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optimising local energy communities

D7.3 The outcome of end-user engagement and social impacts assessment (first version)

WP 7, Task 7.2

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Technical references

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Executive summary

The first release of D7.3 "The outcome of end-user engagement and social impacts assessment" describes the eNeuron engagement framework and the engagement process carried out by the pilot leaders in Marche Polytechnic University (UNIVPM), Lede SA (Skagerak), City of Bydgoszcz (Bydgoszcz), and Lisbon Naval Base (Marinha). It also presents the social evaluation framework, including a set of KPIs defined to assess the social dimension of the project's intervention.

The eNeuron engagement framework foresees three main types of target stakeholders: 1) indirect beneficiaries; 2) Users of the eNeuron toolbox; and 3) Other stakeholders. The current report describes the first phase of the engagement plan (M18- M24) and the outcomes of the process; in particular, the main ones are listed as follows:

- The engagement activities at UNIVPM included a set of informative actions addressing the academic community via social media (e.g., Twitter, Telegram, and LinkedIn). Both virtual and in presence presentations with students from various master's and bachelor courses were conducted, as well as the researchers' night (M23) where UNIVPM has shown the goals of the eNeuron project to the citizens of Ancona (Italy) to increase their awareness on both the economic and environmental aspects.

- The engagement activities at Skagerak included a set of informative actions via social media and the company's internal communication channel, as well as workshops with households and meetings with the technical staff.

- The engagement activities at Bydgoszcz included a set of informative actions via social media, as well as presentations at the local technical school and university.

- The engagement activities at Marinha included in-person presentations in events linked to sustainability and specific internal ad-hoc meetings with the technical staff and unit representatives.

The outcomes of the social assessment indicate that indirect beneficiaries of the pilots attribute a high level of importance to sustainability and energy-related measures. Despite of this, they are still not very familiar with the concept of Local Energy Communities (LECs) and more actions are needed to support both awareness and collaboration within LECs.

During the second engagement phase, the engagement strategy will be fine-tuned to account for the project developments and progress. The social KPIs will focus on the eNeuron toolbox users to evaluate the user's acceptance and experience. Results will be shared in D7.4 "The outcome of end-user engagement and social impacts assessment (final version)" due in M48.

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Abbreviations and acronyms

Acronym	Meaning
BESS	Battery Energy Storage System
DER	Distributed Energy Resources
DSO	Distribution System Operator
EU	European Union
EH	Energy hub
ICT	Information and Communication Technologies
ILEC	Integrated Local Energy Community
KPI	Key Performance Measure
LEC	Local Energy Community
PEOU	Perceived ease-of-use
PU	Perceived usefulness
PV	Photovoltaics
SD	Standard Deviation
SEI	Social media engagement index
SO-KPI	Social Key Performance Measure
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Behaviour

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1   Introduction

This deliverable draws on the main outcomes of Task 7.2 "End-users engagement and assessment of social impacts", which focuses on the development of the end-user engagement plan for each eNeuron pilot and the definition of the social evaluation framework covering key indicators to be assessed during the project lifetime.

The first release of "D7.3 The outcome of end-user engagement and social impacts assessment (first version)" describes the eNeuron engagement framework, the indicators proposed for the evaluation of the social impact of actions, and presents the initial outcomes of this process. It covers the first phase of the engagement activities (M18- M24) and addresses the indirect beneficiaries of the eNeuron project (as defined by the engagement framework). The second release of this document (M48) will cover the second engagement phase and will draw on this existing framework to deploy engagement activities addressing the users of the eNeuron toolbox and other stakeholders.

1.1   Purpose of the Document

"D7.3 The outcome of end-user engagement and social impacts assessment (first version)" describes the eNeuron engagement and social evaluation frameworks as well as the initial outcomes of the engagement activities in each pilot, which are measured with the KPIs (Key Performance Indicators) developed within the social evaluation framework. The results of this analysis will guide future engagement actions which will be analysed and presented in the final version (D7.4) at the end of the project.

1.2   Structure of the Document

The document is structured in eight main chapters. *Chapter 2* describes the methodological approach adopted for the development of the eNeuron engagement and social evaluation frameworks, as well as their adaption to the specific needs of each pilot. *Chapter 3* describes the eNeuron engagement framework, featuring the common characteristics of engagement in pilots and providing a consistent approach across them to have comparison and analysis. *Chapter 4* deals with the social evaluation framework and provides the key social indicators to be assessed in the project. These indicators should be read in conjunction with the technical, economic, and environmental indicators developed in Task 7.1 to get the full picture of the eNeuron sustainability impact. Lastly, *Chapters 5-8* describe how these frameworks have been implemented in the 4 pilot sites (UNIVPM, Skagerak, Marinha, and City of Bydgoszcz) and provide the actual engagement plan for each of the pilot in the first phase of the engagement activities (M18-M24). These chapters cover

the engagement activities performed in each pilot site and present the analysis of engagement KPIs and social acceptance indicators for the first phase of the project.

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2 Methodological approach to eNeuron Engagement

Task 7.2 "End-users engagement and assessment of social impacts" follows a three-step approach:

- **Step 1: Development of the eNeuron engagement framework and pilots' specific plans**: The eNeuron framework (*Chapter 3*) sets the engagement strategy and defines the key target stakeholders, the desired levels of engagement, and tailored tools to engage with them. The engagement framework is then customised to each pilot to meet specific local needs and results into local engagement plans (*Chapters 5-8*), which guide the engagement activities in each pilot.

- **Step 2: Definition of the social evaluation framework:** Along with the engagement plan, an overall methodological framework is created to identify social indicators to be monitored and assessed over the project execution. These indicators measure the acceptance of the eNeuron toolbox and concepts, and provide a way to assess the users' perceptions as well as other goals and ambitions of the pilots (*Chapter 4*).

- **Step 3: Analysis of social acceptance in the pilots based on the framework developed in Step 2**: in this last step, data are collected from the pilots and analysed to assess stakeholders' perceptions, acceptance, and changing behaviours. Furthermore, they also inform the replicability plan with relevant social aspects and provide recommendations that could be leveraged in other projects across the EU. Furthermore, the results from the evaluation process will be used to fine-tune the pilots' engagement plans to be executed during the second phase of the process.

The methodology for the elaboration and implementation of the eNeuron engagement and social evaluation frameworks (Steps 1, 2, and 3) is summarised through a flowchart as depicted in the figure below:

Figure 1: Methodology for engagement framework and assessment of social indicators

2.1 Step 1: Development of the eNeuron engagement framework and pilots' specific plans

The development of the eNeuron engagement framework was based on a mix of bottom-up and top-down approaches.

The bottom-up approach started from the characterization of each pilot *("Pilot profiling")* based on a questionnaire distributed to the pilot leaders (UNIVPM, Skagerak, Marinha, and Bydgoszcz). The questionnaire supports the scoping of the engagement framework, as it defines the local contexts and social objectives of each pilot, the target groups for the engagement activities, and the availability of existing resources that could be used to facilitate the engagement process. The questionnaire was slightly customised to capture the peculiarities of each pilot (See example in Annex I).

The top-down approach: ICONS produced an initial list of engagement tools for each pilot *("Identification of engagement tools"),* starting from the results of the questionnaires above, and considering target stakeholders, social objectives to be achieved, and available resources. Suggested tools came primarily from desk research and were selected from an internal database that ICONS maintains and regularly updates. Engagement tools may include panels, surveys, roundtables, public consultations, focus groups, hackathons, gamification, etc. Each serves different objectives depending on the requested level of participation of stakeholders in the different phases of a project.

In 4 dedicated workshops, pilot leaders and ICONS performed a feasibility check on the shortlisted engagement tools and defined the expected timeframe of activities *("Feasibility check of*

Engagement tools and KPIs"). The engagement tools were screened based on the analysis of pros and cons and the evaluation of feasibility with regards to:

- Required resources (in terms of people, logistics, infrastructure, ICT infrastructure)
- Skills (in terms of human resources able to animate an event, such as a hackathon)
- Costs (related to the points above)
- Online versus offline feasibility
- Adherence to the objectives each pilot wanted to reach
- Other requirements pilots might have had.

The timeframe of activities was decided based on the availability of the project results and the overall project progress in coordination with other engagement activities the pilot was already implementing (if any), to exploit economies of scale. The focus of the workshops was on engagement activities to be carried out in phase 1 (M18-M24). Phase 2 activities will be agreed upon based on the outcomes of phase 1.

As a result of the workshops, a dedicated engagement plan was elaborated for each pilot *("Engagement plan").* The plan includes the local engagement framework (e.g., stakeholders/target groups to be addressed, and desired levels of participation) and the planned activities, representing the roadmap for phase 1.

As the engagement plan is a working document that serves as a guide for pilots to plan the activities, it was updated with modifications over time to adapt it to the specific circumstances or issues that are inherent to the engagement process in each pilot.

The eNeuron engagement framework and pilots' specific plans are described in *Chapters 3 and 5-8*, respectively.

2.2   Step 2: Definition of the social evaluation framework

Activities in this step were partially run in parallel with Step 1.

The eNeuron social evaluation framework includes:

- A set of social KPIs to measure both the effectiveness of the engagement activities and broader social impacts (in particular acceptance)

- Social KPIs cards to describe the indicator, data sources, and calculation methods

- A series of tools to support data collection (two questionnaires and a KPI template)

Considering KPIs are measurable values that show how effective an organisation is at achieving its objectives, ICONS screened an initial list of KPIs *("Formulation of social indicators")* based on the

social objectives provided in the questionnaire (see Step 1). The social KPIs were categorised along the same dimensions as economic, environmental, and technical KPIS produced in Task7.1 to allow for consistent management at the project level.

The suggested list of social KPIs was shared with pilot leaders and the first feedback was collected. The final list was consolidated in the 4 dedicated workshops already mentioned in Step 1 ("*Feasibility check of engagement tools and KPIs*"), considering there is a direct link between the KPIs selected and the engagement activities that will be performed. The workshops also served to agree on the timing for data collection, in particular for phase 1, following the timing of engagement activities in the roadmap for phase 1.

Two questionnaires were designed ("*Questionnaires and templates for data collection*") and agreed with pilot leaders and the project's coordination team to gather the data needed for the assessment of the social KPIs. The first one consists of a feedback survey to be administered during the engagement activities with eNeuron "indirect beneficiaries". The survey addresses issues such as environmental awareness and concerns, perceived benefits of the eNeuron toolbox solution, contribution to energy-changing behaviours, and contribution to reputation/social image of the pilots (See the Full Questionnaire in Annex II). The second questionnaire is addressed to the users of the eNeuron toolbox (technical staff working on its implementation in each pilot) and will assess the user acceptance of the toolbox during the second phase of the engagement process (M25-M48) as familiarity and usage of the tool was still limited at the end of phase 1.

Lastly, a KPI template has been provided to pilots to support the standardised collection of other data.

The eNeuron social evaluation framework is described in detail in *Chapter 4.*

2.3 Step 3: Analysis of social acceptance in the pilots

Once the engagement plans were finalised and the social evaluation framework consolidated, pilot leaders started the implementation of the engagement activities as per the roadmap for phase 1 ("*Engagement process").* Data collection was run in parallel, and this allowed the initial assessment of the social KPIs, including social acceptance ("*Evaluation*"). Results from this evaluation are currently leveraged to provide inputs to the Engagement plans for phase 2 (M24-M48) and fine-tune them to reach the expected social objectives.

Considering the scope of eNeuron, there are no anticipated "direct impacts" of the technologies developed in the project on citizens. As such, it is not possible to perform traditional "ex-ante" (before the interventions) and "ex-post" (after the interventions) social evaluations. However, indirect impacts will be equally important in the project, considering the role that people using

and/or attending municipal facilities in the City of Bydgoszcz or the Skagerak stadium, students in UNIVPM, and the military personnel and employees of the Marinha Naval Base can have. This can contribute to the success of eNeuron by changing their behaviours, and/or pushing for/demanding more investments. A preliminary assessment of these impacts is provided in this report *(Chapters 5-8).*

The final report (D7.4, "Outcome of the end-user engagement and social impact assessment") to be released in M48 will further cover these broad social acceptance aspects, following the engagement activities in phase 2, and also include an analysis of acceptance from the users of the eNeuron toolbox (technical staff).

Furthermore, the outcomes of Task 7.2 will be leveraged in Task 7.3 "Assessment of scalability and replicability at European level" and Task 7.4 "Roadmap and guidelines for optmising the LECs /energy islands" which aim to support the replication and scaling of the solutions and achievements of the eNeuron proposal at the European level. Social KPIs, in particular the users' acceptance and experience, will provide relevant insights for the uptake of the eNeuron toolbox solutions.

3   The eNeuron Engagement framework

The eNeuron engagement framework described in this chapter lays the structure that supports the development of engagement plans in each pilot. It defines common features of the eNeuron engagement activities to enable a consistent approach across pilots by defining:

- the scope of engagement,
- the key target stakeholders,
- the desired or feasible engagement levels,
- the timeframe,
- the structure of the engagement plans.

