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SONNET - Social Innovation in Energy Transitions

Co-creating a rich understanding of the diversity, processes, contributions, success and future potentials of social innovation in the energy sector

D4.2 (D13): Report on the SIE City Lab in Mannheim

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4	Grenoble Ecole de Management	GEM	FR	
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Executive Summary

The deliverable at hand reports on the SONNET city lab in Mannheim which focused on novel governance arrangements to enhance social innovation in energy (SIE) in the district of Neckarstadt-West. The aim of the lab was to develop, test and instigate an organisational governance process, which includes a stakeholder interaction as well as an inner-administrative dialogue and the use of innovative methods to foster dialogue and participation. As part of the lab, different activities were conducted such as design thinking workshops, activities in public and digital spaces to allow for new ways of interaction between local stakeholders as well as for citizen participation in the local energy transition.

Insights gained by conducting the lab show that especially for an inner-city district facing social challenges such as Neckarstadt-West it was crucial to take existing local networks into account when developing activities. The engagement of local stakeholders turned out to be a time-intensive task, mainly because local stakeholders were facing a variety of other challenges that limited the time resources to engage in the local energy transition. However, the lab allowed to test innovative methods (such as digital participation and gamification or design thinking) and to establish novel social relations, especially among professional actors working in the neighbourhood that can work as multipliers for engaging local citizens.

The report is structured as follows: It first introduces the understanding of SIE in Mannheim and the chosen focus of the city lab. Second, it provides an overview of the activities conducted as part of the city lab. Third, it summarizes the results of the city lab evaluation before it finally ends with an analytical reflection.

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1. INTRODUCTION

1.1 Information about the city of Mannheim and its district Neckarstadt-West

Mannheim is a city of about 320,000 inhabitants in south-western Germany. Characterised by its proximity to the two rivers Rhine and Neckar as well as its heavy industry, climate action is a challenge that urgently needs to be taken on. The city has committed to becoming climate-neutral by 2050 and is currently looking into whether this goal can be achieved even sooner. The **Climate Strategy Office of the City of Mannheim** is taking on this challenging task, for example, with the Climate Action Plan 2030, measures for climate impact adaptation and the provision of funding in cooperation with the Climate Action Agency. The **Climate Action Agency** offers consultation, subsidies and supports project ideas from citizens[1].

Currently, Mannheim is facing several challenges to reduce its emissions. It is home to a coal-fired power plant Grosskraftwerk Mannheim (GKM) that does not only supply the city's residents, but also those of neighbouring cities with electricity and heat – a total of 2.5 million people and industry that receive electricity and 160,000 that are connected to its district heat. Furthermore, Mannheim is characterised by heavy industry with a high use of energy that needs to be decreased for realistic chances of achieving climate-neutrality. Still, the projections are promising: A recent study 'Energierahmenstudie Mannheim – Wege zur Klimaneutralität' by the Wuppertal Institute[2] found that Mannheim can reduce its energy-related CO_2 emissions by 99 % by 2050 compared to today's levels and thus meet the targets of the Paris Climate Agreement at the municipal level.

Mannheim is one of six cities participating in the EU project SONNET (**So**cial I**nn**ovation in **E**nergy **T**ransitions) and created a 'City Lab' where residents can get involved into the decision-making process on topics related to the local energy transition: Mannheim is taking action and inspiring others.

To research how these social innovations can support the energy transition, Mannheim established a City Lab with a focus on developing and testing new organisational governance and participation processes. The City Lab provides a space (also physical) and a platform for local stakeholders such as the Neighbourhood Management, the Consumer Advice Centre (Verbraucherzentrale), businesses, local associations and citizens to connect and participate in decision-making processes and receive support from the City of Mannheim.

The City Lab is located in the neighbourhood of Neckarstadt-West, an area that is often disadvantaged and known to be struggling with social problems, but has a lot of creative potential. Neckarstadt-West is located north of the Neckar River banks. Neckarstadt-West is an

[1] for more information see: *www.mannheim-gemeinsam-gestalten.de* and *www.klima-ma.de*
[2] *for more information see: https://wupperinst.org/a/wi/a/s/ad/7307*

urban district with the largest stock of listed old buildings. Compared to other locations in Mannheim, affordable housing is rentable here. Neckarstadt-West is a diverse, densely built and populated district located close to the inner city. Neckarstadt-West is particularly popular with artists and students due to its urban character, proximity to the city centre and diversity. However, the district is also considered a problematic neighbourhood (socially disadvantaged, low education and low income lever, higher percentage of migration, increased poverty rate, low ownership rate), which is why development measures for urban energetic renovation have been taken, among other things. According to the Mannheim Social Atlas, it is a district with strongly above-average social problems[3]. Neckarstadt-West has one of the highest percentages of population with a migration background in Mannheim. A total of about 22,000 people from over 100 nations live here. Many cultural institutions are located in Neckarstadt-West.

Today, Mannheim is home to people from around 170 different nations. Diversity, acceptance and cosmopolitanism are values that are actively lived in Mannheim. The aforementioned challenges in Neckarstadt-West in particular make this neighbourhood stand out as a special experimental field in the city. Constant change, a living process and partial unpredictability of framework conditions (e.g. Corona pandemic) have to be continuously included here and corresponding challenges have to be mastered. The variety of structures in the neighbourhood, active stakeholders, and the passion to be active locally make Neckarstadt-West stand out as a special challenge, intrinsic force and opportunity for social innovation in the energy transition. Therefore, it offers good possibilities for participation concerning energy transitions in Mannheim. This is one of the aspects why this neighbourhood was chosen as the city lab for the SONNET project.

1.2 Information about city lab-like activities before SONNET

The City of Mannheim has been actively driving the transition process for many years. In March 2019, the Mannheim City Council adopted the **Mission Statement "Mannheim 2030"** targeting its strategic goals towards locally implementing the UN Agenda 2030 with its 17 global sustainability goals (cp. Figure 1). The chapter "Mannheim is a climate-friendly – in perspective, climate-neutral – and resilient city that is a model for environmentally friendly life and actions" contributes to set a frame for the local energy transition. The Mission Statement was developed in a broad participation process with citizens, experts as well as with the administration. Over the past decades, Mannheim turned from a mere citizen-service-administration, into a participation administration and then into a co-creation-administration[4].

[3] *for more information see: https://www.mannheim.de/de/service-bieten/soziales/sozialplanung/zentrale-veroeffentlichungen/sozialatlas*
[4] for more information see: *www.mannheim.de/de/stadt-gestalten/leitbild-mannheim-2030*

Figure 1: Mission Statement "Mannheim 2030" – goal climate-friendly city (source: City of Mannheim)

Annually, the **Urban Thinkers Campus** offers the opportunity to discuss and develop new ideas how Mannheim can become more sustainable and a city for all inhabitants. Additionally, the annual **Youth Summit** gives teenagers over 13 years the opportunity to also discuss their needs and inspire the City of Mannheim with new ideas how to transform Mannheim in a children and teen suitable city and this is usually accompanied by a climate-friendly or climate-neutral city, in which the energy transition plays the major role[5]. These formats are an example of how the mission statement is constantly reviewed and developed further.

The two major strategic concepts for the climate and energy transition in Mannheim are the Climate Action Plan (currently being updated, finalization 2022)and the Climate Adaptation Plan (2019). In 2009, the **Climate Action Plan 2020** came into effect. It was the first strategic concept for climate protection in Mannheim. Two important measures were the establishment of the Climate Strategy Office of the City of Mannheim and the sub company Climate Action Agency Mannheim gGmbH. Since then, the motto **"Mannheim on Climate Track"** has been established as the major communication strategy of climate protection in Mannheim (cp. Figure 2). It is the overhead slogan for all climate protection and adaptation measures[6].

[5] for more information see: *www.utc-mannheim.de* and *https://68deins.majo.de/68deins/*
[6] for more information see: *www.mannheim.de/de/service-bieten/mannheim-auf-klimakurs*

Figure 2: Logo of the communication strategy "Mannheim on Climate Track" (source: City of Mannheim).

Although Mannheim is a heavy industry city with its obstacles for climate protection, the Climate Action Plan 2020 had ambitious goals for a more climate friendly city development. Currently, the updating of the Climate Action Plan 2020 is being developed as the **Climate Action Plan 2030** with several fields of action, such as:

- Industry
- Business and service
- Energy production
- Mobility
- Blue-green Infrastructure
- Land occupancy

The Climate Action Plan 2030 is planned to be adopted by the City Council in spring 2022. It is an important part for fulfilling the SECAP (Sustainable Energy and Climate Action Plan) requirements of Mannheim's membership of the Global Covenant of Mayors.

One important step for fulfilling the Mission Statement "Mannheim 2030" to become a resilient city is the **Mannheim Climate Adaptation Plan**[7]. It was developed in a broad participation process together with citizens, scientists and the city administration. Overall, the aspects of climate change adaptation will be considered in all formal and informal planning processes (e.g. urban land-use planning, city planning competition procedures, public space concept, the BUGA planning (Bundesgartenschau = Federal Garden Show)). The Climate Adaptation Plan is a strategic framework for a long-term orientation of the City of Mannheim concerning resiliency. The qualitative implementation of the climate adaptation measures is not only task of the Climate Strategy Office but of all relevant departments of the municipality. The superordinate goals of the Adaptation Plan are preservation and improvement of urban life quality:

- Preservation and improvement of sustainable capabilities of the natural ecosystems
- Preservation and development of the capabilities of urban stakeholders and systems
- Preservation, improvement and optimization of the function in the identified fields of actions

[7] for more information see: *www.mannheim.de/de/service-bieten/mannheim-auf-klimakurs/klimafolgenanpassung*

After a vulnerability analysis the exposure of urban structures and functions against future climatic conditions was determined. Consequently, the following eight fields of actions were identified for Mannheim:

- Reduction of health impacts by heat waves (e.g. Heat Action Plan)
- Development of climate adapted city structures (e.g. consideration of climate protection and adaptation in urban planning processes)
- Traffic and air quality (e.g. greening traffic spaces)
- Water management (e.g. heavy precipitation risk management concept)
- Buildings and materials (e.g. information about climate robust building materials)
- Industry, commerce and tourism (e.g. experience exchange between companies)
- Urban Green, agriculture, forestry, biodiversity (e.g. greening public spaces and funding programs for private greening investments)

As climate adaptation is a common task of the entire city administration, the Climate Adaptation Plan identifies the particularly responsible departments for the individual measures. This ensures a close collaboration of the Climate Strategy Office with other departments such as the health department for developing the Heat Action Plan, the education department for greening school yards or the water department for heavy precipitation management. In Neckarstadt-West climate resilience plays a major role. The dense city structures with a high population rate in the neighbourhood cause competition for public space. High rates of sealing for buildings and car parking leave little space for urban green which is important for clean air, water retention and cooling air temperatures. Neckarstadt-West therefore comes to the fore to implement climate adaptation measures – another reason why the district was chosen as the suitable city lab for the SONNET project.

The **Climate Action Agency Mannheim** (see for more details the next chapter) offers many funding programmes for promoting green energy and energy efficiency. Some of the Agency's topics in the last years were:

"CliMAtactive schools"

The City of Mannheim sponsors the project "CliMAactive schools" (= "kliMAaktive Schule") free of charge for all Mannheim schools (cp. Figure 3). This involves the topics energy saving, efficient energy use and the use of renewable energies. However, in addition to this, mobility, food and consumption play a significant role as well. As part of the project, students learn about the impact of these different topics on climate and alternatives to a climate-friendly life. They put their energy, nutrition, consumption and mobility habits to the ecological test and develop their own ideas for more climate protection at their school. Several modules, ranging from climate change to sustainable consumption are offered, each adapted to lower, middle and upper grades, and offer the opportunity to consider the topic of climate protection in an integrated and interdisciplinary way. Many educational institutions in the Neckarstadt-West neighbourhood have been making use of this municipal service for years, and the number is steadily increasing.

