



D4.6 Citizens and stakeholders in Leipzig's energy transition

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About SPARCS

Sustainable energy Positive & zero cARbon Communities demonstrates and validates technically and socioeconomically viable and replicable, innovative solutions for rolling out smart, integrated positive energy systems for the transition to a citizen centred zero carbon & resource efficient economy. SPARCS facilitates the participation of buildings to the energy market enabling new services and a virtual power plant concept, creating VirtualPositiveEnergy communities as energy democratic playground (positive energy districts can exchange energy with energy entities located outside the district). Seven cities will demonstrate 100+ actions turning buildings, blocks, and districts into energy prosumers. Impacts span economic growth, improved quality of life, and environmental benefits towards the EC policy framework for climate and energy, the SET plan and UN Sustainable Development goals. SPARCS co-creation brings together citizens, companies, research organizations, city planning and decision making entities, transforming cities to carbon-free inclusive communities. Lighthouse cities Espoo (FI) and Leipzig (DE) implement large demonstrations. Fellow cities Reykjavik (IS), Maia (PT), Lviv (UA), Kifissia (EL) and Kladno (CZ) prepare replication with hands-on feasibility studies. SPARCS identifies bankable actions to accelerate market uptake, pioneers innovative, exploitable governance and business models boosting the transformation processes, joint procurement procedures and citizen engaging mechanisms in an overarching city planning instrument toward the bold City Vision 2050. SPARCS engages 30 partners from 8 EU Member States (FI, DE, PT, CY, EL, BE, CZ, IT) and 2 non-EU countries (UA, IS), representing key stakeholders within the value chain of urban challenges and smart, sustainable cities bringing together three distinct but also overlapping knowledge areas: (i) City Energy Systems, (ii) ICT and Interoperability, (iii) Business Innovation and Market Knowledge.

Partners



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1 EXECUTIVE SUMMARY

This report provides comprehensive descriptions of community engagement activities demonstrated in the pilot neighbourhoods: the Duncker district, the Baumwollspinnerei, as well as citywide. It evaluates the added value and replicability of these methodologies and actions, as well as their potential. The descriptions of the implemented activities, targeted outcomes, schedule, and partners' roles and responsibilities have been generated by task T4.6, with input from task T4.2 and T4.7.

The first part provides a brief overview of the participation concept and, the methodological approach.

The second part lists all the participation and activation events carried out in the Duncker district in the time span 2020 till summer 2023 in Leipzig, focusing on the specific target group, the type of participation level, advertising, and communication channels, involved partners and provides an initial evaluation of improvement possibilities and recommendations for future similar activities.

The following chapter lists all the public relations and activities conducted at the demo district "Baumwollspinnerei" while a separate chapter is dedicated to city-wide and overarching formats.

Chapter 6 presents the empirical research program of the University of Leipzig, and the final chapter draws conclusions, highlights lessons learned, and assesses the potential replicability of the described actions.



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2 INTRODUCTION

Work Package 4 aims to demonstrate solutions for Energy Positive Blocks and Districts that function as an active part of the city's overall energy system in the Lighthouse city Leipzig. This includes integrating Renewable Energy Sources (RES), such as solar thermal energy, into an existing district heating network, establishing a virtual power plant, incorporating, and utilizing an energy storage system based on second-life batteries from electric cars, integrating electric mobility and bidirectional charging in existing housing blocks and mixed-use areas. The goal is to optimize self-consumption, reduce curtailment, enhance interoperability, and improve monitoring and control of the various energy systems using Information and Communication Technologies (ICT) between smart buildings, smart grids, and district heating.

Although the SPARCS project has primarily focused on developing technical solutions and creating a standardized model of interconnected, energy-positive living spaces, achieving the project's goal can only be realized by actively involving residents. Therefore, a significant goal of this work package, particularly Task 4.6, is to involve all pertinent stakeholders, which encompass local businesses and residents, and to share our experiences.

Most of the participation activities have been organized in the Duncker district (Leipzig West), with a few activities taking place in the former industrial area, 'Leipziger Baumwollspinnerei' and others planned within the city of Leipzig. This report primarily focuses on the results achieved in the Duncker district. In the first part we will provide an overview of the progress made so far. In the central part, we will present all the activities conducted in the demonstration district, and the sociological studies carried out by the University of Leipzig. Finally, we will present our conclusions regarding the achieved results, lessons learned, and provide insights into the future possibilities of replicating the Leipzig experience in other European cities.

2.1 Participation concept

The project's primary focus is on developing technical solutions and creating a standardized model of interconnected energy-positive districts and neighbourhoods. The successful implementation of the project's goals depends also on extensive collaboration among project partners, future users, the citizens of Leipzig and other relevant stakeholders. Task 4.6 has a key objective of involving the urban society through various forms of participation and raising awareness about energy-positive neighbourhoods, sustainability, and the energy transition.

Despite the initial challenges posed by the COVID-19 pandemic and some delays in the development of the technical results of the project, a bottom-up participation concept and advisory support was developed, aimed at engaging citizens and arousing their curiosity about the project's proposed topics. The aim was to continuously inform and raise awareness among different target groups about the need to transform the energy supply system and change the way we use energy. Additionally, concerned



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target groups were actively involved, even in the early stages of product development, in the design process of the technical SPARCS products, APPs, and measures to ensure optimal usability and increase acceptance among potential users.

The participation concept¹, developed in its first draft in 2021, outlined the primary objectives of the participation process and the project's framework, including project partners, planned initiatives, main target groups, specific participation goals, and suitable participation formats for the SPARCS project in Leipzig. The Participation Concept was a working foundation for all participation efforts (target groups, formats) within the Leipzig SPARCS context and was considered an internal document for the local SPARCS consortium. The contents encompassed the key information to assist project partners and other external stakeholders in realizing the goal of the project.

The participation process was divided into three phases:

- Development phase (M1-12)
- Implementation phase" (M13-M48)
- Replication phase" (M49-60)

In the first 12 months (development phase), the focus was on internal participation among all project partners. Bilateral discussions were conducted to define target groups, determine the characteristics of SPARCS measures, and jointly develop working methods and participation formats. During the development phase, a participation concept was developed and subsequently internally published.

In the participation concept, a clear differentiation has been made between communication and participation activities. The purpose of communication is to inform and raise awareness, representing the lowest level of participation. Communication supports the participation process and serves as a crucial amplifier, providing a passive means for individuals to engage with the topic. It lays the foundation for subsequent activities that require a higher level of involvement. The objective of participation activities is to actively engage people and foster personal commitment within the urban community.

Both methodologies have provided support, to varying degrees depending on the occasions, for the diverse organized activities and the topics represented exemplified in the hexagon in the figure below.

¹ Autoren und Autorinnen (alphabetische Reihenfolge): Christopher Kamdani, wissenschaftliche Hilfskraft, Gruppe Innovationsakzeptanz, Fraunhofer-Zentrum für Internationales Management und Wissensökonomie IMW; Ronny Krutzsch, Projektleiter, Fachbereich Energie und Klima, seecon GmbH; Uta Pollmer, wissenschaftliche Mitarbeiterin, Gruppe Innovationsakzeptanz, Fraunhofer-Zentrum für Internationales Management und Wissensökonomie IMW; Patrycja-Jadwiga Sankowska, Stabsstelle Digitalisierung, Projektleiterin, Fachbereich Beratung und Digitalisierung; Julia Schließauf, Projektgenieurin, Fachbereich Energie und Klima.



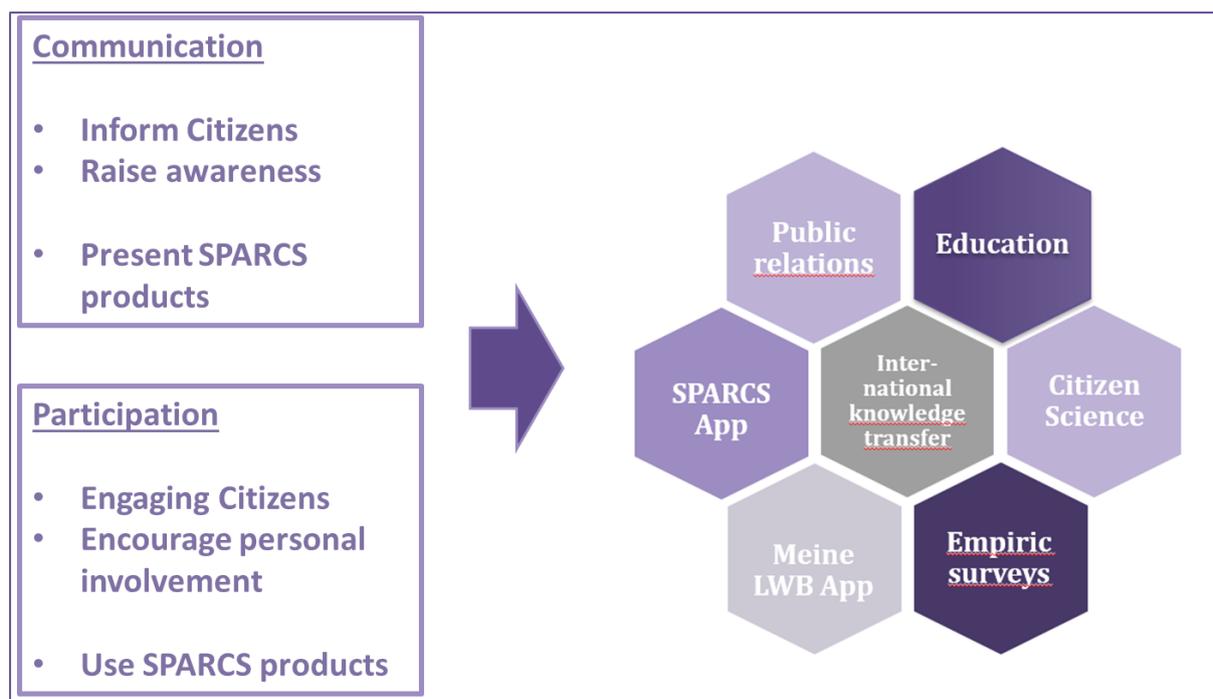


Figure 1: Communication and Participation methodologies supported different topics and activities in the Lighthouse City LHC Leipzig

During the “implementation phase” (M13-M48), participation occurred and continues to occur in the demonstration areas (Duncker district, Baumwollspinnerei, and the continuous development of the Solar Thermal Park Leipzig West) on two levels:

- the “SPARCS product development level” (Meine LWB-App, SPARCS-App, smart socket, solar thermal system, decentralized block-type thermal power station, energy storage, etc.)
- The “SPARCS citizen participation level” aimed to involve individuals and to raise their awareness of the goals, topics, and products of the SPARCS project.

During the “replication phase” (M49-60), the scope of action will be expanded to include replication areas. Similar methodologies and products will be employed within the city of Leipzig. Additionally, citizen involvement methodologies will be implemented in various contexts and demonstration areas. Best practices will be considered for the post-SPARCS period, aiming to re-evaluate cooperation between administration, companies, and citizens.

2.2 Methodological approach and choice of formats

During the development phase of the SPARCS project, participation formats used in practice were examined regarding their relevance for the target groups and project goals in SPARCS. On the one hand, experiences of project partners from previous participation projects in Leipzig and collected experiences from final project reports



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and interviews served as a database. In addition, the evaluation of the experiences of other Smart Cities and Communities 1 (SCC1) projects was included, carried out in parallel in Task 1.6 *Social empowerment* based on public final reports, interviews, and an online questionnaire. The result was a collection of measures assigned to the three phases of participatory communication: pre-engagement, implementation, and post-engagement, supplemented by a summary of successful measures and experiences related to similar products and topics. The (public) database is meant to inspire communities and other stakeholders searching for ideas how to engage citizens and other actors into participation processes (<https://citizen-engagement.eu/>)

Since participation formats must always be adapted to local conditions to be successful, it was important to include experiences from previous projects in Leipzig. Different participation projects carried out by the City of Leipzig related to comparable target groups and/or technical measures and products were analysed for lessons learnt. The basic findings were considered as important elements of the SPARCS participation concept, e.g. a clear definition of the added value of participation for the target groups, the collaboration with local key actors (multipliers), and the establishment of an onsite desk support. The concept mainly differentiates between the following target groups: private tenants of the WSL in the Duncker district, district residents in general, commercial tenants in the Baumwollspinnerei, customers of the Stadtwerke Leipzig (LSW), the city administration with different departments, and policy makers in Leipzig. Depending on the development stage of the project, the target groups have been addressed in the context of specific SPARCS products or the general idea of developing energy-positive districts. The choice of format always depends on the target group and the specific topic (see chapter 4).

2.3 Overview of the status of the project and relationship to other activities

In the next chapter, the report will present the communication and citizen involvement actions at the local level. Some actions are specific to SPARCS products or technical solutions, while others will focus on informing, engaging, and activating citizens about/for energy saving and sustainability issues.

The planning of communication and participation formats was directly linked to the development status of the technical products in SPARCS. Therefore, this report also includes activities and inputs from tasks T4.2, T4.3, T4.5 and T4.7. However, not all use cases and activities conducted previously have resulted in concrete developments in terms of public participation. The following tables illustrate the main relationship of this deliverable to other activities and use cases within the SPARCS project.

Below, the Leipzig partners previously involved in the tasks mentioned above have schematically outlined the realized use cases and provided essential insights into how, and whether, these events have engaged participative processes.



Table 1: Stadt Leipzig – Relationship to other activities in the project

Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
Integrating energy and building data into urban data platform Leipzig (L19-1 and L19-2)	24- 60	city administration (different departments with connection to energy positive district development), SPARCS partners (LSW, CEN; WSL)	<ul style="list-style-type: none"> • Energy atlas: Integrating energy data from various sources on one platform. • Making energy planning easy • Integrating feedback from partners 	Yes
Standard model for energy positive district development (L20-1)	24-60	city administration (different departments with connection to positive energy district development)	<ul style="list-style-type: none"> • Developing a standard approach for energetic district development within city administration • Target: climate just energy positive districts 	Yes



Figure 2: Workshop Energy Mapping (L19-1 and L19-2) and Standard model (L20-1) Source: City of Leipzig



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Table 2: Leipziger Stadtwerke (LSW) - Relationship to other activities in the project

Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
Solar thermal plant (L6-1)	M1 - M60	district-wide heating for residents in "Leipzig-West"	<ul style="list-style-type: none"> • Increase the share of RES in the central district heating system. • Focus on the planning, construction, and integration of a solar thermal plant. • Generation of approximately 13 GWh/a of solar heat 	<ul style="list-style-type: none"> • Yes
Virtual power plant (L9, L10, L11)	M1 – M36	Virtual energy district (citywide)	<ul style="list-style-type: none"> • ICT Platform with different demo cases (smart sockets, intelligent charging management system, "urban cockpit") 	<ul style="list-style-type: none"> • No
Monitored and externally controlled smart sockets (L11-1)	M1 – M36	Virtual energy district (citywide)	<ul style="list-style-type: none"> • Enabling an intelligent energy management system • Monitored and externally controlled smart sockets will be installed in various living units across multiple buildings. • This demonstrates efficient demand side management by monitoring and controlling energy consuming devices. 	<ul style="list-style-type: none"> • Yes
Leipziger App (L16-3)	M1 – M36	Virtual power plant / virtual positive energy community (citywide)	<ul style="list-style-type: none"> • Implementation and testing a mobile user App for reservation and configuration of 	<ul style="list-style-type: none"> • Yes



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Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
			charging/mobility needs <ul style="list-style-type: none"> privately owned or shared company fleet vehicle integrate the necessary interfaces of participants 	

Table 3: Wohnen und Service Leipzig GmbH (WSL) - Relationship to other activities in the project

Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
“Meine LWB-App”	M4, 5, 8, 24, 30, 36, 39, 42	<ul style="list-style-type: none"> Tenants demo district Leipzig West 	<ul style="list-style-type: none"> Function within an existing application to visualize the heating consumption of the apartments due to regulatory standards. Including comparison mechanism to get a better understanding about the energy consumption and to help to optimize 	<ul style="list-style-type: none"> Events with tenants in the demo district Information in the landlord Magazine “Mein Wohnen” Information due to direct letters from landlord about the project and the results



Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
SPARCS-APP	M4, 5, 8, 24, 30, 36, 39, 42, 44	<ul style="list-style-type: none"> Tenants demo district Leipzig West (Beckerstr. 52-56) 	<ul style="list-style-type: none"> Function within a new application to visualize the heating and the electricity consumption of the apartments in real time. Including comparison mechanism to get a better understanding about the energy consumption and to help to optimize and set targets 	<ul style="list-style-type: none"> Events with tenants in the demo district Information in the landlord magazine "Mein Wohnen" Mail sent to tenants with information about the project and the contents / measures.
Intelligent heating control	M4, 5, 8, 24, 30, 36, 39, 42	Object Beckerstr. 52-56	Real time heating optimization with automatic function (artificial intelligence) due to real time data analysis from different sensors in the building like temperature (flow, temperature in and outtake, room temperature, outside temperature) information from the heating controller and	<ul style="list-style-type: none"> Events with tenants in the demo district Information in the landlord magazine "Mein Wohnen" Information due to direct letters from landlord about the project and the results



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Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
			the heating meter, weather forecast.	

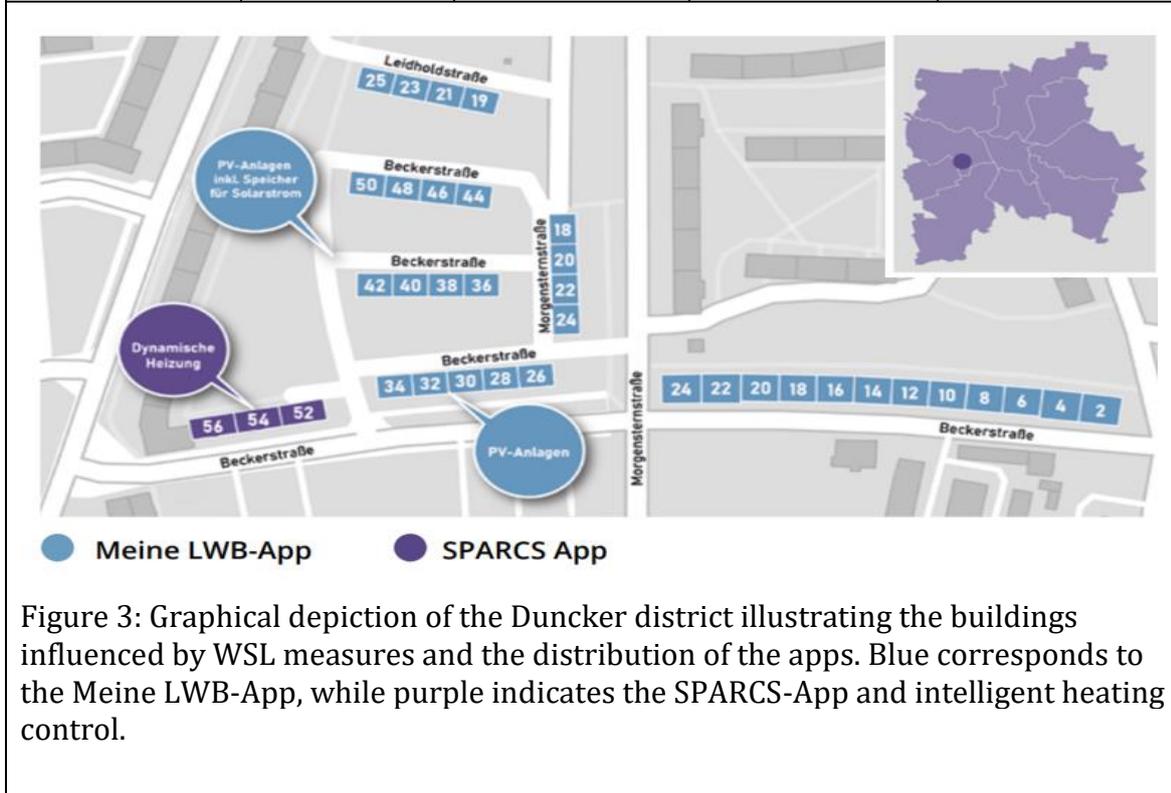


Figure 3: Graphical depiction of the Duncker district illustrating the buildings influenced by WSL measures and the distribution of the apps. Blue corresponds to the Meine LWB-App, while purple indicates the SPARCS-App and intelligent heating control.

Table 4: Cenero - Relationship to other activities in the project

Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
Heating Demand Control	- 24 - 60	Tenants Baumwollspinnerei	<ul style="list-style-type: none"> A specific area in Building 14 is equipped with smart thermostats to control the heating needs of the tenants in the historic building 	<ul style="list-style-type: none"> Yes



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Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
			<p>according to their demand.</p> <ul style="list-style-type: none"> • Individual tenants can use an App to communicate at what times they need the rooms to be heated. • The energy management system, in turn, visualises and displays consumption to make tenants aware of their heat usage. • By combining this with a control feature for the respective heating system, it is also possible to deactivate the heat supply when there is no demand. • Overall, the system is intended to reduce heat-related emissions from the corresponding rental spaces through this combination of information and control. 	
Intelligent EV charging and storage	21-60	<ul style="list-style-type: none"> • The goal is to reduce the carbon footprint in the region through increased use of electric cars and to improve availability of renewable electricity to fuel these vehicles. 	<ul style="list-style-type: none"> • Installation of charging stations, including bidirectional charging stations. • Installation of a PV system to supply renewable energy to the vehicles. • Installation of storage in the form of a large battery to offer renewable energy sources at times when 	<ul style="list-style-type: none"> • Yes



Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
			<p>this variable energy source is not available.</p> <ul style="list-style-type: none"> The bidirectional vehicle serves both as an environmentally friendly means of transportation and as an intermediate storage device. The latter helps to balance the grid frequency in times of both insufficient and surplus supply. 	
Bi-directional charging	21-60	<ul style="list-style-type: none"> This technology is currently in the prototype phase but shows great potential for large fleets with major benefits for microgrid concepts. 	<ul style="list-style-type: none"> Bidirectional charging offers the ability to transform electric vehicles from pure energy consumers into intermediate storage devices. Digital communication (known as charging management) between the vehicle and the charging station initiates charging or discharging of the battery depending on the situation. The power flow of the highly innovative bi-directional charging stations for e-mobility offers great potential for the resilience of electric networks. 	<ul style="list-style-type: none"> Yes
Balancing the microgrid inside the public grid	21-60	<ul style="list-style-type: none"> This use case offers the greatest potential for larger sites that 	<ul style="list-style-type: none"> A PV system in conjunction with a large-scale battery will be integrated into the site's generation and consumption energy 	<ul style="list-style-type: none"> Yes



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Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
		<p>have the capacity to generate and consume their own energy directly on-site.</p>	<p>network. In addition, a bidirectionally capable electric vehicle will be integrated into the microgrid to support grid stability.</p> <ul style="list-style-type: none"> • All flows as well as peer-to-peer exchanges with the microgrid will be controlled by load management software and energy monitoring. 	



Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
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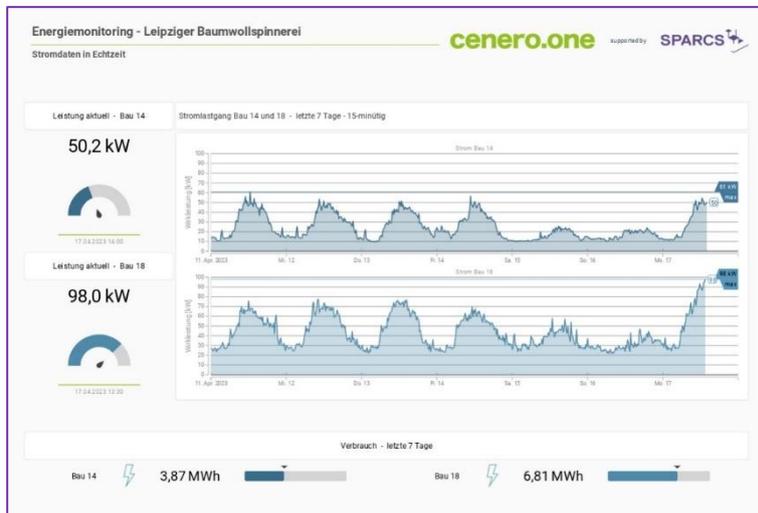


Figure 4: Live energy monitoring with Cenero.one empowers users to detect unusual events or change their consumption when needed. Source: Cenero.one GmbH



Figure 5: Bidirectional BMWi3 plugged into the Kostal Wallbox at the Baumwollspinnerei Source: Simon Baum Cenero Energy GmbH



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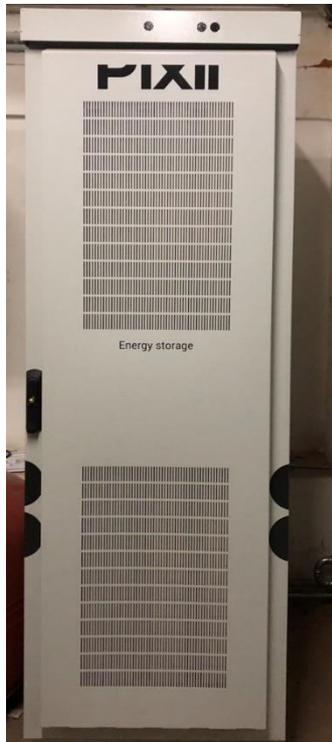


Figure 6: Energy Storage at the Baumwollspinnerei Source Simon Baum Cenero Energy GmbH

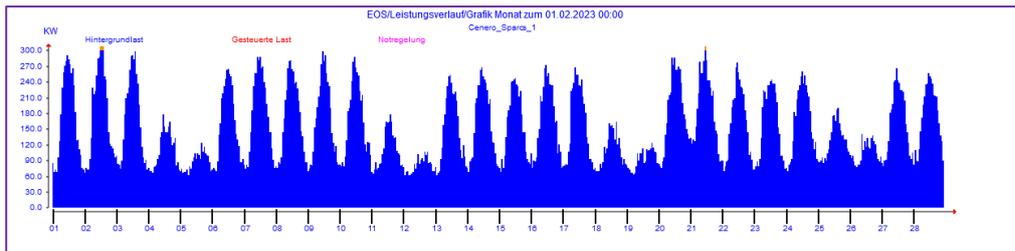


Figure 7: Screenshot from the load management platform Dibalog. Source: Dibalog, Cenero Energy GmbH



Table 5: University of Leipzig, Institute for Infrastructure and Resources Management (IIRM). Relationship to other activities in the project

Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
Decision support system for decarbonization of the district heating system	1-36	<ul style="list-style-type: none"> • Operators of district heating grids, Municipal utility, Energy service provider, District developers • Business strategy units in the energy and buildings sector • 	<ul style="list-style-type: none"> • Development of scenarios for the future heat supply with district heating • Calculating the optimal dispatch of the supply portfolios • Determination of levelized cost of heat supply for each scenario. 	<ul style="list-style-type: none"> • Yes (communication with LSW, presentation to stakeholders and scientific community)
Accessing / using the local flexibility potential from Household customers as a virtual energy community	12-42	<ul style="list-style-type: none"> • Sales unit, Business strategy units in the energy and buildings sector 	<ul style="list-style-type: none"> • Evaluating dynamic tariffs for different customer groups • Calculating the benefits for customers and the utility given optimal purchasing strategies Yes (communication with LSW, presentation to stakeholders and scientific community) 	<ul style="list-style-type: none"> • Yes (communication with LSW, presentation to stakeholders and scientific community)



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Use Cases	Project month	Target Group & demonstration areas	Short Description in key points	Have communication and/or participation activities occurred?
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Figure 8: The team from Leipzig University and Leipziger Stadtwerke at the workshop (2022-11-2)



Figure 9: Presenting SPARCS results at EEM23 in Lappeenranta, Finland (2023-6-8).



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3 PARTICIPATION FORMATS AND CITIZEN ACTIVATION IN THE DUNCKER DISTRICT

3.1 Target

The primary objective of Task 4.6 is to involve the public in the testing and roll-out process of technical SPARCS measures through various forms of communication and participation. This includes raising awareness about energy-positive Neighbourhood, sustainability, and the energy transition. Task 4.6 comprises four specific demonstration actions:

L21-1: Establishing community management and energy advisors to support residents in the energy transformation of privately owned buildings. This involves providing access to the Virtual Power Plant and the smart grid, identifying, and activating key participation groups (such as tenants and local companies), involving strategic partners outside the SPARCS Leipzig consortium, and conducting monitoring and evaluation activities.

L21-2: Providing desk support for interested citizens, offering information on the cost-efficient installation of renewable energy sources like Photovoltaics (PV), and facilitating their participation in the Energy-Positive Community. The desk support also assists local businesses and individuals interested in implementing project solutions and provides advice on the efficient use of renewable energies. It serves as a first direct point of contact for citizens, complementing the planned participation formats.

L21-3: Developing a methodological approach for creating user-centric solutions for energy-positive building blocks in an urban context. This includes organizing workshops and events on a regular basis (four times per year) to facilitate communications, dialogues, and discussions with citizens. The aim is to build upon Leipzig's tradition of citizen engagement and involve them in shaping the development of energy-positive building blocks.

L21-4: Conducting a comprehensive empirical research program to explore how personal-level variables (e.g., personal attitudes) and collective-level variables (social identity variables) contribute to the establishment of energy-positive districts and communities. The research aims to identify effective communication strategies for promoting collective sustainability transitions that lead to behavioural changes.

Detailed information on the activities carried out within these areas of intervention can be found in the following sections.

3.2 District description

The SPARCS demo district, known as the Duncker district, is one of the three designated "energy-positive districts" in the city of Leipzig; it's situated in Leipzig West, near the Spinnerei block and adjacent to the Lindenauer Hafen. The Lindenauer Hafen is an exemplary urban renewal project that revitalizes a former port area in Leipzig West. The Duncker district is characterized by a diverse mix of social and urban



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elements, including industrial locations. The residential area consists primarily of row block constructions built in 1950, partly under monument protection. The district encompasses 31 buildings with a total living space of 65,000 m², offering multiple units designed to meet social housing needs. An exact number of residents is difficult to estimate as we do not know if tenants live alone or together with partners and children. However, we do know that the number of SPARCS-involved apartments is approximately 300. The district presented itself as the ideal testing ground for the proposed user-centric control, via a dedicated platform that promotes active involvement of citizens, to optimize the flow of energy.

Within the Duncker district, there are eight buildings comprising 300 apartments (social housing) and one kindergarten that are owned by LWB (Leipziger Wohnungs- und Baugesellschaft mbH) and supplied with district heating. These buildings serve as the SPARCS demo district Duncker district. All apartments were equipped with net (smart) metering technology for thermal energy. A novel solution was demonstrated within the district, focusing on optimizing thermal energy consumption through the implementation of human-centric thermal demand response programs. These implicit demand response programs will be operated by WSL (Wohnen & Service Leipzig GmbH). The goal is to optimize heat production based on real-time information about the building's thermal demand, thereby achieving a demand-centric approach to heat utilities. New constructions in the area complete the demo district such as a mixed-use building combining a day care centre and social housing (18 apartments) finalized mid-2022, which is connected to the district heating system. Furthermore, another new social housing block with round about 250 apartments was finalized in 2023 which will give the possibility for immediate replication.



Figure 10: Duncker district (Source: WSL)



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Figure 11: Duncker district, picture 2 (Source: WSL)

Indeed, the housing blocks in the Duncker district include social housing flats that provide housing for low-income households. As part of the project's long-term goal, an innovative solution is being developed and implemented to optimize thermal energy consumption. This solution revolves around human-centric thermal demand response programs, which consider the needs and behaviours of the occupants. By implementing these programs, the aim is to achieve more efficient and cost-effective utilization of thermal energy in the social housing blocks.

The LWB maintains the LWB-Kiosk "Nachbarschaftstreff" located in the heart of the Duncker district, which serves as a central meeting place for residents to come together and engage in various activities. The kiosk provides a space for community events, discussions, and social interactions. Residents can visit the kiosk to obtain information about the services and initiatives offered by the LWB. It serves as a hub for disseminating important updates, announcements, and resources related to the Neighbourhood. The LWB-Kiosk plays a vital role in fostering a sense of community and facilitating communication among the residents of the Duncker Neighbourhood. It serves as a convenient location for organizing Neighbourhood activities, promoting local initiatives, and strengthening social connections within the community.



Figure 12: LWB-Kiosk "Nachbarschaftstreff" (Source: seecon)



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3.3 Target groups

Our actions primarily targeted two different levels of stakeholders:

Citizens: This includes potential users of SPARCS products and the broader civil society. The goal was to involve and engage these individuals in the project, raising awareness about SPARCS products, energy sustainability, and the benefits of participation. By targeting citizens, we aimed to foster a sense of ownership and encourage their active involvement in shaping the project's outcomes.

SPARCS Consortium: We also directed our efforts towards engaging the essential stakeholders within the Leipzig SPARCS consortium itself, which encompassed the city administration and external partners serving as amplifiers. Their active participation and collaboration were crucial for the successful implementation of the project. By engaging these stakeholders directly, we aimed to ensure their commitment and alignment with the project's objectives.

Overall, our efforts were directed towards engaging and involving both citizens and the SPARCS relevant stakeholders, recognizing their important roles in driving the project forward.

However, it is important to note that our focus of activities was on the Duncker district. The residents of the demo district primarily consist of senior individuals, families with a migration background, and young families with low income. These individuals can be divided into two groups:

- Private tenants of the WSL in the demo district buildings
- Other district residents (tenants)

From the early activities, the interest expressed by this target group in abstract topics such as climate protection and the energy transition was low or, at the very least, not perceived by the event organizers. To generate interest, improve awareness, and enhance understanding of the impact of their own behaviour, it was helpful to provide relevant information in an easily consumable format and to present the topic in a relaxed and possibly entertaining environment.



3.4 Participation and activation events carried out

The organization of events aimed at engaging citizens in line with the project's objectives had to overcome several obstacles.

Firstly, there were delays caused by the COVID-19 restrictions. In 2020, as we know, it was not possible to organize in-person events. However, Seecon addressed this unforeseen situation by arranging the distribution of posters and postcards within the buildings, as outlined below. Additionally, there were delays in implementing the technical solutions of the project such as the delayed development of the SPARCS-app. Finally, it is important to remember that the target audience consisted of citizens who were not able, predisposed or particularly interested in embracing changes in their lifestyles and being involved in advanced technical and technological innovations like those proposed by the SPARCS project. Indeed, it was quite challenging to find formats that engaged citizens and encouraged their participation in our events.

As mentioned before, in the participation concept, a clear differentiation has been made between communication and participation activities.

The purpose of communication is to inform and raise awareness, representing the lowest level of participation. Communication supports the participation process and serves as a crucial amplifier, providing a passive means for individuals to engage with the topic. It lays the foundation for subsequent activities that require a higher level of involvement. The objective of participation activities is to actively engage people and foster personal commitment within the urban community.

To facilitate dialogue with citizens in this urban context, seecon Ingenieure GmbH, in collaboration with other project partners, focused the workshops in the Duncker district, attempting to reach the inhabitants of social housing through different approaches of co-involvement, including:

- Informational Level (communication)
- Raising Awareness Level (communication)
- Engagement Level (participation)

The various activities carried out and listed below reflect the different approaches.

Information level:

To conduct participation formats, it is necessary to first address the citizens to capture their attention and invite them to the participation formats. The outreach should be done in a format tailored to the people. For instance, in approaching tenants in the Duncker district, the aging population structure of the area had to be taken into consideration. Therefore, a direct postal communication approach was used. Simultaneously, invitations were distributed through notices within the buildings, as well as, for example, posters attached to the LWB kiosk. The purpose of informing was to convey information and to promote step by step the SPARCS-topics. That because, initially, and for the duration of the project, the participation process primarily took place at the informational level, introducing in a successive and gradual manner the



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SPARCS project, its background, objectives, and the broader topics of climate change and energy transition.

Raising Awareness Level:

Subsequently, we endeavoured to transition from an “information level” to a raising of awareness by organizing various events and inviting citizens to participate, engage with SPARCS themes and products, reflect on their habits, and consider the potential to contribute to the development of energy-positive neighbourhoods.

Engagement Level:

The utilization of the developed apps, as well as residents' participation in street festivals, serves two main purposes. Firstly, it aims to make the products and core ideas of SPARCS visible and tangible, and secondly, it is intended to provide people with a sense of engagement, appreciation, and community. "You matter to us. Your opinion counts." This also strengthens the communication and relationship between technical partners like WSL and SWL and their customers, extending beyond the development of SPARCS products. The guided tours with students have also actively engaged participants in our topics.

Due to COVID-19 restrictions, the participation concept had to be adapted to non-contact formats. Digital and smaller activities have been carried out since 2021. As restrictions eased over time, additional formats were offered, specifically related to the SPARCS Apps developed for Leipzig. The events in 2022 included, among others, the presentation of the LWB-App and the SPARCS-App, which are key technological solutions to engage communities and individuals in energy-saving behaviour and data collection.

Secon is currently finalizing all its events for 2023 and planning those for 2024. These events are tailored to the current context of Leipzig and will provide opportunities, for example, for residents in the Duncker district to further engage with the SPARCS-App and for children in the neighbourhood to learn about challenges like climate change that SPARCS aims to address.

Over time, the activities organized and proposed in the district aimed to enhance citizen involvement and transition from an initial strictly communicative and informational level to others that involved citizens to a greater extent. An ongoing contribution to support the communication strategy and event promotion has been the door-to-door distribution of flyers and posters in the target neighbourhood.

In accordance with the tasks of this Work Package, the following tables will highlight and summarize the main achievements of the developed participation concept, including all public participation activities carried out during the period between September 2021 and October 2023.



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Here a short list as overview:

- Ongoing Poster advertising and flyer distribution
- Two Energy Positive Coffee-And-Cake in the District
- Poster survey (CLIMATE SHOWCASE) in staircases on energy consumption
- Postcard campaign
- Drawing Competition for children
- Market of Possibilities
- 3 times: Energy saving consultation workshops and presentation both SPARCS- and Meine LWB-App
- Pop-Up action: the SPARCS-App is just around the corner.
- Cinema for children and families:
 - Checker Tobi and The Mystery Of Our Planets
 - Animals Conference
 - Shorty and the Secret of the Magic Reef
- Walking tour for members of city administration
- Walking tour “Combining Monument and Climate Protection”

3.4.1 Ongoing Poster advertising and flyer distribution

CONSTANT ADVERTISING AND ACTIVE COMMUNICATION CHANNELS	
Project month	M30-M60
Target Group	Duncker district tenants
Participation level	Non-contact participation formats Information Campaign Marketing and invitations to events
Advertising & Communication channels	Poster advertising, flyer distribution thanks to the services of DHL (Deutsche Post)
Involved partners	seecon, LWB, WSL, City of Leipzig
Description	The distribution of flyers and the publicizing of events was a constant element of our communication strategy. These communication channels were chosen because there are residents (such as older individuals) in the neighbourhood who are less accessible through online communication methods. Both channels aimed at promoting the planned events and raising awareness about the project's key issues. Seecon was responsible for the design of the flyers, while Deutsche Post handled their distribution. LWB and Stadt Leipzig provided support to seecon on multiple occasions. LWB periodically offered the use of their kiosk to display posters related to environmental issues and consumption, effectively reaching a wide audience, and promoting the SPARCS project.



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CONSTANT ADVERTISING AND ACTIVE COMMUNICATION CHANNELS	
	<p>Flyers/posters were written in multiple languages to effectively reach a wide range of target audiences within the neighbourhood. The posters have been properly hung for the promotion of the events both at the "Nachbarschaftstreff" of LWB and in their local office, as well as in some shops or schools in the neighbourhood and at the project partners' premises.</p> <p>In order to provide tenants in the neighbourhood with a dedicated contact person for inquiries and information related to energy efficiency, energy saving, building transformation, and renewable energy sources, seecon included direct contact details in every flyer, poster, and published article. A dedicated email address (sparcs@seecon.de) was created for this purpose.</p>
Lessons learned	<p>Early distribution of promotional materials proved to be beneficial. Collaborating with DHL for packaging and distribution effectively reached many people and attracted attention to the project. It was a simple yet effective method for reaching a wide audience and promoting the project. However, distributing flyers through DHL does not allow for precise targeting of invitations to SPARCS buildings. Thanks to DHL, we distributed flyers to about 3,000 apartments.</p>
Recommendations	<p>Selecting a target group in a specific neighbourhood characterized by a particular postcode can enhance the punctual distribution of flyers and improve their reach and impact.</p>





Figure 13: Example of Event Poster for promoting a workshop (Designed and produced by seecon)



Figure 14: Poster displayed on the windows of the LWB kiosk (Source: seecon)



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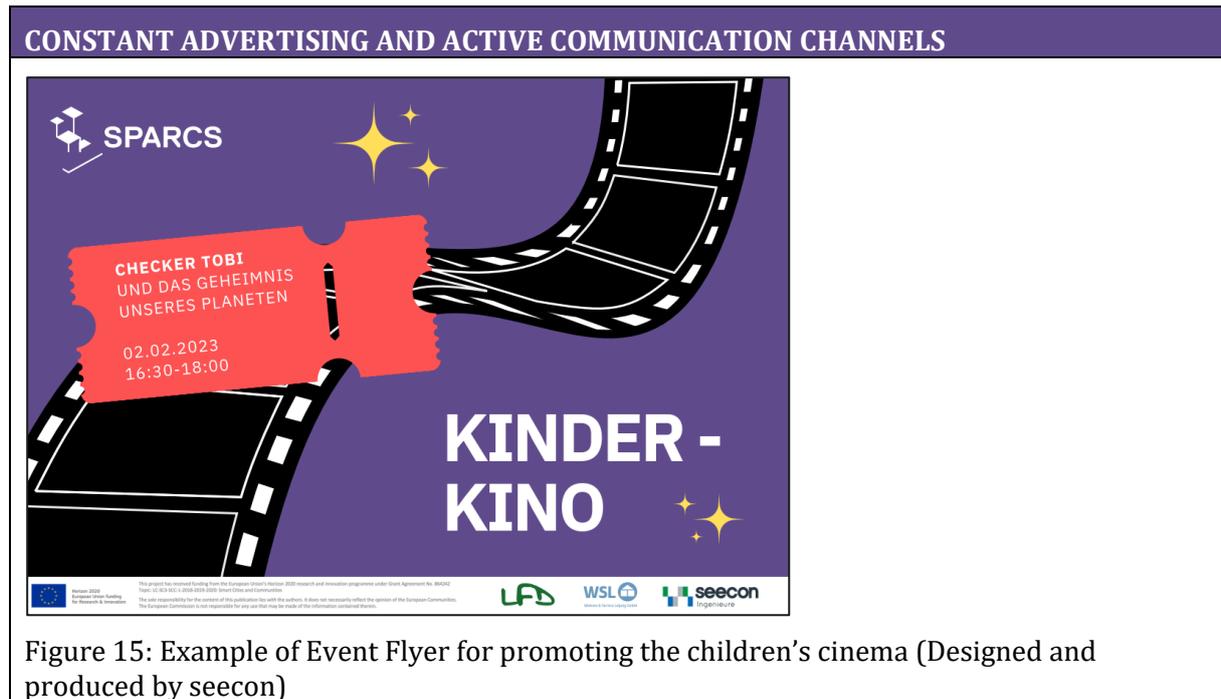


Figure 15: Example of Event Flyer for promoting the children’s cinema (Designed and produced by seecon)



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3.4.2 Presentation in the neighbourhood: "Coffee-and Cake"

TWO ENERGY POSITIVE COFFEE-AND-CAKE IN THE DISTRICT	
Project month	M23; M24
Date	<ul style="list-style-type: none"> • 23.09.2021 • 11.10.2021
Target Group	WSL tenants and LWB customers
Participation level	Inform, raise awareness, involve
Advertising & Communication channels	The events had been preceded by several participation and communication activities: i.e., information flyer, article in the local newspaper as well as numerous social media feeds.
Involved partners	Seecon, WSL, KAOS Cultural Club
Description	<p>Through the Coffee & Cake action, seecon's employees officially introduced the project on-site. By offering warm beverages and cake, they created a friendly atmosphere for members of the Leipzig consortium to engage with the local community. Discussions revolved around the project's objectives, such as reducing energy consumption in urban environments, promoting sustainability, addressing energy transition, and tackling climate change. Residents were encouraged to share their wishes and visions for local sustainable development in the neighbourhood, including topics like waste management, green roofs, and the potential for solar power in the buildings.</p> <p>In addition, residents were asked to provide their anonymous opinions on their level of knowledge regarding energy consumption, their ability to reduce it, and their interest in expanding their knowledge on the topic.</p> <p>Due to the pandemic, the event took place outdoors, which posed a challenge as well.</p>
Lessons learned	<p>These actions were the first opportunities for seecon to be physically present in the neighbourhood and directly introduce the SPARCS project to the residents. It allowed for an initial direct contact with the community and facilitated meaningful engagement with the residents of the area.</p> <p>These meetings were instrumental in introducing and involving local communities in initiatives that promote sustainable energy sources, encourage energy-saving practices, and raise awareness about climate change. They provided for the first time a platform to communicate residents about these important topics and encourage their active involvement.</p> <p>Another lesson learned is that the open offering (cake stand at a well-visible corner) provided the opportunity for passersby to participate as well.</p>



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TWO ENERGY POSITIVE COFFEE-AND-CAKE IN THE DISTRICT	
	Furthermore, these events served as an introduction to WSL's first tangible technical product, the “Meine LWB-App”, which was scheduled for launch in late September 2022.
Recommendations	Offering coffee, cake, and small games for children is an excellent way to attract neighbourhood residents, including those who may initially have less interest in environmental issues.