3.1   Engagement in eNeuron

eNeuron is understood as "green energy hubs (EH) for Integrated Local Energy Communities (ILEC) optimisation". Although it does not presuppose interaction with a large number of prosumers as in typical local energy communities, it interacts with multiple stakeholders such as the users of pilot facilities, their employees, and other stakeholders impacting the project developments. These interactions open up engagement opportunities to:

1) maximize the project impact at the societal level;
2) collect feedback from the users of the eNeuron toolbox to support the future uptake of the eNeuron concept and toolbox.

Indeed, engagement and participatory practices are increasingly becoming part of the business practice and innovation projects in the energy segment. The underlying assumption is that greater participation of citizens and stakeholders can help to boost the impact of collective energy initiatives, contributing to the uptake of innovative energy technologies, creating acceptance, and innovation buy-in.

Engagement refers to all forms of interaction between citizens/individuals, organisations, and communities and can happen at any stage of the development/implementation of the project. It is about communicating, mobilizing, collaborating, gaining acceptance for policies or technologies, and for encouraging changes in behaviour.

Engagement activities can take many formats, from passive methods such as the provision of information in an event or a demonstration (one-way flow) to more active methods (participatory approaches like gamification or focus groups). In eNeuron, the engagement strategy combines various activities to address the defined target stakeholders in each pilot (UNIVPM, Skagerak, City

of Bydgoszcz, and Marinha) and tailored for each site. It leverages existing local engagement resources and new initiatives to involve, consult, and collaborate with the target stakeholders.

3.2   Target stakeholders

In public participation, a stakeholder is often defined as any person or group who has an interest in the project or could be potentially affected by its outputs. Taking into account the characteristics and specificities of the eNeuron project and pilots, three different stakeholder groups have been identified:

- **Indirect beneficiaries:** they consist of all the individuals that indirectly benefit from the eNeuron developments (i.e., greener energy, optimised consumption, etc.) within each pilot. They represent the users of the buildings and facilities where the implementations are taking place and vary widely according to the nature of each pilot. Engagement with the indirect beneficiaries of the facilities and buildings in each pilot helps to raise awareness of sustainable energy practices and foster informed energy behaviour.
- **eNeuron toolbox users:** they consist of all the technical staff directly involved in the implementation and usage of the system. eNeuron engages with the users to collect feedback and understand the pain points of the technologies implemented to fine-tune them and foster replication.
- **Other stakeholders:** they consist of other organisations that may benefit from the eNeuron toolbox solution and concept such as operators. Within this group, engagement activities aim at fostering replication and uptake.

The target stakeholders within each of these categories are detailed in the pilot-specific engagement plan chapters (*Chapter 5-8*).

3.3   Levels of participation

eNeuron leverages the levels of participation model to engage with target groups in the project activities and sustain their engagement throughout the project. These five levels are adapted from Arnstein "Ladder of Citizen Participation" (1969), one of the most popular models in the citizen engagement literature. The Engagement ladder is a tool used to build relationships over time to deepen stakeholders' commitment to a project. The ladder of participation usually includes:

- **Inform:** The community of stakeholders is informed of the project and solutions.
- **Consult:** The community of stakeholders provides feedback on alternatives or solutions.
- **Involve:** The community of stakeholders is directly involved in the project; project decisions reflect the ideas and concerns of the community.

- **Collaborate:** The community of stakeholders represents a key partner in the process; community ideas are integrated into the decisions as much as possible.
- **Empower:** Final decisions are in the hands of the community.

In general, the level of participation in the "ladder" depends on such factors as the objectives, the topics to be discussed/agreed upon, the status, and the phase of the project as follows:

1. Generating interest and increasing awareness: "*Inform" Engagement ladder*
2. Requesting feedback: *"Consult" Engagement ladder*
3. Gathering requirements-Building consensus: *"Involve" Engagement ladder*
4. Generating ideas, co-designing, co-creating, co-implementing solutions: *"Collaborate" Engagement ladder*
5. Community decision-making: *"Empower" Engagement ladder*

These levels are useful as they provide general guidance on the stance of engagement with the defined stakeholders. Within eNeuron, they have been adapted to target stakeholders (i.e., eNeuron toolbox users, indirect beneficiaries, and other stakeholders) and related engagement objectives. The results of this exercise are presented in the following table:

Table 1 Target group and engagement objective

Participation level	Target group and engagement objective
Inform	**eNeuron toolbox users:** disseminate information, raise awareness, promote achievements, progress updates, etc.
	Indirect beneficiaries: communicate the solutions being implemented, and their benefits for the general community; raise awareness and increase support and advocacy for the energy transition; increase knowledge regarding energy flexibility.
	Other stakeholders: disseminate information to incentivize further adoption of energy management and optimization solutions and support eNeuron replication.
Consult	**eNeuron toolbox users:** consult the technical staff implementing the eNeuron solution in the pilot to capture their perception of perceived benefits, ease of use/implementation, key challenges, etc.
	eNeuron indirect beneficiaries: collect feedback and gather perceptions/evaluations that contribute to the project development.
Involve	**Indirect beneficiaries:** to foster dialogue between citizens/beneficiaries of the project, take into account their ideas, and visions; understand expectations, concerns, wishes, etc.

Collaborate	**Indirect beneficiaries**: collaboration with the indirect beneficiaries for the development of specific solutions (i.e., in UNIVPM, students followed by the academic staff participating in the eNeuron project, are expected to contribute to the development of an App to be used in the pilot).
Empower	**Other stakeholders**: for the uptake and replication of the eNeuron toolbox solutions**.**

Based on the different levels of participation in the ladder, the specific target stakeholders, and the objectives to be achieved, different engagement tools can then be evaluated and selected as per the methodology described in *Chapter 2.*

3.4 Engagement process and timeframe

The engagement process in each pilot is led by the pilot leaders, which are responsible for the actual implementation of the engagement plan. The eNeuron engagement framework detailed previously provides a structure approach to interact with the stakeholders and comprises **two phases** for the implementation of activities:

- **Phase 1** (M18 - M24): In this phase, engagement activities aim at informing, consulting the indirect beneficiaries in each pilot and the technical employees. The specific activities carried out so far are described in *Chapters 5-8*, where the pilot-specific engagement plans are covered.
- **Phase 2** (M25-M48): In this phase, engagement activities will also address the users of the eNeuron toolbox to assess users' experience and acceptance. In addition, other stakeholders will be involved to support the replication and uptake of the technologies developed in the project.

3.5 Engagement plan

All these common features have been considered in the definition of the engagement plans in each pilot. As such, the engagement plans cover:

- A short description of the pilot and a socio-demographic analysis of the target stakeholders along with the stakeholder groups identified in paragraph 3.2 (i.e., indirect beneficiaries, eNeuron toolbox users, and other stakeholders);
- An assessment of the key social objectives of the engagement activities, tied to the different level of participation (engagement "ladder");
- A focus on the activities to be performed, the stakeholders to involve, and the engagement tools for phase 1 of the project (Chapters 5-8) and phase 2 (under evaluation).

4 eNeuron Social Evaluation Framework

The eNeuron social evaluation framework is aimed at assessing the social indicators linked to engagement activities and project interventions to define the social impacts of the eNeuron project. The framework defines the indicators and suggests the calculation methods, the tools and timing for data collection. KPIs have been selected in collaboration with pilot leaders through a mix of top-down and bottom-up approaches, as already described in *Chapter 2.* These KPIs complement the technical, economic, and environmental KPIs defined in Task 7.1 to provide a full assessment of the eNeuron impacts.

4.1 eNeuron Social KPIs

Social KPIs (SO-KPIs) in eNeuron can be either quantitative or qualitative. Quantitative indicators provide a measure of quantity (it can be a ratio, a percentage, etc.) and are numerically comparable. Qualitative indicators capture judgments or perceptions and are usually used to measure changes over time. They are particularly relevant to measure the perspectives of eNeuron target stakeholders, the "indirect beneficiaries" and the eNeuron toolbox users.

Considering the indicators hierarchy:
- "Input indicators" measuring human, financial and infrastructure resources needed to deliver an intended result.
- "Activities indicators" measuring the actions implemented.
- "Output indicators" measuring the immediate results of such actions.
- "Outcome indicators" measuring the benefits deriving from these immediate results (usually short-term and for small communities).
- "Impact indicators" measuring the higher-level goals that a project contributes to.

eNeuron KPIs mainly refer to the Output, Outcomes, and Impact dimensions.

The eNeuron social evaluation framework comprises three groups of social KPIs:

1) **Engagement KPIs:** this group of indicators measures the effectiveness of online and offline engagement activities to gather lessons learnt and fine tune the engagement strategy for the following steps. It is broad in scope, covering informative actions on social media as well as face-to-face engagement activities (e.g., workshops). eNeuron engagement KPIs are mainly quantitative and are collected by each pilot leader using the KPI template. They mostly represent activities, output, or outcome indicators of eNeuron engagement activities.

2) **Social Acceptance KPIs:** these indicators are measured based on the questionnaire distributed to the "indirect beneficiaries" of the project and seek to capture information in four key dimensions:

- Environmental awareness and concern
- Perceived benefits of the eNeuron technologies
- Contribution to energy behaviour change
- Contribution to reputation/social image

eNeuron Social Acceptance KPIs are mainly expressed through percentages of respondents (quantitative indicators) and Likert scales (quantitative representations of qualitative indicators of "indirect beneficiaries"' perceptions and opinions).

3) **Users' Acceptance KPIs**. This set of indicators measures the perception of the technical staff implementing the eNeuron toolbox over perceived benefits, ease of use/implementation, key challenges, etc. As for the Social Acceptance KPIs, the indicators are expressed through the percentages of respondents in each category and the mean values based on the Likert scales[1]. For this set of indicators, the measurement will take place in the second phase of the engagement activities (M25-48), as they require higher maturity of the technology development to measure user acceptance.

As the project progresses, engagement activities may entail additional objectives that have not yet been identified, and other KPIs could be introduced in phase 2 of the project (M25-M48).

4.2   Engagement KPIs

Six social engagement KPIs have been identified for the application in the eNeuron pilots. They include:

- SO-KPI1: Stakeholders engaged
- SO-KPI2: Stakeholders engaged by type
- SO-KPI3: Engagement activities by type
- SO-KPI4: Local social media activities
- SO-KPI5: Local Social media engagement
- SO-KPI6: Replication interest

SO-KPIs 1, 2, and 4 represent key *outputs* of eNeuron engagement as they measure the outreach of both offline and social media activities. SO-KPI3 is an indicator of the *activities* performed. SO-KPI5

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[1]Likert scale are survey questions that commonly use a 5 point-scale, ranging from one extreme attitude to another, including a moderate or neutral option. Likert-type questions are a popular way to measure opinions, perceptions, and behaviours, and provide a quantifiable answer option.

is a measure of the interested generated and can be considered as an *outcome* of the eNeuron engagement activities, while SO-KPI6 supports measuring the long-term *impact* of the project via upscaling replication in other contexts.

SO-KPIs 1-5 were already measured during phase 1 of the eNeuron engagement activities. SO-KPI6 will be measured within phase 2.

The following cards describe the eNeuron social engagement KPIs in detail.

No. ID	SO-KPI 01
Name	Stakeholders engaged
Dimension	Social – Engagement
Definition	This indicator refers to the total number of stakeholders (indirect beneficiaries; eNeuron toolbox users; other stakeholders) that were involved in the engagement activities
Calculation	Sum of number of stakeholders involved in the engagement activities
Units	Number of stakeholders
Data	xls KPI template

No. ID	SO-KPI 02
Name	Stakeholders engaged by type
Dimension	Social – Engagement
Definition	This indicator refers to the total number of stakeholders engaged in the project by type (indirect beneficiaries, eNeuron toolbox users, other stakeholders)
Calculation	Sum of number of stakeholders for each category and percentage distribution
Units	Number of stakeholders and percentages
Data	xls KPI template

No. ID	SO-KPI 03
Name	Engagement activities by type
Dimension	Social – Engagement
Definition	This indicator counts the number of engagement activities by type of activity (i.e., workshops, meetings, etc). The indicator does not cover online and social media activities in the "Inform" level in

	the engagement ladder. Other measurements (e.g., number of posts representing an activity on social media) are provided within SO-KPI4.
Calculation	Sum of engagement activities performed by type and percentage distribution
Units	Number of activities and percentages
Data	xls KPI template

No. ID	SO-KPI 04
Name	Local Social media activities
Dimension	Social –Engagement
Definition	The indicator includes number of activities (e.g., posts, tweets, etc), number of impressions, and number of engagement actions on the local social media platforms
Calculation	Retrieved from social analytics, percentage distribution by platform
Units	Number of activities, impressions, and social actions; percentages
Data	Social media analytics

No. ID	SO-KPI 05
Name	Local Social media engagement index (SEI)
Dimension	Social – Engagement
Definition	The indicator measures the amount of interaction that the social media users have with the social media content.
Calculation	This metric divides all the engagement a post receives - including likes, comments, shares, saves, and favourites - by the total number of impressions
Units	Percentage
Data	Social media analytics

No. ID	SO-KPI 06
Name	Replication interest
Dimension	Social – Engagement
Definition	This KPI captures the number of spontaneous manifests of interest in the initiatives implemented in the scope of the project following engagement activities with other stakeholders, and briefly describes them
Calculation	Sum of manifests of interest and brief description

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Units	Number/Qualitative
Data	Internal templates

4.3 Social Acceptance KPIs

Eight Social Acceptance KPIs have been identified to understand the outcomes and impacts that the eNeuron engagement activities have on the project's "indirect beneficiaries." They include:

- SO-KPI7 Importance of environmental sustainability
- SO-KPI8 Importance of energy efficiency measures
- SO-KPI9 Familiarity with Local Energy Communities (LEC)
- SO-KPI10 Awareness of the eNeuron energy measures
- SO-KPI11 Top eNeuron benefits
- SO-KPI12 Energy changing behaviour
- SO-KPI13 Social influence/Image

SO-KPIs 7-11 represent key *outcomes* that the eNeuron engagement activities have on the indirect beneficiaries in terms of driving their understanding of the importance of environmental sustainability and energy efficiency (SO-KPI 7 and 8), and their familiarity with eNeuron concepts (SO-KPIs 9, 10). SO-KPI 11 measures the understanding of the eNeuron benefits as well as provides inputs to the definition of a clear value proposition for its solutions. It is another *outcome* indicator. SO-KPIs 12 and 13 investigate changes in the behaviour of the indirect beneficiaries and their perception of the social image of the pilots. Considering these changes have long-term implications, they can well be considered indicators of the *impacts* brought by eNeuron on the community of citizens, students, and employees benefiting from the project.