Figure 3: CliMAactive Schools (source: Climate Action Agency).

"FlurfunkE"

The City of Mannheim has set itself the goal of improving the CO_2 balance of the city administration in the long term. In addition to structural and technical measures to increase energy efficiency, this also includes the active involvement of employees. In March 2015, the Climate Action Agency launched the "FlurfunkE", as a motivation and action program within the city administration (cp. Figure 4). Here, employees receive tips and advice on how they can make their personal contribution to saving energy and thus to climate protection in the office, and of course also in their free time. "FlurfunkE" intends to inspire enthusiasm for climate protection and energy conservation and to ensure, without pressure, that energy costs and CO_2 emissions are sustainably reduced through a change in user behaviour. Whether at the computer, in the printer room or in the kitchen: Every day, numerous large and small electric devices are in continuous use in the office. Additionally, there is the consumption of heating energy and water. This is a great example of cross-departmental networks of positions and people engaged in sustainability and energy transitions.

Figure 4: "FlurfunkE" (source: Climate Action Agency).

"Spare your car!"

"Spare your car!" (= "Spar dir dein Auto!": 25 households from all districts of Mannheim left their cars parked for 3 months in the form of a contest. In return, they received free train tickets and a cargo bike for one week. In addition, the participating households were able to use stadtmobil's CarSharing service and the VRNnextbike bikes (mobility station) without a basic fee. With this campaign and a lot of social media attention (films, articles, etc.), the Climate Action Agency wanted to inspire other Mannheim citizens to make their contribution to climate and environmental protection. In Mannheim, everything is located within walking distance, by bike or by bus and train. Less car traffic ensures less noise, better air quality and more urban space for people rather than cars.

Energetic urban renovation program

Since 2013, the Climate Action Agency and the MVV Regioplan manage the energetic urban renovation program in several districts throughout the city. This program is financed by the federal state of Germany, called KfW 432. It contains energy consulting and incentives for house owners, sustainable city development, mobility as well as sustainable consumption. The development of the concepts engage residents and are finally being implemented within three to five years (cp. Figure 5). This also involves playful competitions around topics such as energy use, often to change behaviour and create learning experiences. So far, three districts have benefitted from the energetic urban renovation: Käfertal, Friedrichsfeld and Gartenstadt. Neckarstadt-West is highly suitable as next district for this program.

Figure 5: Sanierungsmobil Baden-Württemberg (source: www.zukunftaltbau.de/unternehmen-und-kommunen/gute-beispiele/sanierungsmobil/).

"Make your roof ready for the sun!"

The City of Mannheim promotes solar systems for property owners through the Mannheim Climate Action Agency. It is part of a regional solar network consisting of the Climate Action Agency Mannheim, the Climate Protection and Energy Consulting Agency Heidelberg Rhine-Neckar, the Energy Agency Neckar-Odenwald, the Metropolitan Region Rhine-Neckar and the BUND Heidelberg. Their goal is to promote solar energy in the region by information, consulting and regular knowledge and experience exchange. "Make your roof ready for the sun!" (= "Mach dein Dach sonnenreif!") is a local promotion and funding programme.

"Mannheim makes room for green"

One of the measures of the climate adaptation plan was to create a promotion and funding program on greening roofs, facades and unsealed areas. The Climate Action Agency provides consulting and financing. The campaign "Mannheim makes room for green" ("Mannheim macht Platz für Grünes!") promotes to be adjusted to green from head to toe. To mark the start of the green campaign, the Climate Action Agency rolled out 80 m² of lawn on the otherwise sealed grey market square one morning and surprised people with 400 pots of herbs (cp. Figure 6).

Figure 6: Greening the market place (source: Climate Action Agency).

1.3 Main players in Neckarstadt-West and closely related to Neckarstadt-West

The City of Mannheim closely works together with the **Climate Action Agency Mannheim** which was established in 2009 as a non-profit organisation of the City of Mannheim[8]. The City of Mannheim in cooperation with the Climate Action Agency offers many funding programs: for energy-efficient renovation, greening of roofs and facades and for unsealing as well as for the installation of solar systems. In 2020, the Agency has given 600,000 Euros in co-funding to the citizens' climate and greening projects. The team creates innovative campaigns and actions to translate the city's strategy. The city understands itself as a co-creation administration and the Climate Action Agency is providing the structure and culture of enabling co-creation processes (often, they are closer to the citizens than an administration can be at first). The Agency provides information, activities and competitions for closing the gap between awareness and action.

In the diverse neighbourhood of Neckarstadt-West, many other initiatives are highly active as well, including organisations, associations, and individual citizens. Many of the major initiatives were already active in the neighbourhood before starting SONNET. During the city lab these organisations' structures and networks were useful for developing the project.

The **Neighbourhood Management Neckarstadt-West** was established in 2004 and is another important initiative in Mannheim. The City of Mannheim has established Neighbourhood

[8] for more information see: *www.klima-ma.de*

Management in all neighbourhoods with special development needs. The Neighbourhood Management is part of a strategic district development politics that aims to improve and stabilize living conditions in disadvantaged neighbourhoods. The activation of the inhabitants by participation is its central approach. The Neighbourhood Management informs, consults, mediates and supports inhabitants in all fields of life in the neighbourhood. It engages for all inhabitants of all genders, religions or nationalities. Sustainability is one of the main principles. Target of the Neighbourhood Management is that all projects and activities lead to a long-term positive transition in the neighbourhood. Therefore, the Neighbourhood Management is an important initiative in Mannheim and in Neckarstadt-West that engages in the social transition in the fields of "peacefully living together", "education", "residential environment", "business" and "art and culture"[9].

The initiative **Campus Neckarstadt-West** is an extracurricular education, leisure and supervision offer for primary school children in different locations in Neckarstadt-West. Lunch, homework, music, arts, sports and other activities are part of the program. The children are strengthened in their social behaviour and learn a tolerant living together. The goal is to improve the children's chances in education and participation. The program is free of charge and aims to reach children from all population groups. Initiatives, volunteers and helpers support the project. It is conducted by a cooperation between the City of Mannheim and the MWSP[10].

The **MWS Projektentwicklungsgesellschaft mbH (MWSP) is a project development company** that aims to improve living conditions and social living together in Neckarstadt-West. It improves the liveability of public spaces, supports social institutions as well as local businesses in the district. All projects aim to a just transition by increasing social, ecological and economic sustainability in the neighbourhood[11].

The **GBG – Mannheimer Wohnungsbaugesellschaft mbH** is - with 4,000 employees and around 19,000 apartments - the largest municipal housing society in Baden-Württemberg. It offers housing space for around 15% of Mannheim's residents. It also manages building projects for sustainable urban development by order of the City of Mannheim. The GBG owns many of the residential buildings in Neckarstadt-West and therefore plays an important role in the energetic urban renovation of municipal owned apartments. They are also an important stakeholder due to their good connection to tenants who can be drivers of social innovation.

The **Umweltforum Mannheim** (Environmental Forum) was established in the 1980s. It was the association of Greenpeace and two other environmental organisations - BUND e.V. (Bund für Umwelt und Naturschutz Deutschland, i.e. the registered association Federation for the Environment and Nature Conservation Germany) and NABU (Naturschutzbund Deutschland, i.e. Nature and Biodiversity Conservation Union Germany). Today, sixteen environmental organisations are members. The Umweltforum Mannheim engages in improving environmental and climate change issues in Mannheim. Therefore, they campaign for a just energy transition,

[9] for more information see: *www.mannheim.de/de/stadt-gestalten/quartiermanagement/quartiermanagement-neckarstadt-west*
[10] for more information see: *www.campus-neckarstadt-west.de/konzept/*
[11] for more information see: *www.mwsp-mannheim.de/lokale-stadterneuerung/neckarstadt-west/#handlungsfelder*

transforming from coal generated power and heat to renewable energy sources. The Umweltforum Mannheim is especially active in Neckarstadt-West with topics of energy transition, education, greening and biodiversity[12].

Overall, there are many initiatives that aim for social justice, the improvement of urban green structures and the technical energy transition in Mannheim and Neckarstadt-West, but only few address the social component of the energy transition with a co-creation approach.

1.4 Understanding of SIE for SONNET

Developing the Mission Statement "Mannheim 2030" (cp. Chapter 1.1) was the major factor for defining SIE for the City of Mannheim. The seven strategic goals are based on the 17 UN sustainable developments goals (SDGs). The broad participation process included citizens, experts, scientists and the city administration to decide on how to translate the SDGs into a local strategy including SIE. The process of the mission statement has demonstrated social innovation itself, while highlighting the deepening and internalization of social innovation in governance and participation processes. This served as a good basis for the SONNET project.

Beyond the SONNET activities, Mannheim understands itself as a co-creative administration that integrates citizen participation as an important component in its activities. Since the mission statement process the **Koordinierungsstelle Bürgerbeteiligung** (Coordination Department for Civil Participation) organises the process around civil participation. Major projects are released in the **Vorhabenliste** (intention list, since 2018) twice a year to inform citizens. Additionally, the online platform **Mannheim-gemeinsam-gestalten** (creating Mannheim together, since 2019) offers for most of these projects the possibility for all citizens to participate in the process by contributing in surveys, assessing projects, and sharing their ideas of city development. All results are documented online on the platform. The exact process of participation is regulated in the **Regelwerk Bürgerbeteiligung** (Policy of Civil Participation, since 2018). It determines the tasks of the involved stakeholders – citizens, politics, and administration – and describes the different types of participation. The Regelwerk ensures the success of participation and improves the quality of the processes and results[13].

Within SONNET, Mannheim's attempt was to develop, test and investigate an **organisational governance process**, which includes **stakeholder processes** (i.e. how the process needs to be designed in order to create a public co-designing and mobilizing decision-making process) as well as **inner-administrative processes** (i.e. how the city administration has to be shaped and to act in order to enable the transition process) and **innovative methods** (e.g. Design Thinking), that can effectively support social innovation in energy transition. The City of Mannheim provided two crucial research opportunities: first, to study more **difficult preconditions** i.e. being connected to an industry intensive region for sustainable energy transition and the realization of the lab in a (socially) challenging neighbourhood of Mannheim (municipal district: Neckarstadt-West (NW))

[12] for more information see: *www.umweltforum-mannheim.de/*
[13] for more information see: *www.mannheim.de/de/stadt-gestalten/buergerbeteiligung/regelwerk-buergerbeteiligung/angebote-und-massnahmen; www.mannheim-gemeinsam-gestalten.de/vorhaben; www.mannheim-gemeinsam-gestalten.de/; www.mannheim-gemeinsam-gestalten.de/informationen*

and second, to study SIE within a city that is **committed to sustainable energy** and is active in developing **citizen engagement** and social innovation activities. With a socio-political focus, the city administration of Mannheim aimed to **develop novel urban governance structures and practises for enabling social innovation in the energy sector**. Mannheim's task was to make SONNET known in the neighbourhood, to find and initiate further opportunities for cooperation, to involve multipliers (known and previously unknown) in the project and to provide initial ideas for activities suitable to initiate local SIE. The approach makes use of local participation and citizen engagement.

During the city lab process, Mannheim incorporated the definition of SIE by Sarah A. Soule, Neil Malhotra and Bernadette Clavier: *"Social innovation is the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress. Social innovation is not the prerogative or privilege of any organizational form or legal structure. Solutions often require the active collaboration of constituents across government, business, and the non-profit world"*[14]. In the context of Neckarstadt-West, the exchange of ideas and values amongst residents and initiatives should come to the fore in order to stimulate shifts in roles and relationships in the energy transitions within the neighbourhood. The goal is to initiate new organisational structures by public support to further stimulate private investments and new ideas for energy transitions in the district for social innovations.