Figure 16: During the Coffee & Cake campaign in the quarter, children had the possibility to print and do crafts together with the local association, KAOS Cultural Club. (Source: seecon)



Figure 17: Our volunteers during the Coffe&Cake action (Source: seecon)

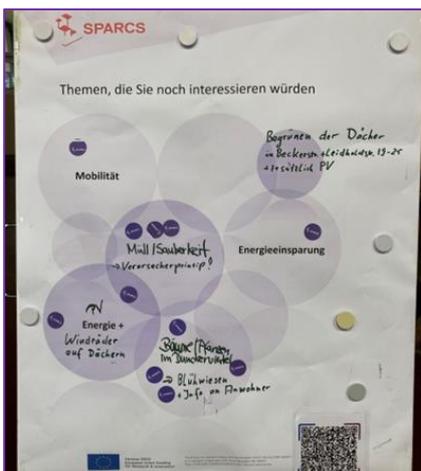


Figure 18: Workshop results on a movable table. The most voted topics are green roofs, cleanliness in the neighbourhood and greenery in the neighbourhood. (Source: seecon)



3.4.3 Poster survey in staircases on energy consumption

POSTER ADVERTISING (CLIMATE SHOWCASE)	
Project month	M23-M24
Date	September, October 2021
Target Group	WSL tenants and LWB customers
Participation level	Non-contact participation formats. Informational Level, Raise awareness
Advertising & Communication channels	Poster advertising
Involved partners	Seecon, WSL, LWB
Description	<p>During this time, the collaboration with WSL was implemented and the first participation events in the Duncker district were announced. This included analogue and COVID-19 conform activities.</p> <p>The so-called “contact-free” participation activities consisted of posters pinned up in the stairwells of the residential buildings of LWB in the Duncker district. A pencil and 3 adhesive dots were also distributed to each residential unit, enabling tenants to participate in the survey in the stairwell. The responses can be visualised on the figures below.</p>
Lessons learned	<p>The project period 2020/2021 has been the most challenging due to the pandemic situation for any kind of classic participation approach.</p> <p>Nevertheless, these kinds of contactless participation events were marked as a milestone and were a perfect solution during the COVID-19 time.</p> <p>All in all, a simple way to reach many people and promote a project.</p>
Recommendations	<p>Create an appealing, CD-conform design for the poster. Incorporate the project logo.</p> <p>Include relevant contact information of the sender, such as a phone number or email address.</p> <p>Ensure that the poster is easily readable from a distance and will draw people's attention.</p>



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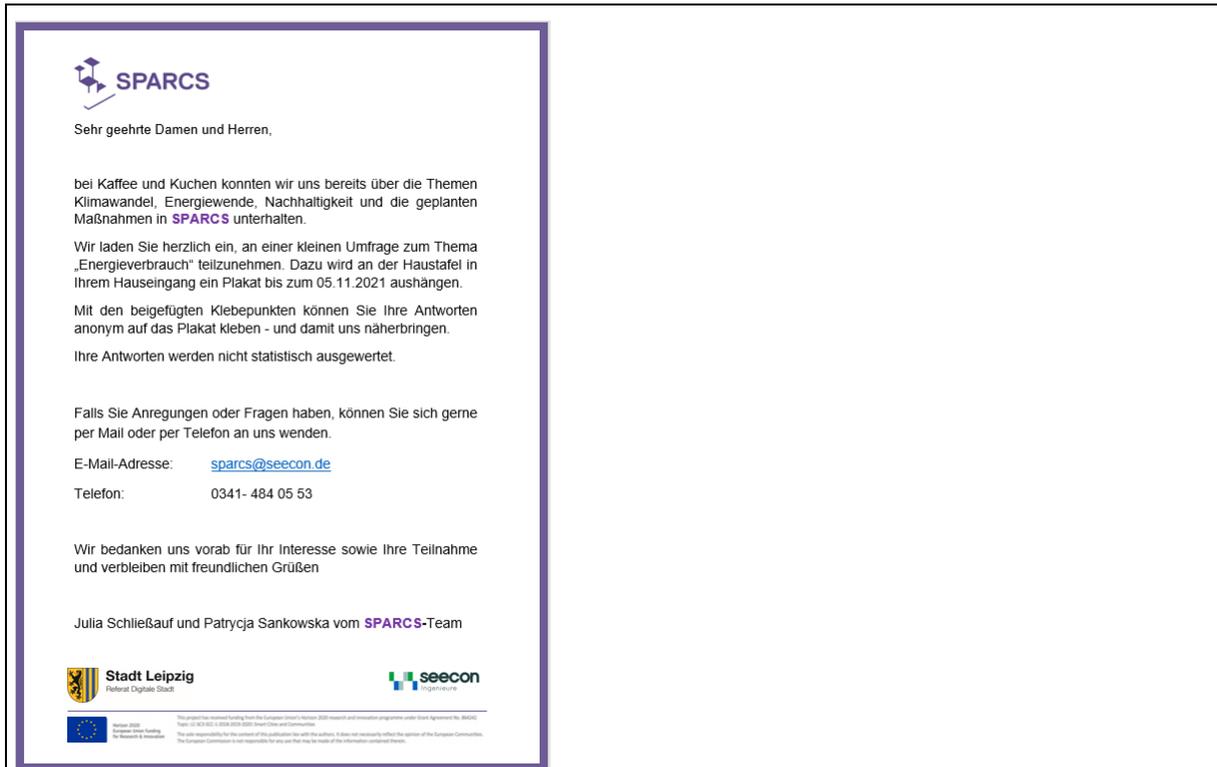


Figure 19: Poster survey in staircases (Designed and produced by seecon)²

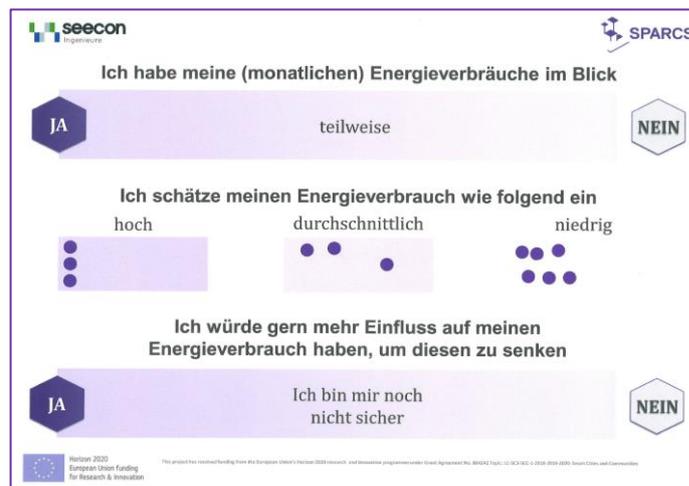


Figure 20: Poster survey in staircases for the tenant’s engagement (Designed and produced by seecon)³

² Translation: “Dear Ladies and Gentlemen, over coffee and cake, we have already been able to talk about the topics of climate change, energy transition, sustainability and the planned measures in SPARCS.



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POSTER ADVERTISING (CLIMATE SHOWCASE)										
Haus	I have my monthly energy consumption in view			I estimate my energy consumption as follows			I would like to have more influence on my energy consumption to reduce it			Bewertungen insgesamt
	ja	teilweise	nein	hoch	durchschnitt	niedrig	ja	nicht sicher	nein	
Leidholdstr. 19		1				1				3
Leidholdstr. 21				1		1				1
Leidholdstr. 23										0
Leidholdstr. 25					1	1				5
Morgensternstr. 20	1	1					1			0
Morgensternstr. 24										0
Beckerstr. 10			1		1				1	3
Beckerstr. 16	1				1		1			3
Beckerstr. 18										0
Beckerstr. 22		1		1			1			3
Beckerstr. 24	1		1	1	1		1	1		6
Beckerstr. 26	1		1			3	1			6
Beckerstr. 28	2		1		2	1		2	1	9
Beckerstr. 30	4	1			3	2		3	2	15
Beckerstr. 32										0
Beckerstr. 36		1	2		3		3			9
Beckerstr. 38										0
Beckerstr. 40	1				1		1			3
Beckerstr. 44			1			1	1			3
Beckerstr. 46		3			3		1	2		9
Beckerstr. 48			1			1			1	3
Beckerstr. 50		1			1		1			3
Beckerstr. 52										0
Beckerstr. 54										0
Beckerstr. 56				3	3	6				12
Summe der Stimmen	11	9	8	6	20	16	13	8	5	

Figure 21: Complete analysis Nr. 1. Source: seecon



Figure 22: How much has been assessed? Graphic representation. (Source: seecon)

We cordially invite you to participate in a small survey on the topic of "energy consumption". For this purpose, a poster will be displayed on the house notice board in your house entrance until 05.11.2021. With the enclosed adhesive dots, you can anonymously stick your answers on the poster - and thus bring them closer to us. Your answers will not be statistically evaluated. If you have any suggestions or questions, please do not hesitate to contact us by e-mail or telephone.

³ Translation: 1. question: I have my monthly energy consumption in view. 2. Question: I estimate my energy consumption as follows. 3. Question: I would like to have more influence on my energy consumption to reduce it



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POSTER ADVERTISING (CLIMATE SHOWCASE)

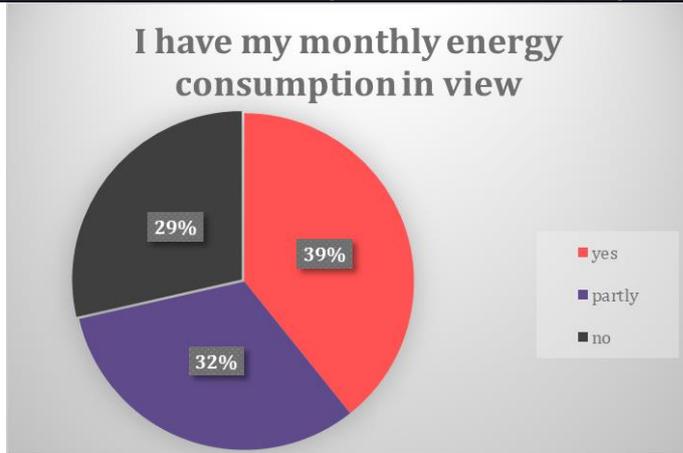


Figure 23: Graphical visualisation of responses. (Source: seecon)

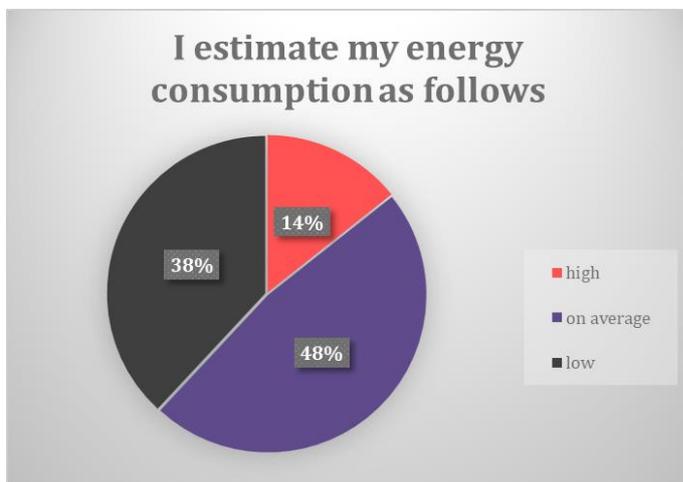


Figure 24: Graphical visualisation of responses. (Source: seecon)

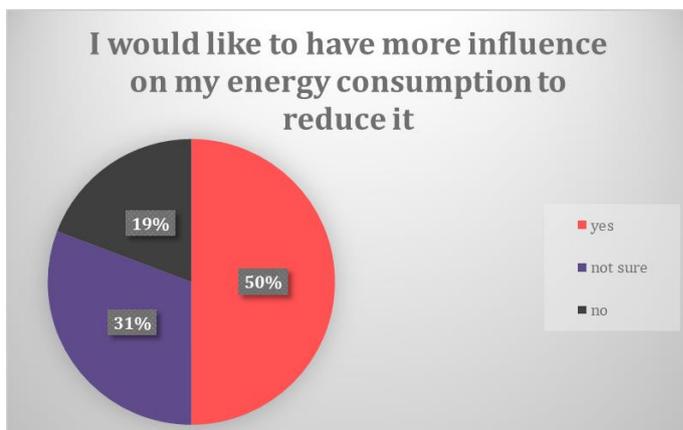


Figure 25: Graphical visualisation of responses. (Source: seecon)



3.4.4 Postcard campaign

POSTCARD CAMPAIGN	
Project month	<ul style="list-style-type: none"> • M23 • M24
Date	<ul style="list-style-type: none"> • September 2021 • October 2021
Target Group	WSL tenants and LWB customers
Participation level	Non-contact participation formats. Informational Level; raise awareness
Advertising & Communication channels	door-to-door leafleting
Involved partners	Seecon, WSL
Description	<p>During this time, the collaboration with WSL has been implemented and the first participation events in the Duncker neighbourhood were announced. This included analogue and COVID-19 conform activities.</p> <p>The so-called “contact-free” participation activities consisted in posters pinned up in the stairwells of the residential buildings of LWB in the Duncker district.</p> <p>Besides that, postcards on the topic of “climate protection activities” were sent to the households in the Duncker quarter, inviting participants to colour the boxes on the postcard that applied to them.</p>
Lessons learned	<p>The project period 2020/2021 has been the most challenging due to the pandemic situation.</p> <p>Nevertheless, this kind of contactless participation events were marked as milestone and were a perfect solution during the COVID-19 time.</p>
Recommendations	Activate and organize an efficient postcard distribution service based on postal codes or streets if possible. Allocate a budget for this service.



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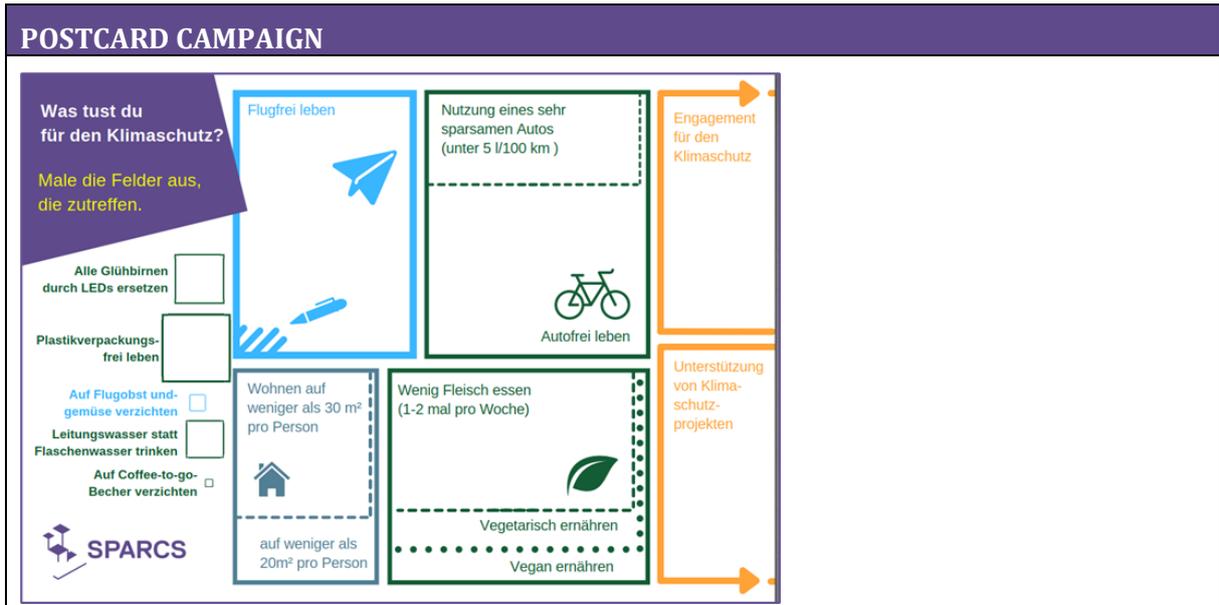


Figure 26: Postcard campaign, front side (Designed and produced by seecon)⁴



Figure 27: Postcard campaign, back side (Designed and produced by seecon)

⁴ Translation: What can you do for climate protection? Fill in the fields that apply. Replace all light bulbs with LEDs. Live without plastic packaging. Do without fruit and vegetables. Drink tap water instead of bottled water. Do not use coffee-to-go cups. Live flight-free. Live in less than 30m2 per person. Eat less meat. etc.



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3.4.5 Drawing Competition

DRAWING COMPETITION	
Project month	<ul style="list-style-type: none"> • M33 • M34
Date	<ul style="list-style-type: none"> • May 2022 • June 2022
Demonstration Areas	Demo District
Target Group	Family and children of the demo quarter, schools
Methodological approach	Inform; raise awareness; involve
Partner	Seecon, City of Leipzig, Leipziger Stadtwerke, WSL, LWB, FhG
Communication channels	Directly engage with teachers and educators from local primary and nursery schools. Distribute posters and flyers in the neighbourhood and within the local schools.
Description	<p>Drawing Competition "<i>What does your home look like in a future, where polar bears and bees also have a place in this world?</i>", organised and promoted by seecon. Goal of the drawing contest was to sensitize children (3-10 years old) and their families to the importance of living in a sustainable world.</p> <p>Through the engagement of a younger generation, we have tried to sensitize families about SPARCS' topics. Every child had the possibility to win a prize according to its age. All awards (books, child friendly greenhouses, card games, coloured pencils, bird houses) were made of recycled materials and related to ecological and environmental topics.</p> <p>About 25 children took part in the drawing competition. And about 30 persons took part in the award ceremony during the "Market of possibilities".</p>
Lessons learned	<p>Involving children in project activities is crucial for multiple reasons. Firstly, it helps introduce them to the topic at an early age, fostering a sense of awareness and understanding. Additionally, engaging children can provide a gateway to reaching their families, as they often share their experiences and knowledge with their family and friends. The activities targeting children were the most well-attended events. It's worth highlighting the remarkable success of involving this demographic, as these events garnered significant participation.</p> <p>It is important to always tailor the formats according to people's needs. For instance, recognizing the need for childcare, we created offerings for families, and subsequently introduced environmental education and awareness initiatives.</p>
Recommendations	Regularly contacting schools in the neighbourhood is essential. They can serve as excellent stakeholders for spreading and promoting



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DRAWING COMPETITION

project activities. By establishing a consistent partnership with schools, the project can benefit from their support in disseminating information, engaging students and families, and organizing events and educational initiatives. This collaboration helps create a strong network within the community and ensures a wider reach for the project's objectives and messages.



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DRAWING COMPETITION



Figure 28: Award ceremony for the drawing competition. (Source: seecon)



Figure 29: Posters have been hung in the neighbourhood and in schools to invite children and families to participate in the drawing competition (Designed and produced by seecon)



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3.4.6 Market of Possibilities

MARKET OF POSSIBILITIES	
Project month	M33
Date	16.06.2022
Target Group	Residents of the demo district: <ul style="list-style-type: none"> • Children / young families (primary school and kindergarten) • Older residents • Citizens with a migration background •
Participation level	Inform; raise awareness; involve
Advertising & Communication channels	<p>The event was preceded by various communication activities, including the distribution of information flyers to approximately 3,000 households, contacting teachers and educators from local primary and nursery schools, displaying posters in the neighbourhood, publishing an article in the local newspaper, and sharing numerous social media posts from different collaborating partners.</p> <p>The promotion of the event took place through various channels:</p> <ul style="list-style-type: none"> • Article in the local neighbourhood magazine • press release in the LVZ (Leipziger Volkszeitung) • Posters in schools and kindergartens • Climate showcase • Postcards/Flyers in mailboxes • SPARCS website/SPARCS newsletter • Social media channels • Nebenan.de (local community platform)
Involved partners	<ul style="list-style-type: none"> • Verbraucherzentrale Sachsen (Leipzig), • Mosaik e.V., • KoLa Leipzig eG. (Ecological, regional and solidarity-based agriculture people). • civic network "Wir im Quartier" of the foundation "Ecken Wecken" (information about neighbourhood projects and design possibilities for a liveable and environmentally friendly neighbourhood at their booth) • seecon, • LSW, • WSL, • City of Leipzig, Referat Digitale Stadt, • ULEI, • DSK Stadt Entwicklung
Description	On June 16 th , 2022, the members of Leipzig consortium met the residents of the Duncker district at the "Market of Possibilities" at the LWB-Kiosk.