These indicators are measured as a follow-on action, after eNeuron events targeted to the pilots' non-technical staff, citizens, and students. They will be measured also in the second Phase of the eNeuron engagement activities to understand progress and changes over time.

No. ID	SO-KPI 07
Name	Importance of environmental sustainability
Dimension	Social – Acceptance
Definition	Self-reported level of environmental concern, which is linked to environmentally responsible behaviour. Individuals are asked to rate the importance of environmental sustainability to them personally.
Calculation	Mean value of results.

	Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 08
Name	Importance of energy efficiency measures
Dimension	Social – Acceptance
Definition	This indicator is designed to evaluate people's perception on the importance of energy efficiency measures to achieve sustainability.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 9
Name	Familiarity with LEC/Energy Hubs
Dimension	Social – Acceptance
Definition	Self-reported level of familiarity with the concept of Local Energy Community (LEC)
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 10
Name	Awareness of the eNeuron energy measures
Dimension	Social –Acceptance
Definition	This indicator is designed to evaluate the stakeholders' awareness of the benefits of the measures implemented in eNeuron.
Calculation	Mean value of results.

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	Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 11
Name	Top eNeuron benefits
Dimension	Social – Acceptance
Definition	This indicator is designed to capture the stakeholder's opinions over the most important benefits of the eNeuron toolbox. A list of options is provided, and individuals have to indicate the key benefit for them.
Calculation	Distribution of respondents
Units	% Respondents
Data	Questionnaire

No. ID	SO-KPI 12
Name	Energy changing behaviour
Dimension	Social – Acceptance
Definition	This indicator is measured by two items capturing 1) increased awareness on energy consumption behaviour after attending engagement session 2) willingness to take energy efficiency measures.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 13
Name	Social influence/Image (pilot level)
Dimension	Social – Acceptance
Definition	The indicator describes the stakeholder's perception concerning the pilot's commitment to sustainable practices. It measures the reputation gains of the pilot due to the implementations of the project.
Calculation	Mean value of results. Percentage of respondents for each Likert item.

Units	Likert scale, % respondents
Data	Questionnaire

4.4   User acceptance and experience

The last set of indicators targets the technical staff at pilot sites and measures the user's acceptance and experience with the eNeuron toolbox.

Seven indicators have been identified and agreed with the pilot leaders and the project coordination team. They will be measured via a dedicated questionnaire to the eNeuron toolbox users in phase 2 of the project and, as such, some slight changes could still happen before their assessment.

Planned indicators include:

- SO-KPI14: Balance between need and complexity
- SO-KPI15: User-friendliness
- SO-KPI16: Perception of the eNeuron toolbox contribution to accomplishing the pilot's goals
- SO-KPI17: Technological advancement
- SO-KPI18: Importance of features and functionalities of the toolbox
- SO-KPI19: Overall satisfaction with the eNeuron toolbox
- SO-KPI20: Users'-driven upscaling

These indicators are adapted from the Technology Acceptance Model (TAM) based on TRA (Theory of Reasoned Behaviour) and introduced by Davis back in 1989[2]. The model identifies two factors that affect the decision to use a technology, notably:

- "Perceived usefulness (PU)" – defined by Davis as "*the degree to which a person believes that using a particular system would enhance his or her job performance".*
- "Perceived ease-of-use (PEOU)" – defined as "*the degree to which a person believes that using a particular system would be free from effort".*

Within eNeuron, PEOU will be clearly measured with SO-KPI16, while both PU and PEOU are covered in SO-KPI15.

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[2] "User acceptance of Information Technology: system characteristics, user perceptions and behavioural impacts", F. Davis, 1989.

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The TAM model has been continuously studied and extended. Among major upgrades, there is the so-called TAM 2[3]. eNeuron considers some of the variables from this model, which are most appropriate to measure the acceptance of the toolbox. They include:

- "Output quality" (TAM2), quality of the final results in relation to the tasks that match their job relevance): Perception of the eNeuron toolbox contribution to accomplishing the pilot's goals (SO-KPI17).
- "Job relevance" (TAM2), level of applicability to a job and number of tasks the system is able to support) adapted to Technological advancement (SO-KPI18) and Importance of features and functionalities of the toolbox (SO-KPI19).

All these indicators (SO-KPI14-18) represent key project outcomes from an end-user's perspective. The framework also foresees a general question on satisfaction (SO-KPI190) and a final question to users that would recommend the system (SO-KPI20). While SO-KPI19 represents an *outcome* of eNeuron, users' willingness to recommend the project (SO-KPI20) may provide an initial view of its potential *impact* after the end of the project when the solution will be up-scaled and replicated in other contexts.

No. ID	SO-KPI 14
Name	Balance between need and complexity
Dimension	Social – User Acceptance
Definition	This indicator captures the users' perceptions of the usefulness of the eNeuron toolbox, balancing it with an assessment of its complexity.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 15
Name	User-friendliness
Dimension	Social – User Acceptance

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[3] "A theoretical extension of the technology acceptance model: Four longitudinal field studies", Venkatesh, Davis, 2000.

Definition	The indicator captures the users' perception of the user-friendliness of the eNeuron toolbox.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 16
Name	Perception of the eNeuron toolbox contribution to accomplishing the pilot's goals
Dimension	Social – User Acceptance
Definition	This indicator measures the users' perception concerning the contribution of the eNeuron toolbox to the achievement of the pilot's goals.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 17
Name	Technological advancement
Dimension	Social – User Acceptance
Definition	This indicator measures the user's opinion concerning the technological advancement of the eNeuron toolbox, compared to other state of the art technologies.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 18
Name	Importance of features and functionalities of the toolbox
Dimension	Social – User Acceptance

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Definition	This indicator provides users' perceptions concerning the importance of each of the features/functionalities of the toolbox.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 19
Name	Overall satisfaction (concerning the eNeuron toolbox)
Dimension	Social – User Acceptance
Definition	The indicator measures the users' level of satisfaction with eNeuron solutions.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

No. ID	SO-KPI 20
Name	Users'-driven upscaling
Dimension	Social – User Acceptance
Definition	This indicator measures the users' willingness to recommend the eNeuron toolbox to other organisations.
Calculation	Mean value of results. Percentage of respondents for each Likert item.
Units	Likert scale, % respondents
Data	Questionnaire

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5   UNIVPM Engagement Plan and Social Evaluation

5.1   UNIVPM Engagement Plan

5.1.1   Pilot profile & stakeholders to be engaged

Università Politecnica delle Marche (UNIVPM) is located in Central Italy. It has various campuses across the region that may constitute an ILEC. UNIVPM can be considered an energy hub with four sub-hubs located in Ancona (Italy):

1. Montedago multi-energy microgrid (three faculties: Engineering, Life Sciences, and Agriculture);
2. Faculty of Economics;
3. Faculty of Medical Sciences;
4. UNIVPM Rectorate (headquarters).

Site 1 is a micro–Energy Hub, while sites 2, 3, and 4 are passive users with no distributed energy resources (DER). The stakeholders addressed within each stakeholder group by the engagement activities in UNIVPM are detailed below:

1) **Indirect beneficiaries:**
   - Non-technical staff (university administrative personnel);
   - University community (students and their families; Professors);
2) **eNeuron toolbox users:** technical staff involved in the implementation of the solutions in the various pilot buildings and facilities. These will include both the University's staff (Engineering department), as well as the technical staff from the outsourced company.
3) **Other stakeholders:** the local community in general and other stakeholders - such as Municipalities, Regional Governments, and Industries cooperating with universities; Other university campuses.

Table 2 describes the pilot profile including the sociodemographic information related to the stakeholder groups:

Table 2 UNIVPM pilot profile

	Engagement target	Stakeholders	Number	Age	Gender	Education
1.	Indirect beneficiaries	Students	17,000	22-23	-	Undergrad, Masters, Ph.D. students

2.		Professors	500	(55% + 60 years) (30% between 40-50 years)	65% men, 35% women	Masters, Ph.D.
3.		Staff	500	45-48	64% men, 34% women	
4	**eNeuron toolbox users**	Technical staff	6	40-45	83% men, 17% women	Professors, Researchers, Postdocs, Ph.D. students

5.1.2 Social objectives

One of the key goals of UNIVPM is to increase the awareness concerning the energy transition not only of professors, staff, and students, but also of stakeholders, such as families, municipalities, Regional Government, and industries cooperating with universities. A particular focus is given to the increasing knowledge concerning the contribution and importance of flexibility in energy systems and related technologies.

UNIVPM's engagement plan (Phase 1) was designed having in mind these goals. At this stage, the activities aimed mostly to inform the stakeholder groups about the project and the technical solutions implemented in the University campuses and also consult them to obtain feedback.

Information and awareness are a fundamental step in the engagement process. They contribute to achieve the desired outcomes by setting the scene and putting the project and technical solutions on the radar. Informative activities will be followed by more participatory techniques, to enable collaboration among the stakeholders in the second phase of the engagement process.

5.1.3 Engagement activities, timing, and tools

The initial engagement plan covered a wide range of methods and tools to engage with the local stakeholders. In an interactive process, it was adapted, and the final activities performed are described in Table 3:

Table 3 Engagement activities roadmap for phase 1

Phase	Purpose	When	Tools
Phase 1	**Inform all Indirect beneficiaries** (students, non-technical staff, professors) and **Other Stakeholders**	**M18 – M23**	➢ Social media channels (LinkedIn, Twitter, Telegram) ➢ Informative poster ➢ Flyers & Leaflets
	Inform students	**M19**	➢ Presentation in University courses, (Bachelors' and Masters')

	Consult students	**M19**	➢ Feedback form following the presentation in university courses
	Inform indirect beneficiaries (students, professors) **and other stakeholders** (the local community)	**M23**	➢ European Researchers' night
	Consult students and citizens of Ancona and towns nearby	**M23**	➢ Feedback form following the European Researchers' Night
	Collaborate with indirect beneficiaries (students, professors)	**M22***	➢ Student hackathon (for app development);

*The hackathon activity is being evaluated and will be launched during the second phase of the engagement.

With "Inform" being the primary participation level sought by UNIVPM in phase 1, the University largely leveraged social media, online presentations in Bachelors' and Masters' courses, and the participation in the European researchers' night.

Social media: UNIVPM used its existing social media accounts on LinkedIn, Twitter, and Telegram starting in April 2022. The content produced aimed at encouraging people to learn more about the eNeuron initiatives, raise awareness concerning the importance of energy management and saving, and renewables consumption for the energy transition and the flexibility concept. It included posts and reposts activities.

On-line presentations in Bachelors' and Masters' courses: presentations were done in May 2022 in Bachelors' and Masters' courses at UNIVPM, to present eNeuron activities and the role of UNIVPM within the project.

European Researchers' night: This event is thought to bring the general public and the world of research together, which is an existing initiative that happens once a year and that seeks to involve ordinary people in scientific endeavours, by making use of streets, squares, and places to talk about research. During the European Researchers' night, the concept of the LEC and the UNIVPM experience was presented.

To capitalise on the last 2 activities, UNIVPM distributed the online **Feedback form survey**, administered during the presentations in the University courses and the Researchers' night. The survey aimed at assessing general attitudes and perceptions concerning the environmental sustainability, as well as collect inputs linked to some of the project aspects. It represents both a

tool to "*Consult*" participants on certain aspects (e.g., perceived eNeuron benefits) as well as a way to evaluate the outcomes and impacts of these engagement activities, and the project as a whole.

