Rochapea district

After the basic training sessions, a steering group was established with the people that were most involved and committed to the creation of a REC. This group oversees developing the statutes and legal form of the REC. The feeling of belonging to the steering group is developed through a new series of sessions, where the technical, legal and financial aspects of a REC are explained in such a way that the group is able to make decisions to develop and establish it.

Additional co-creation sessions are organised for the steering group:

1. Two sessions for social cohesion.
2. Two sessions for further technical, business model (BM), and operative aspects.
3. Two sessions for aspects concerning legal issues, statutes and governance.

The main **results** of these sessions were:

- Citizen engagement: Involving both citizens and small traders in the neighbourhood. The number of participants in the training sessions varied between 50 and 70. The subsequent steering group sessions involved approximately 10 people. The energy community continued to recruit members and currently has approximately 75 members.
- The creation of the energy community itself, the development of its statutes and internal regulations, and its legal registration¹⁹ [12]

The main **conclusions** are:

- The training sessions focused on three pillars, energy, governance and social cohesion, the latter being very important as it reinforces the feeling of belonging to a neighbourhood and a group, which facilitates the process of recruiting members and developing working teams.
- Local authorities have an important role to play in empowering citizens to create Energy Communities. This can be achieved if they concentrate their efforts in training people at local level (in the case of Pamplona City Council this was done via a tandem between the Municipal Energy and Participation units).

¹⁹ Website of Rochapea Energy Community “Arrotxa-E”: <https://arrotxae.org/>

3.8. Collaborative mural in Rochapea – How to build community and engage citizens through art

In spring 2024, the University of the Basque Country (UPV/EHU), with the support of Pamplona City Council and AH Asociados, facilitated the process of co-creating a mural in the Rochapea neighbourhood (Pamplona) by activating local stakeholders.

The **aim** of this initiative was to carry out a collaborative mural, providing visibility to the complex topic of energy transition through the active involvement of citizens, with a pedagogical function.

In addition to activating the local actors, another goal was to create a community and raise awareness of the transition needed in the district, working as an initiator of new projects and synergies in the neighbourhood.

The activity was aimed at citizens of Rochapea and other local actors active in the district.

An artistic project related to the **energy transition and the role of women** in it was created, involving the co-creation of four collaborative murals in the neighbourhood.

Firstly, a steering group was created, made up of local agents who would coordinate the activity: local retailers' association, a local artist, a school and UPV/EHU. This group oversees and participates in the process and carries out the related dissemination activities.

Two workshops were organised to co-design the mural (20/03/2024 and 18/04/2024, see Figure 26). The narrative is built from proximity, reconstructing key milestones in the neighbourhood's history and identity to prefigure its desired future as a positive energy neighbourhood. Thus, the mural is organised in three parts: past, present and desired future.



Figure 26: Workshop for the design of the mural (steering group and local artist)

Based on the results of the workshops, the artist reconstructed the drawing of the mural on the outside wall of the Escolapios-La Compasión school. This school, in the initial steering group of the mural, invited the other three schools of the neighbourhood to the painting sessions.



Figure 27: Local artist, Garazi, drawing the outline of the mural in Rochapea

The mural was then painted through collaborative painting sessions under the supervision of the steering group. Some of these sessions were dedicated and organised exclusively by the schools for their students and others were coordinated by the steering group and open to the public.



Figure 28: Collaborative painting session

The project was communicated through various channels:

- A local magazine publishing a monthly article with the progress and activities of the project.
- Social media of the UPV/EHU, oPEN Lab, schools and the city council.
- oPEN Living Lab Pamplona newsletter.
- Rochapea Living Lab and oPEN Lab websites.
- Local radio.
- Leaflets distributed to local businesses and schools.
- Street events.
- Through local agents via their communication networks with neighbourhood groups such as WhatsApp and monthly meetings.
- Oral communication.
- Through schoolteachers to students and, by extension, to families.
- Local and regional newspapers.
- District forum.