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MARKET OF POSSIBILITIES	
	<p>At the information stands, citizens had the chance to get information about the project and to talk about their future as well as different topics regarding local energy saving solutions, climate protection, sustainable transports, and consumption. Furthermore, they had the possibility to get in touch with employees from the City of Leipzig and to promote their own ideas and needs concerning a sustainable development of the Neulindenau district, of which the Duncker district is a part.</p> <p>The warm and friendly atmosphere of the day was a great opportunity to celebrate the award ceremony of the Drawing Competition "<i>What does your home look like in a future, where polar bears and bees also have a place in this world?</i>", organised and promoted by seecon in the weeks before.</p> <p>In the meantime, about 15 adult tenants had the opportunity to get advice from local external parties such as the Consumers' Advice Centre (Verbraucherzentrale), Caritas und KoLa.</p>
Lessons learned	<p>The tenants in the neighbourhood are primarily elderly individuals and families with children, many of whom have a migration background. As a result, these participatory formats are much more effective than digital ones, particularly during the summer. We have successfully increased awareness of the project, with families and children showing interest and providing input and questions at the DIPAS touch table (Use of digital participation tool: DIPAS) or Ökofete-booth.</p> <p>We observed that providing tangible offers and activities, along with eye-catching elements such as the Drawing Competition, Coffee&Cake, and the DIPAS touch table, is crucial for engaging citizens. Therefore, establishing good and timely communication with local schools, after-school programs, and day-care centres can effectively attract residents and families. Additionally, networking, public relations, newspaper articles, and active social media presence play a significant role in promoting local events.</p>
Recommendations	<p>Activating and involving external strategic key partners: Creating a network of key partners is crucial for the success of SPARCS.</p> <p>By actively engaging with external organizations and stakeholders, we can leverage their expertise, resources, and networks to further promote and advance the project's goals.</p> <p>Establishing a permanent presence in the neighbourhood: SPARCS ensures a continuous presence in the community using the LWB-Kiosk. This serves as a designated contact point for LWB tenants, allowing us to maintain regular communication and interaction with residents. This ongoing presence helps foster a sense of community and allows us to address any concerns, provide information, and encourage participation in project activities.</p>



MARKET OF POSSIBILITIES



Figure 30: Local partner offering free advisory services (Source: seecon)



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3.4.7 Energy saving consultation workshops and presentation both SPARCS- and Meine LWB-App

WORKSHOP: WHAT DOES MY ENERGY CONSUMPTION REALLY MEAN?	
Project month	<ul style="list-style-type: none"> • M36 • M42 • M48
Date	<ul style="list-style-type: none"> • 16.09.2022 • 03.03.2023 • 05.10.2023
Target Group	Residents of the demo quarter: WSL tenants and LWB customers in the Energy District "Dunckerviertel"
Participation level	The SPARCS- and Meine LWB-App, key products of the SPARCS project, was introduced to the community. Informing, raising awareness, engaging through energy consulting and use of the apps.
Advertising & Communication channels	Invitation via direct mail, posters, Flyers, SPARCS-newsletter, local press
Involved partners	<ul style="list-style-type: none"> • seecon Ingenieure GmbH, • Mosaik e.V., • Caritasverband Leipzig e.V., • LWB • WSL
Description	<p>To raise awareness among citizens about environmental and specifically energy issues, as well as to discuss the energy transition and spark their interest in taking active steps, an event was organized for the tenants of the Duncker quarter as part of the heating and energy activities by SPARCS. In cooperation with LWB, WSL and Caritas, seecon engineers led a lively discussion session on energy and electricity saving in their own homes.</p> <p>During the workshop, SPARCS partners provided insights into the project's background, the concept of the App, and its features. Participants were encouraged to test the App and share their feedback, which was valuable for the final development phase. The participants actively and with great interest engaged in topics such as tenant electricity model (Mieterstrom⁵), photovoltaics, heating cost calculations, digital solutions for monitoring and controlling their own energy consumption, as well as general possibilities for reducing greenhouse gas emissions. During the sessions, concrete</p>

⁵ In "tenant electricity models", the core concept is to generate electricity locally. The self-generated electricity is directly consumed within the building or neighbouring facilities in close spatial proximity



WORKSHOP: WHAT DOES MY ENERGY CONSUMPTION REALLY MEAN?	
	<p>tips were provided for reducing heating costs and saving energy. Additionally, digital solutions for monitoring and controlling energy consumption were introduced.</p> <p>The workshop covered various topics, including:</p> <ul style="list-style-type: none"> • Monitoring and managing energy consumption and costs. • Understanding energy and water usage patterns • Practical tips for saving energy at home. • Introduction and demonstration of both Meine LWB App and SPARCS App <p>The collaboration with LWB social management infrastructure was enhanced, aiming to establish the neighbourhood meeting as a well-known and popular venue. Additionally, collaboration with Caritas was sought to regularly organize the "energy consultation hour."</p>
Lessons learned	<p>The participants (about 12-15) actively participated and demonstrated a strong interest in topics such as tenant electricity, photovoltaics, heating bills, digital solutions for monitoring and controlling energy consumption, and overall reduction of greenhouse gas emissions. To foster constructive discussions, a small surprise bag filled with energy-related products and materials related to the SPARCS project was provided.</p> <p>To maintain a continuous presence in the neighbourhood, SPARCS utilizes the on-site LWB Kiosk, which serves as a contact point for LWB tenants.</p>
Recommendations	<p>Eye-catcher, targeted marketing, networking, and carefully selecting the target group in advance, as well as identifying the existing communication channels in that context from the beginning, are crucial for effective outreach. Practical topics and demonstration of direct benefits (e.g., concrete cost savings) generate interest and help place larger issues.</p> <p>Presenting practical energy-saving tips is an excellent way to capture the attention of residents who may not have shown interest in the general topics of SPARCS.</p> <p>This format has been successful and serves as a great way to introduce the LWB App and the project to engaged and interested participants in the neighbourhood.</p> <p>Furthermore, the presence of organizations such as Caritas or Mosaik ensured that the workshop presentation was inclusive and engaging for participants at all levels of communication and knowledge.</p> <p>The use of simple language and concrete examples allowed every person to feel involved and understand the content effectively.</p>



WORKSHOP: WHAT DOES MY ENERGY CONSUMPTION REALLY MEAN?

Improvements can be made in organizing flyer distribution: It is important to time the distribution effectively, as it can serve as a powerful advertising tool.



Figure 31: Workshop participants (Source: seecon)



Figure 32: Invitation Flyer (Designed and produced by seecon)



Figure 33: Welcome Cookies for the workshop participants (Source: seecon)



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WORKSHOP: WHAT DOES MY ENERGY CONSUMPTION REALLY MEAN?



Figure 34: Surprise bag for workshop participants (Source: seecon)



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WORKSHOP: SPARCS APP AND DYNAMIC HEATING CONTROL	
Project month	<ul style="list-style-type: none"> • M39 • M48
Date	<ul style="list-style-type: none"> • 15.12.2022 • 05.10.2023
Target Group	Tenants of the Beckerstraße 52-56
Participation level	Information, Engagement Level
Advertising & Communication channels	Postcards, posters, local press, goody bag as advertising material
Involved partners	WSL, LWB
Description	<p>This workshop had a specific focus on introducing the SPARCS App and engaging in discussions regarding essential aspects of reducing energy consumption using this tool. The App offers detailed monthly information on energy costs, and its functionalities were thoroughly explained during the workshops.</p> <p>Due to technical constraints, the workshops targeted a small group of participants, as the App was only available in test buildings (Beckerstrasse 52-56). The goal of these sessions was for SPARCS partners to provide insights into the project's background, present the App's concept, and highlight its features. Participants were encouraged to actively test the App and share their feedback, which would be taken into consideration during the final development phase.</p>
Lessons learned	<p>Unfortunately, none of the residents attended the workshop despite the following publicity efforts: flyers were distributed to residents' letterboxes 1.5 weeks in advance, and posters were displayed in the entrance halls of their buildings. No RSVP or registration was required, and the invitation mentioned a giveaway bag (Wundertüte). The workshop was scheduled for 4 pm on Thursday, December 15th.</p> <p>Ideas for future workshop execution and publicity include closer coordination with LWB social workers in the area to determine a time and date that suits the residents. During interviews about the use of the SPARCS App, residents could provide feedback on their preferences for workshops and any barriers to attending. Invitations could be sent earlier, and reminders could be sent to residents. It may be advisable to avoid scheduling workshops close to major holidays when people tend to be busier.</p>
Recommendations	<p>Providing more personalized invitations for small target groups.</p> <p>Avoid scheduling events just before major holidays or at the end of the year.</p>



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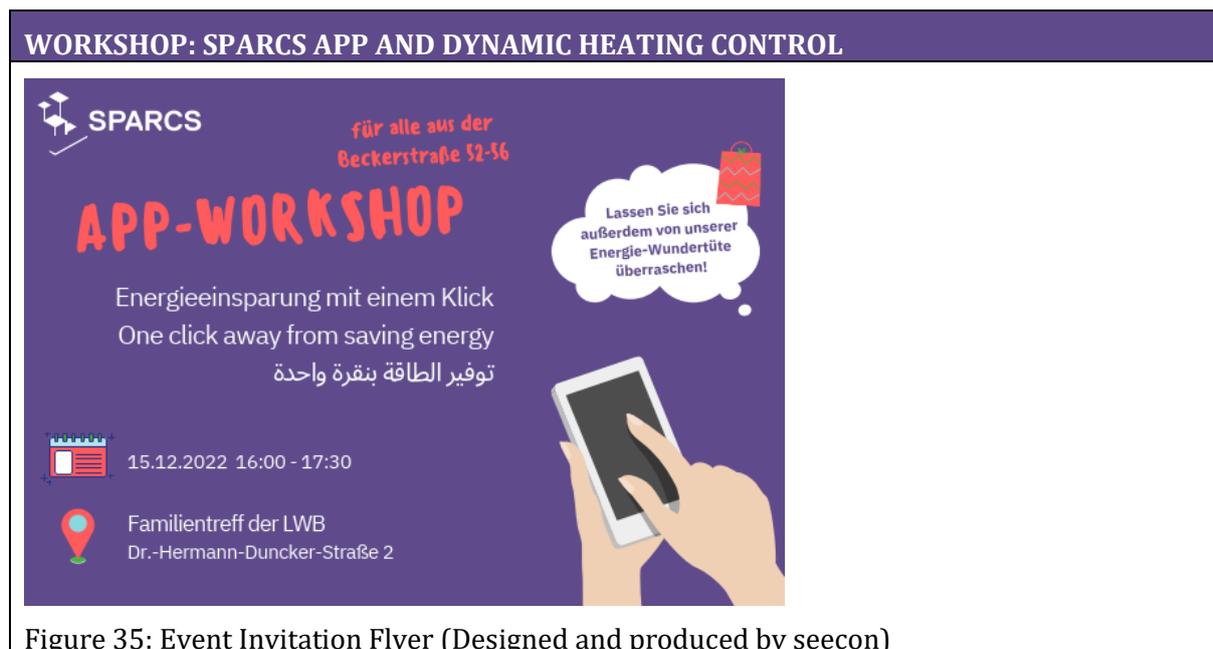


Figure 35: Event Invitation Flyer (Designed and produced by seecon)

3.4.8 Pop-Up action: the SPARCS-App is just around the corner

POP-UP ACTION FOR THE SPARCS APP	
Project month	M44
Date	25.05.2023
Target Group	Tenants of Beckerstraße 52-56
Participation level	Inform, raise awareness, engage using the SPARCS-App
Advertising & Communication channels	Postcards, posters, Voucher campaign. Flyers were distributed door-to-door, and posters were hung in the common areas of the apartment buildings and at the LWB Kiosk. WSL also distributed letters with a detailed description of the procedure to download the App and to register.
Involved partners	WSL, LWB, Stadt Leipzig, seecon
Description	On a warm afternoon in May, employees from seecon, the City of Leipzig, and WSL stood in front of the buildings on Beckerstrasse with a roll-up banner, an information booth, and many vouchers for a nearby grocery store. The aim was to directly present the contents of the App to the residents of Beckerstrasse (18 flats), where the App was being implemented. seecon, WSL, and LWB collaborated closely to establish direct contact with the target group and assist them in downloading and effectively using the App. On the same day, every tenant residing in these buildings received a letter from WSL containing instructions and the necessary code to download the app and log in.



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POP-UP ACTION FOR THE SPARCS APP	
	Approximately a month later, employees from seecon returned to distribute flyers in every mailbox, drawing attention to the app and the registration process, while also inviting people to the SPARCS-Fete scheduled for early July 2023.
Lessons learned	Reaching this target group and reigniting their interest in an innovative App has proven to be quite challenging. During the App presentation day, only one resident of the buildings downloaded the App, and a second lady came down to the courtyard showing interest but did not complete the download.
Recommendations	In a replication phase of this experience, it is advisable to carefully select the target group and engage them through highly targeted, repetitive, and frequent actions.



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Figure 36: Invitation poster (Designed and produced by seecon)



Figure 37: Pop-up Action and Voucher campaign in front of the Beckerstraße 52-56 buildings (Source: seecon)



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3.4.9 Cinema for children and families

CINEMA FOR CHILDREN AND FAMILIES	
Project month	<ul style="list-style-type: none"> • M28 • M45 • M47
Date	<ul style="list-style-type: none"> • 02.02.2023: "Checker Tobi and the secret of our planet" • 02.07.2023: during the SAPRCS-Fete, "Shorty and the Secret of the Magic Reef" • 27.09.2023: "Animals Conference"
Target Group	Children of the Duncker neighbourhood and their families
Participation level	Inform, raise awareness, engage
Advertising & Communication channels	<ul style="list-style-type: none"> • Flyers: Distributed by mail to over 3.000 households • Posters: Displayed in schools and at the neighbourhood meeting point • Early announcement: 3 weeks in advance
Involved partners	<ul style="list-style-type: none"> • Seecon • LWB • Landesfilmdienst Sachsen e. V.
Description	<p>The film screening was a great success.</p> <p>The idea behind this event was to attract the attention of families and children by screening films that promotes the topic of environmental sustainability. It was a great way to present and discuss the SPARCS project with a young and motivated audience. Over 40 visitors participated in the event (also attracted by the cotton candy offered on the day of the event).</p> <p>On this day, seecon had the opportunity to present itself once again as a reliable partner to answer any questions related to energy efficiency and the promotion of renewable energy. After this event, seecon even received a phone call from a citizen with inquiries about the project.</p>
Lessons learned	<p>Over 40 visitors attended the event, indicating a positive response and interest from the community.</p> <p>The event was well received, with attendees expressing a desire for more events of a similar nature in the future.</p> <p>Advisory support was offered by seecon, and it was accepted by the participants, demonstrating the value of having experts available to address inquiries and provide information.</p> <p>Informational material about SPARCS was provided, along with a film focusing on climate change, further enhancing the educational aspect of the event.</p>



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CINEMA FOR CHILDREN AND FAMILIES	
	Providing free entertainment for children and families is an effective means of conveying such topics in an engaging manner "on the side". And not just to children, but also to adults.
Recommendations	As often happens at events with high participation, there is a risk of underestimating the accumulation of waste. It is therefore advisable to plan time for cleaning up and to separate the accumulated waste.



Figure 38: Workshop’s participants (Source: seecon)



Figure 39: Invitation Flyer (Designed and produced by seecon)



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3.4.10 SPARCS-Fête

SPARCS FÊTE	
Project month	M45
Date	02.07.2023
Target Group	Public participation events included residents and their families, as well as SPARCS partners and non-SPARCS partners. The objective is to introduce pre-developed SPARCS products, such as the SPARCS App to individual users.
Participation level	The SPARCS products were presented to residents, aiming to inform, raise awareness, and engage them. Desk advisory and energy consultation were provided to assist with inquiries and support. Cooperation and networking efforts were made.
Advertising & Communication channels	Posters, social media, flyer distribution thanks to the services of DHL (Deutsche Post)
Involved partners	<ul style="list-style-type: none"> • seecon, • LSW • WSL • LWB • City of Leipzig, Referat Digitale Stadt, • Caritas, • ULEI, • Cenero, • Fraunhofer IMW, • Landesfilmdienst Sachsen e. V.
Description	<p>In collaboration with all project partners in Leipzig, we aimed to present various activities to engage families and residents of the neighbourhood, with a specific focus on promoting the event to the inhabitants of Beckerstrasse, who are the target group for the SPARCS-App. The event further intensified cooperation with LWB Social Management employee, aiming to establish the neighbourhood meeting as a well-known and popular gathering place and to establish cooperation with Caritas in organizing regular "Energy Consultations." During the day, about 25 / 30 residents of the neighbourhood approached various booths to receive consultation on different topics.</p> <p>In parallel, to attract citizens' attention, the Landesfilmdienst presented the film "Shorty and the Secret of the Magic Reef" as part of the 11th Rabazz Children's and Youth Film Festival (Landesfilmdienst Sachsen e. V.).</p> <p>The association "Omas for Future" was supposed to present at their booth with a "Future Quiz," and the city of Leipzig would be available for clarification and discussion on environmentally and climate-friendly design of the Duncserviertel using the digital</p>



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SPARCS FÊTE	
	<p>participation table. Unfortunately, their presence was cancelled at the last minute.</p> <p>The LSW provided games and upcycling projects, and for children and families, postcards with simple theme-related questions have been prepared, which can be stamped and collected at the partner booths.</p> <p>During the event, we promoted the SPARCS-App once again, as well as the two upcoming events scheduled for September and October.</p>
Lessons learned	The stamp cards proved to be a perfect tool to allow people to visit all the booths, receive information, and engage with the participating partners, initiating conversations or answering questions such as "What are renewable energies?"
Recommendations	<ul style="list-style-type: none"> - Offering local products (manufactured and food) - Improving Activities for children and families and enhance advertising in schools and Kindergartens. - Developing ideas for stamp cards: using the stamp cards as a possible means to collect anonymous feedback and gather information for evaluation



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Figure 40: Invitation flyer to the SPARCS-Fete (Designed and produced by seecon)



Figure 41: Program, site map and "Klimaschaufenster" – Information poster on reducing energy footprint (Designed and produced by seecon)



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SPARCS FÊTE



Figure 42: SPARCS-Fete moments (Source: seecon)



Figure 43: SPARCS-partners (Source: City of Leipzig)



Figure 44: SPARCS-Fete stamp-card for children & families (Designed and produced by seecon)



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3.4.11 Walking tours

3.4.11.1 Walking tour for members of city administration

WALKING TOUR FOR MEMBERS OF CITY ADMINISTRATION	
Project month	43
Date	28.04.2023
Target Group	City administration
Participation level	Inform, discuss
Advertising & Communication channels	E-Mail, personal communication
Involved partners	City of Leipzig: Sustainable Development Unit, Housing and Reconstruction Unit, Digital Unit, Building Management Unit, Traffic Unit, Heritage Site Protection Unit, Economic Development Unit Cenero, WSL
Description	Different city departments were invited to a walking tour in the demo districts Baumwollspinnerei and Duncker district, where technical partners presented the solutions that were implemented. Approximately 30 were invited directly (with call to spread further), on this rainy day before a public holiday 13 came. Meanwhile, the potential and feasibility to replicate these solutions across the entire city was discussed.
Lessons learned	The tour started an interesting professional exchange on SPARCS related topics and the replication potential of some solutions, e.g., to municipal buildings.
Recommendations	Interest was high and the local walking tour was appreciated. As always, early planning with respect to other events such as local holidays are the key. It is worth giving other city units the opportunity to get to know project solutions and insights, and to discuss them.



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WALKING TOUR FOR MEMBERS OF CITY ADMINISTRATION



Figure 45: City partners at SPARCS demo district Baumwollspinnerei. (Source: (cc by sa) Irene Müller/Stadt Leipzig)



Figure 46: City partners during the walking tour at SPARCS demo district Duncserviertel. (Source: (cc by sa) Irene Müller/Stadt Leipzig)



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3.4.11.2 Walking tour “Combining Monument and Climate Protection”

WALKING TOUR “COMBINING MONUMENT AND CLIMATE PROTECTION”	
Project month	44
Date	12.05.2023
Target Group	Citizens
Participation level	information
Advertising & Communication channels	Partners, social media, official campaign of City of Leipzig on “Tag der Städtebauförderung”
Involved partners	City of Leipzig
Description	<p>The concept of energy-positive districts and the technical solutions behind it is not easy to communicate to inhabitants and citizens. Additional challenges arise if the respective neighbourhood is (partly) under monument protection. This includes, for example, energy-efficient building renovation, the installation of photovoltaic systems, and sufficient space for rainwater infiltration. In turn, monument protection serves the preservation of cultural heritage and architecture. When these two topics intersect, the challenge is to reconcile the interests of monument protection with those of climate protection.</p> <p>In Neulindenau, in addition to a variety of residential buildings, residential courtyards and street spaces are also under monument protection. At the same time, there are many efforts to become a climate friendly neighbourhood. 40 people took part in the walking tour. A two-hour tour was set out to explore how this balancing act can be achieved. The tour started at Saalfelder Straße 31, passed by Lützner Plan and "Servicewohnen am Lindenauer Hafen" among others, made a stop at the SPARCS demo district. It walking tour was summed up with a presentation on the energetic foundations of the neighbourhood visualized with the help of data from the Energie Atlas Leipzig (SPARCS measure L19-2).</p>
Lessons learned	Walking tours are a nice way of showing which measures have taken place in the district or neighbourhood.
Recommendations	As many SPARCS measures have a “virtual” character and are not directly visible in the district it is helpful so have some explanation part at the beginning or the end of the walking tour e.g. to give some more in-depth explanations for non-visible elements such as the virtual energy district.



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WALKING TOUR “COMBINING MONUMENT AND CLIMATE PROTECTION”



Figure 47: Presentation of energetic situation of SPARCS demo district and surroundings (source: City of Leipzig)



Figure 48: walking tour through SPARCS demo district and surroundings (source: City of Leipzig)



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4 PUBLIC RELATIONS AT DEMO DISTRICT “BAUMWOLLSPINNEREI”

4.1 District description

The Baumwollspinnerei is a large former industrial site in the west of Leipzig. Established in the 1880s, the site was home to the largest cotton spinning mill in Europe. Most of the site consists of large historic red brick buildings with thick walls and high ceilings that were once used exclusively for industrial purposes. Today it houses over 350 users, a vibrant cosmos comprising of businesses, artists, studios, and residential tenants.

Historic sites like this one present several challenges. Among them are heritage protection laws, the change from a single tenant to a multifunctional, diverse, and dynamic tenant base, building strength and statics, as well as inaccurate, incomplete and/or unreliable building and network plans. SPARCS is pursuing the development of the Baumwollspinnerei into a smart, energy-positive, and therefore sustainable neighbourhood. As part of the initiative, regenerative forms of energy generation, storage, and e-mobility management as well as the digitalisation of the energy system are being implemented.

4.2 Target groups

Due to the complexity of this historic site, its emerging diverse tenant base and the mix of generation and consumption, the concepts developed at this site can be easily transferred to other sites in the city. If the numerous obstacles can be overcome and such innovative technologies can be realised here, then they should be transferable elsewhere. As the site is well renowned and well visited by tourists, it has the potential to reach people from all walks of life. The main target groups that we have reached thus far in the SPARCS context are residents and businesses located directly on site. Furthermore, specialists from energy and sustainability industries, were introduced to the SPARCS solutions during a site visit. Pupils discovered the area with a virtual scavenger hunt and in-person presentations in the frame of Project week for students in cooperation with GaraGE [Project week for students in cooperation with GaraGE](#) (see 4.2/4.3).

4.3 Participation and activation events carried out

4.3.1 Addressing tenants: face-to-face information session

To involve the diverse group of tenants at the Baumwollspinnerei, CENERO Energy, engaged the tenants directly through informational flyers and a face-to-face meeting. At the meeting, Cenero introduced the SPARCS project and described how the implemented measures would directly benefit the tenants, the site, and the environment. The meeting was concluded with a Q&A session.