Lastly, to collaborate with students at UNIVPM, a hackathon is planned to start by February 2023.

Student hackathon (for app development); the goal of the hackathon is to create a functioning app by the end of the event. It will involve university students from Maters' courses of the Engineering Information Department (DII). The app will be used to provide feedback concerning the campus comfort linked to the energy management of the local energy hub. This activity started to be planned during phase 1 of the engagement activities and will be implemented during phase 2.

5.2   Social evaluation – UNIVPM

This subchapter presents the outcomes of the engagement activities and social impact evaluation of UNIVPM. It provides the assessment of the KPIs described in Chapter 4 (eNeuron Social Evaluation Framework). As previously indicated, the first phase of the engagement process comprises engagement KPIs and the social assessment KPIs.

5.2.1   Engagement KPIs

The engagement activities at UNIVPM included eight presentations in Bachelors' and Masters' courses to provide an overview of the eNeuron project, and the activities in which UNIVPM is involved. Additionally, UNIVPM participated in the European Researchers' night, reaching a wider audience outside the University's boundaries. Together, these engagement activities reached a total of 511 stakeholders.

The KPIs are reported in Table 4:

Table 4: Engagement KPIs – UNIVPM

No. ID	KPI	Total	%
SO-KPI 01	**Stakeholders engaged**	511	-
SO-KPI 02	**Stakeholders engaged by type**	-	-
	– Indirect beneficiaries	511	100%

	– eNeuron toolbox users	-	-
	– Other stakeholders	-	-
SO-KPI 03	**Engagement activities by type**	9	-
	– Presentations	8	89%
	– Other (Attendance at the European Night of Researchers)	1	11%

UNIPVM also used its social media accounts (Twitter, Telegram, LinkedIn) for engagement activities. The data retrieved from the social analytics are reported in Table 5, in particular the number of activities (e.g., posts, reposts, tweets, etc), number of impressions (i.e., number of times the content is displayed to users), and number of engagement actions on the local social media platforms (i.e., comments, likes, shares etc.).

Table 5: Social media KPIs – UNIVPM

No. ID	KPI				
	Local social media activities	**Total**	**Twitter**	**Telegram**	**LinkedIn**
	– Number of activities (posts, reposts)	100	40	20	40
	– Percentage distribution by platform (%)	-	40%	20%	40%
	– Total number of impressions (visualisations)	23600	7000	600	16000
SO-KPI4	– Percentage distribution by platform (%)	-	30%	2%	68%
	– Social actions (like, comments, shares, – clicks, suggests the post)	3000	600	-	2400
	– Percentage distribution by platform (%)	-	20%	-	80%
	– Number of followers	3248	129	33	3086
	– Percentage distribution by platform (%)	-	4%	1%	95%
SO-KPI5	– Local Social media engagement index (local SEI)	13%	9%	-	15%

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In terms of followers, also due to the use of its institutional channels, UNIVPM had a total of 3,349 followers, of which 95% were from LinkedIn. The remaining followers are divided between Twitter (4%), Telegram (1%).

The local social media engagement shows that, thanks to 100 social media activities (80 posts and reposts on Twitter and LinkedIn, and 20 on Telegram), 23,600 impressions were achieved. The distribution shows again the strong importance of LinkedIn with 67.80% of impressions, followed by Twitter (29.66%) and Telegram (2.54%).

Users engaged in 3,000 social actions - likes, comments, shares, clicks, suggestions – on social media: Again, LinkedIn outstands with 80% followed only by Twitter with 20%. The results of the Local Social media engagement index (SO-KPI5) suggest that the audiences of the pilot's social media were actively engaging with the content published with positive engagement rates (9% for Twitter, and 15% on LinkedIn).

Overall, social media has become a vital part of our daily lives, especially considering the young age of the individuals in the target groups. As such, the use of such platforms is fundamental for achieving the pilot's main objectives. Of course, the mere numbers of outreach and engagement are not sufficient to make assumptions about the actual impact of such initiatives on the public's awareness and energy behaviour; however, they have a strong potential for engaging with online audiences.

5.2.2 Social Acceptance KPIs

The social indicators present the results of the questionnaire administered during the engagement activity carried out by UNIVPM. Respondents comprise Bachelor's and Masters' students from the Marche Polytechnic University, and general visitors at European Researchers' Night. A total of 100 individuals responded to the survey. The majority were male students (80 out of the total), under 30 years old (mostly in college graduation age). The questionnaire was distributed online during the presentations with Bachelors' and Masters' students.

The aim of questionnaire was to understand the overall perception of the pressing environmental issues, awareness concerning the LECs, and benefits of the eNeuron initiatives. The results are reported below:

Importance of sustainability
(SO-KPI 07)

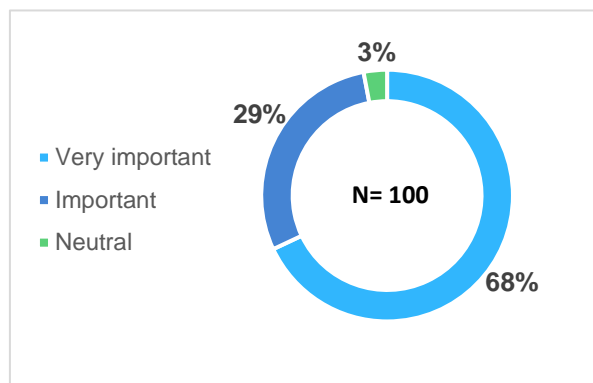**Importance of energy-related measures**
(SO-KPI 08)

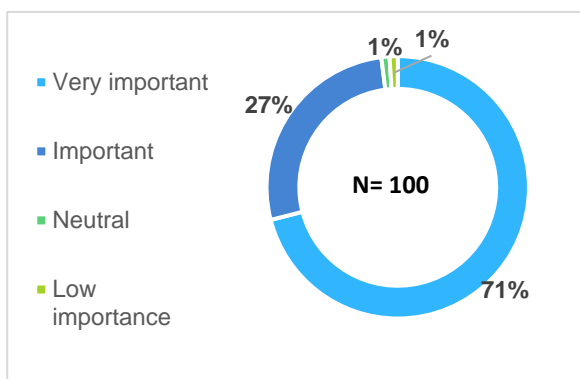**Figure 2**: Importance of sustainability (SO-KPI 07)

Figure 3: Importance of energy-related measures (SO-KPI 08)

As expected, the importance of environmental sustainability is unanimous, with 68% of respondents stating that it is very important for them personally. When asked about the importance of energy-related measures in particular, a slightly higher number of respondents (71%) stated that such measures are very important. These very positive levels of awareness and environmental concern reflect in part the respondents' profile, which comprises mostly engineering students with strong knowledge concerning the environmental impact associated with energy use in general. The key challenge is to transform high levels of environmental awareness into concrete practice capable of driving change.

Familiarity with LECs
(SO-KPI 09)

Awareness of the benefits of the solutions
(SO-KPI 10)
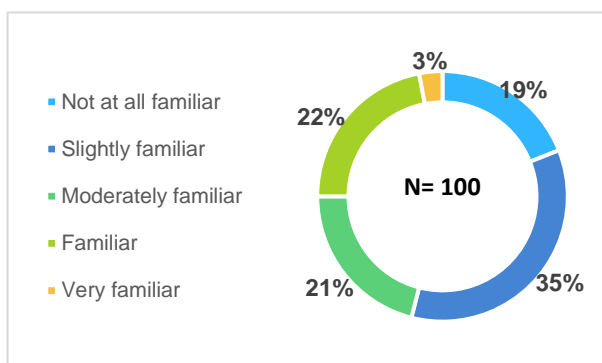
Figure 4: Awareness of the LECs (SO-KPI 09)
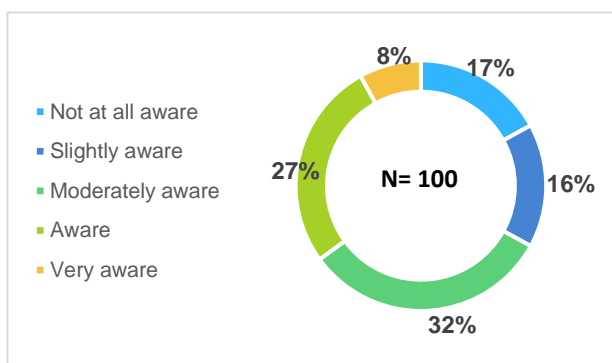
Figure 5: Aware of the benefits of the solutions (SO-KPI 10)

When asked about their familiarity with LECs, almost half of the respondents stated they are not familiar or only slightly familiar with the concept. This figure suggests that the LEC concept is still not very known among these stakeholders. The lack of information about innovative energy initiatives can pose a limitation for further uptake and participation in local energy initiatives, as

according to popular diffusion of innovation theories, awareness is a key element in the adoption process of innovation.

With regards to the awareness of benefits of the solution (SO-KPI 10), only 35% of the respondents stated they are fully aware of it. Stakeholders with a clear understanding of the benefits of the technologies implemented (e.g., environmental, economic) can play a relevant role in the adoption and replication of these systems.

Table 6: Most important benefits of the eNeuron toolbox (SO-KPI 11)

No ID	Most important benefits of the eNeuron toolbox	%
	Reduction in energy consumption due to system optimization	48%
	Higher utilization of clean energy (renewables)	46%
SO-KPI 12	Reduction of energy bills	3%
	Revenue generation from energy trading activities	2%
	Other (Please specify)	1%

The respondents were presented with a list of some of the key benefits of the eNeuron solution. 48% of the respondents agree that the reduction of energy consumption is the most important benefit, followed by the higher utilization of Renewables Energy Sources (RES). Reduction of energy bills and the possibility of generating revenues are not highly evaluated, probably because this target group does not derive a direct value from such benefits. It may also be the case that when it comes to environmental sustainability, monetary gains are not a priority for these respondents.

The view of the most valued benefits can be also understood as drivers of technology acceptance by this target group and can support the development of a clear value proposition, to be exploited in communication and information activities.

Energy changing behaviour
(SO-KPI 12)

"I have become more concerned about my energy consumption behaviour"
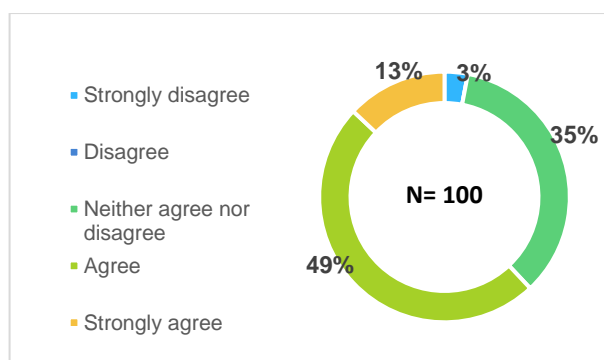
"I will take active measures to contribute to energy efficiency"
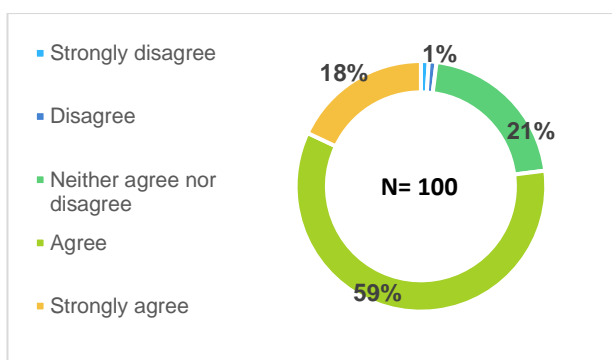
Figure 6: Energy changing behaviour
(SO-KPI 12a)

Figure 7: Energy changing behaviour
(SO-KPI 12a)

One of the aims of the engagement in energy projects is to foster and influence behaviour change. Indeed, the existing literature on the topic suggests that the energy literacy is a necessary condition for individuals to make informed decisions and act upon their energy consumption behaviour. To this regard, respondents were asked if they agreed with the following sentence "*After attending this event, I have become more concerned about my energy consumption behaviour*". 62% of the respondents either agree or strongly agree. When asked if, after attending the activity, they would seek to take active measures to contribute to energy efficiency at home, workplace, or in another environment, 77% of the respondents agreed/strongly agreed. These results somehow reflect the importance of engaging with the stakeholders to motivate and drive action.