The main **results** of the activity are:

- Citizen engagement: A large number of local actors participated in the activity, not only in the design and painting of the mural, but also in the activities associated with its development (such as organising, carrying out and participating in promotional events, spreading the word, contacting dissemination channels like newspapers, etc.).
- Building on local history and identity: Reflecting on what the neighbourhood used to be like, what it is like now and how the citizens want it to be contributed to raising awareness of the current situation of the neighbourhood and its needs. This reflection process has been carried out in a natural way, increasing the awareness and engagement of the community and, especially, of the children (the future of the neighbourhood), who have played a great role in painting the mural thanks to the participation of the schools. The schools and teachers organised painting sessions with the students, thereby being an active agent in the development of the mural.
- Collaboration among schools: this initiative allowed the four schools in the neighbourhood to collaborate, re-establishing relationships between them. In this way, synergies have been created among them and new projects have been proposed linked to the energy and sustainable transition needed in the district. Those emerging projects could be developed within the framework of the Living Lab, involving the quadruple helix.

It can be **concluded** that this activity succeeded in activating the local actors and strengthening community links.



Figure 29: Collaborative mural of Rochapea

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4. Best Practices in Living Lab Tartu (EE)

In this chapter, four best practices from oPEN Living Lab Tartu are introduced. These practices have helped to facilitate the creation of a Living Lab in Tartu through:

- Piloting an innovative renovation method.
- Providing accurate and useful information about renovation.
- Engaging stakeholders in the renovation process.

The original oPEN Living Lab Tartu area was Annelinn, a peripheral apartment building district in the city facing several social challenges with a variety of vulnerable groups residing in the area. As of June 2024, due to various external factors such as rising EURIBOR rates, high inflation, the energy crisis, etc., the project team has been forced to designate a different area for the Living Lab pilot scheme. The practices listed below have ensured a smooth transition into the new area.

The new area, Veeriku district, similar to the Annelinn district, consists of five to nine-story apartment buildings built in the 1970s and 1980s that are in need of renovation (see Figure 30). As in Annelinn, in larger buildings with many apartment owners it is difficult for the members of housing associations to reach a consensus regarding renovation, which is why they benefit the most from professional support.

The aims remain the same in the new Living Lab area: to rejuvenate the urban space and renovate apartment building(s) with the guidance of Renovation as a Service (RaaS) to ensure a comprehensive and co-creative process and move closer to creating a Positive Energy Neighbourhood.

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Figure 30: Ravila 49 apartment building in Tartu, a typical apartment building in Veeriku.

By employing the best practices presented in this chapter and continuing to improve them, Tartu city has laid a strong foundation for future renovation and urban rejuvenation initiatives.

4.1. Dreaming workshop

In September 2022, the oPEN Living Lab Tartu, in collaboration with the Institute of Baltic Studies (IBS), the Tartu Regional Energy Agency (TREA), the Tallin University of Technology (TalTech) and the City of Tartu, organised a “dreaming” workshop to engage with the residents and housing association leaders from the 10 apartment buildings to be renovated within oPEN Lab.

During a creative “dreaming” and co-creation exercise, the goal was to introduce the various aspects of innovative renovation (prefabricated panels, ventilation and heating, surroundings of the house, cellars, façade and balconies, hallways), including construction prices for their particular apartment building. This was achieved through discussion and joint “dreaming”,

capturing feedback from the residents concerning what they hoped their house would look like after renovation.

The event started with an icebreaker exercise – “Dream house” – where people could write on post-it notes what their dream house is like. Secondly, the **world café method** was used, dividing people into six groups or tables based on the topic (balconies, outside area, hallways, ventilation, smart home, cellars). The discussion leader(s) at each table changed tables every 20-30 minutes, taking their topic to the next table so everyone had a chance to discuss each topic. Various tools were used by discussion leaders: graphs, inspirational photos, maps, technical drawings, etc. After the meeting, the summary of the workshop was released and sent to the houses. The participants were given some time to respond and highlight whether there are further issues they wanted to express. They also validated the list of works to be included into the renovation price offer. As a result, the terms of reference (ToR) for collecting price offers for the renovation works were updated according to the input from the dreaming workshop.