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ADDRESSING TENANTS: FACE-TO-FACE INFORMATION SESSION	
Project month	25
Date	20.10.2021
Target Group	Tenants and businesses located at the Baumwollspinnerei and their employees.
Participation level	Communication, informative
Advertising & Communication channels	<p>To ensure efficient coordination and effective communication, CENERO reached out to the tenants and businesses based at the Baumwollspinnerei. An email campaign was initiated to arrange a face-to-face meeting. To further enhance the effectiveness of the email communication, an electronic flyer was thoughtfully included as an attachment.</p> <p>This personalised approach aimed to establish a strong rapport and foster a sense of inclusiveness among all stakeholders.</p>
Involved partners	CENERO Energy GmbH
Description	<p>Face-to Face information session</p> <p>During the meeting, an introduction to the SPARCS project was given, and the different measures planned at the Baumwollspinnerei were described. The involvement and benefits of the project to the environment, the site and directly to the tenants were explained. A Q&A session concluded the session. This action reached approximately 10 people from different tenant groups.</p>
Lessons learned	<p>It was noted that most tenants and businesses are most interested in finding out what efforts are expected from their side and what benefits or advantages they can gain from the project. Personal interaction fosters stronger engagement and provide a valuable opportunity to establish personal connections with tenants, making future communication easier. The meeting highlighted the importance of clear and concise communication. Presenting information in a straightforward manner helped tenants understand the purpose and goals. Furthermore, it is important to know the background of your target group before approaching them to structure your information at the appropriate level so that it is understood, and your audience remains curious and attentive. Make sure to schedule enough time for questions. A demonstration of physical hardware attracts the interest of participation. Lastly it is also important to show enthusiasm and provide success stories of similar projects.</p>
Recommendations	<p>Try to use different types of visual, audio and physical media to best engage the audience. Tools such as short explanation videos, displaying or passing around hardware as well as graphic slides are beneficial. In cases where it is economically feasible, distribute promotional items, such as a sensor, to make people</p>



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ADDRESSING TENANTS: FACE-TO-FACE INFORMATION SESSION	
	<p>feel more involved in the project. If you recognise scepticism in certain individuals within the group, approach them individually and offer private one-on-one meetings. Share important milestones and achievements to maintain positive communication, commitment and interest as the project evolves. This will also ease future engagement with tenants, should you need their assistance, help or involvement at a later stage in the project.</p>
	
<p>Figure 49: Screenshot of the PowerPoint slides presented during the information session for tenants. (Source: Simon Baum)</p>	

4.3.2 Showroom

We have set up a showroom at the Baumwollspinnerei site which serves as an introduction to the project as well as the starting point for the guided tours. Here we welcome various guests, ranging from school groups to professionals and experts, to show and explain the measures implemented in relation to the SPARCS project. Charts and dashboards displaying live consumption and generation patterns of the buildings associated with the project are visualised in a high granularity on a monitor at the showroom. After visiting the showroom, guests can take part in a comprehensive tour of the premises, which is conducted by Cenero’s knowledgeable staff. The aim of this tour is to show the practical implementation and the places where the various measures are realised. A highlight is the bidirectional charging station adjacent to Hall 18. While public viewing is not available, interested individuals can arrange personalised tours upon request to the Cenero office.

SHOWROOM	
Project month	32 - 43
Date	17.05.2022
	28.06.2022
	24.04.2023



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SHOWROOM	
Target Group	Scholars participating in the GaraGe Programme, city administrators and students. So far approximately 75 people have visited the showroom. The showroom and the guided tours are offered by appointment and are free of charge.
Participation level	Demonstration of live energy monitoring, guided tour of the premises and SPARCS related measures.
Advertising & Communication channels	Informative flyers, branded merchandise, an introduction video, live online demonstrations of data, guided site tours, and face-to-face discussions and question and answers.
Involved partners	GaraGe
Description	<p>Within the showroom, visitors will find an array of informative flyers and branded SPARCS merchandise, creating a vibrant and engaging environment. As part of the experience, a short introduction video is screened, explaining the overall SPARCS project.</p> <p>The live online demonstration of the on-site energy consumption and air quality data is an engaging visual communication channel. This real-time information on the charts and dashboards, provide an immersive and impactful experience that highlights the project's achievements.</p> <p>Moreover, the showroom provides an excellent opportunity for face-to-face interaction, as the various measures implemented on site are thoroughly explained by knowledgeable staff members. This personalised approach encourages open dialogue, enabling visitors to ask questions, delve deeper into the project details, and actively engage with the sustainability initiatives that are being undertaken.</p> <p>In summary, the showroom offers a multi-faceted experience that combines informative materials, branded merchandise, an introduction video, live online demonstrations of data, and face-to-face discussions.</p>
Lessons learned	<p>When engaging with scholars, it is crucial to identify meaningful use cases or examples that resonate with their interests. It is important to establish a direct correlation between the work being done and something they value. For instance, when emphasizing the importance of renewable energy sources, one can capture their attention by highlighting the potential consequences of depleted non-renewable energy sources. By making it clear that without sufficient renewable energy and infrastructure, they may face challenges in charging their smart phones, the significance of the project becomes tangible and relatable to their daily lives.</p> <p>Additionally, establishing the context of the project is vital when introducing it to scholars. This entails clearly stating the objectives,</p>



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SHOWROOM	
	<p>relevance, and potential impacts of the research. By providing this context, scholars can better grasp the significance of the project and understand how it contributes to the broader field of study.</p> <p>The most important lesson learned, is to explain the work in understandable terms. Keep sentences short and to the point. Avoid technical jargon where possible.</p> <p>When engaging with specialists, it became evident that their primary interest lies in specific details, factual information, clear timeframes, and actual data. They sought in-depth knowledge regarding the project's intricacies and were particularly interested in understanding the associated risks and challenges and the potential for replication. Be sure to structure the information accordingly.</p>
Recommendations	<p>To engage scholars effectively, it is important to employ strategic techniques. Begin by asking questions that are straightforward and uncomplicated, ensuring that scholars are not hesitant or discouraged from participating and interacting. One effective method is to encourage them to turn to the person sitting next to them and engage in a brief exchange of one or two questions. This approach not only fosters engagement but also helps them focus on the topic at hand, making them more comfortable in their involvement.</p> <p>Encourage participants to ask questions, share their thoughts, and actively participate in discussions throughout the information showroom or guided tour. By establishing an inclusive and non-judgmental atmosphere, scholars will feel more inclined to express their viewpoints and engage in meaningful dialogue.</p> <p>To enhance the overall experience and aid in information retention, strive to create a multi-sensory environment. Incorporate visuals, sounds, or tactile elements that captivate participants' senses.</p> <p>Moreover, it is important to emphasize the benefits and relevance of the showcased information. Use storytelling techniques to convey the information in a compelling manner, creating a narrative that resonates with participants on an emotional level. Share real-life examples, success stories, or personal experiences that vividly illustrate the impact of the subject matter. By connecting the content to their interests, goals, or concerns, you can effectively convey the importance and value of the information being presented.</p>



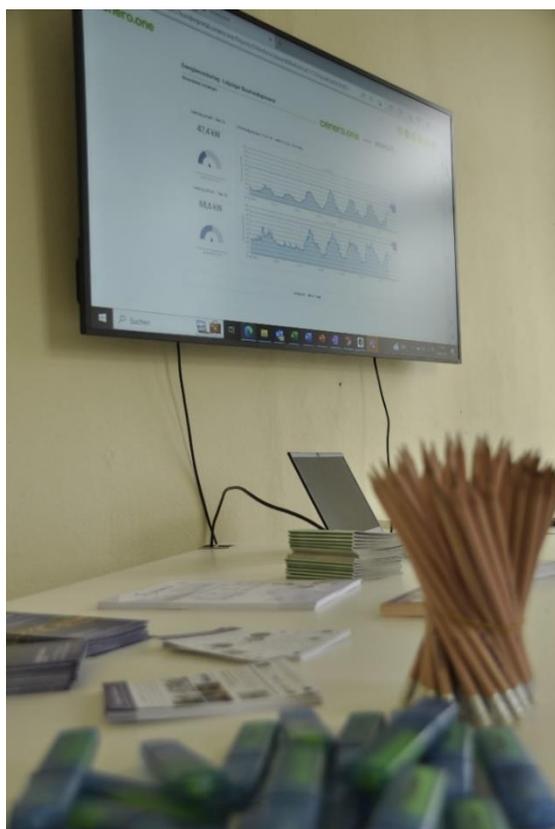
SHOWROOM

Figure 50: Showroom at the Baumwollspinnerei with live consumption data visualised by Cenero.one. r (Source (cc by sa) Irene Müller/Stadt Leipzig)

4.4 Conclusions drawn from the experiences at the Baumwollspinnerei.

In summary, the successful completion of a research project of this nature necessitates the cooperation of diverse stakeholders, making participation and activation events crucial. Both internal and external communication and involvement play a decisive role in the success of the project. By creating an enabling environment that promotes transparent communication and meaningful dialogue, and encourages active participation and sharing of ideas, we can support a culture of learning, facilitate effective collaboration, and ensure streamlined processes.



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5 OVERARCHING FORMATS

In addition to the activities described in chapters 3 and 4, which relate to very specific measures in the demo districts, a whole range of overarching formats took place addressing a broader target audience. These activities aimed at:

- The dissemination of the SPARCS project and the SPARCS measures (Environmental Days, Ökofete),
- The general awareness raising for energy transition topics among the Leipzig population (with a focus on youth) (project week, action bound tours, DIPAS),
- The exchange of experiences of the SPARCS cities on the topic of participation (international workshops), and
- Measures to be disseminated beyond the demo districts (Smart Sockets, Solar thermal plant, Leipziger App).

These activities/formats are described in detail on the following pages.

5.1 International workshops

INTERNATIONAL WORKSHOP ON “THE NEW NORMAL”	
Project month	M20 / M23
Date	01.06.2021 (15 participants) 30.09.2021 (12 participants)
Demonstration Areas	SPARCS-international (SPARCS cities)
Target Group	City administration, technical and scientific actors of SPARCS cities involved in participation activities
Participation level	Inform and raise awareness, engage, and develop solutions
Advertising & Communication channels	SEE, LPZ, FHG
Involved partners	Organisation: Fraunhofer IMW and seecon Participants: Kladno (CZ), CVUT (CZ), ESPOO (FIN), VTT (FIN), KONE (FIN), LEIPZIG (DE), Cenero (DE), City Institute Lviv (UA)
Description	Objective: Exchange of experience and ideas on citizen engagement in Covid-19 times – developing solutions to involve relevant target groups Workshop I Participants were asked to identify in advance relevant target groups that were difficult to reach due to Covid-19, including a brief description. These target groups were characterized in detail during the workshop. The participants discussed the specific challenges to achieve them and how these challenges can be overcome. The discussion initially took place in two

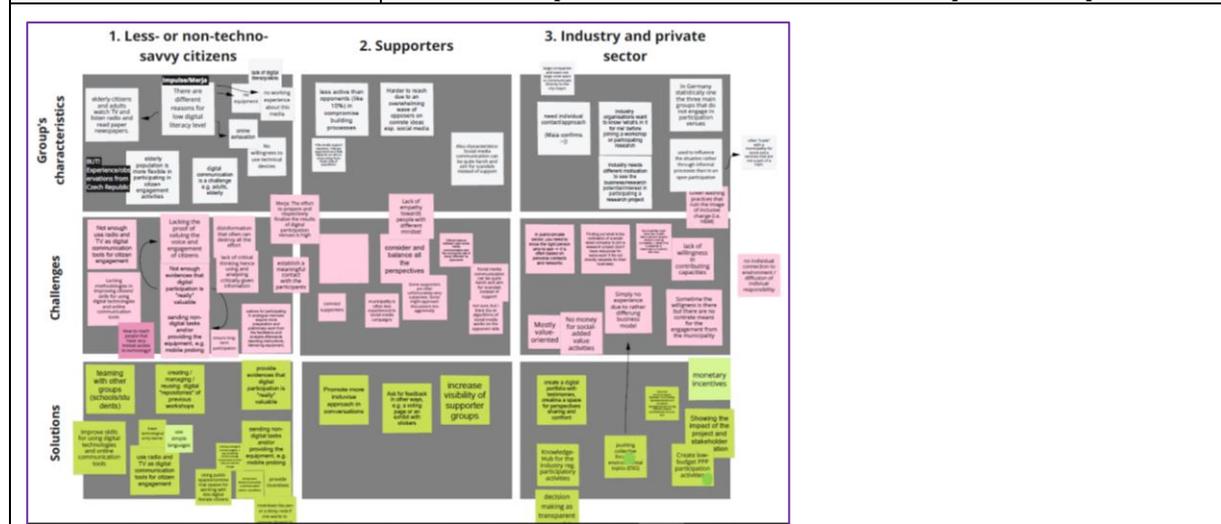


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INTERNATIONAL WORKSHOP ON “THE NEW NORMAL”	
	<p>groups using the MiroBoard Platform, later the results were presented in the plenum and briefly discussed again. Relevant target groups included citizens with varying levels of techno-savviness, project supporters, industry, private companies, people with a migrant background, and young adults.</p> <p>Workshop II</p> <p>According to the participants' wishes, in the follow-up workshop, three examples of good practice from the cities of Kladno, Leipzig and Reykjavik were presented. The groups then discussed what to pay particular attention to during replication and what errors should be avoided. This discussion was documented on MiroBoard. (The discussion was documented on MiroBoard, as can be seen in Figure below). As a result of the workshop, one-pagers were created for the three formats that were presented, which summarized the discussion results.</p>
Lessons learned	<p>Exchanging experiences about practical examples is always a benefit if the general conditions of the participants are comparable. After the first workshop there was great interest in a follow-up workshop, which was held 4 months later. The discussion has since been tabled for a later time. New input, e.g., further project development and new insights, are needed to continue the discussion. The one-pager was met with little interest, and there was little feedback on the draft of the first example.</p>
Recommendations	<p>As target groups were difficult to reach during the Covid-19 Pandemic, it makes sense to ask about the framework conditions and interests of the participants before the workshop to find a common denominator and to be able to plan the discussion. Suggestions and ideas that cannot be implemented directly in the workshop serve as the basis for follow-up workshops.</p>



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ENERGY TRANSITION PROJECT WEEK WITH EXTRACURRICULAR LEARNING VENUE	
	<p>in the curricular subject area in the field of renewable resources for renewable energies.</p> <p>Students were introduced to the basics of power supply and various primary energy sources, as well as environmental protection and climate change. A simulation game showed the students how human activities are influencing climate change.</p> <p>To motivate participants to take action themselves, the program includes practical components. For example, experiments were conducted on silicon solar cells, dye-sensitized solar cells are produced, and the impact of insulation on heating energy demand is examined.</p> <p>The project week was concluded by a field trip where the participating students explored Leipzig-West with a "digital scavenger hunt". At various stations they could discover projects that were implemented under the SPARCS framework.</p> <p>As the project week was based on the student's curriculum and schedule, the event took place over several days on different occasions between 2022 and 2024.</p> <p>The modules:</p> <ol style="list-style-type: none"> 1. introduction & a simulation game on the energy transition 2. Photovoltaics. 3. heat provision and energy saving 4. stop motion video on a forementioned topics <p>The last module included an excursion to the SPARCS demo districts.</p> <p>The project week was carried out with 9th and 10th grade students from five different schools. In the school year 2021/22, 182 pupils were reached in 14 groups; 2022/23 141 pupils attended, in overall 13 groups.</p> <p>After the first year, the project week was evaluated, and the content was adapted accordingly.</p>
Lessons learned	<p>It became evident that there are varying levels of knowledge and different levels of interest in the topic of energy transition among the participating classes. During the project week, efforts were made to cater to the diverse participants as best as possible, resulting in lively discussions.</p> <p>During the evaluation of the classes, it became apparent that the practical components were particularly well-received.</p>
Recommendations	<p>The cooperation proved successful. It can be recommended to engage other stakeholders, such as extracurricular learning institutions, in the planning and implementation of additional</p>



ENERGY TRANSITION PROJECT WEEK WITH EXTRACURRICULAR LEARNING VENUE

learning modules. They are experienced in planning such activities and usually already have contacts to schools.

Additionally, it must be considered that Schools usually need long-term planning to integrate external activities in their teaching. Mind also the specific rhythm of school years. In the activities, try to combine static modes of presenting knowledge with more engaging parts, such as producing a stop motion video or walking tours.



Figure 52: Students during the project week at extracurricular learning venue “GaraGe”.
(Source: (cc by sa): Irene Müller/Stadt Leipzig)



5.3 Action bound tours (virtual scavenger hunts)

DIGITALLY GUIDED WALKING TOUR WITH "ACTIONBOUND" TO THE DEMO DISTRICTS	
Project months	32, 33, 34, 43, 44, 46
Dates	30.5.22, 28.6.22, 14.7.22, 24. /25.4.23, 10.5.23, 6.7.23
Demonstration Areas	Baumwollspinnerei District, Duncker District, E-Bus Charging Station, Virtual District
Target Group	Pupils aged 13-17
Participation level	inform, educate, involve, discuss
Advertising & Communication channels	Direct communication
Involved partners	GaraGe: Extra scholar educational institution for technology education, Cenero: on site presentation, WSL: on site presentation, LWB: on site presentation
Description	<p>The Digital City Unit developed a digitally guided walking tour with "Actionbound" in the demo districts for pupils, which presents the reasons for the district's energy transition, the realized projects, and what pupils could do themselves. Each time, one of the technical partners presented their district solutions. The pupils participated in this walking tour on the final day of the project week. In total, 72 pupils in school year 2021/22 and 84 in 2022/23 took part.</p> <p>Actionbound is an interactive platform for creating and conducting digital scavenger hunts and interactive tours. These Bounds can be completed by users with their smartphones or tablets by visiting specific locations, answering questions, or mastering challenges. Actionbound is commonly used for educational, entertaining, or informational purposes, providing a playful and interactive experience for participants of all ages. The pupils' Actionbound tour can now be tested by anyone.</p> <p>In addition to the pupils' tour, the Leipzig team in cooperation with Cenero created a shorter Actionbound tour specifically designed for the Baumwollspinnerei district, which is targeted towards an adult audience.</p>
Lessons learned	Our digital scavenger hunt takes place in the demo districts. If the weather is rainy, briefing the students beforehand to wear appropriate clothes is crucial. Discuss this with the accompanying teachers: even if the students theoretically know the program, and theoretically are old enough to care for themselves, it is worth considering briefing them. If people are unprepared, the weather can hamper the mood of the group. This is especially likely to happen after sudden weather changes.



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DIGITALLY GUIDED WALKING TOUR WITH “ACTIONBOUND” TO THE DEMO DISTRICTS	
	<p>Regarding the tour we learned that it is better to include only one partner presentation, because timing otherwise becomes very difficult.</p> <p>Furthermore, it became evident once again that engaging students in technology-based activities is challenging if the technology on-site does not function properly. Ensuring an adequate supply of suitable hardware is of paramount importance. Lastly, we learned that it is not possible to meet everyone's desires and needs. Some pupils always complain.</p>
Recommendations	<p>Developing a digital scavenger hunt with Actionbound proved to be fun and easy and can be considered a playful way to showcase urban developments.</p> <p>Nonetheless do not underestimate the conceptual work needed. Plan enough time for preparation and trial.</p> <p>When conceiving the tasks, consider difficulties in preparing tasks for students as a non-educator. All information needs to be short and well explained, and tasks need to be understandable in terms of the provided content.</p> <p>Conceiving the tour, consider practicalities such as toilets, weather, places for rest and food. Get experience and adapt as accompanying teachers and student groups differ from one another.</p> <p>After all, we realised that it is easier to handle shorter bounds. So, if you wish to offer a lot of material, consider putting it not in one bound, but splitting it into several bounds that can be played subsequently.</p>



DIGITALLY GUIDED WALKING TOUR WITH “ACTIONBOUND” TO THE DEMO DISTRICTS



Figure 53: Students working in groups on tasks during digital scavenger hunt (Source (cc by sa): Irene Müller/Stadt Leipzig)



Figure 54: Students with pads during digital scavenger hunt (Source (cc by sa): Irene Müller/Stadt Leipzig)



Figure 55: Students visiting electric bus charging court during digital scavenger hunts (Source (cc by sa): Irene Müller/Stadt Leipzig)



Figure 56: Students during a digital scavenger hunt at Baumwollspinnerei, Simon Baum (Cenero Energy) explaining (Source (cc by sa): Irene Müller/Stadt Leipzig)



5.4 Use of digital participation tool: DIPAS

DIPAS TOUCH TABLE	
Project month	33 (June 2022)
Date	16.06.2022
Demonstration Areas	Duncker Neighbourhood (Neulindenau)
Target Group	Citizens
Participation level	Information
Advertising & Communication channels	In addition to " Market of possibilities "
Involved partners	City of Leipzig
Description	<p>As part of the Energetic Neighbourhood Concept in Leipzig-Neulindenau, the participation event "Market of Opportunities" took place in the Duncker district on June 16, 2022, in collaboration with the SPARCS consortium. The City of Leipzig (Office for Housing and Urban Renewal) partnered with seecon Ingenieure GmbH to engage the residents of the Neighbourhood. In addition to children and young families, older residents were also involved.</p> <p>The event included the presentation of the integrated climate protection Neighbourhood concept for Neulindenau, as well as citizen participation using a digital participation system (DIPAS). The digital planning table allowed interested citizens to provide localized feedback on planning projects using accessible digital maps, aerial photographs, plans, 3D models, and geodata. Ideas and suggestions for a climate- and environmentally friendly design of the Neighbourhood could be participatively contributed.</p> <p>Meanwhile, the SPARCS consortium engaged with visitors in discussions about sustainable energy supply solutions and mobility alternatives. The process, actors, and status of the Energetic Neighbourhood Concept were presented through iPads and the DIPAS table. Participants had the opportunity to express suggestions, criticisms, or questions regarding the areas of action. This led to the generation of ideas such as installing bicycle racks, preserving natural grass areas, developing butterfly meadows, or expanding playgrounds.</p> <p>The DIPAS table was provided by the city of Leipzig and has proven to be an excellent digital system for local citizen participation. DIPAS is a geospatial-augmented reality table that visualizes SPARCS products and lets the citizen understand their impact through an active, real-time interaction. With DIPAS, citizens can retrieve digital maps, aerial photographs, plans, 3D models and geodata during an event and provide precisely localized feedback on planning projects.</p>



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DIPAS TOUCH TABLE	
Lessons learned	<p>Understanding climate and energy data concerning their residential Neighbourhoods can be challenging for citizens. However, digital participation tools and data visualizations can shed light on the subject, especially when they are connected to their own homes. To achieve this, it is essential to have Neighbourhood-specific, and ideally, building-specific energy and climate data, along with information about potential measures within the community.</p> <p>For successful implementation, the online tool used must be user-friendly and accessible to all. For instance, the ability to input contributions via tablets or similar devices might require professional assistance, especially when involving older individuals. Nevertheless, our participants consistently demonstrated great interest and enthusiasm in "trying out" and testing the touch table and digital applications. This positive attitude towards technological advancements bodes well for fostering wider acceptance and usage of such tools in the future.</p>
Recommendations	<p>Allocating a significant amount of time for gathering and preparing Neighbourhood and building-specific climate and energy-related data for the online tool is crucial. The process involves multiple steps, including data collection, validation, and formatting to ensure accuracy and user-friendliness. Ensuring that someone is available as a point of contact for using the touch tables and tablets is vital to facilitate smooth and effective engagement with the digital tools. This designated person will serve as a support resource and guide for users, particularly those who may require assistance, such as older individuals or less tech-savvy participants. Explain to the participating citizens where and how their comments and information will be used, e.g., for further development concepts or will they lead to concrete actions. It causes frustration by the participants if it is not clear if and how their given input is not utilized further.</p>



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DIPAS TOUCH TABLE



Figure 57: The touch table displaying the DIPAS tool located in the LWB-Kiosk during the Markt of possibilities (Source: secon)

5.5 City-wide event: Environmental days (online event)

ENERGY POSITIVE COMMUNITIES: WHAT ARE THEY EXACTLY AND HOW SHOULD THEY LOOK?	
Project month	M20
Date	29.06.2021
Demonstration Areas	Citywide
Target Group	Tenants of the city of Leipzig
Participation level	Online. Inform and raise awareness
Advertising & Communication channels	Ökolöwe (official website of the Environmental Days), LWB (Poster, social media), Leipzig City (press release)
Partner	SEE, LPZ, FHG
Description	<p>As part of the Leipzig Environmental Days 2021, a citizens' workshop was planned to discuss with Leipzig citizens how they imagine their energy-positive district and what they need to implement it. First, the participants should discuss how one recognizes that a district is not energy positive. The next step was to find out what measures can be taken to change this. These measures should be divided into those that can be influenced by residents and those that can be influenced only by external actors. Finally, solutions should be developed for the measures that can be implemented by citizens.</p> <p>As face-to-face events were not allowed due to Covid-19 restrictions, the workshop was held online, and results were documented on MiroBoard. The target group were environmentally conscious citizens</p>



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ENERGY POSITIVE COMMUNITIES: WHAT ARE THEY EXACTLY AND HOW SHOULD THEY LOOK?	
	of Leipzig between the ages of 20 and 50 who would like to get involved in urban development.
Lessons learned	While online workshops in the working world were already part of normal everyday life, the format was not particularly suitable for the exchange with citizens in this framework. The Environmental Days are established as a street festival and bring the topic to the population in the context of leisure and family activities. Although the announcement was made through various media and via posters in LWB buildings, in the end there was only one participant who was also professionally involved in the topic. It can be assumed that an on-site discussion round would have attracted more participants who happened to be passing by.