Social image/reputation
(SO-KPI 13)

"The energy efficiency measures that are being implemented in UNIVPM show that it has a strong commitment to the energy transition and sustainable practices"
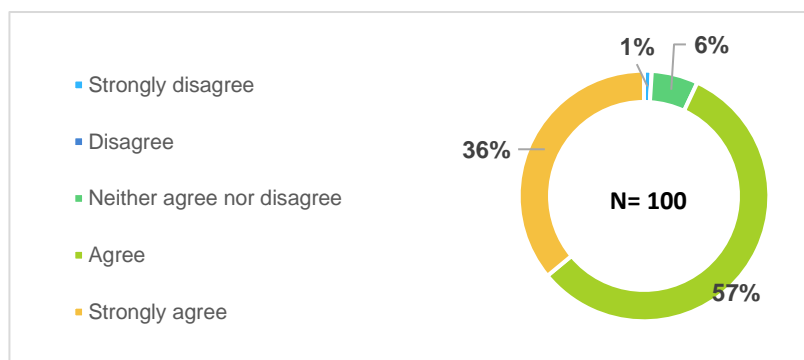
Figure 8: Social image/reputation (SO-KPI 13)

To measure the impact of the project interventions in the social image of the pilot, respondents were asked whether they agreed with the following sentence "*The energy efficiency measures that are being implemented in UNIVPM show that it has a strong commitment to the energy transition and sustainable practices*". 93% of the respondents agree/strongly agree with the sentence, while only 6% does not have an opinion. These figures indicate a very positive impact on the pilot's image and reputational gain, which translates in a solid trustworthiness and credibility for the organization.

A summary table presenting the descriptive statistics of the KPIs is provided at the end of the social evaluation chapter of each of the pilots. It presents the mean value of the KPIs (measured on a 5-point Likert scale, in which 1 is the minimum value, and 5 the maximum value) and the standard

deviation (SD). The SD gives an indication of how far the individual responses to a question deviate from the mean (i.e., the distribution of the responses). A high SD shows that responses are far from the mean (indicating that responses are very polarized), while a low SD indicates that values are clustered close to the mean.

As observed in Table 7, awareness of LECs and their benefits (SO-KPI 9 and SO-KPI 10) are the KPIs with the lowest mean values in UNIVPM. More education actions are therefore needed. With this respect, the focus of phase 1 in the Inform participation level in the Engagement ladder proves effective and respondent to a well-defined need in the community of students and other indirect beneficiaries.

Table 7: Summary of Social Acceptance KPIs

	Mean	Standard Deviation
SO-KPI 07	4.65	0.54
SO-KPI 08	4.68	0.55
SO-KPI 9	2.55	1.12
SO-KPI 10	2.93	1.20
SO-KPI 12a	3.69	0.81
SO-KPI 12b	3.92	0.72
SO-KPI 13	4.27	0.66

6 Skagerak Engagement Plan and Social Evaluation

6.1 Skagerak Engagement Plan

6.1.1 Pilot profile & stakeholders to be engaged

The Norwegian demo is deployed in an industrial-size installation, precisely in an operational football stadium called "Skagerak Energilab", which combines a big-scale (800 kW) PV generation plant with a Battery Energy Storage System (BESS) (1 MWh) and power electronics allowing several operational modes for the unit, including fully islanded operation.

The stakeholders addressed within each stakeholder group in Skagerak Energilab are grouped as follows:

1) **Indirect beneficiaries**:
   - Employees of the stadium
   - Visitors attending the stadium events
   - Odds soccer club (fan club)
   - Local community (i.e., households in the adjacent areas of the stadium)
2) **eNeuron toolbox users**: technical staff working on the implementation of the eNeuron toolbox in the pilot.
3) **Other stakeholders**: planners representing Distribution System Operator (DSO), municipalities, closed energy systems, business parks, integrated local energy communities, and similar.

Table 8 describes the pilot profile, including the sociodemographic information related to the target public:

Table 8: Skagerak Energilab pilot profile

	Engagement target	Stakeholders	Number	Age	Gender	Education
1.		Households	42	Elderly living in apartments	50% men 50 % women	High school and University bachelor's degree
2.	Indirect beneficiaries	SMEs	9	Mainly young and middle-aged	90% men 10% women	High school and University bachelor's degree
3.		Commercial buildings	1	Mainly young and middle-aged	90% men 10% women	High school and University bachelor's degree

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4.		Visitors	4,000 (on a match approx.)	Mainly young and middle-aged.	N/A	High school and University bachelor's degree
5	eNeuron toolbox users	Technical staff	-	-	-	-

6.1.2 Social objectives

Skagerak Energilab aims to increase the awareness that is necessary to change people's behaviour and willingness to interact with new services provided by the local energy system.

To achieve such objectives, Skagerak focuses on the "inform" and "consult" engagement levels to provide information for the indirect beneficiaries, to assist them in understanding the eNeuron project and other activities related to local energy communities led by Lede (utility company that hosts the Norwegian pilot).

Furthermore, involvement in eNeuron project is expected to provide an opportunity for broad two-way knowledge transfer, where Skagerak Energilab can share their experience and learn with other peers from Europe, while acquiring knowledge in new areas related to local energy systems. This objective is achieved via the participation in the project and exchanges with the other pilots. As it does not involve local social engagement, it is not further dealt in this report.

6.1.3 Engagement activities, timing, and tools

The engagement activities carried out in this first phase are described in **Table 9**:

Table 9: Skagerak Engagement activities roadmap for phase 1

Phase	Objective	When	Engagement tool
Phase 1	**Consult** users of the eNeuron toolbox	**Ongoing**	• Meetings with users of the eNeuron toolbox (interactions for the development of eNeuron and the lab)
	Inform indirect beneficiaries (visitors, households, employees) and other stakeholders	**M22 – M23**	• Article published on Skagerak's internal webpage "Workplace" (for internal employees); • Skagerak's Energilab website; • Social media (LinkedIn)
	Inform and consult indirect beneficiaries (households)	**M20**	• Workshop with householders at Skagerak Arena

Consult indirect beneficiaries (households)	M20	• Feedback form following the workshop

Skagerak relied mostly on its digital channels to inform the indirect beneficiaries of the project and a workshop to engage the local households. This workshop allowed the Skagerak team to consult the participants via a feedback survey. Lastly, the pilot also engaged with the future users of the eNeuron Toolbox. This activity is still ongoing and will ensure a fast deployment at the pilot site as well as meeting technical end-user needs and expectations.

 In detail:

Social media: an article concerning the eNeuron implementations was published in Skagerak Energilab's existing LinkedIn page and on Skagerak internal communication platform "Workplace" (August 2022).

Workshop with households: the workshop took place at Skagerak Arena in August 2022. The participants included Lede household customers and aimed to inform them about the eNeuron project and, more in general, the LEC concept and benefits.

Feedback survey: the survey was administered during the workshop and aimed at assessing general attitudes and perceptions concerning the environmental sustainability and collect feedback for the project.

Meetings with users of the eNeuron toolbox: in phase 1, various interactions for the development of eNeuron and the Skagerak lab took place. They involve the pilot leader and the partners responsible for the technical developments in the pilot (i.e., Sintef).

6.2 Social evaluation – Skagerak

This subchapter presents the outcomes of the engagement activities and social impact evaluation of Skagerak. It provides the assessment of the KPIs described in chapter 4 (*eNeuron Social Evaluation Framework*); in particular, it deals with the engagement KPIs and Social Acceptance KPIs.

6.2.1 Engagement KPIs

As previously described, the engagement activities at Skagerak Energilab included a set of informative actions on LinkedIn and the company internal communication channel, and a workshop with households and meetings with the users of the eNeuron toolbox. A total of 24 stakeholders have been reached with the engagement activities. The KPIs are reported below:

Table 10: Engagement KPIs - Skagerak

No. ID	KPI	Total	%
SO-KPI 01	**Stakeholders engaged**	24	100%
SO-KPI 02	**Stakeholders engaged by type**	-	-
	– Indirect beneficiaries	17	70%
	– eNeuron toolbox users	7	30%
	– Other stakeholders	-	-
SO-KPI 03	**Engagement activities by type**	5	-
	– Workshop	1	20%
	– Meetings with technical staff	4	80%

Skagerak social media activities aimed to promote one article:

Table 11: Social media KPIs – Skagerak

No. ID	KPI			
	Local social media activities	**Total**	**LinkedIn**	**Other***
SO-KPI 04	– Number of activity (posts, reposts)	2	1	1
	– Percentage distribution by platform (%)	-	50%	50%
	– Total number of impressions (visualisations)	1116	497	619
	– Percentage distribution by platform (%)	-	45%	55%
	– Social actions (like, comments, shares, clicks, suggests the post)	118	18	100
	– Percentage distribution by platform (%)	-	14%	86%
SO-KPI6	– Local Social media engagement index (local SEI)	10.6%	3.6%	16.2%

* Skagerak Energilab's Internal communication channel

Both LinkedIn and Skagerak internal communication channel were used for the social media activities. The results show that 1,116 impressions were achieved, evenly split between Skagerak internal communication channel (55%) and LinkedIn (45%).

In terms of social actions (i.e., likes, comments, shares, clicks, suggestions),118 were collected: In this case, only 14% come from LinkedIn, while the remaining 86% are due to the strong contribution of the internal communication network. Based on the total number of impressions and social actions generated, the "Local Social media engagement index" (SEI) was calculated. This indicator shows the audiences' engagement with the online content published. In Skagerak, LinkedIn publications reached a 4% SEI, while the internal page reached a 16% SEI. While Skagerak internal channel generates strong engagement, future social media activities should focus on expanding the outreach and generating further engagement outside the boundaries of the Skagerak organization.

6.2.2 Social Acceptance KPIs

Skagerak feedback survey addressing the indirect beneficiaries was administered during a full-day workshop with Lede household customers at Skagerak Arena. A total of 16 individuals responded to the questionnaire, 12 males and 4 females, with ages varying from 30 to 60 years old. The results are presented below:

Importance of sustainability
(SO-KPI 07)
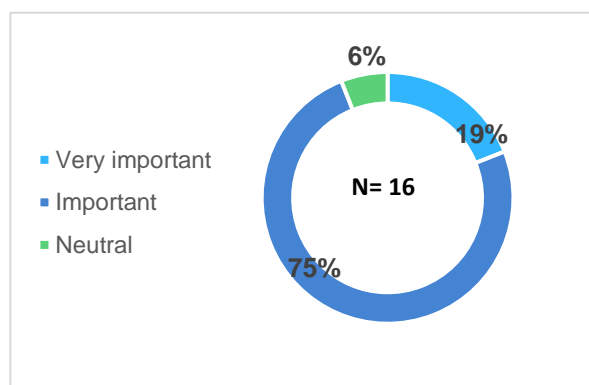
Figure 9: Importance of sustainability (SO-KPI 07)

Importance of energy-related measures
(SO-KPI 08)
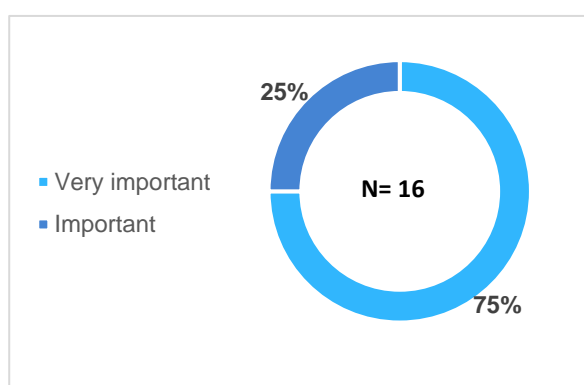
Figure 10: Importance of energy-related measures (SO-KPI 08)

At Skagerak, people's views on the importance of energy-related measures are fairly high with 75% of the respondents stating it is "important" to them. This contrasts with the previous pilot (UNIVPM), where most of the respondents stated that sustainability is "very important", suggesting a slightly higher level of concern of young, educated people on this matter.

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When it comes to energy-related measures in particular (figure 10), most of the responds in Skagerak believe they are "very important" to achieving sustainability. This indicates a good understanding of the role that energy systems play towards a more sustainable world, likely making this group receptive to energy innovations.
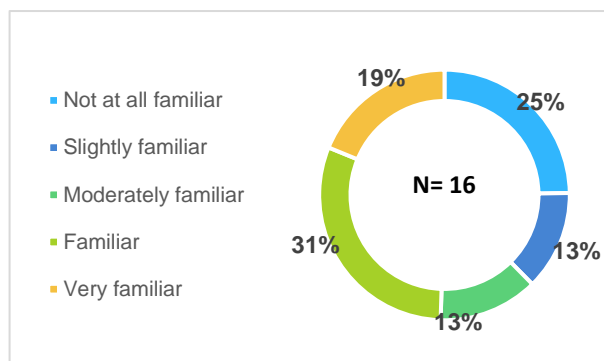
Familiarity with LECs
(SO-KPI 09)

Awareness of the benefits of the solutions
(SO-KPI 10)

Figure 11: Familiarity with LECs (SO-KPI 09)
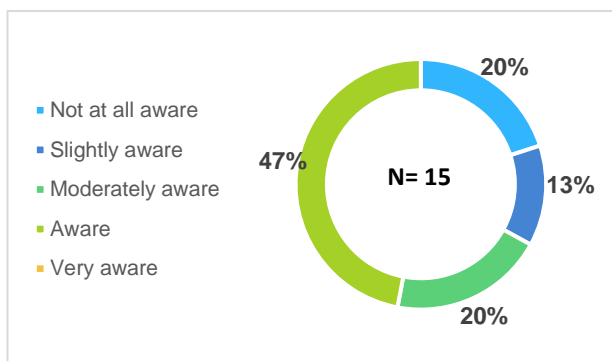
Figure 12: Awareness of the benefits of the solutions (SO-KPI 10)

Respondents are quite familiar with the concept of local energy community. In total, 44% stated they are familiar or very familiar with the concept. Awareness of the benefits of the eNeuron solutions is also very high.