[14] source*: www.gsb.stanford.edu/faculty-research/centers-initiatives/csi/defining-social-innovation*

2. SONNET City Lab process in Mannheim

2.1 Setting the stage and challenge structuring

Selection of the neighbourhood

Mannheim had the clear mission from the beginning to focus on the local energy transition in the Neckarstadt-West district. It was also and additionally politically decided that the urban, creative and active neighbourhood Neckarstadt-West (cp. Figure 7 & Figure 8) should be investigated more closely within the framework of an energy study as well as possible participation formats. These preliminary studies were completed in 2020, and their findings and objectives were integrated and pursued in the SONNET project work. The strong socio-political focus in Neckarstadt-West strongly supports the questions of the SONNET project and the aim of the Mannheim City Lab.

Figure 7: Demarcation of the district Neckarstadt-West (source: City of Mannheim).

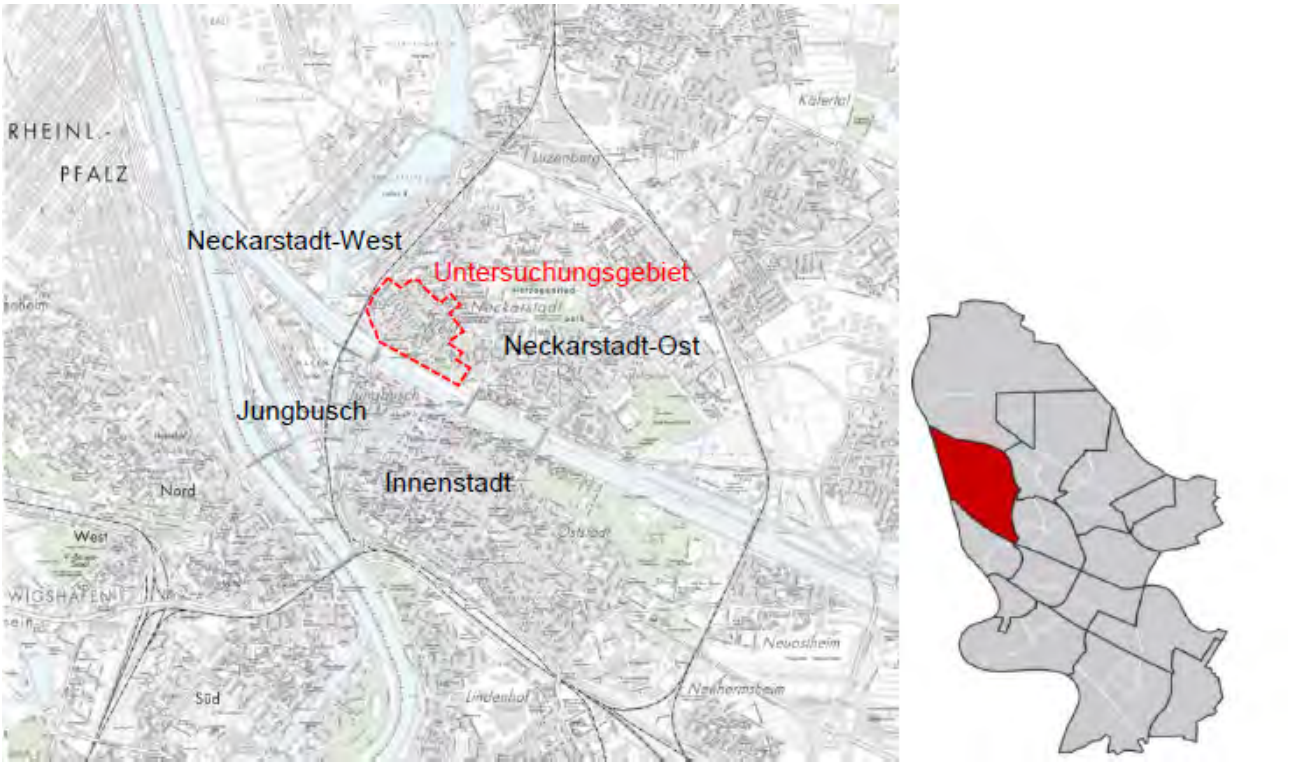

Figure 8: Location of the district Neckarstadt-West in Mannheim (source: City of Mannheim).

A closer look into Neckarstadt-West – status quo and challenges

Neckarstadt-West is one of the 38 districts of the City of Mannheim. It's area is around 9.94 km² and counts around 21,300 inhabitants. The district is characterized by perimeter block development from the early 20th century with residential buildings of up to four floors. Many of the buildings have elaborated and decorated facades. 40 % of all buildings are declared historic monuments (cp. Figure 9). Moreover, residential buildings of up to three floors from the 1920s and after World War II buildings from the 1950s shape Neckarstadt-West as well (cp. Figure 10). 73 % of the buildings are residentially used, 3 % are business used, 22 % are mixed residential and business buildings. However, many of these old buildings need (energetic) renovation.

Figure 9: Residential building declared historic monument (Gartenfeldstrasse) (left); protestant church (right) (source: City of Mannheim)

Figure 10: Four representative types of buildings in Neckarstadt-West (source: MVV Regioplan)

60% of the residents of Neckarstadt-West are 25 to 64 years old. Every ninth person is 65 years or older. The share of children, teenagers and young adults is together 28.8%. The comparison of the age distribution with the entire city shows significant differences: especially a lot of young people live in Neckarstadt-West. It is expected that the population grows by a rate of 6% until 2038. 60% are single-person households, over 25% of the households with children are single parent. Around 69% of the residents of Neckarstadt-West are people with migration background, the highest rate of all districts in Mannheim. A high percentage of the migrants from EU countries are from Bulgaria and Rumania, the migrants from so called EU2 countries. Over 25% of the EU migrants

in Mannheim live in Neckarstadt-West. The rate of unemployment in Neckarstadt-West is 8.3%, higher than Mannheim's average of 4.5%[15].

Around 80 % of the 900 properties in Neckarstadt-West is privately owned. Traffic spaces, public spaces and spaces of public organisations such as kindergartens and schools are owned by the City of Mannheim. Other important owners are the Protestant Church (Lutherkirche) and the Catholic Church (Herz-Jesu Kirche). Several housing societies (e.g. GBG Mannheimer Wohnungsbaugesellschaft mbH) and corporate building societies also own properties and real estates in Neckarstadt-West.

Neckarstadt-West is a highly densely built neighbourhood. Only few green spaces are available such as the Neckar river banks. The Neumarkt square is the centre of the district. It offers a little park with urban gardening and a playground. Overall, there are only few city trees and other small green spaces that are often used for parking. Private yards and gardens are also very rare. This shows climate-ecological impact. On hot days in the summer, Neckarstadt-West is one of the hottest districts in the city with negative effect on health. The city heat island effect is evident in the neighbourhood (cp. Figure 11).

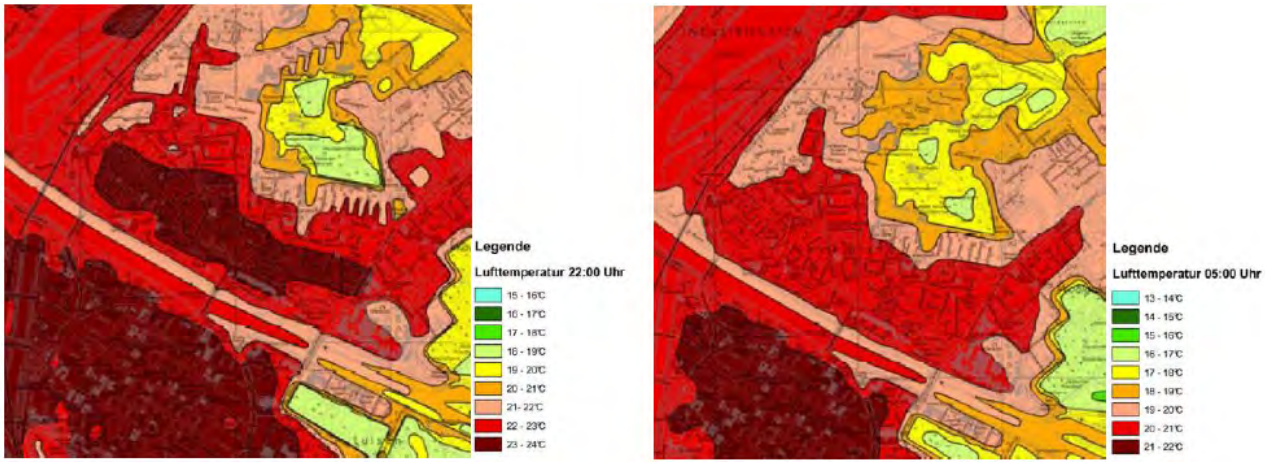

Figure 11: Isotherm map from August 2009 (22h and 5h) (source: Climate Analysis Mannheim 2010).

The energetic urban renovation in Neckarstadt-West

The Mannheim City Lab is an important step to accomplish the city's Mission Statement "Mannheim 2030" to become a climate-friendly and resilient city. As outlined in chapter 1, Mannheim has been in a transformation process for a long time. The **energetic urban renovation KfW 432**, a federal promotion program, is part of the campaign "Mannheim on climate track". This program has already been conducted in three districts throughout the city – Gartenstadt, Friedrichsfeld and Käfertal. Simultaneously with the SONNET project, the energetic urban renovation program (part A) started in Neckarstadt-West to benefit from synergies of both works.

[15] *for more information see: https://www.mannheim-gemeinsam-gestalten.de/dialoge/neckarstadt-west-auf-klimakurs#uip-1*

In 2020, the City of Mannheim mandated the local company MVV Regioplan to compile an integrated Neighbourhood Concept of energetic renovation potentials. Goals of this Neighbourhood Concept are: reduction of CO_2 emissions, enhancement of energy efficiency, establishment of sustainable city development, cooperation with locally active stakeholders, networking and support of existing project ideas, sensitization and activation of citizens and businessmen, optimization of mobility opportunities and mobility behaviour, reduction of fossil fuels as well as supply of renewable energies. The Neighbourhood Concept collected the data of the energetic status quo and demonstrates development scenarios towards climate neutrality. It further suggests specific measures for more climate protection and adaptation in Neckarstadt-West, e.g. free consulting services of public promotion programs for citizens (house restoration/refurbishment, greening, renewable energy installation etc.) as well as energy checks for tenants and education programs such as “CliMAactive Schools”.

Energy Balance in Neckarstadt-West

The Neighbourhood Concept part A shows that in Neckarstadt-West heating is the biggest sector (62%) in the final energy balance, followed by power (30%) and traffic (8%). However, in the primary energy balance it is evident that power is the largest sector (55%), followed by heating (38%) and traffic (7%). The CO_2 balance also demonstrates that power (51%) is the largest emission source, followed by heating (41%) and traffic (8%). Final energy sources are long-distance heating (44%), gas (38%), heating current (12%), heating oil (6%), and solar heat (1%). In the baseline level, there are 838 buildings with a total heated living space of ca. 427,000 m². The heated area splits into private households (90%), public sector (8%) and businesses and service (2%).

On the basis of the actual state and potential analysis in the different consumption areas, it was possible to work out in climate scenarios that in the medium term up to the year 2030 and in the long term up to 2050 there is considerable scope for the energetic renovation of the district and thus for the reduction of energy consumption and CO_2 in Neckarstadt-West. The heating sector, which is by far the largest consumption sector in the balance sheet, has the greatest potential for energy savings and efficiency (cp. Figure 12). The prerequisites for their development in the baseline are challenging against the background of the listed building stock and the heterogeneous ownership structure. In the electricity and transport sectors, the absolute reduction potentials are lower, but still make a decisive contribution to meeting the nationwide climate protection goals. For example, there is a great potential of using solar power on roofs as the potential analysis shows (cp. Figure 134). It should be noted that the private household sector can make the greatest contribution.