Housing association leaders were invited directly via phone and email. They were in turn asked to invite 3-4 residents from their buildings, preferably selected by representing the profile of the house. An information leaflet was sent to the housing associations so that they could forward it to their internal e-mail list and print it out to be displayed on the information board in their hallways. Finally, information about the workshop was also shared on the local area of the oPEN Lab website²⁰ [13].

In total, 52 participants (including project team members) took part in the dreaming workshop (see Figure 31). Based on their input, the organisers could update the construction tender and preliminary price offer (ToR).



Figure 31: Dreaming workshop to engage with the residents and housing association leaders in Tartu.²¹

²⁰ <https://tartu.ee/et/annelinnpluss#uritused>

²¹ Photographer: Tiina Pitk. <https://www.tartu.ee/et/annelinn-projekti-tootuba>.

The workshop was a great success, and the world café method worked well. The residents were engaged and shared their opinions, thoughts and wishes openly. According to the feedback form distributed to all the participants, they valued the event and even thought there should have been more time to discuss the topics. They all felt that they could openly share their thoughts.

Upon moving to the new Living Lab area Veeriku at the beginning of 2024, the same methodology was successfully replicated with the new Living Lab participants from this area.

The important **lessons learnt** from this dreaming workshop are²² [14]:

- Holding a workshop on a **Saturday** was justified since more participants could take part.
- Careful planning and the presence of an **interdisciplinary team** were important elements for the success of the meeting.
- Printouts of inspirational photos and technical drawings proved very helpful to illustrate the discussion topics.

4.2. Price calculation tool and use in several co-creation workshops and in RaaS

Over the last 18 months, TalTech, in collaboration with TREA and the City of Tartu developed a price calculation tool **to provide apartment owner association (AOA) managers and apartment owners the opportunity to design their own renovation scenarios.**

The tool provides insights into several renovation questions like:

- How much renovation would cost.
- What elements are included in the price of renovation.
- How much energy is consumed and its cost before renovation.
- What the energy consumption and costs would be after renovation.
- What the annual and monthly costs of renovation would be after renovation for apartment owners.
- How the costs change seasonally before and after renovation in the dwellings.
- How different renovation actions change the final price and annual/monthly home financial costs (e.g. heating).

As part of the process of developing the tool, the Tartu Living Lab team mapped all possible renovation actions. Next, detailed price estimations for these actions were obtained from 14 different construction companies. Then, the price estimations were inserted into an Excel-based tool. Finally, energy consumption data from the buildings was gathered and inserted into the tool.

The tool has been updated several times to better communicate home costs to apartment owners and AOA managers (see Figure 32).

²² Discussion summary (in Estonian):

https://tartu.ee/sites/default/files/uploads/Linnavarad/Annelinpluss/17sept_tootuba_kokkuv6te.pdf.

D2.3: Best Practices for Citizens Engagement and Awareness Raising to Facilitate PEN Transition