Table 12: Most important benefits of the eNeuron toolbox (SO-KPI 11)

No ID	Most important benefits of the eNeuron toolbox	%
SO-KPI 12	Reduction in energy consumption due to system optimization	31%
	Reduction of energy bills	54%
	Higher utilization of clean energy (renewables)	8%
	Revenue generation from energy trading activities	8%
	Other (Please specify)	0%

When asked about the most important benefits of the eNeuron solution, the majority of the respondents believe it is the reduction of energy bills and the optimization of consumption. These answers contrast with the UNIVPM pilot, probably because respondents in Skagerak consist of households who may benefit directly from the energy measures deployed by Skagerak and are more likely to associate the implementations with the economic gains that can be derived from it. The reduction of energy bills and energy consumption remains a valuable proposition for its future deployment on large scales, including different actors and decision-makers.

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Energy changing behaviour

(SO-KPI 12)

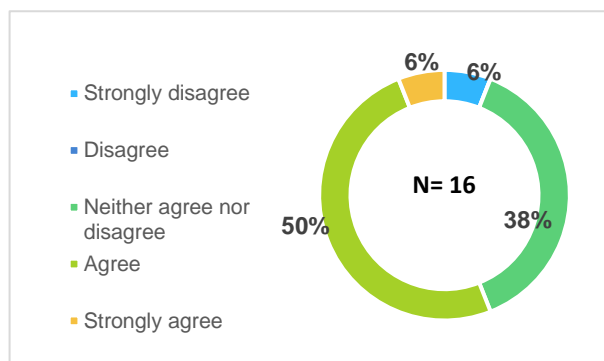**"I have become more concerned about my energy consumption behaviour"**

"I will take active measures to contribute to energy efficiency"

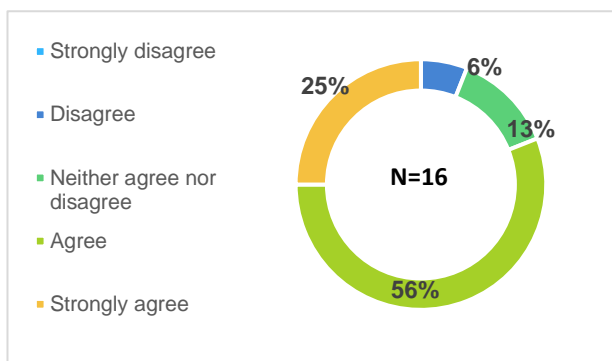**Figure 13**: Energy changing behaviour (SO-KPI 12a)

Figure 14: Energy changing behaviour (SO-KPI 12b)

The largest part of the workshop participants stated to have become more concerned about their energy behaviour after the initiative, and 56% stated they will take active measures against it. These are positive results that support the initial assumption that raising awareness and involvement of citizens leads to better energy consumption behaviour. Indeed, presenting issues through a more local lens can create a sense of familiarity and fosters trust among the stakeholders. In addition to triggering changes in public perceptions concerning their energy use, initiatives that facilitate dialogue and engagement are also key for gathering support for environmental projects and policies.

Social image/reputation

(SO-KPI 14)

"The energy efficiency measures that are being implemented in Skagerak show that it has a strong commitment to the energy transition and sustainable practices"
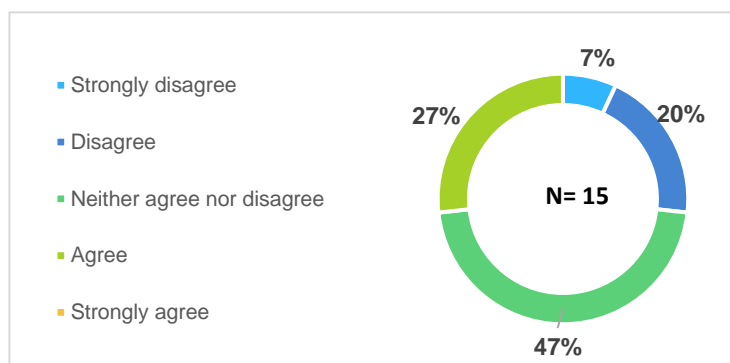
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Figure 15: Social image/reputation (SO-KPI 13)

When it comes to the social image of the pilot, 27% of the respondents agree that the energy measures implemented, indicating it has a particular commitment to the energy transition and sustainable practices. On the other hand, 47% neither agree nor disagree. These perceptions might be due to the fact that the respondents in general are becoming more and more demanding when it comes to sustainable practices implemented.

The descriptive summary of results (mean and SD) is provided in the table below. These figures show quite positive levels across all indicators.

Table 13: Summary of social acceptance KPIs

	Mean	Standard Deviation
SO-KPI 07	4.13	0.50
SO-KPI 08	4.13	0.50
SO-KPI 09	3.06	1.53
SO-KPI 10	4.75	0.41
SO-KPI 12a	3.50	0.89
SO-KPI 12b	4.00	0.82
SO-KPI 13	2.98	0.88

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7 City of Bydgoszcz Plan and Social Evaluation

7.1 Bydgoszcz Engagement Plan

7.1.1 Pilot profile & target segment

The city of Bydgoszcz is a dynamically developing economic centre, with a population of 358,000 inhabitants. The pilot covers the area of the city of Bydgoszcz and its major energy nodes; most of them are newly constructed buildings with some degree of energy self-sufficiency.

The stakeholders addressed within each stakeholder group by the engagement activities in Bydgoszcz are detailed below:

1. **Indirect beneficiaries:**
    a. The community of individuals attending the facilities (i.e., users of the sports facilities, Cultural Centre, and city offices).
    b. Employees working at the pilot buildings.
2. **eNeuron toolbox users:** the technical staff involved in the implementation of the solutions on the various pilot buildings and facilities.
3. **Other stakeholders:** SMEs, building managers, other municipalities, and organizations in the Bydgoszcz city and adjacent areas, which could be interested in replicating the eNeuron solution.

Table 14 describes the pilot profile, including the participant buildings and sociodemographic information related to the stakeholder groups:

Table 14 Bydgoszcz pilot profile

	Engagement target	Stakeholders	Number	Age	Education
1.		Non-technical staff and Attendees of the Animal shelter	500	Mostly middle age	Broad educational profile (from vocational to University education)
2.	Indirect beneficiaries	Non-technical staff and Attendees of the Łuczniczka sport facility	2000	Mostly young	High school, University
3.		Non-technical staff and Attendees of the Zawisza sport facility	2000	Mostly young	High school, University
4.		Non-technical staff and Attendees of the Astoria swimming pool	5000	Mostly young	High school, University

5.		Non-technical staff and Attendees of the Pałac Młodzieży – youth cultural center	1000	Young	Kids, students, High school, University
6.		Non-technical staff and Attendees of the City offices at Grudziądzka	1000	Middle age	Higher education
	Users of the eNeuron solution	Technical staff in All buildings	20	Various	High school

7.1.2   Social objectives

A central objective for the Bydgoszcz pilot is to establish a sense of priority concerning energy saving among the social actors involved (both the citizens and organizations), with a focus not only on the production of clean energy, but also on the proper management of energy itself. As such, bringing the attention and raising the awareness of citizens and organizations is key for the dissemination of good practices concerning the issue of sustainable energy consumption.

This objective has been considered since phase 1 of the eNeuron engagement activities. Bydgoszcz has therefore, focused on a set of informative actions, addressing the stakeholders within the buildings that are part of the project (schools), as well as participation in events that enable the pilot to network with external stakeholders.

Another central goal of eNeuron in the city of Bydgoszcz is to improve energy management in public buildings and serve as a good practice to Bydgoszcz citizens and stakeholders, in particular those with a similar profile (in terms of size and scope), i.e building owners, large enterprises, companies, and municipalities among others. Therefore, engagement activities should also serve to showcase the eNeuron solution and foster the adoption of similar initiatives by other buildings and facilities in the city, also enabling the replication goal of the eNeuron solutions. This will be an important goal for phase 2 of engagement activities.

7.1.3   Engagement activities, timing, and tools

The engagement activities conducted in this first phase are described in Table 15:

Table 15 Bydgoszcz Engagement activities roadmap for phase 1

Phase	Objective	When	Engagement tool

	Consult eNeuron toolbox users: technical staff in the pilot buildings	**Ongoing**	• Ongoing meetings/ad-hoc collection of requirements
Phase 1	**Inform indirect beneficiaries:** citizens and attendees of buildings and facilities	**M18**	• Social media (Facebook page) • Local website
	Inform indirect beneficiaries: university students and school employees	**M20**	• Physical presentations at: - Centrum Odnawialnych Źródeł Energii w Bydgoszczy - Politechnika Bydgoska
	Consult indirect beneficiaries	**M20**	• Feedback survey following the presentations
	Inform other stakeholders: building owners outside the pilot, SMEs, etc.	**M23**	• Presentation at Hamburg City Hall in the scope of the "My SmartLife" project meeting.

In phase 1, Bydgoszcz had various ad hoc meetings with technical employees for the collection of requirements. Like in the other pilots, an evaluation of user acceptance will be released in phase 2 and provided in the final report. Other tools and activities performed in phase 1 include:

Social media and local website: Bydgoszcz leveraged its existing social media page (Facebook) and the city's local website (www.czystabydgoszcz.pl) to promote the eNeuron project for the citizens. The key message concerned "civic energy", where energy users (citizens, local governments, companies) take part in product and management of renewable energy and profit from it.

Meeting with students: In June 2022, Bydgoszcz organized two meetings; one at "Centrum Odnawialnych Źródeł Energii w Bydgoszczy", addressing the students of the technical school, and a second meeting with university students and technical staff at "Politechnika Bydgoska". As for the other pilots, Bydgoszcz leveraged these activities to distribute a **Feedback survey** aimed at assessing general attitudes and perceptions concerning the environmental sustainability as well as collect inputs linked to some of the project aspects.

Lastly, Bydgoszcz *presented the eNeuron project* **at Hamburg City Hall** in the scope of the "My SmartLife" project meeting, in which Bydgoszcz is a follower city.

7.2   Social evaluation – City of Bydgoszcz

This subchapter presents the outcomes of the engagement activities and social impact evaluation of Bydgoszcz. It provides the assessment of the KPIs described in chapter 4 (eNeuron Social Evaluation Framework).

7.2.1   Engagement KPIs

As mentioned, the engagement activities at Bydgoszcz included a set of informative actions on social media, as well as presentations in schools participating in the project. The KPIs are reported in **Table 16**:

Table 16: Engagement KPIs - Bydgoszcz

No. ID	KPI	Total	%
SO-KPI 01	**Stakeholders engaged**	230	
SO-KPI 02	**Stakeholders engaged by type**		
	– Indirect beneficiaries	135	59%
	– eNeuron toolbox users	20	9%
	– Other stakeholders	75	32%
SO-KPI 03	**Engagement activities by type**	12	-
	– Meetings	2	17%
	– Presentations	1	8%
	– Meetings with eNeuron toolbox users	9	75%

A total of 230 stakeholders were engaged. The majority includes students, teachers and other school stakeholders participating in the meetings at the two schools (Indirect beneficiaries: 135). Other stakeholders include the participants to the MySmart Life project meeting where eNeuron was presented (75 in total). Lastly, the pilot engaged with approx. 20 future eNeuron toolbox users in 9 meetings.

In addition, Bydgoszcz used its Facebook channel for social engagement activities. The local social media engagement activity of the city of Bydgoszcz is focused on a campaign on its Facebook institutional account. The social media campaign achieved 305 impressions and 12 social actions. More activities are expected in this area.