Figure 58: Invitation poster for the event (Designed and produced by seecon)



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5.6 City-wide events: Ökofete

SPARCS MEETS LEIPZIGER ÖKOFETE 2022	
Project month	M33
Date	26.06.2022
Demonstration Areas	Location: Clara-Zetkin-Park: LWB Info mobile with booth number C 14.
Target Group	<p>City-wide.</p> <p>Ökofete, the largest environmental fair in central Germany, offers fun, entertainment, and a wide range of activities for families and citizens. Our target group, families, and children, was present at the event.</p>
Participation level	Inform. Raise awareness. Engagement.
Advertising & Communication channels	In Leipzig, the SPARCS consortium regularly participates in various folk festivals such as the annual Ökofete (the largest environmental fair in Central Germany). SPARCS was presented at its own booth with the opportunity to do handicrafts (for children), with flyers and other information material as well as give-aways with the SPARCS logo.
Involved partners	seecon, LWB, FHG
Description	<p>On Sunday, June 26th, 2022, the Leipzig Ökofete 2022 took place in the Clara-Zetkin-Park in Leipzig. With the theme "Worth knowing about the environment, sustainability, and nature conservation," this event showcased the largest environmental fair in Central Germany, providing a combination of fun, entertainment, and a diverse range of offerings for families and citizens.</p> <p>Over 100 exhibitors participated on that day, presenting ideas, suggestions, and sustainable products. Among them, seecon's employees and partners from the SPARCS consortium were available to address visitors' inquiries regarding SPARCS-related topics. Simultaneously, various activities such as a button machine and drawing sessions on energy-saving themes were provided to engage children.</p>
Lessons learned	The fair was a significant moment to capture the attention of families and children. However, since it was a city-wide event, the target group extended beyond the reference neighbourhood in the Duncker district. Therefore, in 2023, we organized the SPARCS-Fete at a more local level, involving actors and partners present in the neighbourhood of the demo district and specifically targeting and engaging the residents of SPARCS buildings.
Recommendations	Keeping the kids busy is a great way to get in touch with the adults. Crafting and painting takes a while and provides the



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SPARCS MEETS LEIPZIGER ÖKOFETE 2022

opportunity to talk about topics that are influenced by the crafting themes (pictures about renewable energy, green transport, etc.).

Interesting giveaways also attract adults and tempt them to ask what the project is about when large posters with the name, logo and keywords are placed next to the table. Be flexible on the topic, it doesn't always have to be about the specific SPARCS products, raising awareness for larger topics such as the energy transition in general is also an important basis for citizen participation and activation.



Figure 59: SPARCS is present at the Ökofete (Designed and produced by seecon)



Figure 60: Families at the Ökofete and consultation on the SPARCS project.



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5.7 Smart Sockets

MONITORED AND EXTERNALLY CONTROLLED SMART SOCKETS	
Project month	<p>M1 – M31 Project idea</p> <p>M32 – M39 Projekt/ Minimum Viable Produkt (MVP)</p> <p>M40 – M60 Introduction of the MVP in the test circle</p>
Date	M1 – M60 (implementation and monitoring)
Demonstration Areas	City of Leipzig
Target Group	Electricity customers of the Leipziger Stadtwerke and Citizens
Participation level	direct
Advertising & Communication channels	<ul style="list-style-type: none"> • Communication on the SPARCS project (Smart power socket) in articles in the staff newspaper • Creation of newsletters/articles for the SPARCS consortium • Preparation of external communication tools on the smart socket (letters/flyers/ brochures/ notices) • Dissemination of information via internal communication channels/ interviews with employees on the smart socket • Conduct webinar/lecture on L-ZERO
Involved partners	none
Description	<p>The Leipzig municipal utility is developing a smart home solution on the digital eco-platform "L-ZERO", which is intended to sensitise customers to the purchase and consumption of electricity. This enables customers to actively participate in the energy market. One goal of the solution is to enable users to increase the share of renewable energy in their energy consumption. During the project LSW plans to test the solution and adapt it to the customers' needs.</p> <p>Current procedure:</p> <p>The roll-out of the Smart Sockets take place at intervals.</p> <ol style="list-style-type: none"> 1. Roll out within the development group of the Smart Socket (internal) 2. Roll-out within the SPARCS consortium (City of Leipzig, University of Leipzig, Leipziger Stadtwerke) with an existing electricity supply contract with Leipziger Stadtwerke 3. Roll-out for employees of Stadtwerke Leipzig with an existing electricity supply contract with Leipziger Stadtwerke



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MONITORED AND EXTERNALLY CONTROLLED SMART SOCKETS	
	<p>4. Roll-out for existing customers with an existing electricity supply contract with Leipziger Stadtwerke</p> <p>Next steps (replication):</p> <p>In the future, the digital eco-landscape L-ZERO is to be expanded with further services for the target group of tenants in the city of Leipzig. For example, by concluding green, regional electricity contracts or a wide variety of participation formats that have the energy transition in mind.</p>
Lessons learned	<ul style="list-style-type: none"> • Invest substantial time for user experience design and implement a testing process for scheduled updates. • Basic conditions must be created (smart building) • Creating awareness among people to save energy is a process.
Recommendations	<ul style="list-style-type: none"> • Development of products according to the needs of customers



Figure 61: Mockup App “Leipzig ZERO” (Source: LSW)



Figure 62: Smart Sockets in “Leipzig ZERO” (Source: LSW)



5.8 Solar thermal plant

INTEGRATION OF A SOLAR THERMAL PLANT INTO DISTRICT HEATING – SPECIFICALLY IN THE AREA OF LAUSEN	
Project month	M1 – M60 and longer (2025)
Date	-
Demonstration Areas	Leipzig Lausen (Leipzig West)
Target Group	District heating customers and citizens
Participation level	Information
Advertising & Communication channels	Newspapers, Online (dedicated website, city of Leipzig, solar thermal sector specific), Information Flyer, Project/Information Cubicle at the construction site
Involved partners	LSW, City of Leipzig
Description	<p>As part of the official approval process within the administration of the City of Leipzig (i. e. Development plan) public participation is mandatory in the form of:</p> <ul style="list-style-type: none"> • Display of planning document in city hall • Official Resident & citizen meeting at construction site (demonstration of project, Q&A session) • Communication on local newspapers <p>This communication has already taken place, so there is a general awareness about the project. The directly affected neighbours can contact the project team directly with any concerns.</p> <p>After the final investment decision by LSW, project communication is now more frequent and focused. Directly after the decision to go ahead a press release was issued and the official German website (https://ukunft-fernwaerme.de/) was launched including the contact data and project communication. As part of the press release news and media articles were published.</p> <p>Further communication is planned as followed:</p> <ul style="list-style-type: none"> • Project updates will be published via the official website. • Before construction work starts another information event and Q&A session with the directly affected neighbours is planned (incl. information brochures) • If concerns, problems, or questions arise the direct neighbours will be able to contact the project team directly, all other citizens use the official contact details provided via website. • Construction sign including project details.



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INTEGRATION OF A SOLAR THERMAL PLANT INTO DISTRICT HEATING – SPECIFICALLY IN THE AREA OF LAUSEN	
	<ul style="list-style-type: none"> Information flyer for neighbours and interested citizens Project information & presentation cubicle at the construction site complete with collector models and 3D renderings of the planned solar plant
Lessons learned	<ul style="list-style-type: none"> Citizens & neighbours are open minded and positive towards the project and even welcome the change towards RES (it was feared that there will be much higher resistance, as with other RES projects, e.g. onshore wind) Most concerns are focused on how the plant will appear and if there will be changes on how the neighbouring community can experience & use the space. The neighbours want to participate (i.e. provide sheeps for maintaining the plant or mowing services or plant fruits and vegetables for regional sale)
Recommendations	<ul style="list-style-type: none"> early communication and public participation + continuous exchange with impacted neighbours
	
<p>Figure 63: Solar thermal plant (Source: LSW)</p>	



5.9 Implementation of the Leipziger App

IMPLEMENTATION LEIPZIGER APP	
Project month	M1 – M36
Date	
Demonstration Areas	Citywide and national
Target Group	Customers with e-cars
Participation level	Information
Advertising & Communication channels	Internet
Involved partners	Leipziger Stadtwerke
Description	<p>With the "Leipziger" App, LSW has developed a user-friendly platform designed for mobile devices that enables citizens and customers of the municipal utilities to simplify the use of charging stations in and around Leipzig. With the App, the more than 450 charging stations in Leipzig can be accessed and the user is offered an overview of the charge level, current price, and a transparent presentation of all bills. Thanks to supported roaming, the App can also be used to control more than 3,300 additional charging points of roaming partners nationwide.</p> <p>In the further development of functionalities, the municipal utilities rely on an iterative replacement of externally supplied services with in-house developments based on open source. The App forms the foundation for many other value-added services to continuously provide the user with innovative services. These include, among other things, fault detectors of the city of Leipzig, city maps and other mobility services.</p> <p>Users of company cars also have the option of charging from home via App control and are reimbursed monthly for the electricity used via B2B billing.</p> <p>Outlook until M60: Users can reserve stations in real world business case settings.</p>
Lessons learned	<ol style="list-style-type: none"> 1) Usability for end users plays a major role in the user acceptance of the app. Minor bugs and issues caused bad ratings and angry service support calls. 2) Utilizing the app and the underlying incentive mechanisms is useful for citizen engagement. For instance, the function to offer specifically catered offers and discounts depending on electric vehicle use, allows to incentivize citizens towards a higher usage of CO₂ reducing mobility.



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IMPLEMENTATION LEIPZIGER APP

Recommendations

Invest substantial time for user experience design and implement a testing process for scheduled updates. Use built-in offer and rewards functions to activate citizen engagement.

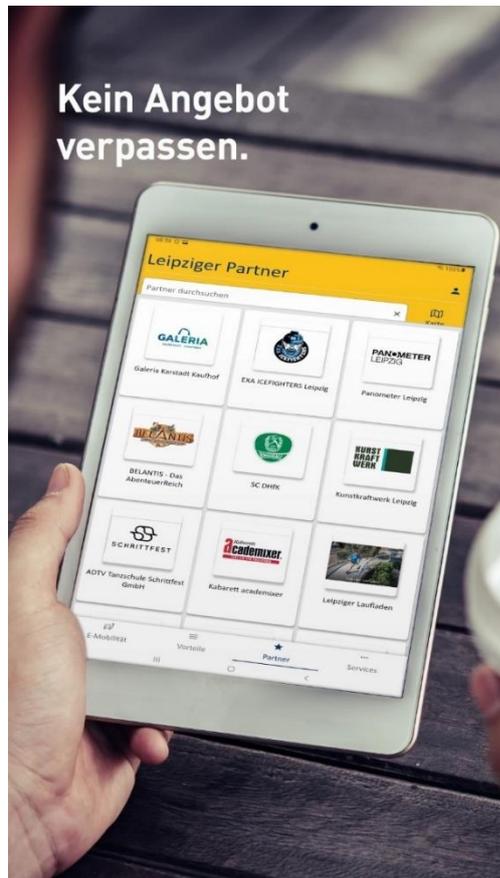


Figure 64: App view (Source: LSW)



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5.10 Standard model for smart cities

CODESIGNING A STANDARD MODEL FOR DEVELOPING EXISTING DISTRICTS IN A CLIMATE JUST WAY	
Project month	34,38, 42, 44
Date	13.07.2022, 3.11.2022, 28.3.2023,
Target Group	City units involved in district development
Participation level	Discussion, consultation, co-decision
Advertising & Communication channels	Emails, personal communication
Involved partners	City of Leipzig
Description	<p>In a series of workshops with other city departments involved in district development, the Digital City Unit discussed the concrete targets and feasible process towards standardized energetic district development towards climate just, positive energy districts. It assessed the topics to be considered and the problems to be resolved on the way to it.</p> <p>A meeting with Espoo has been carried out in M28, understanding the differences and commonalities in designing a process for a standard model and connections to action E22-1.</p> <p>This was followed by an extensive phase of understanding the needs and constraints of the different Leipzig city departments, and other projects in regard to climate-neutral district development were carried out by interviews to build trust and willingness for cooperation.</p> <p>To arrive at a common understanding, find ways to deal with the conflicts of interest of different city units, and to reach a unified approach, workshops with several city units, which form the working group, were conducted. The group discussed at which point in time the action fields that the city units represent have to be taken into account in a process to climate neutral districts.</p> <p>The first workshop, held on July 13th, 2022, with 15 participants from 8 different city units aimed at building a common information basis regarding the current process, improvement needs, understandings of climate-just districts, and a first process draft.</p> <p>The second workshop was held in on November 3, 2022, with 14 participants from 9 different city units.</p> <p>The following three topics were identified as central subjects that need further clarification: the objectives need to be concretised on district level; the process towards that target needs elucidation, and that easier data access is crucial. The Leipzig SPARCS team decided works on each of them through a specific process.</p>



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	<p>Considering the objectives of developing existing districts in a climate just way, a report will be prepared in M49, that aims at specifying general goals on district level.</p> <p>For elaborating the process, a working group with three different city units formed, and discusses how to proceed and improve from the current status. The aim is to develop a model proposition to be discussed in the large group.</p> <p>Regarding data, the digital city unit develops a new tool, the so called “energy atlas”. For the standard model, it shall unify data needed for planning, and for applying for funding for district development – data that were formerly available only from various sources. This way, it allows seeing data in one glance. Having all data in one place instead of needing to search it for each district individually will up the concept development enormously. This way, people can spend more time and energy on planning and implementing steps towards climate just positive energy districts. Currently in M48, this tool is in a pilot status. A tendering process will be prepared until the end of the year.</p>
<p>Lessons learned</p>	<p>Cooperating with the various city units proved to hit a topic that many people had questions on and were eager to discuss. It became clear that in this circle it was not easy to differentiate between things that can be influenced by people from municipalities, and those it could not influence. Furthermore, it was crucial to gain the legitimacy to work on the topic. Once this was established, the position was questioned less. The need for the work was never called into question. Defining the objective of the task from a debated position was difficult though.</p> <p>Cooperating with various city units proved fruitful insofar, as a group interested in and connected to district development could be formed. It now can serve as a sounding board for developed products.</p> <p>The availability of time besides routine schedules presented a challenge. Although there is significant interest in discussing deeper questions with regards to “climate just district development”, the standard model had to limit itself to following a different, established approach of integrated district development.</p> <p>Due to this, the initial group proved too big and too little involved in the work currently done on district development in the city, to fruitfully codesign an approach to climate just, positive energy district development. After the initial phase, working in a smaller task force with those people currently directly dealing with the subject then was a consistent step.</p>
<p>Recommendations</p>	<p>Even in debated positions, it proved again central to start by defining the objective of processes clearly. If you are not familiar to the working structures, this can include for a start “understanding the structures myself, to be able to understand what could help where”.</p>



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Be ok with unclarity, and conflict. Our cities are not designed for sustainable lives. Reshaping them to cater for sustainable, climate just lifestyles means calling a lot of basic assumptions and procedures into questions. This is not done in one day, and the unease with changing towards it will surface in conflicts of various kinds. This can include: “your approach is not ambitious enough”, “your approach is too ambitious”, “who is defining the targets?” “You are not responsible” “your target is not clear enough” “your target is wrong” and others. It is ok to start somewhere and work your way towards more clarity.

When you organise workshops with people from different units, make sure your methods invite everyone to speak, so that you can benefit from the knowledge of all the people you invite. If your goal is not only to establish connections and build understanding, but you want to give others who were not present an insight, or you want to work with what people said, remember to also harvest/capture what your invitees say about objective.

When building a work force, start with engaged people, as they have significant interest in the topic and more thought through questions. Later don’t forget to boil questions down to concrete problems.

Do not get discouraged by unclear hierarchies or discontent and difficulties in developing a standard process for climate just district development. It is a major reshaping of city procedures and withstanding uncertainty is crucial for innovation.



Figure 65: City unit representatives during a workshop working on what climate just district development means (Source: Irene Müller/Stadt Leipzig)



Figure 66: Discussion continues even after the workshop’s end (Source: Irene Müller/Stadt Leipzig)



6 EMPIRICAL RESEARCH PROGRAM

6.1 Targets

The overall goal of Leipzig University (ULEI)⁶ was to test whether interventions (e.g., app usage, participation in SPARCS events) lead to participating households behaving more energy-efficiently. Therefore, targets are related to the specific factors that were measured to assess behavioural change and effectiveness of interventions.

This entails:

1. Investigation of socio-psychological factors driving citizens to get involved in district-based smart and ecologically sustainable energy management by measuring of person-level factors, such as personal attitudes or perceived personal competences, as well as capturing collective-level factors, such as identification with the community, perceived energy-related and project-related community norms and perceived collective efficacy to improve sustainable energy use as a community.
2. Derivation of transferrable knowledge about the "human factor" in implementing pro-ecological community innovations.
3. Assessment of behavioural change and the effectiveness of interventions at three time points through a longitudinal evaluation study design.
4. Implementation of control groups with no SPARC measures to ensure that intrapersonal behavioural change and effects of SPARCS measures are not due to "learning effects."

However, for the purpose of this deliverable we focus on reporting data related to community engagement. Therefore, the subsequent sections of this report will present carefully selected data that aligns most closely with the content objectives of this report.

6.2 Methods

6.2.1 Design and procedure

To test effectiveness of SPARCS interventions we implemented a quasi-experimental longitudinal research design (see Figure 67), meaning that:

1. we observed changes of self-reported questionnaire data in groups of people over time and that
2. reside in the SPARCS demo quarter (hereafter 'treatment group') or are from different districts of Leipzig that are not part of SPARCS (hereafter 'control groups'). These groups are a fundamental part of experimental designs and are essential to study the effects of a particular intervention and therefore for establishing cause-and-effect relationships.

⁶ Leipzig University, Institute for Psychology



The treatment group, namely residents of the SPARCS demo quarter, receives the SPARCS interventions. Control groups, on the other hand, serve as a basis of comparison for the treatment group. It consists of participants who do not receive a particular intervention but are otherwise like the treatment group in terms of relevant characteristics. For SPARCS we decided to incorporate two control groups, one that is geographically close to the SPARCS demo quarter, in fact even within the same neighbourhood ('Neighbourhood control group') and one that is located further away ('Control group'; see Figure 68). We made that decision to investigate "proximity and spillover effects". These terms are used to describe the phenomenon where the intervention provided to one group affects other groups or individuals either directly or indirectly. The investigation of proximity and spillover effects aim to understand the broader impact or consequences of an intervention beyond the treated group. It involves examining whether the treatment not only produces effects on the intended target but also influences other related individuals, groups, or systems.



Figure 67: Map overview of treatment and control groups in ULEI research program

Residents of these groups were invited to participate in our research program by filling out questionnaires at three different stages of the SPARCS implementation process.

The first household survey was planned and conducted shortly before the rescheduled implementation phase of SPARCS interventions in summer 2021. This measurement point functioned as a baseline measurement and served as a reference point, against which changes in intrapersonal questionnaire data could be compared to during the intervention.

The second household survey was planned as a post-test of the implementation phase (of the SPARCS App in particular) and was scheduled at the end of the heating period in April 2022. Even though, the rollout of the app was delayed to the heating period



one year later, we decided to move forward with the second household survey due to the war in Ukraine which resulted in an energy crisis. However, the second household survey did not function as a post-test, but rather a new baseline measurement point.

The third household survey (initially planned as a follow-up test) was then planned as the new post-test. The app was rolled out during the heating period 2022/2023. Therefore, the third survey was conducted in May 2023.

Each household survey wave consisted of three phases:

1. Distribution of announcement flyers,
2. Distribution of survey questionnaires,
3. Collection of survey questionnaires.

A week before data collection started, each household in the sampling area was informed via flyers about the day and time range ULEI employees were to personally distribute survey questionnaires to households. Surveys were accessible in a paper-pencil format only, for which participants had one week to fill out. One week after distribution of the survey questionnaires, ULEI employees personally collected filled out questionnaires. In case (potential) participants are not at home at phase 2 and/or 3, survey questionnaires or stamped envelopes were placed in the mailbox.