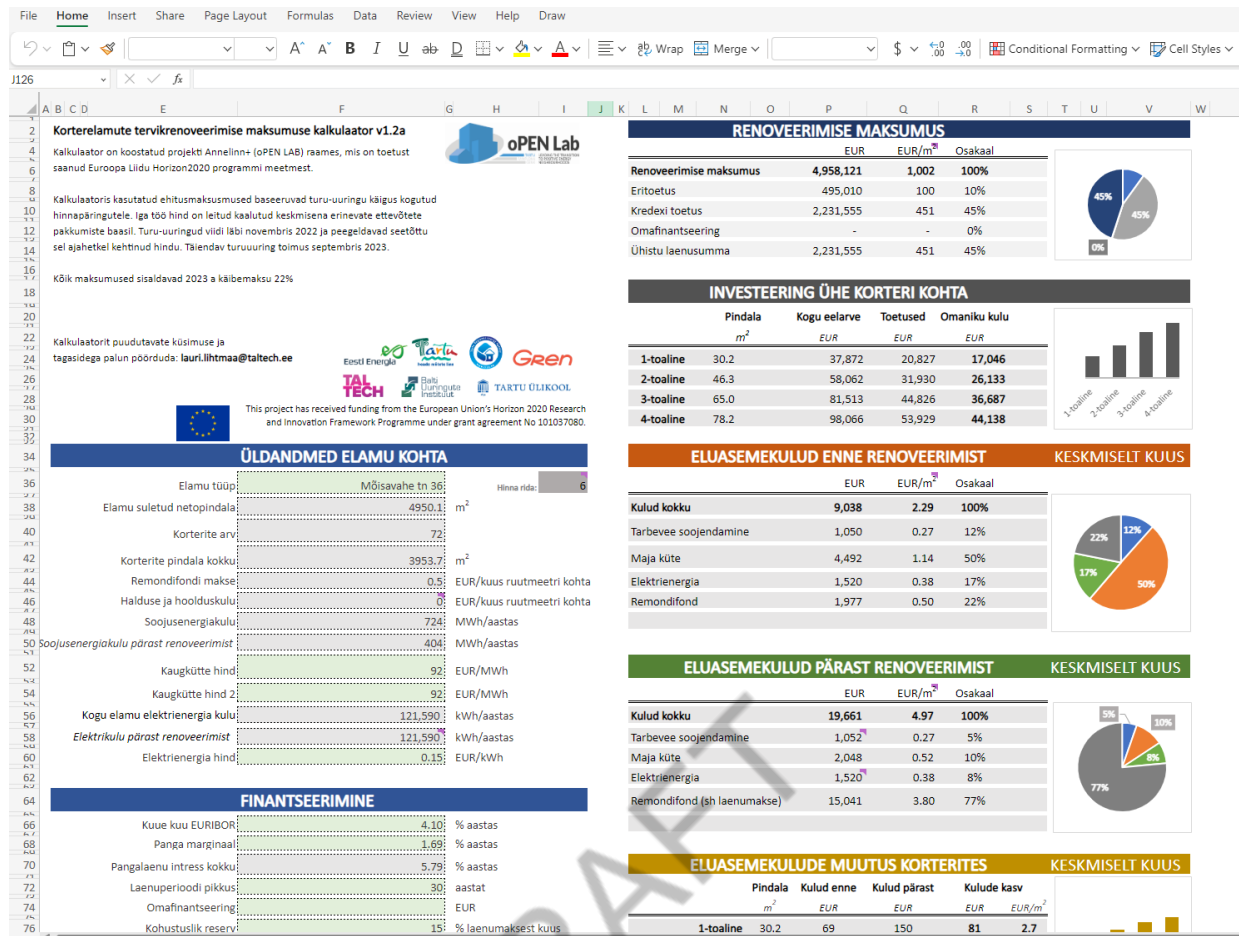


Figure 32: A screenshot of the renovation price calculation tool.

Once finalised, the tool has been used in meetings with AOA leaders and apartment owners in 10 buildings that were part of the oPEN Lab within the former Annelinn area. Today, the tool is used to communicate home costs to the new oPEN Lab area of Veeriku during physical meetings and is also distributed as a printout in direct e-mails to apartment owners.

Moreover, the tool is in use in the Renovation as a Service (see Subchapter 4.3) service launched by the Tartu City Government in May 2023. Currently, over 30 renovation cost estimations have been calculated with the tool and another 120 will be calculated within the service by 2026.