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Table 17: Social media KPIs - Bydgoszcz

No. ID	KPI		Facebook
	Local social media engagement		**Facebook**
SO-KPI 04	– Number of activity (posts, reposts)		-
	– Total number of impressions (visualisations)		305
	– Social actions (like, comments, shares, clicks, suggests the post)		12
SO-KPI5	– Local Social media engagement index (local SEI)		4%

7.2.2 Social Acceptance KPIs

Bydgoszcz feedback survey addressing the indirect beneficiaries was administered during the meetings with students. A total of 57 individuals responded to the questionnaire, 82% males, and 18% females, within the ages of 13-25. The results are presented below:
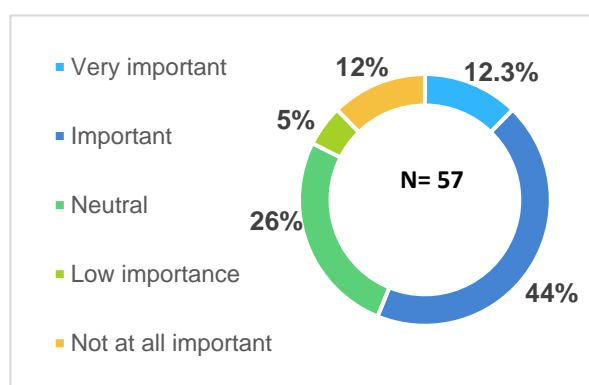
Figure 16: Importance of sustainability (SO-KPI 07)
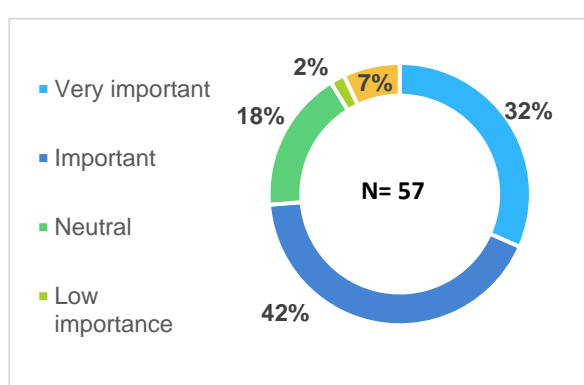
Figure 17: Importance of energy-related measures (SO-KPI 08)

For the respondents of Bydgoszcz pilot, the importance of sustainability is lower compared to the previous cases and only 56% of respondents stated sustainability is important or very important for them personally. Despite of this, most of the respondents believe that energy-related measures are of high importance for achieving environmental sustainability.
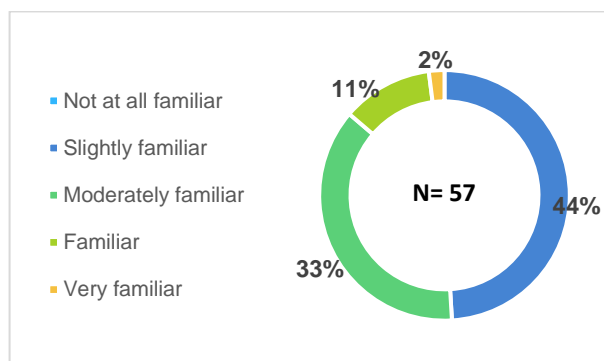
Familiarity with LECs
(SO-KPI 09)

Figure 18: Awareness of the LECs (SO-KPI 09)

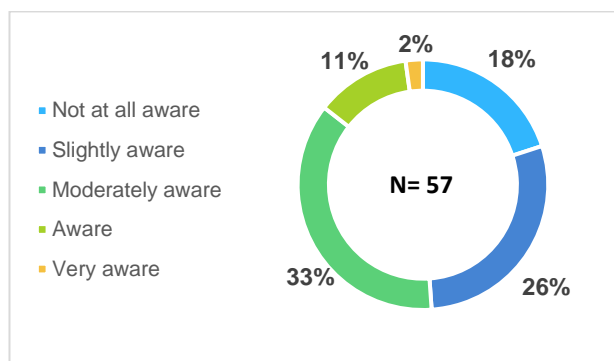### Awareness of the benefits of the solutions
(SO-KPI 10)

Figure 19: Awareness of the benefits of the solutions (SO-KPI 10)

Levels of familiarity with the LECs are also low, with only 15% of the respondents stating they are familiar with the concept, aligning with the number of people that understand the benefits of the solutions being implemented in the Bydgoszcz pilot. This may reflect the age range of this stakeholder group, comprehending mostly teenagers. It is important to note that engaging individuals since an early age in this process is valuable for increasing energy literacy and forming conscious energy consumers of the future.

Table 18: Most important benefits of the eNeuron toolbox (SO-KPI 11)

No ID	Most important benefits of the eNeuron toolbox	%
SO-KPI 12	Reduction of energy bills	42%
	Higher utilization of clean energy (renewables)	26%
	Reduction in energy consumption due to system optimization	14%
	Revenue generation from energy trading activities	14%
	Other (Please specify)	4%

When it comes to the most important benefits of the eNeuron toolbox, the reduction of energy bills is the most important benefit to this target group, accounting for 42% of the answers. It is followed by higher utilization of renewables and reduction in energy consumption.

Energy changing behaviour
(SO-KPI 12)

"I have become more concerned about my energy consumption behaviour"

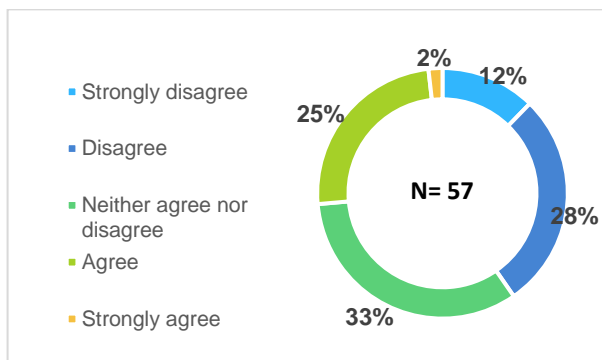**"I will take active measures to contribute to energy efficiency"**

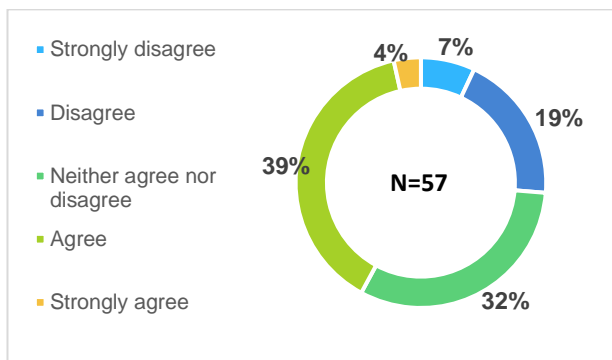Figure 20: Energy changing behaviour (SO-KPI 12a)

Figure 21: Energy changing behaviour (SO-KPI 12b)

In contrast to the previous pilots, when asked if the respondents have become more aware of their energy behaviour, a relevant number of the respondents do not believe so (around 40%). Aligned with this, less than half of them expect to take active energy measures. Overall, the opinion and participation of young people, as potential agents of change, are key for the implementation of programs and projects by government institutions and groups interested in tackling environmental issues. These results suggest the need to further rethink the engagement activities that can trigger change in their perceptions concerning environmental sustainability issues and that can bring to behavioural changes.

Social image/reputation

(SO-KPI 13)

"The energy efficiency measures that are being implemented in Bydgoszcz show that it has a strong commitment to the energy transition and sustainable practices"
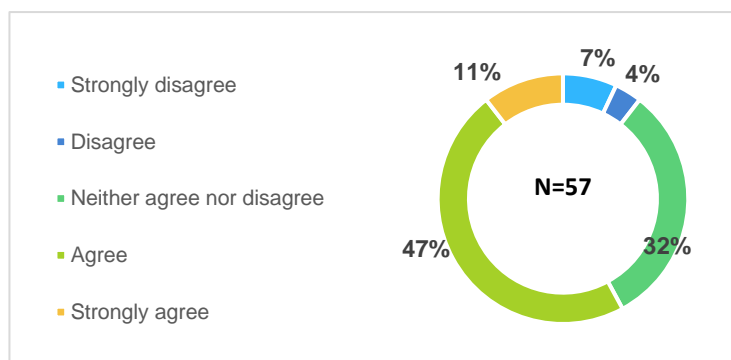

Figure 22: Social image/reputation (SO-KPI 13)

With regards to the social image of the Bydgoszcz pilot, most of the respondents believe that the energy efficiency measures implemented demonstrate its commitment to the environmental sustainability; this number is slightly higher than the other cases analysed.

The descriptive summary of results (mean and SD) is provided in table 19. As can be seen, awareness on LEC (SO-KPI 10), benefits of the eNeuron solutions (SO-KPI 11) and energy changing behaviour (SO-KPI 13 and b) have the lowest rates among this stakeholder group. Overall, the respondents' perceptions are slightly lower compared to the previous pilots.

Table 19: Summary of social acceptance KPIs

	Mean	Standard Deviation
SO-KPI 07	3.39	1.16
SO-KPI 08	3.89	1.10
SO-KPI 09	2.49	0.81
SO-KPI 10	2.81	1.20
SO-KPI 12a	2.75	1.02
SO-KPI 12b	3.12	1.00
SO-KPI 13	3.51	0.98

8 Marinha Engagement plan and social evaluation

8.1 Marinha Engagement Plan

8.1.1 Pilot profile & target segment to be engaged

Lisbon Naval Base consists of a large complex comprising many different units. It hosts most of the Portuguese Navy Fleet ships, as well as many of its administrative, training, and support services. Five units are initially involved in the eNeuron project, each representing a typology of energy consumption, as follows:

- Unit with residential consumption profile – the Residential Mess (living quarters).
- Unit with office-like consumption profile – the Directorate of Ships.
- Unit with industrial consumption profile – a workshop and a Canteen.
- Unit with sports centre consumption profile – CEFA (the Naval Base sports complex).

Based on the pilot's profile, the stakeholders addressed within each stakeholder group by the engagement activities in Marinha are detailed below:

1) **Indirect beneficiaries:**
   - Employees working at the Naval Base;
   - Residents of the Naval Base, including the officials and their families, as well as non-resident military personnel.
   - Visitors of the Naval Base.
2) **Users of the eNeuron solutions:** technical staff involved in the implementation of the solutions in the various units of Lisbon Naval Base; and the electrical managers of the pilot units responsible for overseeing the energy assets installations.
3) **Other stakeholders:** other non-participant units of the Naval Base and intended directors (approx. 15 units), other Naval Bases, facilities, or installations outside Lisbon's pilot area; external organizations and general public.

Table 20 describes the pilot profile, including the sociodemographic information related to the target public:

Table 20 Marinha pilot profile

	Engagement target	Stakeholders	Number	Age	Gender	Education
1.	**Indirect beneficiaries**	Residents (military personnel and families)	N/A	Mainly middle age (around 35-40 years old).	80% male; 20% female	Average education (secondary and advanced levels)

2.		Non-resident military personnel	5,000			
3.		Others (visitors)	200			
4.		Staff/employees	3,000			
5.	**Users of the eNeuron solution**	Technical staff	Approx. 10			

8.1.2   Social objectives

With the implementation of the eNeuron project and the engagement activities, Lisbon Naval Base aims to increase both awareness and environmental concern to achieve energy savings and costs reduction.

Marinha expects to generate engagement with the system managers for coordinated and efficient use of the local Renewable Energy (total of around 1 MWp installed PV generation) for the internal consumers. Additionally, it aims to trigger creativity within the involved people to implement new energy efficiency measures regarding active or reactive power reduction to the main grid, by leveraging the Energy Hub concept (taking into consideration the particularities of the military population).

Considering these objectives, Marinha focused first on the "inform" engagement level, by deploying a series of activities to communicate the project for the primary target group (employees of the Naval base, residents), as well as to reach other stakeholders (i.e., other naval bases and facilities). The pilot, though, is also actively engaging the future toolbox users to ensure the developments reflect the user needs.

The second phase of engagement will seek for more collaborative participation, also with the aim of upscaling eNeuron.

8.1.3   Engagement activities, timing, and tools

The engagement activities conducted in this first phase are described in Table 21:

Table 21 Marinha Engagement activities roadmap for phase 1

Phase	Objective	When	Tools
Phase 1	**Consult eNeuron toolbox users:** technical staff in the pilot buildings	**Ongoing**	• Ongoing meetings/ad-hoc collection of requirements

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	Inform Indirect beneficiaries (officials including resident and non-residents) and **Other Stakeholders**	**M19-M20**	• Presentations at the:
			  – Portuguese Army Environmental Week
			  – EDP NEW R&D Session- Local Energy Communities 2.0

	Consult officials	**M24**	• Feedback Survey
	Inform Naval Base Commander and Transport Unit	**M20**	• Presentation for the Lisbon Naval Base Commander and the director of Transport unit
	Involve the units inside the Naval Base about the scope of the eNeuron and request contributes to improve the project.	**M23**	• Military message.

Marinha is continuously engaging with the technical staff to discuss end-user requirements and get feedback. Moreover, considering the primary objective to inform officials in the Naval base and other stakeholders outside the Naval Base (to set the ground for future replication), Marinha attended public events in the sector to present the project and conducted a meeting inside the Naval Base. In detail, the activities and tools leveraged by the pilot in the first phase include.

Presentations in public events: Marinha has participated in two events during the months of May and June 2022 (Portuguese Army Environmental Week; EDP NEW R&D Session- Local Energy Communities 2.0) to provide an overview of the eNeuron project and of the activities carried out in the pilot.

Meeting with the Lisbon Naval Base Commander and director of transport unit: this meeting was conducted in June 2022 and had the purpose to present the project and, to raise awareness and to engage the Naval Base hierarchical structure in the eNeuron project, and more specifically, the Lisbon Naval base Pilot activities and benefits.

Feedback form/Survey: The survey was administered by e-mail and addressed to naval officials. It aimed at assessing general attitudes and perceptions concerning the environmental sustainability as well as collect inputs linked to some of the project aspects.