Figure 12: Energetic renovation need of buildings on the ground floor (blue: yes; green: no) (source: MVV Regioplan).

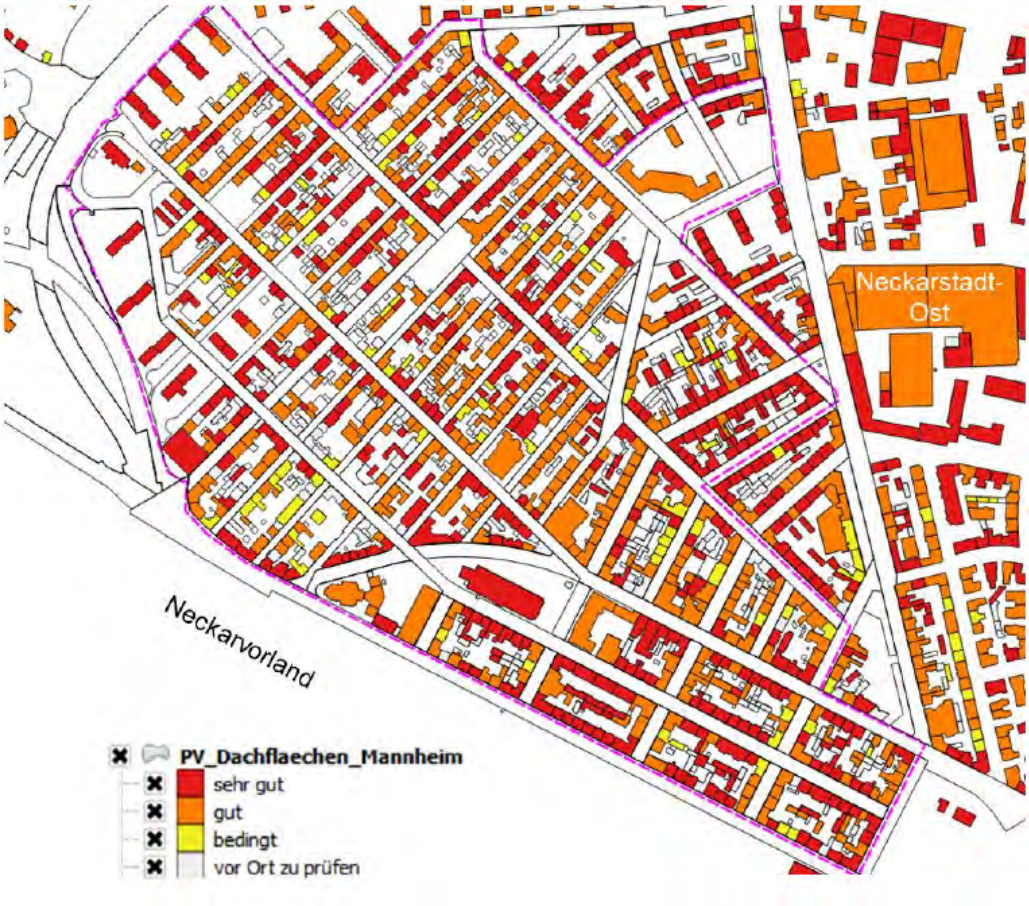

Figure 13: Suitability of roofs for solar panels (red: very good; orange: good; yellow: limited; white: to be investigated) (source: LUBW (2020), Energieatlas BW).

Energetic urban renovation management and the implementation of the SONNET City Lab in Mannheim

The results of the Neighbourhood Concept (finalized in December 2020, KfW 432, Part A) is of great value for the SONNET project to concretize measures for the city lab. From 2021 to 2024, an energetic urban renovation management ("Energetisches Sanierungsmanagement" – KfW 432, Part B) will be established in the neighbourhood Neckarstadt-West to implement the measures of the Neighbourhood Concept (grant notification received from the federal government in May 2021). This ensures the long-term implementation of the SONNET City Lab in Neckarstadt-West: integrating and further developing social innovations in energy transition on a local level. For the implementation of the Neighbourhood Concept it will be of great importance to engage the numerous stakeholders with particular interests, needs and issues individually in climate protection and sustainability in general. Topics like monument conservation and town scape imprinting, accessibility and age-based living, energy autarky, electro mobility and fair distribution of the streets for different forms of mobility emphasize the complexity of the tasks in the following years. SONNET created the innovation basis for the renewal program as it brought together the important stakeholders, initiatives, networks and multipliers within the district.

2.2 Agenda and goal(s) setting, ex-ante analysis

The goals of the SONNET City Lab in Neckarstadt-West were identified in the three design thinking workshops taking place from December 2019 to March 2020. To consider all aspects the diverse group of the Mannheim SONNET City Lab team was involved in the goals choosing process, including administration staff with the insights of inner-administrative practices, local stakeholders with their important knowledge of the neighbourhood and the academic partners from Fraunhofer ISI with their scientific perspectives. It was important that the goals of the Mannheim City Lab were embedded in the Mission Statement "Mannheim 2030", particularly implementing the chapter "Mannheim is a climate-friendly – in perspective, climate-neutral – and resilient city that is a model for environmentally friendly life and actions".

Mannheim's task was to make SONNET known in the neighbourhood, to find and initiate further opportunities for cooperation, to involve multipliers (known and previously unknown) in the project and to provide initial ideas for measures for locally functioning SIE. All of this is based on local participation and citizen engagement. For the definition of SIE and energy topic/focus in the Mannheim lab, the Climate Strategy Office organised three design-thinking workshops from December 2019 to March 2020. To include all perspectives, stakeholders from initiatives of the energy transition, multipliers from the district Neckarstadt-West as well as researchers of the SONNET project were invited to contribute: Climate Strategy Office, Climate Action Agency, Office for Economic Development, Neighbourhood Management Neckarstadt-West, MWSP, Fraunhofer-Institut of System and Innovation Research ISI.

The head of the Climate Strategy Office Agnes Schönfelder led the city lab team. She was supported by her staff members Sabrina Hoffmann, project manager for sustainable city development, from the beginning on and later by Viktoria Reith as well, project manager for climate adaptation. Employees of the Climate Action Agency (Marianne Crevon) and the Office for Economic Development (Georg Pins, Nicolas Vierling) are co-leads of the SONNET City Lab in Mannheim. This inner circle team was composed of the experts in energy transition in Mannheim. To gain further insights in the neighbourhood Neckarstadt-West, the broader SONNET team was formed in three design-thinking workshops, including additional stakeholders MVV Regioplan, a sub company of the local utility company MVV, and the Neighbourhood Management Neckarstadt-West who contributed with expert knowledge in energy issues and specific neighbourhood knowhow. Moreover, the MWSP, the local project development company, was identified as a multiplier for Neckarstadt-West.

At the first meeting (02.12.2019), the participants clarified cooperation possibilities, interests and suggestions for the implementation of measures/ideas. At the second workshop (20.01.2020), multipliers developed initial proposals for measures/ideas to implement the energy transition in Mannheim and especially in Neckarstadt-West (cp. Figure 14). At the third appointment (13.03.2020), multipliers finalized the proposed measures in order to present them to the public in Neckarstadt-West at the large project kick-off in June (had to be postponed to December 2020 due to the corona pandemic).

Figure 14: Results from Design Thinking Workshops 1 & 2 (source: City of Mannheim).

The Design Thinking workshops took place simultaneously with the development of the Neighbourhood Concept Part A. Therefore, first potentials and the energetic status quo were incorporated in the workshops. This already identified the needs and challenges (e.g. heating, power, traffic) that now had to be focused on (see chapter 2.1). In the Neighbourhood Concept and the three design thinking workshops the ex-ante analysis was conducted and laid the basis for the following experiments that will further be demonstrated in the next chapter.

2.3 Experimenting (incl. network building)

Due to the Corona pandemic, the Mannheim City Lab had to come up with alternative ways for citizens to participate in the identification of energy related issues. This included, for example, a pop-up event in a public space in fall 2020, the digital opening event in winter 2020 or the Mobile Green Room® in summer 2021. Here, too, ideas that had already been developed by a smaller group (especially in the mentioned design-thinking workshops) could be discussed and further aspects brought into the process of the SONNET project.

To ensure that less skilled and less powerful groups and persons were equally included in the process the project team had numerous individual appointments in existing networks and meetings from the beginning of the project. The City Lab team introduced SONNET and its ideas to gain active stakeholders and engaged multipliers for the project. This was especially important due to the diversity and quantity of the stakeholders in Neckarstadt-West. The goal was to involve them early on in the process, raise awareness for the potential of SIE and diffuse this knowledge

through their networks to encourage SIE. The Neighbourhood Management was identified as one of the most influential stakeholders. To involve people with low knowledge of the German language, the Neighbourhood Management accessed integration pilots (with different languages) which was of great importance in a neighbourhood with plurality of nations which is an opportunity as well as a challenge (cp. chapter 2).

Due to the Corona pandemic it was important to offer a lot of different formats of participation, to make our SONNET-project known and to encourage the citizens to become active in their own energy transition. These formats needed to be able to be conducted even in times of restrictions: digital set-ups, events in public space and in smaller groups, as well as phone calls and mails. These are further explained below:

Networking and online participation

Networking (throughout the duration of the project and intensified from April 2020)

Building up networks with central organisations in Neckarstadt-West was key to the SONNET City Lab in Mannheim. Therefore, many appointments and meetings were held with the networks education and living environment, the Consumer Centre, Campus Neckarstadt-West etc. to engage them into the project. Since August 2020, the Consumer Centre - in cooperation with the Climate Action Agency - offers free consultation hours for the residents on the energy questions. The exchange with Campus Neckarstadt-West was also very successful as they were an important partner for spreading the KliMAthon App. Furthermore, the implementation of regular online meetings with the LOS of the MWSP and the Neighbourhood Management were essential to develop new ideas for SIE and to spread them to the residents. By this, people were already prepared for the opening event.

Mannheim Gemeinsam Gestalten (since January 2021)

Since January 2021, the information about the SONNET project and the energetic urban renovation management was published on the online platform “Mannheim gemeinsam gestalten” (engl.: “Shaping Mannheim together”) under the slogan “Neckarstadt-West auf Klimakurs” (engl.: “Neckarstadt-West on Climate Track”). It shows the process of the project, notifies citizens about upcoming events and offers the possibility to leave comments or ideas. The contact persons of the project are also named to offer low obstacles to get in touch[16].

[16] for more information see: *https://www.mannheim-gemeinsam-gestalten.de/dialoge/neckarstadt-west-auf-klimakurs#uip-1*

Events and experiments

Three Design-Thinking Workshops (December 2019 - March 2020)

In exchange with the active stakeholders from Neckarstadt-West the agenda and the goals for SONNET were set in three design thinking workshops. The stakeholders were important multipliers to take the ideas of SIE into the neighbourhood (cp. chapter 2.2).

Pop-Up Event (September 2020)

In September 2020, the City Lab team organised in cooperation with the Climate Action Agency, MVV Regioplan and the Neighbourhood Management a pop-up event in a public space on the Neumarkt square to show presence despite the pandemic (cp. Figure 156). It took place even before the opening event because it was unclear when the opening event could be conducted due to Covid. The pop-up event allowed to sensitize residents for SIE, to discuss the results from the design thinking workshops and to collect more ideas for SIE in the energy transitions in Neckarstadt-West that could be used for the opening event. The topics were energy, sustainability and better living in the neighbourhood. About 15 people participated in the event.