The tool is a great success, gathering interest at the national level to be redesigned for use on the national renovation website and transformed into a digital tool. Additionally, the tool has also attracted the interest of the finance sector since customers interested in an apartment building renovation loan can be offered a better and more informative tool to calculate their renovation costs.

The price calculation tool works best to compare different renovation scenarios:

- Deep renovation vs partial renovation.
- Deep renovation vs deep renovation with prefabricated elements.
- Deep renovation with different interest rates and different energy price estimations.

The **main lesson learnt** is that AOAs need a tool to know the estimated cost of renovations before committing to an expensive renovation project. Based on this, they can assess the ability of their apartment association to undertake the given renovation. This is also shown by the great interest of the state and the financial sector in the tool.

4.3. Renovation as a Service (RaaS)

To promote renovation in Soviet-era buildings and among AOAs, the Tartu City in collaboration with TREA developed a Renovation as a Service (RaaS) service to help managers of AOAs to overcome obstacles involved in renovations. The service was activated in January 2023 and will operate until the end of 2026.

The aim of the service is to help AOAs compete for national renovation financing and to provide technical and financial help to managers of AOAs in the process of preparing renovations and during the construction process.

The RaaS service of the City of Tartu consists of eight components:

1. Collection of consumption data.
2. Calculation of new energy labels.
3. A review of the structural and technical state of the apartment building.
4. Provision of a renovation plan based on the technical state of the building and national renovation standards.
5. Estimation of the renovation costs and home costs post-renovation.
6. Assistance in applying for national financing.
7. Assistance in tenders for the design.
8. Assistance in tenders for the construction.

The Tartu City Government promoted the RaaS service from January 2023 onwards via multiple communication channels, direct emails to AOAs, local media and information events with great outcomes and **results** by the end of 2023:

- Three information days were organised by the city.
- 175 AOAs were contacted, resulting in a meeting with 104 AOAs (59.42%).
- 100 on-the-spot visits were carried out.
- 50 new energy performance certificates (EPCs) were issued.
- 36 building reports were issued.

As the RaaS service has only operated for one year and there have been no new calls for national renovation financing, it is a bit too early to fully evaluate it. However, first feedback indicates that the service is greatly appreciated by multiple AOAs. Moreover, the city of Tartu perceives the service as very important within their strategic framework.

The RaaS service became public in January 2023 and already 104 AOAs showed interest. So the **main lesson learnt** so far is that there is a need for such a service, regardless of the presence of technical consultants who have so far been providing services similar to RaaS.

4.4. Lobbying for prefabricated element renovation financing

To gain national support for oPEN Lab innovations and prefabricated element renovation innovations, the City of Tartu together with TREA lobbied the Estonian Ministry of Economy to respond to the unprecedented set of external circumstances influencing renovation objectives.

Tartu has always been the foremost municipality in promoting and supporting deep renovation within Estonia. As a hands-on municipality with the most experience, the city has a platform and relationships to communicate the situation on the ground and to present issues that might otherwise not reach the national policy level.

The Estonian construction market was in flux at the end of 2022. The country was experiencing the highest inflation rate in the EU, at around 20%. On top of this, the start of the Ukrainian war disrupted the availability of construction materials and work force.

The price estimations for renovations reflected the situation. The construction price estimates from 12 months earlier almost doubled, posing a risk to national, Tartu, and oPEN Lab renovation ambitions.

The new situation was quickly communicated to the Ministry of Economy by the oPEN Lab project core team, indicating that an **unprecedented set of circumstances would need an unprecedented intervention**. The circumstances would also put at risk the national achievements made in prefabricated element renovation (see Figure 33).