8.2   Social evaluation – Marinha

This subchapter presents the outcomes of the engagement activities and social impact evaluation of Marinha. It provides the assessment of the KPIs described in Chapter 4 (eNeuron Social Evaluation Framework).

8.2.1 Engagement KPIs

The engagement activities at Marinha included a set of informative actions addressing the naval community, including in-person presentations in sectorial events and ad-hoc meetings with technical staff and unit representatives.

Table 22: Engagement KPIs - Marinha

| No. ID	KPI	Total	%
SO-KPI 01	**Stakeholders engaged**	241	
SO-KPI 02	**Stakeholders engaged by type**	-	
	– Indirect beneficiaries	241	100%
	– eNeuron toolbox users		
	– Other stakeholders	-	-
SO-KPI 03	**Engagement activities by type**	3	-
	– Presentations	2	67%
	– Meeting	1	33%

8.2.2 Social Acceptance KPIs

Marinha questionnaire was addressed to naval officials and administered by e-mail. A total of six (06) officials responded to the survey, with ages between 40 to 60 years old. The survey is still running, and more views and perspectives are under collection.
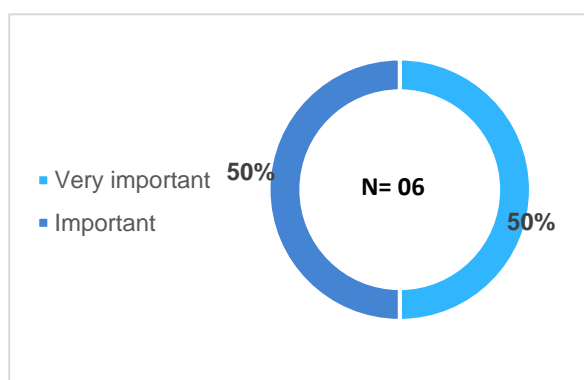
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Importance of sustainability
(SO-KPI 07)
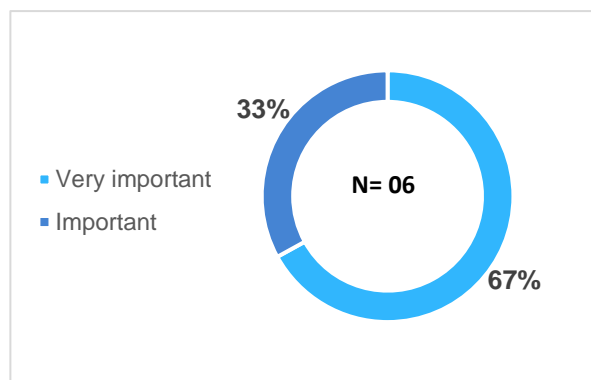
Figure 23: Importance of sustainability (SO-KPI 07)

## Importance of energy-related measures
(SO-KPI 08)

**Figure 24**: Importance of energy-related measures (SO-KPI 08)

The importance of sustainability and energy-related measures is quite high for these respondents. It is important to note that the ongoing energy crisis in Europe has increasingly attracted the public opinion, on the debate concerning energy consumption, and the need to create ways to optimize and reduce energy consumption.

Familiarity with LECs
(SO-KPI 09)
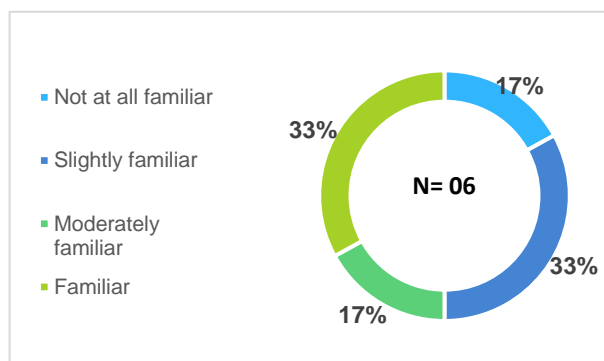
Figure 25: Familiarity with LECs (SO-KPI 9)

Awareness of the benefits of the solutions
(SO-KPI 10)
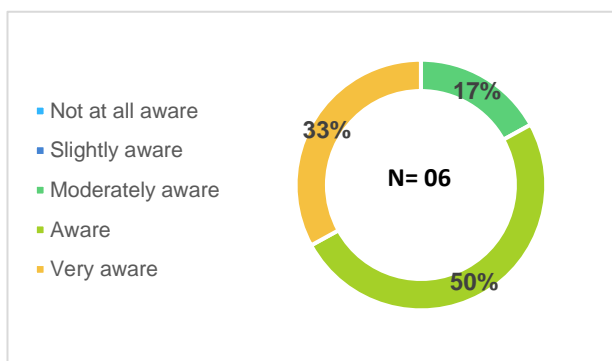
Figure 26: Awareness of the benefits of the solutions (SO-KPI 10)

Most of the respondents seem to have some degree of familiarity with the concept of LECs, and only a very small part has stated not to be familiar at all. When it comes to the benefits of the solutions being implemented in this pilot, respondents show a relatively high awareness.

**Table 23**: Most important benefits of the eNeuron toolbox (SO-KPI 11)

No ID	Most important benefits of the eNeuron toolbox	%
SO-KPI 12	Reduction in energy consumption due to system optimization	33%
	Reduction of energy bills	33%
	Revenue generation from energy trading activities	17%
	Higher utilization of clean energy (renewables)	17%
	Other (Please specify)	-

The most important benefits of the eNeuron solution are the reduction in energy consumption and reduction of energy bills. This suggests that for this group of stakeholders, energy costs are a key issue, which are probably exacerbated in the current context of soaring energy prices.

Social image/reputation

(SO-KPI 13)

"The energy efficiency measures that are being implemented in Marina/Lisbon Naval base show that it has a strong commitment to the energy transition and sustainable practices"
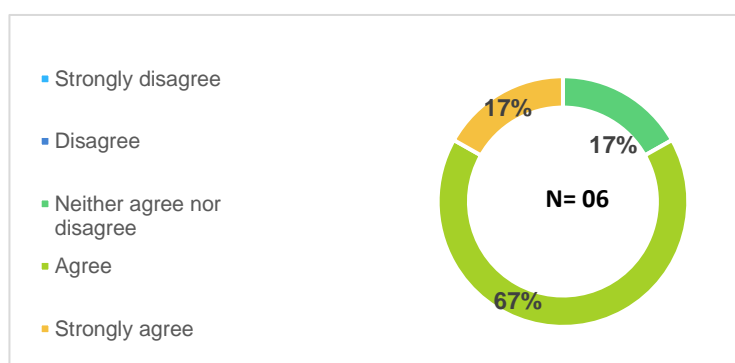
Figure 27: Social image/reputation (SO-KPI 14)

With regards to the social image of the pilot, most of the respondents believe that these measures show a strong commitment to sustainable practices in the pilot.

The descriptive summary of results (mean and SD) is provided in Table 24. The figures show quite positive levels across all indicators, SO-KPI 09 (familiarity with LECs) having again the lowest rating:

Table 24: Summary of social acceptance KPIs

	Mean	Standard Deviation
SO-KPI 07	4.67	0.51
SO-KPI 08	4.50	0.54
SO-KPI 09	2.67	1.21
SO-KPI 10	4.17	0.75
SO-KPI 13	4.00	0.63

eneuron

Conclusions

The eNeuron engagement plans were designed by taking into account the pilot's specific objectives, and comprised a set of interactions with the indirect beneficiaries of the project and the technical employees participating in the implementation of the solutions. This report described the outcomes of the engagement process and the key social indicators collected during the first phase of the engagement activities.

The engagement plan will be updated and reconsidered in the course of the project to account for the specific circumstances and events that impact on the planned activities. The first phase (M18-24) of the eNeuron engagement plan comprised mostly activities aiming to "inform" and "consult" indirect beneficiaries and eNeuron toolbox users (technical staff). The collection of social indicators during the engagement activities also allowed to have a snapshot of the stakeholders' perceptions and attitudes.

The results show that there is a common concern across most of the surveyed stakeholders around the issue of sustainability and a central importance of energy-related measures. On the other side, individuals have limited knowledge concerning the Local Energy Communities (LECs) as well as the benefits of the implementations in eNeuron.

Concerning the key benefits of the solutions implemented, priorities seem to vary according to stakeholder groups and specific settings. While university students at UNIVPM highlighted its potential to reduce consumption and increase the share of RES used, respondents at Skagerak, Marinha and Bydgoszcz tend to value the cost aspect the most.

Overall, engagement activities seem to play a key role in raising awareness of energy efficiency and possibilities to use the renewable energy and have an intrinsic value, not only to reach the outcomes defined, but also in terms of exchanging information, building trust and strengthen relationships among stakeholders.

The second phase of the engagement process will seek to explore further engagement activities with the indirect beneficiaries of the pilots and other stakeholders, to highlight eNeuron replication and upscaling potential. It will also focus on the users' acceptance and experience.

References

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Annex I

Questionnaire:

Dear respondent, the aim of this questionnaire is to capture in-depth qualitative knowledge on the target population in [SITE NAME]. The information will be used for building community profiles, which are aimed at generating a good understanding of the community we are working with.

The profiles illustrate the community's socio-economic characteristics, lifestyle, environmental awareness and savviness, and information consumption habits. This will provide important inputs for the identification of the most effective tools to engage with the target public. The questionnaire serves an input for the elaboration of the end-users/prosumers' engagement framework, as part of the Task 7.2 "End-user's engagement and assessment of social impacts", in the scope of WP7.

Background questions

Q1. What is the approximate number of [LIST OF STAKEHOLDERS] at [SITE NAME]?

Q2. Among the segment(s) of society that the activities in the [SITE NAME] aims to benefit [LIST OF STAKEHOLDERS] which is the most relevant, considering the project's objective?

Demographics

Q3. What is the average age of the target stakeholders at [SITE NAME]? Please, provide the information for [LIST OF STAKEHOLDERS])

Q4. Can you provide an overview of the gender composition of [SITE NAME]? Please, provide the information for [LIST OF STAKEHOLDERS]).

Socioeconomic

Q5. Can you provide an overview on the general economic conditions of the target stakeholders at [SITE NAME]? Please, provide the information for [LIST OF STAKEHOLDERS]).

Q6. Can you provide your perception on the digital literacy of the target stakeholders at [SITE NAME]? Please, provide the information for [LIST OF STAKEHOLDERS]).

Environmental awareness

Q7. Are there any communication or engagement programmes/initiatives with a focus on energy and environmental issues already in place in the pilot location? If yes, please describe them briefly.

Q8. How would you describe the environmental concern/savviness of the stakeholders at [SITE NAME]? Please, provide the information for [LIST OF STAKEHOLDERS]).

Existing communication channels/tools

Q9. What online and offline tools are already in use to engage with the target stakeholders (if any)?

Q10. What are you views/opinion on which could be the best tools to engage with them? Examples include:

- Local participative workshops
- Local events
- World café/Interviews/Focus groups/ study circles
- Social networks
- Online panels
- Other forms of public consultations
- Smart platforms
- Other

Social objectives

Q11. What social objectives do you aim to achieve through the implementation of eNeuron?

Annex II

Target segment: indirect beneficiaries

Dear respondent, the aim of this questionnaire is to understand your overall perception of the pressing environmental issues, and knowledge on the Local Energy Communities/energy Hubs.

Questionnaire:

Q1. Your gender

1. Female
2. Male

Q2. Your age group

1. <30 years
2. 30-40 years
3. 40-50 years
4. 50-60 years
5. >60 years

Environmental awareness and concern

Q3. How important is the issue of environmental sustainability to you personally?

1. Not at all important
2. Low importance
3. Neutral
4. Important
5. Very important

Q4. How would you rate the importance of energy-related measures to achieve environmental sustainability?

1. Not at all important
2. Low importance
3. Neutral
4. Important
5. Very important

Q5. Were you familiar with the concept of local energy communities or energy hubs before participating in this event?

1. Not at all familiar
2. Slightly familiar
3. Moderately familiar
4. Familiar
5. Very familiar

Perceived benefits of the eNeuron toolbox

Q6. Are you aware of the benefits of the eNeuron solution being implemented in [insert pilot name]?

1. Not at all aware
2. Slightly aware
3. Moderately aware
4. Aware
5. Very aware

Q7. Considering the eNeuron toolbox benefits listed below, which one is the most relevant to you?

1. Higher utilization of clean energy (renewables)
2. Reduction in energy consumption due to system optimization
3. Reduction of energy bills
4. Revenue generation from energy trading activities
5. Other (Please specify)

Contribution to energy behaviour change

To what extent do you agree with the following statements:

Q8. After attending this event, I have become more concerned about my energy consumption behaviour.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Q9. After attending this event, I will take active measures to contribute to energy efficiency at home, workplace, or in another environment.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

Contribution to reputation/social image

Q10. The energy efficiency measures that are being implemented in [insert pilot name] show that it has a strong commitment to the energy transition and sustainable practices.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree

5. Strongly agree

If Q10 = 1 or 2, Please explain why (optional)