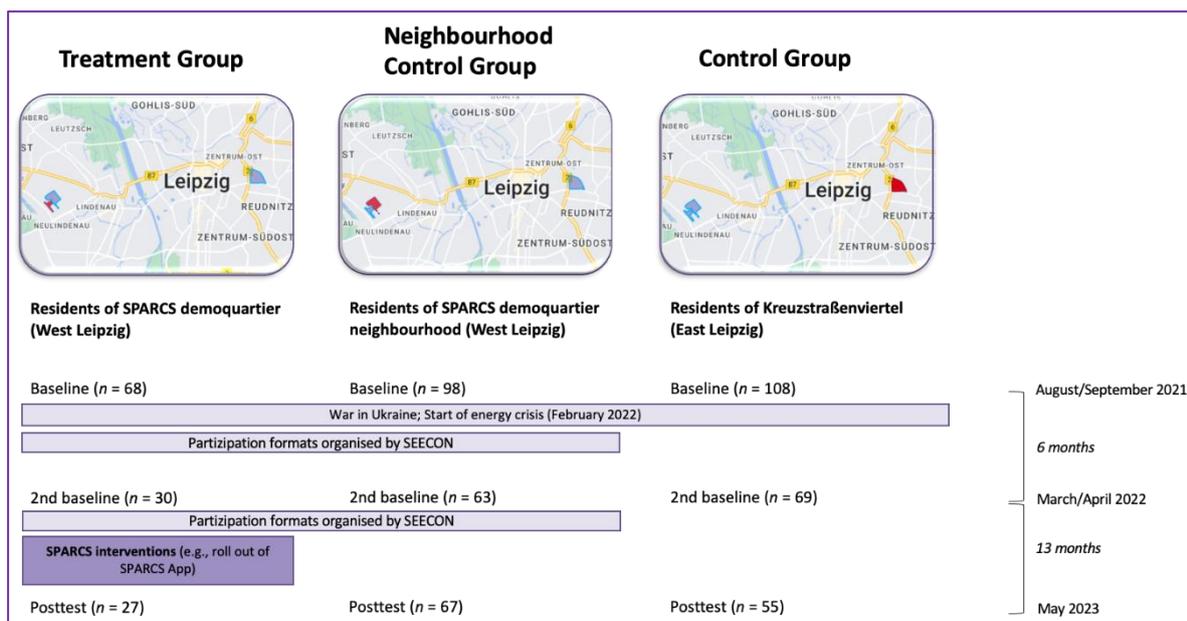


Figure 68: Overview of study design and procedure

6.2.2 Sample size and response rate

Overall, 274 residents participated in the first baseline survey, 162 residents in the second baseline survey, and (as of August 28th) 155 residents participated in the post-test survey.

We investigated the response rate. In longitudinal designs, decreasing response rates present a challenge to researchers. This phenomenon denotes a reduction in the



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percentage of participants who engage in data collection efforts over time. Overall, the response rate in the first baseline survey was 24.33%, and in the second baseline survey, it was 12.9%. It is not yet possible to assess the response rate for the post-test survey.

Efforts were made to mitigate declining response rates by distributing additional questionnaires with each survey wave. This strategy aimed to compensate for the reduced participation by increasing the number of questionnaires distributed to ensure a sufficient sample size for data analysis. However, this was only possible for both control groups. The treatment group faced a limitation in the number of potential participants with approximately 300 households total, preventing the ability to counteract the declining response rate.

6.2.3 Characteristics of participants

For this research program, a sample of participants was recruited from different geographic locations in Leipzig. This paragraph aims to outline the central sociodemographic characteristics of the individuals who participated in the study; separate for each location or group (treatment and control groups; see Table 6 below).

Overall, the age of the participants ranged from 18 to 97 years ($M = 58.2$, $SD = 17.5$) years. Half of the participants identified as male (50.5 %). On average household size was 1.79 ($SD = 0.83$), suggesting that there are approximately 1.79 individuals living in each household. We also assessed political orientation. An average political orientation score of 4.39 on a scale from zero ("extreme left-wing") to ten ("extreme right-wing") suggests that on average there is a moderate leaning towards the left side of the political spectrum.



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Table 6: Summary of design and participants characteristics

VARIABLES	TREATMENT GROUP	NEIGHBOURHOOD CONTROL GROUP	CONTROL GROUP
Response rate in %			
Baseline survey	28.33	38.89	17.03
2 nd baseline survey	10.6	15.56	12.15
Posttest survey	-	-	-
Sample size			
Number of participants (baseline)	68	98	108
Number of participants (2 nd baseline)	30	63	69
Number of participants (posttest)	27	67	55
Age			
Range (Minimum - Maximum)	19 - 88	25 - 90	18 - 97
Mean (standard deviation)	57.3 (17.2)	60.5 (15.1)	56.3 (19.8)
Gender in count (%)			
Male	62 (53.9 %)	117 (55.2 %)	95 (44 %)
Female	52 (45.2 %)	94 (44.3 %)	120 (55.6 %)
Diverse	1 (0.9%)	1 (0.5 %)	1 (0.5 %)
Household size (incl. participant)			
Range (Minimum - Maximum)	1 - 5	1 - 5	1 - 4
Mean	1.83	1.95	1.58
Political Orientation			
Range (Minimum - Maximum)	0 - 10	0 - 10	0 - 10
Mean (standard deviation)	4.43 (1.87)	4.40 (1.73)	4.35 (1.94)
Education in count (%)			
No educational certificate/ or Secondary school leaving certificate	17 (20,3 %)	19 (13.2 %)	22 (14.6 %)
Secondary school certificate	40 (47.6 %)	55 (38.2 %)	48 (30.8 %)
vocational baccalaureate/ or high school diploma	16 (19 %)	18 (12.6 %)	32 (20.6%)
Degrees from university of applied science/ or university	11 (13.1 %)	51 (35.4 %)	48 (30.8 %)
Income in count (%)			
Up to 899 €	11 (13 %)	2 (1.4 %)	12 (7.6 %)
900 – 1.499 €	20 (23.5 %)	13 (9.1 %)	42 (26.4 %)
1.500 – 1.999 €	22 (25.8 %)	25 (17.5 %)	40 (25.1 %)
2.000 – 2.599 €	11 (12.9 %)	35 (24.5 %)	17 (10.7 %)
2.600 – 3.199 €	3 (3.5 %)	25 (17.5 %)	18 (11.3 %)
3.200 € or more	2 (2.4 %)	25 (17.5 %)	12 (7.5 %)
No disclosure	16 (18.8 %)	18 (12.6 %)	18 (11.3 %)



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Note. Secondary school leaving certificate = English equivalent to 'Hauptschulabschluss', Secondary school certificate = English equivalent to 'Mittlere Reife', vocational baccalaureate/ or high school diploma = English equivalent to 'Fachhochschulreife / Abitur'.

6.3 Results

Please note that due to the small sample sizes, conducting inference statistical analysis was challenging. As a result, most of the reported results are presented descriptively rather than using statistical significance. Therefore, it is important to interpret any statements related to statistical significance or inference analysis with caution, as they may not be robust or conclusive.



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6.3.1 Engagement in topics relating to energy-saving.

6.3.1.1 Energy-saving action stage

In the initial baseline survey, we employed a modified version of the action phase model developed by Bamberg (2013)⁷ to assess the degree of involvement (i.e., action stages) among residents in energy-saving practices. The purpose was to determine residents' self-perception regarding energy-saving initiatives, which can be instrumental in effectively initiating processes of change by meeting individuals at their current level of engagement.

Survey participants were requested to indicate their level of involvement in energy-saving measures using a 6-step phase model, ranging from "I have not yet contemplated saving energy" to "I am actively endeavouring to minimize my energy consumption as much as possible. Moreover, I aim to continue this practice and further reduce energy usage in the upcoming months."

The figure below **Error! Reference source not found.** illustrates that the distribution of action stages appears to be similar across the three groups. Most residents (> 60%) from all three locations express that they are already employing all possible methods to reduce their energy consumption and plan to sustain or even enhance their efforts. Approximately 10% of participants intend to initiate energy-saving measures and possess the knowledge required to do so. Additionally, 10 to 20% of residents in all groups aspire to reduce their energy consumption but encounter difficulties or lack knowledge on how to proceed. Only a small proportion of individuals (approximately 10%) have never contemplated energy-saving or fail to recognize the necessity to do so.

Overall, it becomes apparent that most residents expressed that they are already engaged in energy-saving behaviours and continue to even further their efforts. This is in line with moderate agreement across groups ($M = 5,1$) to the statement "Active hints that help me save energy I find good." on a scale of one ("strongly disagree") to seven ("strongly agree"), indicating that residents are on average interested in tips that help them to save energy.

However, our findings from the first baseline survey demonstrate a diverse range of engagement levels among residents regarding energy-saving practices. Understanding these varying levels of engagement can guide the development of targeted strategies to promote sustainable change within the community.

⁷ Bamberg, S. (2013). Changing environmentally harmful behaviors: A stage model of self-regulated behavioral change. *Journal of Environmental Psychology*, 34, 151–159.
<https://doi.org/10.1016/j.jenvp.2013.01.002>



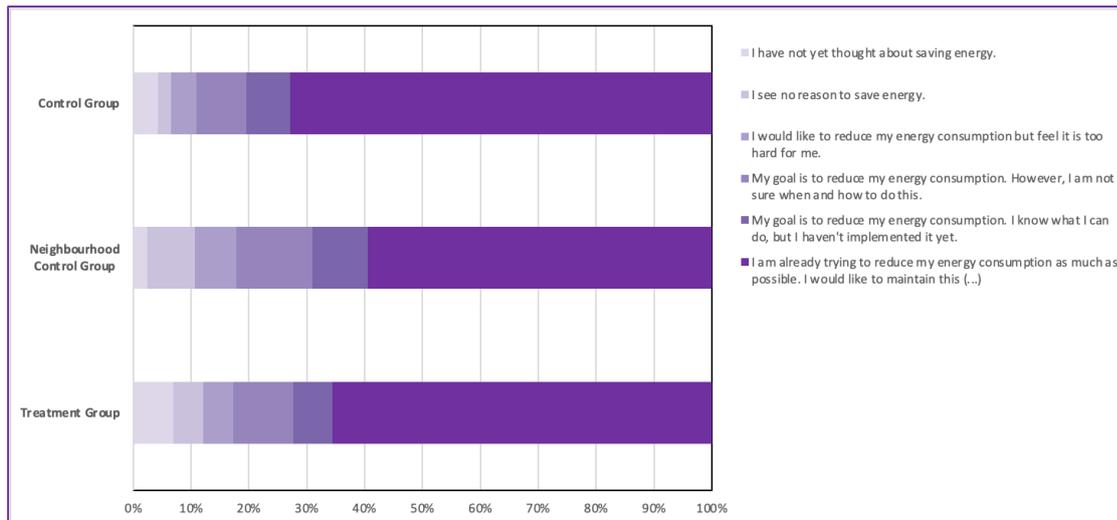


Figure 69: Action stages in terms of energy-saving behaviour

6.3.1.2 Policy acceptance

To determine policy acceptance towards promoting renewable and environmentally friendly energy, we used three statements as indicators (e.g., "I would be willing to accept higher subsidies for environmentally friendly technologies, even if they are tax-funded"), measured in all three surveys. Respondents were asked to rate their agreement or disagreement on a scale of one ("strongly disagree") to seven ("strongly agree"). To calculate the total scale scores, we averaged the ratings across all the statements.

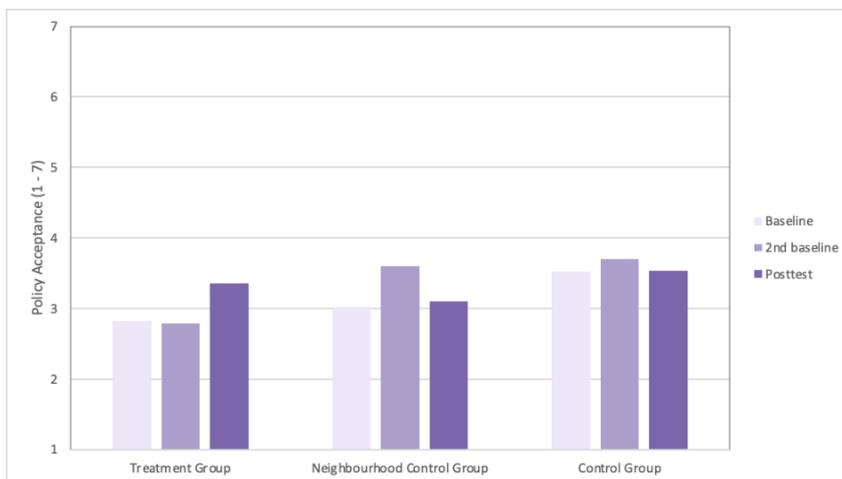


Figure 70: Mean values of policy acceptance across groups over time

The results depicted in the Figure aboveFigure 70: Mean values of policy acceptance across groups over time indicate that across all three groups, policy acceptance values were



relatively low, as evidenced by mean values below 4. Specifically, the treatment group displayed the lowest value ($M = 2.83$), which was also marginally significantly different from the control group ($p = .052$). This suggests that there exist initial disparities between these two districts. Descriptively, it appears that policy acceptance values are stable in the control group over time, while an increase can be observed in the treatment group at this post-test and in the neighbourhood control group at 2nd baseline. Although the differences may not be statistically significant, this observation suggests a potential disparity in the changes or trends of policy acceptance between the control and treatment group. Further analysis or investigation (e.g., impact of energy crisis) may be necessary to understand the reasons behind this difference and its implications for energy transformation efforts.

Interpreting low policy acceptance toward environmentally friendly technology in the context of energy transformation within communities carries implications. It suggests that there may be resistance or lack of support among community members for the adoption and implementation of initiatives related to environmentally friendly technology. This resistance can pose challenges to the successful transition towards more sustainable energy practices in the community. To overcome these barriers, it becomes crucial to understand and address the underlying reasons behind the low policy acceptance, which may include concerns related to cost, perceived effectiveness, or lack of awareness. By addressing these factors and actively engaging with the community, strategies can be developed to increase policy acceptance and promote greater participation in energy transformation efforts.

6.3.2 Potential of collective engagement

6.3.2.1 Implementation of shared (collective) goals in the past within community

By assessing residents' perceptions of shared goals that have been successfully implemented in the past, we gain insight into the level of cohesion and collaboration among residents within a community. This is important because past behaviour and experiences reflect the ability of residents to come together, set common objectives, and work collectively to achieve them.

In the first baseline survey, we capture residents' perspectives on their past collaborative achievements by using one statement as an indicator ("People in the [name of district] have already been able to implement ideas that they collectively set their minds to in the past (e.g., joint efforts to create a traffic-calmed street)."). Respondents were again asked to rate their agreement or disagreement on a scale of one ("strongly disagree") to seven ("strongly agree").

Figure 67 shows that residents demonstrate rather low and similar levels of agreement with the statement regarding past successful collective efforts. It suggests that there may be a lack of cohesive and collaborative experiences within the community. This could be due to various reasons, such as a lack of community cohesion, limited opportunities for collective action, or a history of unsuccessful collaborative endeavours. However, it's important to note that low agreement does not necessarily mean that transformative processes are doomed to fail. It highlights an area for



improvement and the need for strategies to build trust, foster collaboration, and promote collective action within the community. To address this, future projects may consider adopting bottom-up approaches, in which the active involvement of the community in the transformative process is more strongly emphasized.

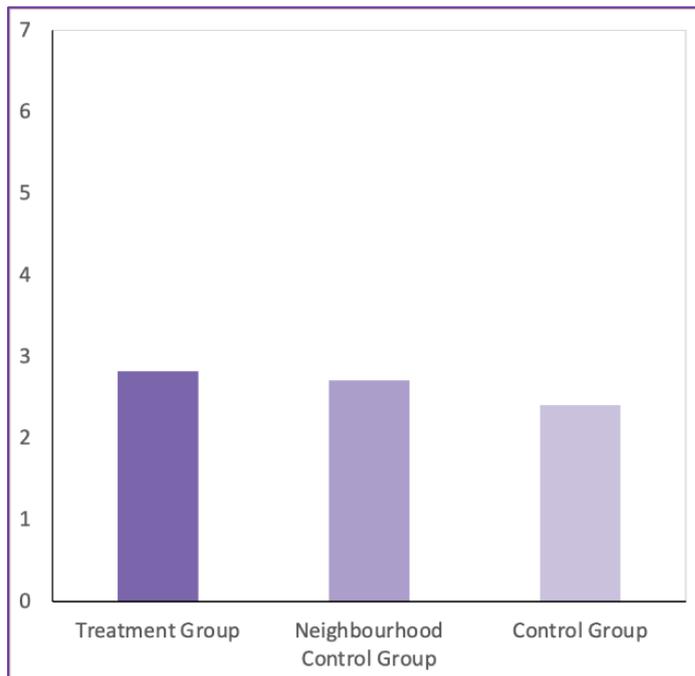


Figure 71: Mean values of residents' perceptions of implementation of shared goals in the past

6.3.2.2 Identification with residents of same community district

This data will be provided once it is fully digitized.

6.3.3 SPARCS-related variables

In this paragraph, we will present data regarding residents' involvement in the project, their willingness to use an app for monitoring heat, water, and electricity consumption, as well as their needs for improved consumption monitoring.

6.3.3.1 Exploring residents' engagement in the SPARCS project

In the baseline survey and treatment group only, we inquired about their level of identification with the project, specifically in terms of transforming the Duncker demo quarter into a CO₂-neutral energy quarter (upper bar in Figure 72). Additionally, we asked if they viewed the project proposal favourably (second bar from the top in Figure below) and if they would participate in events related to the SPARCS-Project (lower bar in Figure 72). Respondents were asked to rate their agreement or disagreement on a scale ranging from one ("not at all"/"strongly disagree"/"definitely no") to seven ("very strong"/"strongly agree"/"definitely yes").



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In the subsequent post-test survey, we also inquired whether residents had participated in events related to the SPARCS project. The inclusion of this data will be provided once it is fully digitized.

The following figure displays the distribution of residents' ratings regarding these questions. Residents' identification with the project proposal and their overall evaluation exhibits strong variation and polarization. Approximately 40% of residents identify with the project, while an equal proportion does not (~40%). Moreover, around 50% of individuals consider the project proposal to be good. Regrettably, only 30% of residents indicated a moderate to strong agreement in their willingness to participate in SPARCS events.

These findings highlight the importance of further efforts to enhance residents' involvement and encourage active participation in the project.

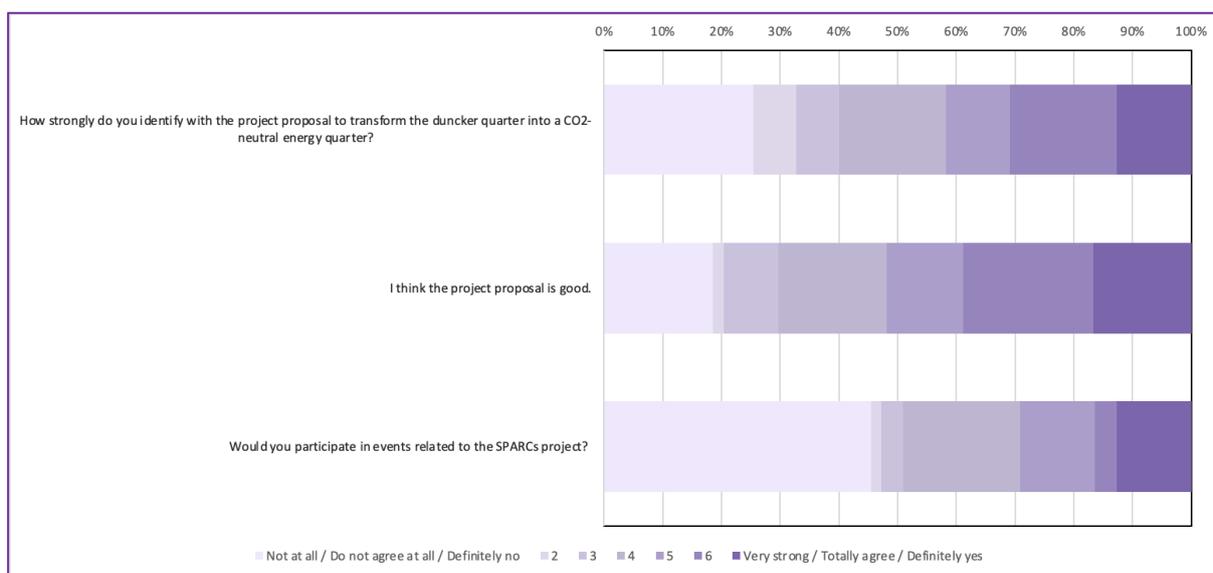


Figure 72: Diverging stacked bar charts representing distribution of answers on a 7-point rating scale for several questionnaire items.

As we sought to examine the influence of proximity and spill-over effects, one of the factors of interest was residents' knowledge of other individuals in their neighbourhood who were participating in the SPARCS project. To gauge this, residents were asked to rate how many people they know on a scale from one ("no, I don't know anyone") to seven ("yes, I know a lot"). Initially, this question was directed solely to residents in the treatment group during the baseline assessment. However, starting from the second baseline assessment, the same question was included for both control groups as well.

Figure 73 illustrates the average ratings provided by residents in each group. At the baseline stage, where the project had not yet been officially introduced to residents, we anticipated lower values. As the project progressed, particularly in the treatment group, we expected an increase in the ratings, as well as higher mean values for the treatment group (and potentially the proximate Neighbourhood control group compared to the control group located further away). However, no noticeable increase from



baseline to the second baseline assessment was observed in the treatment group, and there were no significant differences in mean values between the groups at the second baseline. It is important to note that the sample size, particularly in the treatment group during the second baseline survey, was insufficient to accurately represent the residents in that group. However, the data is in line with reported experiences of other project partners in this deliverable regarding number of attendees at events.