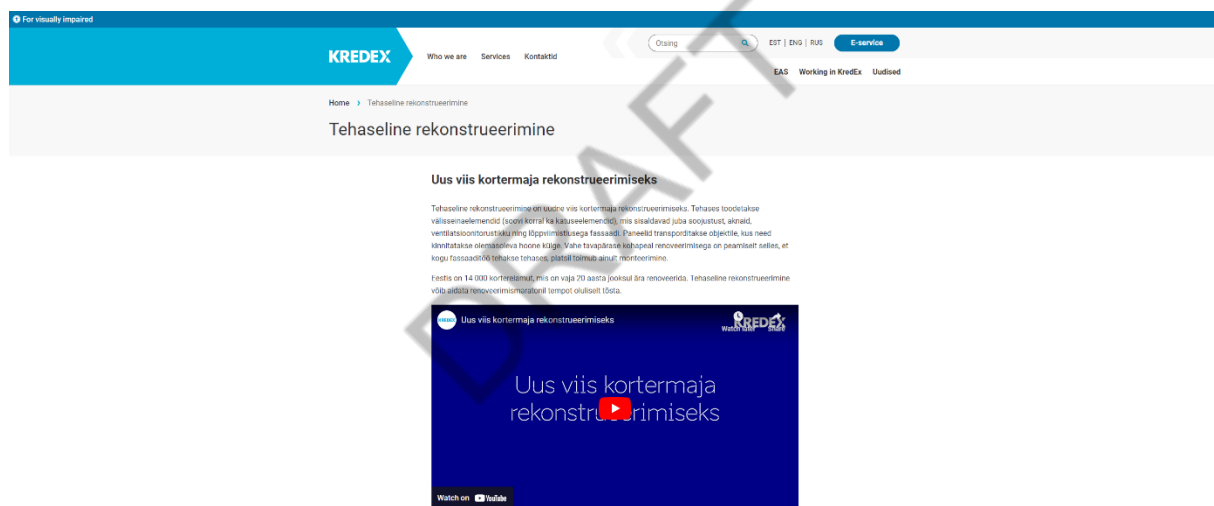


Figure 33: Webpage of the Estonian national financing agency KredEx to promote and introduce prefabricated element renovation

As a result of the lobbying, the national financial support for prefabricated element renovation was raised to 50% of all deep renovation costs. Currently, these financing terms have been extended to 2024.

Therefore, as a **main lesson learnt**, this approach proved that quick communication of issues and obstacles can help you find unexpected allies and even better results than initially needed.

5. Overall analysis

Analysing the twenty best practices of citizens engagement and awareness provided by the three Living Labs of the oPEN Lab project, the activities can be grouped into four main groups:

- Co-creation activities.
- Awareness raising activities.
- Engagement activities.
- Dissemination activities.

Next, the scope of the different best practices can be classified into three main groups according to their purpose:

- Project oriented (oPEN Lab focused).
- Outreach (wider public oriented).
- Scaling-up (replication focused).

Table 2 provides an overview of the common characteristics of each activity carried out in relation to the main groups and scopes mentioned above:

Activity	Living Lab	Kind of activity	Participants	Scope
Appreciate inquiry sessions	Genk	Co-creation	Residents, public and private researchers, industrial partners	Project oriented
Neighbourhood party	Genk	Engagement	Residents	Project oriented
Genk is Mensenwerk	Genk	Awareness & dissemination	Urban planners, architects, policymakers, housing experts, researchers, students, citizens	Outreach
Neighbourhood Information Point	Genk	Awareness & engagement	Residents	Project oriented
Transisthor	Genk	Co-creation, awareness & engagement	Residents, citizens	Outreach
Information sessions	Genk	Engagement	Residents	Project oriented
Knowledge & Networking Day Energiehuis Limburg	Genk	Dissemination & engagement	Public servants, individuals & organizations assisting energy-related matters	Outreach & scaling up
Flanders Technology & Innovation Festival	Genk	Dissemination & awareness	Residents, citizens, (construction) professionals, public servants	Outreach & scaling up