Figure 15: Impressions from the pop-up event on the Neumarkt (left) and ideas shown on a map of Neckarstadt-West (right) (source: MVV Regioplan).

SONNET Opening Event (December 2020)

As Corona intensified over the winter, the Mannheim City-Lab of the SONNET project was finally launched at a virtual meeting hosted by the City of Mannheim and the Fraunhofer Institute for Systems and Innovation Research (ISI), themed as neighbourhood talk "Full of energy! Innovative ideas for the energy transition in Neckarstadt-West" on December 16th 2020. Due to the pandemic, this event had to be postponed several times. More than 50 people, including representatives from a range of local organisations (e.g. MWSP, GBG, Pflege im Quadrat, Neighbourhood Management, Consumer Centre, Campus etc.) and other interested citizens, joined the event to hear from the City Lab implementers as well as other presenters about what activities are going on in the Neckarstadt-West neighbourhood (cp. Figure 167).

The delayed kick-off event brought together participants interested in social innovation in energy transitions to discuss and propose actions Mannheim can take to achieve more local actions to produce energy sustainably, to use energy sparingly and to carry the idea of the project into society. These topics were developed in the preparatory design thinking workshops and during the pop-up event and offered the basis for the neighbourhood talk.

Figure 16: One part of the participants in the virtual group photo (source: City of Mannheim).

The SONNET project was introduced by the program manager for Mannheim, Agnes Schönfelder of the City of Mannheim, who shared Mannheim's latest activities as a city of innovation and transformation. Sabrina Hoffmann, responsible for the City Lab Mannheim, presented the SONNET project and gave an insight into the previous cooperation with the Neighbourhood Management and the project development company MWSP.

In breakout groups, active discussions were held on the topics of "environmentally friendly mobility," "promotion, education and participation," and "energy and housing" (cp. Figure 17, Figure 18 & Figure 19). The goal was to learn from the local multipliers which proposed measures and ideas for the local energy transition in Neckarstadt-West and which additional projects could be initiated.

Here is a selection of ideas put on the table: Mobility stations, Gamification: New edition of "Spare your car!" in Neckarstadt-West & local use of challenging apps, “ideas bus”, district fund/crowdfunding, children's energy camp, sample construction site “multi-family house”, pilot project for a community photovoltaics system.

Figure 17: Slide from the breakout group „energy and housing” (source: City of Mannheim).

Figure 18: Slide from the breakout group "promotion, education and participation” (source: City of Mannheim).

Figure 19: Slide from break out group "environmentally friendly mobility" (source: City of Mannheim).

Two Experiments – greening and gamification (May 2021 – August 2021)

After evaluating the results of the opening event in December 2020 (see results of the break-out groups Figure 17; Figure 18 and Figure 19 above), two experiments were chosen for the Mannheim City Lab. As the pandemic was still a limiting factor, it was important that the experiments were suitable for these conditions. Therefore, two ideas from the opening event that allowed to be held in public space as well as virtually were followed: show the benefits of urban green structures in the densely built area of Neckarstadt-West and awareness raising for energy consumption issues of the local inhabitants by the means of gamification. Both experiments allow to inform and involve people in the social aspects of energy transitions without personal contact in times of curfew and social contact constraints.

Experiment 1: Mobile Green Room®

Firstly, the **Mobile Green Room®** was installed in Neckarstadt-West for 12 weeks over the summer, from May 17th to August 10th 2021 in order to let the inhabitants experience the advantages of urban green. The Mobile Green Room® served as a prototype of greening the city. It was organised from January to March 2021 in cooperation with MVV Regioplan, the partner of the Climate Strategy Office for the energetic urban renovation, already strengthening their teamwork for the following years. One obstacle was to find suitable locations for the Mobile Green Room®: it had to be big enough for the truck to unload the Mobile Green Room®, it should be under informal social control to prevent vandalism and it should be a sealed area for demonstrating the positive effects of urban green. Finally, three suitable locations were identified: Paul-Gerhard Church, Clignet Square and Neumarkt Square (cp. Figure 20, Figure 21 & Figure 22). Panels installed on the Mobile Green Room® inform about the energetic urban renovation management, the project partners and promote the KliMAthon app.

The Mobile Green Room® was a great opportunity for local stakeholders in the energy transition to build networks in the district in public space, thereby ensuring a low obstacle for spreading

the ideas among the inhabitants. As an outdoor event location, the Mobile Green Room® offered an ideal stage for local stakeholders to promote their ideas to contribute to the local energy transition even during Covid restrictions. The following organisations participated and events took place (a selection):

- 21./23./28./30.05.2021 Church Service: sermons with reference to climate change; promotion of the environmental management of the Protestant Church in Mannheim
- 27.05.2021:Consumer Centre Baden-Württemberg
- 02.06.2021: Children´s Shop
- 12.06.2021: Protestant Community Neckarstadt: children suitable church service + information about climate protection from EKMA
- 14.06.-04.07.2021: Migrants4Cities
- 08./09.07.2021: Consumer Center
- 12.07.2021: Together against discrimination
- 14.07.2021: Community Garden Project pupils from Neckarschule
- 15./16./17.07.2021: Urban Thinkers Campus, SONNET closing event
- 21.07.2021: Information from Family Meeting with children age 0-3 ("FamilienTreff")
- 24.07.2021: KliMAthon- Finals & cleaning event
- 26.07.2021: Information event Migration Advisory Council and Neighbourhood Management
- 27.07.2021: Climate Strategy Office in cooperation with the Coordination Department for Participation: Mannheim Heat Action Plan
- 28.07./09.08.2021: Citizens Consultation Hour of the Neighbourhood Management ("Bürgersprechstunde")

The feedback from all organisations and participants was positive. They valued the opportunity of promoting their offers in public space and enjoyed the attraction of the Mobile Green Room®. The accompanying press work was done by the City of Mannheim, MVV Regioplan, the MWSP, the Protestant Church and the Neighbourhood Management. Due to the success (among others: high number of participants in individual events, positive press feedback from other organizations, visibility in the neighbourhood, direct feedback to the neighbourhood management, extensive addressing of local stakeholders) the Mobile Green Room® was extended for 2 weeks until August 27th, 2021.

Figure 20: Mobile Green Room® at Paul Gerhard Church; media event (source: City of Mannheim).

Figure 21: Mobile Green Room® at Clignet Square (source: MVV Regioplan).

Figure 22: Mobile Green Room® at Neumarkt Square (source: MVV Regioplan).

KliMAthon App

The second experiment was the introduction of the **KliMAthon App**, implementing the idea of gamification that was developed in the opening event. It motivates consumers to save energy and to live a more climate-friendly life with a number of different challenges in this field. The challenges with the action fields “Living”, “Food”, “Mobility”, “Shopping”, “Leisure”, “Holidays” and “Digital Life”, touching the different dimensions of energy transitions, were developed in cooperation with the Climate Action Agency and the start-up company Worldwatchers GmbH[17] from January to April 2021. While the Climate Strategy Office guaranteed the scientific requirements for the challenges, the Climate Action Agency considered the suitability and feasibility for the citizens and Worldwatchers implemented these ideas in the app. A lot of time was invested to adapt the challenges to Mannheim in general and Neckarstadt-West in particular. The app was promoted throughout Neckarstadt-West by the Climate Action Agency and the Neighbourhood Management by newspaper articles, posters in public space and in trams, flyers and social media (cp. Figure 23, Figure 24). Those two stakeholders are the closest to the citizens and promoting the app together strengthened their collaboration. The KliMAthon was supported by many local stakeholders and politicians.

The KliMAthon took place from June 11th to July 24th, before school holidays to also enable schools to participate as teams. The possibility of building teams was an extra feature that allowed to participate as a group and therefore also involving people with low technical skills, for instance

[17] for more information see: *https://en.worldwatchers.org/*

children together with their grandparents. Other teams were, for example, formed by school classes and businesses. The results of the KliMAthon are that overall, 506 people participated in the different challenges. Over six weeks, they together saved 28 t CO_2, thus about 55 kg per person.

Figure 23: Flyer and poster to promote the KliMAthon App (source: Climate Action Agency).

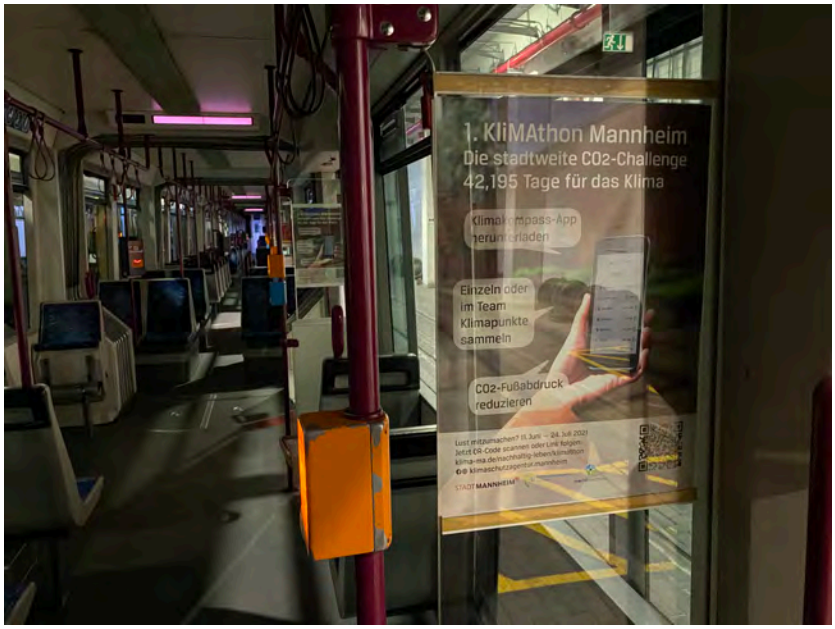

Figure 24: Promotion of the KliMAthon in trams (source: Climate Action Agency).

On July 24th 2021 the closing event of the KliMAthon took place. Participants of the app were invited to meet at the Mobile Green Room® to join a clean-up event in Neckarstadt-West together with the Surfrider Foundation. About 60 people helped cleaning the Neckar river banks as well as the streets in the neighbourhood for over two hours (cp. Figure 25). After done work an ice-cream bike offered free ice-cream for all participants at the Mobile Green Room®.