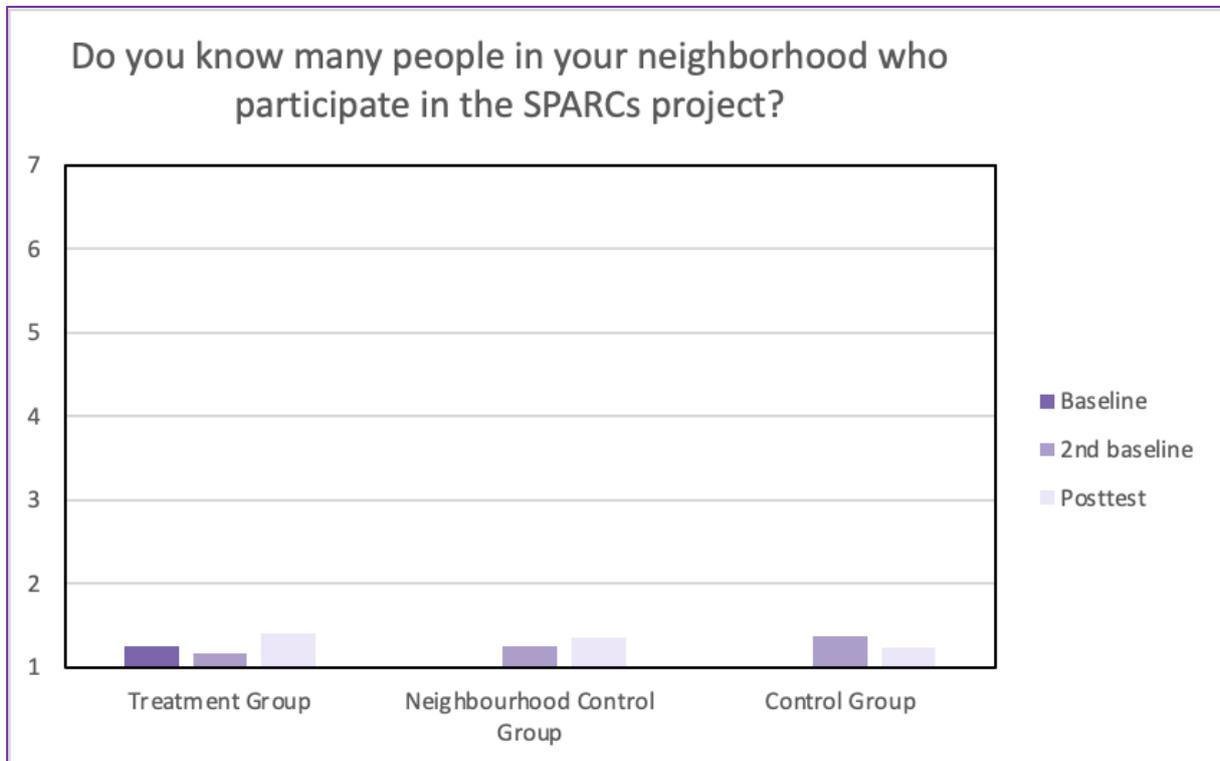


Figure 73: Mean values of residents' knowing other people in the neighbourhood that participate in the SPARCS project.

6.3.3.2 Willingness to use an App to monitor energy consumption

One aspect of the SPARCS project that heavily relies on human factors is the utilization of a mobile application for improved control and management of energy consumption, specifically in terms of heat. To assess residents' willingness to adopt such an app, we posed the question to use an app to participants in all three groups at each of the three survey points. Respondents were asked to rate their level of willingness on a scale ranging from one ("very low") to seven ("very high").

The following figure displays the overall willingness levels and reveals, encompassing all groups, consistently low values (< 4) throughout the survey period. The findings indicate that residents' willingness to employ an app for energy consumption management remains relatively low and unchanged over time.

During the baseline survey, an additional question was included to ascertain the importance placed by residents on having all apartment-related topics, including contracts and energy consumption, accessible through an app. Respondents were



asked to rate their agreement on a scale from one ("strongly disagree") to seven ("strongly agree"). The responses to this question were similar across all groups, with an overall average rating of 3.38. These results suggest that, at least among the surveyed individuals, app-based management of documents does not hold a high priority.

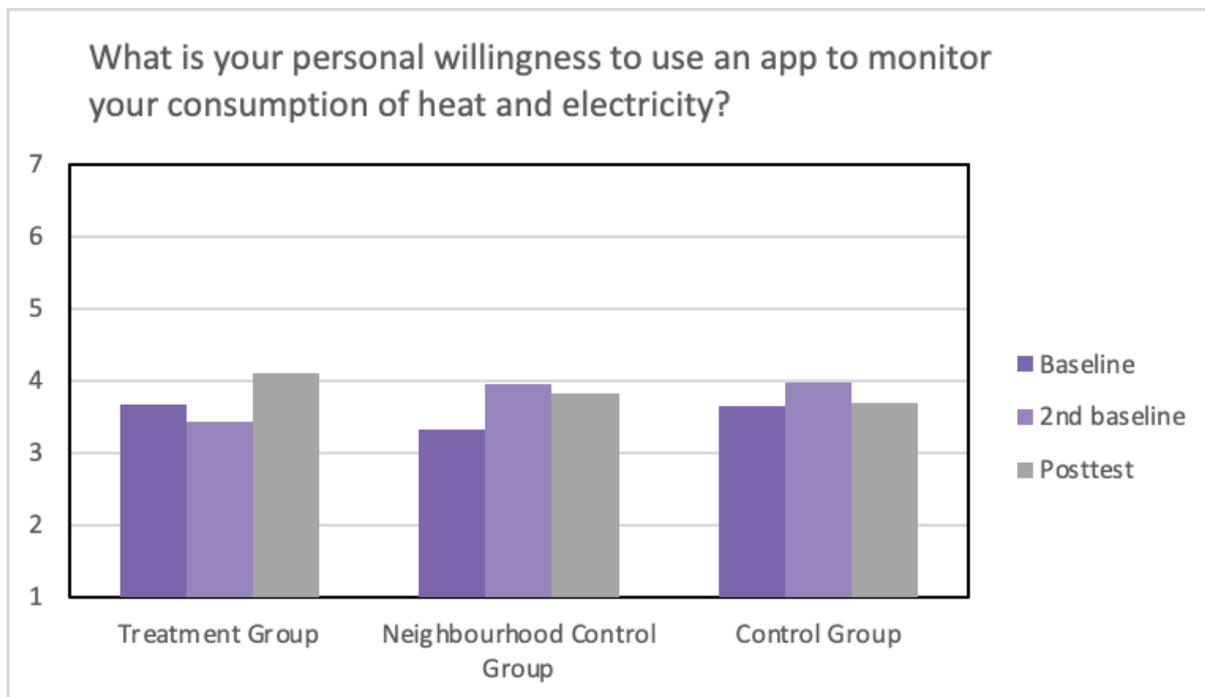


Figure 74: Mean values of residents' willingness to use an app to monitor energy consumption.

In conclusion, the results indicate a generally low level of willingness among residents to use the app for energy consumption management throughout the survey period. These insights shed light on the potential challenges and considerations when implementing app-based solutions for energy management in residential settings (which again is in line with project partners' experiences reported in this deliverable) and underscore the need to address user preferences and priorities in the design and promotion of such technologies. For instance, we inquired about residents' perceived importance of receiving monthly or daily information regarding their energy consumption, again using a scale ranging from one to seven. Even though, the responses indicated relatively low importance for both options, with mean values of $M_{monthly} = 4.09$ and $M_{daily} = 2.96$, notably, participants rated the monthly information option significantly higher than the daily information option.



7 CONCLUSIONS

This report aimed to provide an overview of citizen engagement activities carried out in the demo districts during the monitoring period 2021-2023. This overview of events seeks to highlight some of the possible and achievable activities at the local level, their main characteristics, the elements that have made them possible, and the challenges encountered. It is possible to conclude that organizing events aimed at citizen engagement in line with the project's objectives faced and overcame several obstacles.

Nevertheless, looking back at the activities carried out over the past years, a lot has also been accomplished. This included a wide diversification of the activities offered and a greater involvement of partners and target groups. Over time, the activities organized and proposed, especially in the Duncker neighbourhood, sought to provide a wide range of communication and information activities to foster greater citizen involvement.

During the monitoring period (M23 – M48), we achieved positive results concerning the number of live events organized, increased participation, and enhanced networking. Families with children actively participated, and interested citizens provided input and asked questions at various locations, such as the DIPAS-table or at the Ökofete booth. We informed families about the opportunities offered by the developed apps and brought people together around specific energy-saving topics.

Moreover, with focused attention on Dunckerviertel activities, every possible step has been taken to ensure a consistent provision of energy consulting services in the neighbourhood. This is evident in the continuous collaboration among seecon, WSL, and LWB for each planned endeavour, as well as the steady offering of events like the Energy Consultation Hours. This format has particularly gained firm ground within the neighbourhood, with consistent citizen participation in these meetings, and housing companies like LWB and WSL expressing interest in replicating this model in other areas.

Additionally, the seecon SPARCS Team has consistently established itself as a dependable point of contact for Duncker tenants, being present at events and available in the back office with a team of experts prepared to address inquiries.

7.1 Lessons learned and practical recommendations

Building on the ULEI's empirical research program, it can be summarized that overall, regarding participating residents' perceptions of energy-efficient behaviour, a high number of participants expressed their commitment to energy conservation, highlighting their current efforts in saving energy. However, it was also commonly stated in open answer formats of the survey questionnaire that their capacity to undertake additional actions was largely constrained by structural factors beyond their control, including inadequate insulation in tenements and the type of heating systems in place. These factors, largely determined by external influences, limit the tenants' perceived ability to exert meaningful influence in this regard. Additionally, socioeconomic factors play a role in being able to get involved in transformative processes. Housing blocks with higher socioeconomic status may have more



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resources and a greater ability to invest in transformative energy projects, leading to higher acceptance. In contrast, housing blocks with lower socioeconomic status may have different priorities and limited resources, making them more sceptical or resistant to such projects. Therefore, the social structure of housing blocks can have a big influence on acceptance of the project.

Drawing from ULEI's survey findings, as well as their on-the-ground experience conducting the surveys and the participation in events designed to engage residents in the project, it seemed hard to motivate people to partake in the SPARCS project or events. This challenge was especially exacerbated by the hardships of the COVID pandemic and the accompanying social distancing rules. However, this aligns with existing research literature indicating that initiatives primarily driven by municipalities or top-down approaches may be less successful compared to projects that actively involve citizens and adopt a bottom-up approach. Given the transformative nature of projects aimed at community development, which heavily rely on residents' acceptance and engagement, we recommend further intensifying collaboration with affected residents and actively incorporating their perspectives into the project's design and implementation. This inclusive approach holds the potential to foster a sense of ownership among residents and enhance their willingness to participate, ultimately contributing to the project's overall success.

Regarding ULEI's evaluation design and research in the field, we proactively anticipated potential challenges such as drop-out and decreasing response rates and took several measures to address them. These measures included the use of incentives and the possibility to win a prize, as well as the distribution of more questionnaires to counteract decreasing response rates and encourage participation. However, one significant obstacle we encountered, particularly in the treatment group, was the restricted sample size resulting from the relatively low total number of households. This limitation, combined with the already low response rates, presented a considerable hurdle for scientific exploration, especially when the investigation of causation, rather than mere correlation, was a focal point of research interest. For future projects with a relatively low total number of households, we would aim to enhance the targeting of resident engagement. Despite having already implemented personalized invitations through announcement flyers and adopting a direct questionnaire distribution method, we recognize the importance of making the project and its goals even more transparent for residents (at the possible expense of biased research data due to pre-influence). To achieve this, we propose sending additional information material about the project well in advance of the questionnaire process. This extra step will allow residents to gain a clearer understanding of the project's purpose and objectives, fostering a sense of involvement and trust which potentially increases participation rates.

Apart from obstacles regarding sample size, research in the field, especially interdisciplinary research, can be dynamic. Researchers must be flexible and adaptable in their approaches, as they may encounter unexpected challenges (such as delays of interventions) or need to adjust their methods based on new insights or changes in society and politics (e.g., war in Ukraine and emerging energy crisis).



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Embracing the diversity of perspectives from different disciplines and being open to learning from them became crucial in navigating these complexities.

At the same time, as we reflect on our experience, we recommend that future projects incorporate long-term planning of evaluation designs and employment of staff that oversee the evaluation in future projects. Transformation processes in community projects are not instantaneous and may take time to manifest, especially when employing a top-down approach. To ensure effective evaluation, it is essential to allocate adequate resources for the extent of the period during which the transformation process may unfold. We therefore acknowledge that our self-reported questionnaire data alone may not fully capture the changes in participating residents' awareness and behaviours. In our case, interventions directly affecting participating residents only commenced toward the end of the evaluation process, limiting the potential to observe immediate shifts in the data. To address this challenge, we propose to conduct further questionnaires, even after the project's conclusion, to assess whether the transformative processes initiated have permeated participants' awareness and to gain valuable insights into the sustained impact of the interventions and the project's overall success in achieving its transformative goals.

Based on the results of the ULEI's research program and on the experiences gathered during the organization of events both in the Duncker District and at the Baumwollspinnerei, we can summarize some important factors and considerations that emerged during these months and should be considered by those who intend to replicate the experiences of citizen engagement proposed in Leipzig:

1. Find an appealing and concrete topic that resonates with the target audience.
2. Identify and define the right target group and use appropriate language and communication channels.
3. Employ different marketing strategies, establish strong networking connections, and create eye-catching elements to attract attention.
4. Plan and carry out engaging events that offer valuable information and opportunities for interaction.
5. Set good examples and showcase successful case studies to inspire and motivate participants.

7.1.1 Identifying and defining the right target group and using appropriate language

Before embarking on any citizen engagement activities, it is crucial to understand the specific demographic and psychographic characteristics of the target group. This could include factors such as age, location, interests, or behaviours related to environmental and energy topics. By gaining insights into the preferences and needs of the target group, we can tailor our communication efforts and messages to resonate with them. In our case it was important to know whether people only sleep in a certain neighbourhood or whether they work and live there and are therefore more motivated



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to contribute to the transformation. Similarly, whether they are tenants or homeowners was essential to know. It was also important to consider both what people lose and what they gain from the planned transformation and how much they will be affected by it.

In the case of the Duncker district, our target audience primarily consisted of families, elderly individuals and migrants. It was evident that these target groups were not initially inclined or particularly interested in embracing changes in their lifestyles or engaging with advanced technical and technological innovations like those proposed by the SPARCS Project. Therefore, we diversified our participation offerings to attract their attention through activities such as family cinema, drawing competitions, and energy-saving workshops. We made sure to use simple language and provide concrete examples to ensure effective understanding and engagement from every individual. We also aimed to provide informative content that allowed everyone to familiarize themselves with the proposed topics.

7.1.2 Find an appealing and concrete topic

After that the most difficult challenge is to find a topic that resonates with citizens on a personal level. To address this challenge, it is crucial to ask ourselves the following questions: Is the topic I'm proposing of genuine interest to people? Are they seeking answers and solutions in this area? Are there specific problems they are facing that are related to the main topic? Is the topic tangible and concrete, so they can relate to it?

When considering our target groups, we observed that topics such as "saving energy costs" tended to have a greater impact compared to more abstract concepts such as "saving polar bears." We therefore assumed that it is important to understand the specific needs and concerns of our target audience and tailor our messaging accordingly.

Furthermore, it is important to acknowledge that an increasing number of competitors, often commercial, with different offers and bigger budgets, are targeting the same group and diverting their attention.

7.1.3 Marketing strategies, strong networking connections, and eye-catching elements

The use of diverse marketing strategies can greatly enhance the entire process of citizen engagement. Publicizing themes or events across various print and digital channels can help reach a wider audience.

Building relationships with local community partners, and stakeholders presents valuable opportunities for spreading the message and engaging the target group.

In our case, the collaboration with LWB's own social management proved invaluable as they helped identify existing communication channels within the local context. These channels may include community centres, social media platforms, local



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newsletters, and word-of-mouth communication within the neighbourhood. Through direct contact and word-of-mouth communication, it became easier to connect with the target group and ensure effective message delivery. The presence of participants at the SPARCS-Fete 2023 validated the effectiveness of these efforts. Moreover, this cooperation allowed us to establish a consistent presence in the neighbourhood as, for example, the LWB-Kiosk was consistently made available to the SPARCS Project.

Networking plays a significant role in effectively reaching the target group. Collaborating with relevant organizations expands the scope of people reached and taps into existing networks. In our case, partnerships with organizations such as LWB, the local Caritas association, the Verbraucherzentrale, and Mosaik e.V. ensured that the workshop presentations were inclusive and engaging for participants at all levels of communication and knowledge. Developing strong networking was vital for engaging more people.

When utilizing different marketing strategies, attention should be given to the preparation of advertising materials. Some considerations include creating visually appealing poster designs that incorporate the project logo and adhere to CD conformity. Improvements can be made in organizing flyer distribution by strategically timing the distribution to maximize its impact. Efficient postcard distribution services can be organized based on postal codes or streets, if possible, by allocating a budget for this purpose. Personalized invitations for smaller target groups can also be provided.

Early planning, considering other local events such as holidays, is crucial for successful marketing efforts.

7.1.4 Carry out your event!

After carefully analysing all the elements that contribute to event preparation, it is possible to carry out a successful event. This is crucial because establishing direct contact with individuals makes it easier to involve them, establish personal connections, and motivate them to actively contribute to the transformation. Personal interaction fosters stronger engagement, and face-to-face meetings provide valuable opportunities to establish personal connections with tenants, facilitating more effective future communication.

During the event, it is important not to assume that all information about a specific issue is already known. Taking the time to explain even generally known topics, as we did during our energy-saving workshops, helps ensure everyone is on the same page. We also learned the importance of accompanying and involving individuals in growing their awareness of the transformations and providing them with concrete information about the project. While abstract notions were sometimes proposed, real examples, best practices, and energy-saving consulting had a greater impact than theoretical concepts.

Furthermore, we observed that offering tangible activities and eye-catchers in the Duncker neighbourhood, such as a drawing competition, coffee & cake, DIPAS table, film viewings, or gift bags, proved to be effective in engaging citizens. However, it was



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sometimes challenging to find a concrete, tangible, and appealing topic that would capture people's interest as well as a suitable day and time.

7.1.5 Set good examples!

As mentioned earlier, it is crucial to have a deep understanding of your target group's background before engaging with them. This knowledge allows you to structure your information at an appropriate level, ensuring that it is understood while maintaining the audience's curiosity and attention. Additionally, identifying meaningful use cases or best practice examples that align with their interests can greatly enhance engagement. It is essential to establish a direct correlation between the work being done and something that holds value for them.

To capture participants' attention, storytelling techniques can be employed in some cases. This involves conveying information in a compelling manner or creating a narrative that resonates with participants on an emotional level. By asking simple questions, sharing best practices, real-life examples, success stories, or personal experiences, the impact of the subject matter can be vividly illustrated. It is important to keep sentences concise and straightforward, avoiding excessive technical jargon whenever possible. By connecting the content to participants' interests, goals, or concerns, the importance and value of the information can be effectively conveyed. The walking tours serve as excellent examples in this regard. They provided a visually engaging way to showcase the measures implemented in a district or neighbourhood. As many SPARCS measures are not directly visible but have a "virtual" character, offering explanations at the beginning or end of the walking tour helped provide more in-depth insights into non-visible elements such as the virtual energy district.

Considering these factors and implementing effective strategies, enables the creation of meaningful and impactful citizen engagement initiatives that contribute to sustainable development and positive changes.

7.2 Impacts and Replicability potential

All work in the Lighthouse City Leipzig aims to develop solutions and services for future energy positive districts (EPD) to achieve a sustainable development of Leipzig, and to activate citizens to identify with and commit to this goal. Replication and exploitation opportunities are the drivers for the actions. SPARCS offers a platform for demonstrating, analysing, evaluating, and optimising the solutions as well as a means for collaboration and community engagement models.

At the beginning of SPARCS, no information events on climate protection and renewable energies were being offered in the Duncker district. Furthermore, there were no actors involved in a close and active exchange with the citizens of the Duncker neighbourhood. Within the framework of SPARCS, the events mentioned here in the deliverable were offered and carried out.

Since September 2022, the LWB has offered its tenants the use of the "Nachbarschaftstreff". As mentioned above the "Nachbarschaftstreff" in the Duncker



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district is a meeting place for residents and a place of low threshold offers for meetings, communication, information, leisure activities and social participation. All offers and activities are under the guiding principle of strengthening the commitment and self-organisation of the neighbourhood residents. These are diverse and not exclusively aimed at specific target groups.

The creation of further "LWB Nachbarschaftstreff" locations in other socially disadvantaged neighbourhoods is being planned for the coming years to develop long-term measures to improve the living environment.

The LWB expanding the "Nachbarschaftstreff" model to other neighbourhoods represents a significant replication potential. Since the LWB acts as a multiplier, experiences from SPARCS can be incorporated into other "Nachbarschaftstreff" locations to address the topics of energy saving, climate protection and the expansion of renewable energies there as well.

In addition, it is important to mention that from the organizers' perspective, the experience of citizen participation in the Dunker District has allowed us to experiment with various approaches to engaging citizens. Particularly regarding Seecon, this has provided us with the opportunity to implement and structure the Seecon Team-Citizen Participation more effectively. We have developed a service offering and citizen participation formats, which we will also reuse in the future when working with other local authorities. This is done while considering the specific local needs of each entity, the target audience, and the requirements and expectations of our future stakeholders. We have learned that the communication level needs to adapt to the audience and objectives of each project.

Specifically, the experiences gained in SPARCS will feed into our standardization processes for the development of climate protection and district concepts, as has already occurred in the development of three Leipzig districts and in the creation of informative posters in Neukolln (Berlin). To these considerations, an equally important final aspect is added. The process of communication and citizen engagement is of vital importance in various projects. However, it should not be forgotten that, at least in our experience, we have been able to observe that participation succeeds when funding is made available, Otherwise, it is difficult to develop a business model solely focused on economic viability.



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8 ACRONYMS AND TERMS

8.1 List of Abbreviations

DHL:	Deutsche Post
GmbH:	Gesellschaft mit beschränkter Haftung (German for Ltd. Company)
ICT:	Information and Communication Technologies
LEI:	City of Leipzig, Digital City Unit
LWB:	Leipziger Wohnungs- und Baugesellschaft mbH
PECM:	Positive energy community management
PED:	Positive energy district
PV:	photovoltaic panels
RES:	Renewable Energy Sources
SCC:	Smart Cities and Communities
VPP:	Virtual Power Plant
WP:	Work package



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8.2 List of partner acronyms used in SPARCS

PARTNERS	
Teknologian Tutkimuskeskus VTT OY	VTT
Espoon Kaupunki	ESP
Stadt Leipzig	LPZ
Camara Municipal da Maia	CMM
Reykjavikurborg	RVK
Statutarni Mesto Kladno	KLD
Municipality of Kifissia	KFS
Lviv City Council	LVIV
Kone OYJ	KONE
Siemens Osakeyhtiö	SIE
Plug-IT Finland OY	PIT
Citycon OYJ	CIT
Suomen Rakennusinsinöörien Litto RIL RY	RIL
Adven	ADV
Fraunhofer Gesellschaft Zur Forderung der Angewandten Forschung E.V	FHG
BABLE UG	BABLE
WSL Wohnen & Service Leipzig GMBH	WSL
Stadtwerke Leipzig GMBH	LSW
Cenero Energy GMBH	CEN
Seecon Ingenieure GMBH	SEE
University of Leipzig	ULEI
Sociedade Portuguesa de Inovacao consultadoria empresarial e fomento da inovacao S.A	SPI
NEW - Centre for New Energy Technologies S.A	NEW
Orkuveita Reykjavikur SF	OR
Ceske Vysoke Uceni Technicke V Praze	CVUT
Suite5 Data Intelligence Solutions Limited	SUITE5
ELIN VERD S.A	VERD
National Ecological Centre of Ukraine	NECU
LCE Lvivavtodor	LCE
CiviESCo	CiviESCo



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