Positive Energy Neighbourhood Office	Pamplona	Awareness & engagement	Residents, citizens	Project oriented & Outreach
IWER square design	Pamplona	Co-creation	Residents, City Council	Project oriented
Grupo de Acción Contra el Despilfarro Energético	Pamplona	Engagement	Primary school students, teachers	Outreach, Scaling up
Virtual reality sessions	Pamplona	Co-creation	Residents (elderly people)	Project oriented
Crowd mapping for energy transition	Pamplona	Dissemination & co-creation	Primary school students, teachers, students' relatives	Project Oriented, Outreach & Scaling up
Climate Action Group	Pamplona	Awareness, engagement & dissemination	Residents & local associations	Outreach & scaling up
Energy Community trainings	Pamplona	Engagement & co-creation	Residents & local agents	Project Oriented, Outreach & Scaling up
Collaborative mural Rochapea	Pamplona	Engagement & co-creation	Residents & local agents	Project oriented & Outreach
Dreaming workshop	Tartu	Engagement & co-creation	Residents & apartment owner associations	Project Oriented
Price calculation tool	Tartu	Awareness & engagement	Residents & apartment owner associations	Project Oriented
Renovation as a Service (RAAS)	Tartu	Awareness & engagement	Apartment owner associations	Outreach & scaling up
Prefabricated element renovation financing	Tartu	Engagement	City of Tartu, Estonian Ministry of Economy, residents & apartment owner associations	Project Oriented, Outreach & Scaling up

Table 2: Main characteristics of the activities presented through best practices

6. Conclusions & Recommendations

Positive Energy Neighbourhoods, and energy transition in general, will not be possible without active public participation and citizen engagement. To engage relevant citizen groups, **increasing awareness** on energy issues and their implications for our life and (near) future is required. Thus, a preliminary message on urban strategies is: if we do not act now for our future, we are doomed to suffer the consequences.

Several activities presented in this report aim to raise awareness among the different stakeholders to pave the way towards positive energy neighbourhoods. Local info-points or one-stop shops for renovations in the neighbourhoods where renovations take place are examples of the importance of being close to the citizens to succeed with large-scale renovations of residential buildings.

Large projects like oPEN Lab, involving technological innovations and a large number of stakeholders (both those who are part of the consortium and others that get involved as the project progresses, such as subcontractors and other active local stakeholders), are extremely difficult to explain at the local level to the different target groups. Thus, the different activities described in this report aim to **engage citizens** and other actors in very specific aspects of the oPEN Living Labs of Genk, Pamplona and Tartu. These engagement and co-creation activities also make it possible to actively raise awareness, such as by means of activities related to art facilitated by local artists (e.g. Transistor in Genk and the collaborative mural in Pamplona).

Some of the activities such as specific workshops are short-lasting, while others take more time and effort, such as the creation of an energy community (e.g. eight months of preparation with workshops and other activities in the case of the oPEN Lab energy community of Pamplona). Some involve artistic works (such as Transistor in Genk or the Collaborative mural in Pamplona) that will have a longer impact on the neighbourhood and will last beyond the duration of the oPEN Lab project.

Also remarkable is the fact that involving certain groups of the population can be a very difficult challenge, such as the young people (who are not emancipated, are not in charge of their energy bills and do not show interest in this type of initiatives) or people without sufficient economic resources who cannot afford to renovate their homes). The awareness raising and engagement processes described in this publication, together with an appropriate use of different financial instruments, can help to tackle **energy poverty** rates and support fair energy transition.

The following is a series of **recommendations** for the implementation of citizen engagement, dissemination and awareness raising activities:

- Public authorities are aware that the challenge of deep renovations of private residential buildings requires important investments by the owners. In this sense, most public authorities provide financial support for such renovations. However, it is clear that financial support is not sufficient if the EU wants to renovate 35 million building units by

2030²³ [15]. There are other barriers that need to be tackled, especially in multi-owner buildings where awareness raising is important, but close guidance and assistance is also needed. Therefore, the implementation of **one-stop shops or info-points in the renovation neighbourhood** with a door-to-door approach to raise awareness and get citizens engaged has proven to be effective, with the number of dwellings renovated exceeding those in other areas of the city.