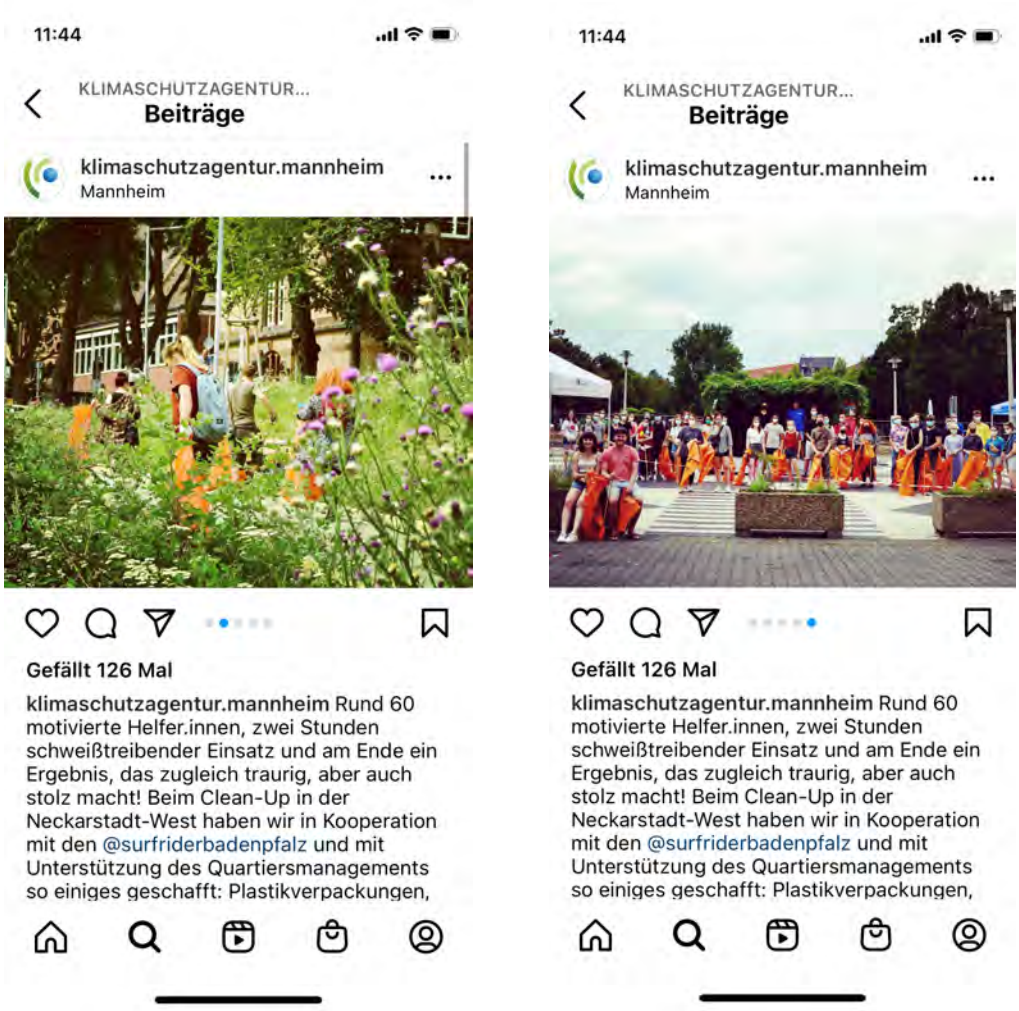

Figure 25: Instagram posts from the Climate Action Agency after the successful closing event of the KliMAthon (source: Climate Action Agency).

SONNET Closing Event – Urban Thinkers Campus (July 2021)

The closing event of the SONNET city lab Mannheim took place from July 15th to July 17th under the motto "Mannheim on Climate Track" in the context of the annual Urban Thinkers Campus (UTC). The UTC is an initiative of the World Urban Campaign of UN Habitat. The target of UN habitat is to promote sustainable development in cities. The UTC offers an opportunity for an open exchange between local institutions and citizens. It was the 6th UTC in Mannheim which was promoted under the title "Climate Action – Mannheim and the Local Green Deal". In former years, the UTC was a very popular participation event for the citizens. The UTC therefore was chosen as an ideal event to embed the SONNET closing event.

DAY1: On July 15th at the opening event of the UTC, Mannheim's Mayor Dr. Kurz welcomed the participants and introduced Harald Welzer who held a speech about "Climate neutral cities? 4 affabilities, 2 impositions and 1 truth" to prepare the participants for the following days. Moreover,

the film “27 years later” was shown and subsequently discussed by Mayor Dr. Kurz, Harald Welzer and Angelika Weinkötz.

Day 2: On July 16th a group of experts discussed online the energy transitions in cities in the urban lab No.4 (cp. Figure 26). Sabrina Hoffmann from the Climate Strategy Office of the City of Mannheim led the discussion with Anja Bierwirth from the Wuppertal Institute, Susanne Schmelcher from the German Energy Agency and Dr. Robert Thomann, manager of the sMArt City Mannheim GmbH. They all gave short presentations about their work and experiences in the energy transitions and the role of social innovations. Furthermore, they discussed the challenges of energy and heating transitions in Mannheim and its districts such as the problems of old buildings’ (energetic) renovation, financing and time issues. They agreed that it is important to focus on the decarbonisation of long distance heating in Mannheim, the extension of solar panels on roofs, and to implement climate protection in city and traffic planning.

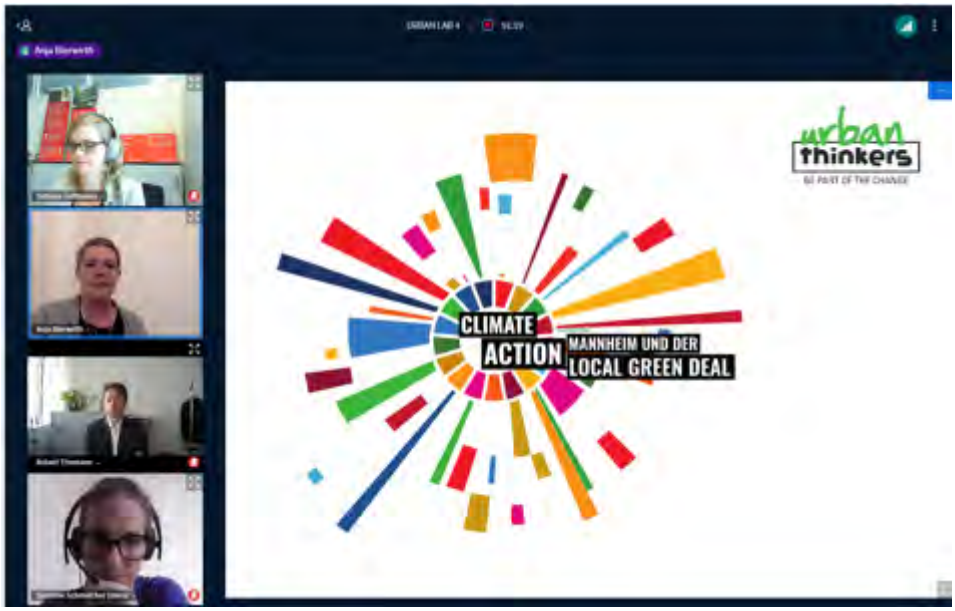

Figure 26: Group of experts discussing energy transitions in cities at the UTC (source: City of Mannheim).

Day 3: On July 17th the SONNET closing event took place at the Mobile Green Room® in Neckarstadt-West (cp. Figure 27). The goal of the closing event was to collect ideas for the Climate Action Plan 2030 and how social innovation in the energy transition and the learnings from the SONNET project can be integrated. Although the event was widely spread via newspaper, social media and newsletter, only nine people, citizens from different parts of Mannheim, participated in the urban lab No.10. Thus, the closing event was by far less successful than the pop up and opening events before. However, many ideas in the action fields of “green-blue infrastructures”, “energy/buildings”, “mobility” and “consumption” were collected that will be included in the Climate Action Plan 2030 and in the continuation of the SONNET project by the urban energy renovation management over the next three years (at least).

Figure 27: Closing event at the Mobile Green Room® (source: City of Mannheim).

Continuation of the SONNET project

During the intensive activities in Neckarstadt-West and the development of the Neighbourhood Concept of the neighbourhood (KfW 432 - Part A)[18] it became clear that the networks and engagements have to be implemented long-term in order to help the district to become climate neutral. As the SONNET project showed, it is important to use existing frames and stakeholders to initiate SIE in Neckarstadt-West. In May 2021, the City of Mannheim received the acceptance of the KfW for the financing of the urban energy renovation management that will be implemented over the next three years, with an option of extension for 2 more years. This allows a recruiting of one employee that manages the process and offers consultation in Neckarstadt-West.

[18] for more information see: https://www.mannheim-gemeinsam-gestalten.de/dialoge/neckarstadt-west-auf-klimakurs#uip-1 and https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Kommunen/F%C3%B6rderprodukte/Energetische-Stadtsanierung-Zuschuss-Kommunen-(432)/

3. EVALUATION

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2.4 Introduction

While the first section of the report concentrated on describing the process and the Mannheim context, in this second part of the report, we evaluate the city lab process and its activities with regard to their contribution to the specific aims of the Mannheim city lab and furthermore with regards to the overall aims of the SONNET project. We start with explaining how the evaluation process was designed in relation to the aims of the city lab and the challenges of evaluating the city lab. We furthermore introduce our evaluation criteria and the empirical material the evaluation is based on.

The goals of the Mannheim city lab as stated in the SONNET project proposal were **to develop novel urban governance structures and practices for enabling social innovation in the energy sector**. During the implementation of the city lab, these overall objectives were operationalised (see chapter 3) and this operationalisation was readjusted throughout the processes in order to adapt to the changes in needs encountered during the city lab process. This process of readjustment is described in the following chapter (3.1. Ongoing evaluation of the Mannheim City Lab) in more detail. The SONNET city lab Mannheim finally addressed the following aspects of achieving a local energy transition which were used to assess the goal attainment and the effects of the city lab:

- Mobilising existing professional stakeholders in Neckarstadt-West for topics related to energy transitions
- Eliciting possibilities for a discussion platform on topics related to climate change and energy transition in Neckarstadt-West
- Establishing a continuous dialogue between stakeholders and initiatives in Neckarstadt-West
- Raising awareness for topics related to climate change and energy transition among citizens of Neckarstadt-West and motivating citizens to engage in activities

Focus of the evaluation

The experimental character of the lab had to be taken into account when developing the evaluation methodology and has also influenced the evaluation process itself. The evaluation started with the definition of the experiments used by the city lab Mannheim, namely the two activities implemented in summer 2021 (see section 2.3. "Two experiments"). However, it became clear during the evaluation that this was too narrow a definition of experimentation. We therefore used the SONNET definition that focus on "experimenting as a process that includes two aspects: first, setting up the city lab and its overall structure and second, conducting concrete interventions and activities" (see: SONNET D4.1. Report on transdisciplinary research protocol for

six co-creating SIE city labs, p. 26). This broader definition allowed to embed each city lab activity in the overall process, a process that can be seen as experimental from the beginning.

The process was experimental insofar as no blueprint existed for the city lab stakeholders with regards to how to involve a quarter like Neckarstadt-West in a process of participatory energy transition. The choice of the municipal district of Neckarstadt-West with its very specific characteristics (social structure of its resident population and its built environment[19]) was a venture per se. While previous urban renewal activities with a focus on energy / sustainability transition had already been carried out in Mannheim, they had been implemented in districts with relatively high rates of homeowners living in detached houses and / or newly created districts. These characteristics differ from Neckarstadt-West as the district is a densely built and populated area, with few green and recreational und unsealed spaces. Furthermore, the majority of inhabitants in Neckarstadt-West are tenants that live in older apartment buildings with refurbishment needs. The population is characterised by social deprivation facing problems related to unemployment, migration and lack of German language skills, social exclusion or the like. In this context, engaging into administration led citizen participation especially on the topic of energy had so far not been prioritized. Furthermore, with regards to energetic refurbishment of a densely populated inner-city district no blueprint existed in Mannheim.

Furthermore, it was experimental as the process was open with regards to the tools, methods and to some extent the outcomes and flexible to react on unforeseen changes or to lock-in situations. At the beginning of the lab it remained unclear which approaches, tools and methods would be suitable to raise awareness for energy transition among Neckarstadt-West-citizens and to engage in a participatory transition process. The city lab was therefore a possibility to test out what would work well and under which preconditions.

Evaluation methodology

Taking into account the goals of the city lab, and its experimental character, the following **evaluation criteria were** chosen for the analysis:

- The relevance of the activities with regards to the needs of the inhabitants of the neighbourhood Neckarstadt-West.
- The coherence and embeddedness of activities with the Mannheim strategy "Mannheim on Climate Track" and the embeddedness of various non-SONNET related activities existing in Neckarstadt-West.
- The inclusiveness of the process of the city lab: this aspect was twofold and looked a) whether the relevant stakeholder in Neckarstadt-West had been included in the city lab and b) whether professional stakeholders from outside Neckarstadt-West, especially staff from different city departments had been involved in the city lab and how.

[19] for more details on the specific characteristics of NSW see chap 2.1 of this report

- The effectiveness of the lab with a specific focus on how the city lab had contributed to changing social relations, for example new networks of actors, changes in communication patterns or even new organisation structures.

For data collection and analysis we concentrated on qualitative methods as they allowed greater flexibility to adopt to the processual character of the lab and trace the development of changes. Furthermore, rather than quantitative targets, it was the relevance and inclusiveness of the city lab activities that was in focus of the evaluation and could be best assessed using qualitative methods. The evaluation criteria were translated into descriptors which should help to assess the relevance and inclusiveness of the city lab as well as to qualify the degree of changes in social relations and awareness raising for energy issues in Neckarstadt-West.

The following list of descriptors was used:

RELEVANCE

Relevance of activities & embeddedness in the local context

- Degree of suitability of the city lab's activities with regard to the needs of the city lab participants, especially in Neckarstadt-West
- Degree to which the local specificities of Neckarstadt-West have influenced the overall process implementation and the choice, design and implementation of the city lab activities.

INCLUSIVENESS

Stakeholders

- Motivation to participate in organization of the city lab
- Embeddedness of participating stakeholders in organizational structures

Reaching the target groups

- Extent to which (new) target groups have been reached
- Extent to which awareness had been raised

EFFECTIVNESS (WITH REGARD TO SOCIAL INNOVATION)

Changes in social relations

- Changes in organization / communication structures
- Changes in stakeholder constellation

Assessment of the role of SIE for the local energy transition

- Contribution to the energy transition in Neckarstadt-West and in Mannheim
- Creating a common understanding of SIE: changes in the understanding and in the use of the concept

Table 1: List of descriptors for the evaluation of city lab activities in Mannheim

Our main data collection methods were interviews and participatory observation. At the heart of the evaluation were interviews with stakeholder involved in the two activities, the Mobile Green Room® and the KliMAthon app. These interviews had been designed in a two-step process: we conducted one interview before the start of the activity and another interview was conducted at the end / after the implementation phase of the activities. This approach allowed to trace the changes in the city lab process as well as changes in social relations. Overall, 10 interviews were conducted between May and beginning of August 2021. 3 interviewees were interviewed twice (6 interviews), Furthermore, 4 additional interviews were conducted (with 1 interview including 2 interviewees).

In order to better understand the overall process of the city lab, we took into account data generated in other SONNET work packages, especially interviews conducted with Mannheim stakeholders such as SIE-actors (as part of SONNET's WP3) or members of local policy networks (as part of SONNET's WP2) in spring and summer 2020. The data was complemented by observation at different events conducted during the city lab (design thinking workshop, virtual launch events, closing event (on site event in Mannheim), informal discussion with the city staff in charge of SONNET activities as well as documents on non-SONNET related activities, especially the urban renewal program, KfW432.

Overview of data sources that have informed the evaluation

- 10 interviews with stakeholders involved in the activities of the city lab (conducted between May and August 2021)
- 5 events visited / participant observation (3 design thinking workshops, City lab kick-off and closing event)
- 10 interviews conducted in SONNET's T2.2 (policy network analysis for SIE – conducted in summer and autumn 2020, bevor the official launch of the city lab)
- 2 interviews conducted in SONNET's T2.1 (Collaborative governance arrangements for SIE – conducted in spring 2020, bevor the official launch of the city lab)
- 2 interviews conducted in SONNET's WP3 (In-depth case study analysis of SIE initiatives – conducted in summer 2020, bevor the official launch of the city lab)
- 1 online observation / participation in the Webinar "Lunchtalk for Future" with Mannheim's lord mayor (May 2021)
- Analysis of further documents related to City Lab activities

2.5 Ongoing evaluation of the Mannheim City Lab (process and experimentation)

This chapter evaluates the processes of the city lab implementation. It puts an emphasis on the changes in goals and adaptation of activities and describes the different stakeholder groups involved during the implementation. Our analysis according to three main topics:

- Tracing the development of the 1.5 yearlong city lab Mannheim process, focusing on the shifts and reorientation of objectives and the adjustment of activities;
- Assessing the (changing) involvement of stakeholder and their interaction as part of the city lab process
- Reporting on difficulties encountered during city lab implementation.

We will not describe the activities of the city lab in detail, as they are well described in the City Report (chap. 2.3.).

Development processes of the city lab

The city lab's implementation process is characterised by trials, reflexion and re-orientation of activities. Different phases of the city lab are visualized in the figure below and further described in the following section.

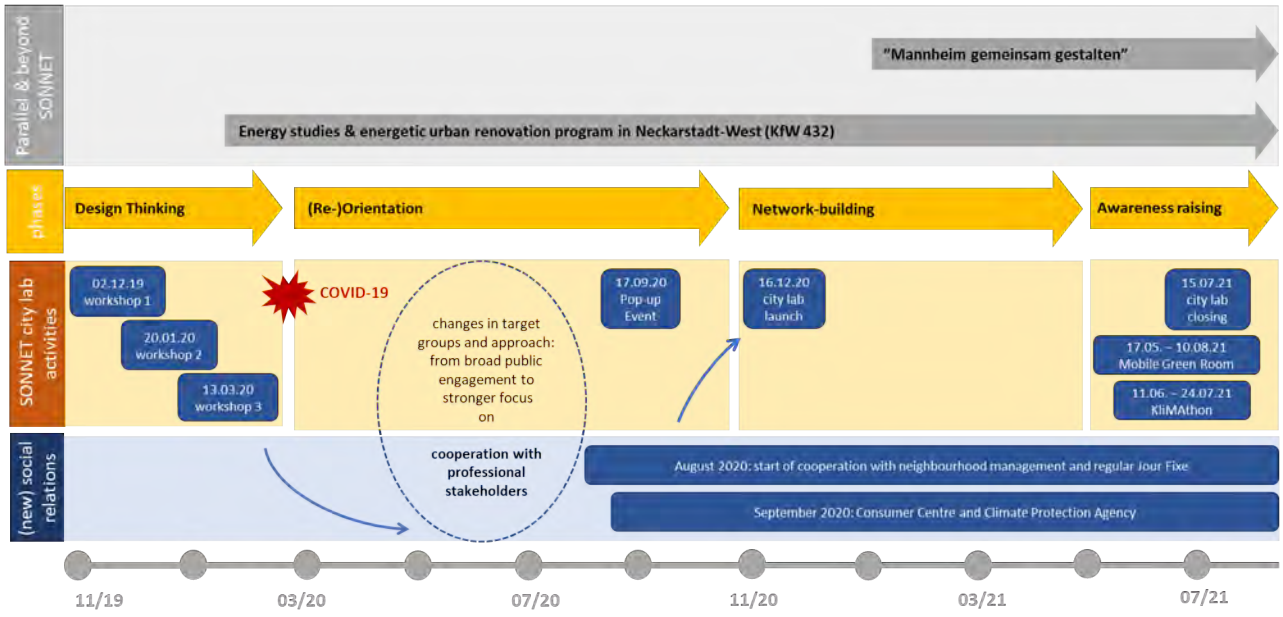

Figure 28: Overview of the city lab process in Mannheim

Phase 1: The city lab started with three **design thinking workshops** involving city administration staff and stakeholders working in Neckarstadt-West. This workshop method was seen as highly innovative and had been already tested in the district Neckarstadt-Ost, located next to Neckarstadt-West. The objectives of the design thinking workshops in Neckarstadt-West were to bring relevant stakeholders together, all working on topics relevant to the energy transition but working on different levels and departments of the city administration, and to develop activities to be implemented in Neckarstadt-West.

Phase 2: The first Covid-19 pandemic induced lock-down entered into force a couple of days after the last design thinking workshop, hindering further work of the workshop participants. While

the Covid-19 pandemic was surely a disrupting event changing the priorities and possibilities of stakeholders involved in the workshops, it became obvious in summer 2020 that the development of concrete activities out of the workshops would require more time than the city lab offered and the broader engagement of diverse stakeholders. The Covid-19 induced break was a possibility to **re-think** the initially planned process, and to take a step back in the processes: After introducing the topic of the city lab and getting to know the neighbourhood better in terms of its potentials and difficulties for SIE, it had become clear that the mapping and involvement of locally organized stakeholders interested to collaborate on energy and broader sustainability issues in Neckarstadt-West would be a crucial first step in order to successfully reach out to citizens of Neckarstadt-West and develop activities with a clear added value and impact.

Phase 3: Because of the special context conditions in Neckarstadt-West, the early involvement of local stakeholders was found to be especially important. In consequence, close exchange processes with the local neighbourhood manager (see chapt.1.3) were set up with the objective to **build up a local network of stakeholders** on sustainability and energy topics. These adjustments in objectives and the work of identifying interested Neckarstadt-West stakeholders in the summer and autumn months of 2020 resulted in the (virtual) city lab launch event in December 2020. It targeted especially professional (full-time professionals, e.g. teachers at schools, neighbourhood managers etc.) and organized stakeholders (volunteers, e.g. associations, local citizen networks) of Neckarstadt-West and gave them a new platform to exchange ideas on how to bring forward the topic of energy transition in Neckarstadt-West. As the Covid-19 pandemic hit Neckarstadt-West very hard in the winter months of 2020/21, the discussion on activities to be developed to **reach out to citizens of Neckarstadt-West** (the second SONNET objective that had so far remained in the background) were continued within a narrow group of people involved in the energy transition of Neckarstadt-West.

Phase 4: The final choice was made for two pandemic-compliant activities in spring 2021: the Mobile Green Room® and the KliMAthon app (for more detail see chap. 2.3.). Other ideas brought forward during the design thinking workshop or the launch event (e.g. a climate-camp for children or a prototype of energy efficient apartment) had to be dropped as a result of the restrictions imposed by the Covid-19 pandemic. These activities might be picked-up as part of the further work in Neckarstadt-West beyond the SONNET project.

All SONNET events (such as related to the Mobile Green Room® or the launch and closing event) and activities (especially the KliMAthon app) were used to widen and deepen the network of partners in Neckarstadt-West. The SONNET city lab was from the beginning embedded into other city activities related to the topic of energy and sustainability transition. On the city level this is the strategy "Mannheim on Climate Track" and several activities related to energetic refurbishment (greening of roofs of city buildings and a funding programme for greening of facades) and the citizen participation activities (organized and moderated through the platform "Mannheim Gemeinsam Gestalten"). In Neckarstadt-West, SONNET joint forces with the energetic urban renovation plan of the district (funding as part of a German funding programme KfW432, see more in detail chapt 2.1.) for which the proposal was developed during 2020. Exchange between these different projects was steered by the Climate Strategy Office of the City of Mannheim and in a newly created jour fixe. This Jour Fixe is a regular meeting between the main responsible actors of the projects which are: the Climate Strategy Office; the Climate Action

Agency, MVV Regioplan GmbH, the neighbourhood Management NSW and the local urban renewal-group of the urban developer MWSP.

Stakeholders involved in the SONNET city lab and changes during the implementation

At an early point of its implementation, the Mannheim city lab re-evaluated its initial goals and went through a process of goal readjustment. The phase that followed was characterised by network building. This included also a shift in target groups (see also the figure 29). Especially reaching out to the broad public i.e. citizens of Neckarstadt-West went further into the background and the network formation with professional stakeholders was prioritised (see below for an exact definition) of professional stakeholders.

Figure 29 illustrates the different stakeholders involved in the city lab Mannheim and sketches the changes in target groups in the course of the lab.