- Involving vulnerable groups in energy communities to assure Just Energy Transition can be very difficult. Business models oriented to **energy communities must consider the limited purchasing power** of this type of stakeholder groups. Some energy communities take this aspect into account and reserve some of the energy produced by their means for vulnerable groups.
- Moving towards PEN requires the involvement of the relevant stakeholders of the quadruple helix at a local level. **Workshops and co-creative projects** with short-term but common objectives encourage collaboration and knowledge sharing among these different stakeholders and allow for steady progress in the right direction.
- Communities become resilient and sustainable through the active participation of citizens who get involved in common projects and work for common interests and goals. However, it is difficult to make people participate in abstract and difficult subjects such as “energy” (football matches are easier to get enthusiastic about). Thus, it is important that every awareness raising, and engagement activity organised has an enjoyable component, however small that may be. Organise parties, provide local food (waffles, tortillas...) and celebrate achievements. As often highlighted by the oPEN Living Lab Genk team: KEEP IT FUN. This will make it possible to **build stronger communities aware of the value of the environment in general, concerned about the climate crisis and ready to act together for a more sustainable future.**
- **Education on basic energy aspects** helps individuals understand the impact of their energy consumption habits and become aware of possible changes they can make to their daily habits to reduce energy consumption. In this sense, it is important that they understand which one is the most appropriate type of contract with the energy providers for their energy demand. Thus, public authorities can easily organise workshops educating on the energy bill or provide information about it in their one-stop-shops for energy and renovation. This is the case of the PEN Office implemented in oPEN Living Lab Pamplona.
- Highlighting the **benefits of renewable energy sources** fosters enthusiasm by citizens and local communities towards sustainable alternatives, and thus, increases their willingness to act.
- It is highly recommended to **involve influential people** and associations in the neighbourhood, merchant associations, neighbourhood associations, local magazines, etc. as they can be a “local engine” to create confidence in the project and motivate

²³ See more details in the proceedings of the webinar “Leaving no one behind: how to enable private finance for renovation with positive energy neighbourhood projects?” organized by oPEN Lab on 3/06/2024. [Leaving no one behind: how to enable private finance for renovation with positive energy neighbourhood projects? | oPEN Lab \(openlab-project.eu\)](https://openlab-project.eu/leaving-no-one-behind-how-to-enable-private-finance-for-renovation-with-positive-energy-neighbourhood-projects/)

collective action. These local ambassadors do not need to be experts in the energy field, but rather can be artists, environmental activists, shop owners, representatives of local associations or even individual citizens with charisma and good ideas.

- Citizen participation in PEN is mandatory, but it is difficult to maintain the interest of citizens in long-term projects and goals. To do this, **a mix of different communication/awareness raising/engagement/co-creation activities throughout the whole process** is necessary, addressing different stakeholders/citizens groups at a time. In this sense, it is not always necessary to explain what the broader context is (e.g. the fact that they are part of a Living Lab) as they often do not care. The focus should be on the short-medium term when it comes to specific engagement activities. Over-information can lead to rejection, in the same way as a lack of information.
- Some of the activities have been implemented together with **schools**. There have been several reasons for doing so: 1) pupils go to school to learn, so they can learn about energy issues; 2) children are the future, so they should be part of the energy transition and change their behaviour in relation to energy consumption after learning about it; and 3) it is possible to access families through children (and this has been the case in the oPEN Living Lab Pamplona in order to have as many households as possible completing the interactive maps).
- When designing an awareness raising or an engagement activity, first **consider what the target audience needs** (not what the project needs) and communicate accordingly.
- Try **not to make assumptions** about the needs, expectations, worries of the citizens; go and ask whenever necessary.

7. Further information

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Table 3: Contact information

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