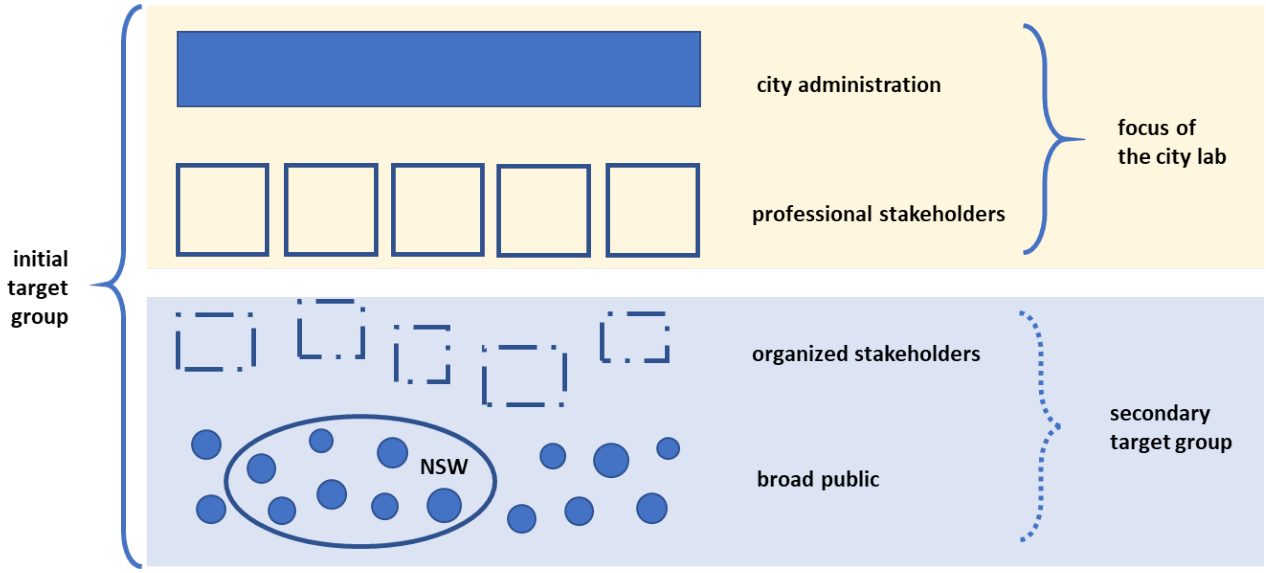

Figure 29: Overview of stakeholders involved in the SONNET city lab Mannheim

Cooperation with professional stakeholder

As described above, the design thinking workshops were a good method to start the discussion in the neighbourhood but proved less suitable for developing activities to be implemented in the neighbourhood and to involve citizens. The initial idea to test new participatory methods had to be dropped in the course of the city lab. Also the citizen's participation could not start straight forward. Instead a focus had to be put on getting to know existing structures of Neckarstadt-West, e.g. the interest of local stakeholders, already existing initiatives that could be included or successful ways of making energy transitions relevant for the neighbourhood. Consecutively network building with professional stakeholders in Neckarstadt-West and finding multipliers and mediators for the topic had to be prioritized. Neckarstadt-West as a dense inner-city

neighbourhood has already a lively scene of associations, although only few initiatives on the topic of energy exist.

An important multiplier and networker for connecting SONNET to existing activities in the district was the neighbourhood management. The task of the Neighbourhood management is to help establish local networks, especially in disadvantaged neighbourhoods. While a local Neighbourhood management in Neckarstadt-West existed for a longer time, the neighbourhood manager currently in charge took up her position in summer 2020. Hence, she was not involved in the first phase of the city lab, especially the Design Thinking Workshops. In the course of the city lab, the neighbourhood manager played a central role for the identification, mobilising and federation of Neckarstadt-West stakeholder around climate change, sustainability and energy issues. Her aim and work focus is to look broadly and be open to all sorts of interested stakeholders. This process is still ongoing, but has considerably gained speed in summer 2021 with the implementation of the two activities: Green mobile Room® and KliMAthon app.

As the process of network generation and "setting the stage" was explorative it started with stakeholders from administration departments and well-known local stakeholders. In the course of the processes, the network was broadened and included associations, initiatives, action groups and religious communities. During the city lab, the stakeholder involvement relied heavily on stakeholders that were willing and pro-activity interested in engaging around the topic of energy and sustainability transition in Neckarstadt-West. As the process moved further and more activities took place (beyond the SONNET project time) questions how to deal with contestation and the inclusion of stakeholders opposing the ideas of energy transition or certain forms of institutionalisation will need to be taken into account. Due to Covid-19 pandemic some stakeholders, such as schools, were not able to participate to the desired extent. While the lengthiness of mobilizing organized stakeholders and establishing this network had been underestimated, a positive surprise was the number of interested stakeholders willing to engage and join forces on the topic of sustainability transition in Neckarstadt-West. The interview partners mentioned on several occasion that introducing sustainability as topic and citizen's participation in Neckarstadt-West had a big potential to fail. Energy transition was a relatively 'new' topic to Neckarstadt-West, which means that it so far has not been in focus of local activities. Although there had been a few stakeholders and sporadic activities related to energy transition, only very limited exchange and meeting platform for activities existed.

By nature, the stakeholder identification process is not finalised yet. The SONNET project has provided the possibility to kick-off this process of stakeholder identification and mobilisation. The first impulses to engage in this process came from the city administration, in particular from the city's Climate Strategy Office and SONNET city partner. They see their role as initiators of the mobilisation process and as enablers, e.g. when it comes to link with other city departments.

Involving a broader public and citizens of Neckarstadt-West

With the Mobile Green Room® and the KliMAthon app, two activities have been designed to raise awareness and involve citizens of Neckarstadt-West. However, citizens' involvement was not as successful as hoped by the city.

One explanatory factor is the specific pandemic situation making public events very difficult. Public gathering was limited as a result of the Covid-19 situation and hampered the full use of the Mobile Green Room®. Requirements for hygiene concepts not only created extra work but also created barriers as participants had to register beforehand to an event and spontaneous gathering were not possible. Furthermore, the short period for preparation of the Mobile Green Room® and the app (March-May 21) left not enough time for a wide-ranging communication over a broad variety of communication channels into the neighbourhood. The Mobile Green Room® was set up initially for 2 months (mid-May-mid-July 2021) before being extended by a full month. The timing in summer (May-August 2021) meant that some activities had to take place during school holidays resulting in less possibilities for schools and youth organisations to plan events using the Mobile Green Room®. One of the learnings of the lab that many of the interviewees described was that reaching out to citizens often takes more time than expected. Furthermore, the role of multipliers liaising with the citizens was revealed as crucial. Due to pandemic restrictions, it was difficult to integrate important multipliers especially schools or local initiatives. Those multipliers were busy to adapt to the needs of the new situation, such as home-schooling or organisation of vaccination events.

On a positive note, the SONNET team managed to test with the Mobile Green Room® and the app two activities aiming at reaching out to and involving citizens in times of physical contact restrictions. Especially the 'Mobile Green Room®' was designed as a platform that offered the possibility to promote activities in the neighbourhood in a low-threshold way. Interviewees reported that the Mobile Green Room® was well accepted by the local population. It was used as recreational area and as space for a spontaneous gathering. One concern of the organizers had been that the Mobile Green Room would be deliberately destroyed. However, no vandalisms was reported. The Mobile Green Room® had been accepted and appreciated by the citizens. Furthermore, the Mobile Green Room® proved to be a good possibility to engage in collaboration with new local stakeholders, in particular the protestant church and the association "surfriders" (an association that advocates for the protection of rivers and lakes).

There are other factors, however, that should not be overlooked. They are linked to the specific situation of Neckarstadt-West with a socially deprived population for which energy transition is not seen as the most priority topic by its citizens (especially during the Covid-19 pandemic). In order to reach out to non-interested citizens, the interview partners would have needed more time to adequately communicate the events around the Mobile Green Room® and the KliMAthon app and develop strategies how to make the topic more relevant for local stakeholders. Also the translation in different languages for reaching out to non-German speaking inhabitants proved to be crucial for the neighbourhood. As a learning from the city lab, this should be picked up in activities beyond SONNET. Closely related to the specific local context was the difficulty to introducing a new topic of so far less priority in the neighbourhood without playing it off against other pressing needs of the neighbourhood. Energy transition is still today a contested topic in Neckarstadt-West, as it is perceived as a topic of interest especially for wealthy people with a supposed higher CO_2 footprint than the majority of Neckarstadt-West residents. As a reaction, SONNET communication and the activities targeting the Neckarstadt-West citizens broadened the focus and used climate change and sustainability as framework under which also pressing topics of the neighbourhood, especially green spaces and mobility could find its place.

Embedding the lab in the local context and difficulties encountered during the implementation

Obstacles leading to changes in the overall city lab process were already described in the previous section of this report (development processes of the city lab). However, further factors influenced the implementation of the city lab. One example was the fact that the activities were related to an EU project. According to the SONNET city lab team, this sometimes created the association of something abstract that is not directly related to the real life conditions in Neckarstadt-West. In addition, the rather abstract topic around SIE created challenges for embedding activities locally. Therefore, instead of framing activities as SONNET-related, activities were often combined with already existing activities and activities linked to broader processes in order to underline the relevance of these actives for local development. As mentioned above, the SONNET city lab Mannheim took a broader focus beyond energy because topics around sustainable consumption or mobility were more likely to be of interest for citizens. One success of the embedded strategy in Neckarstadt-West was that further funding as part of the KfW432 funding program could be obtained to carry on activities after the end of the project.

The Mannheim team did not hire a distinct person responsible of managing the SONNET city lab. Instead the existing staff of the Climate Strategy Office of the City of Mannheim managed the SONNET project among their other projects. Due to changes in the staff constellation during the SONNET city lab, the Climate Strategy Office of the City of Mannheim experienced a lack of personnel resources especially in the summer of 2021.

2.6 Methods evaluation

As explained in section 2.3 of this report, the city lab Mannheim made use of different methods and formats such as design thinking, gamified approaches, events in public space and networking activities with local stakeholders. For the evaluation of these methods, we differentiate between three main approaches that significantly differ in the way actors are involved in experiments and social relations were changed:

- First, methods directed towards the engagement of professional or organized stakeholders and multipliers such as administrative actors, local (business) associations and (citizens / neighbourhood) initiatives or other organized groups (including schools) – these activities targeted changes in social relations between actors in more institutionalized settings.
- Second, methods that addressed a broader participation of citizens for example through activities in public spaces – these activities targeted awareness rising and the engagement of actors that so far did not engage in energy related activities.
- Third, the KliMAthon as a form of gamification based on a digital application – this activity targeted the involvement of new actors that could be reached in their daily environments via digital engagement.

We investigate which methods worked best for which purpose and furthermore elaborate on the innovativeness of these methods.

Engagement of professional actors

Methods that were in particular directed towards the engagement of organized (including local initiatives and associations) and professional actors were the design thinking workshops, the City Lab launch event that was held virtually and ongoing networking activities such as regular meetings between stakeholders.

At the very start of the city lab process in Mannheim, three design thinking workshops were conducted between December 2019 and March 2020. Actors invited to these workshops were mainly professionals from different city administration departments that were already active in the neighbourhood Neckarstadt-West or worked on topics related to energy. In terms of the innovativeness of the method, especially the integration of different administrational actors (from different city departments but also from different organisations) in a rather open process can be seen as innovative way to kick-off activities in Neckarstadt-West as this contributed to changing social relations. Social relations changed insofar as the workshops brought together actors with relevant professional and local knowledge for the energy transition in Neckarstadt-West. Also the SONNET City Lab launch event was especially successful in involving professional stakeholders in a communication process between different stakeholders already active in Neckarstadt-West but not yet federated under the overarching topic of energy transition. Due to the Covid-19 pandemic, it took place virtually via Zoom. The event served as kick-off for several activities related to energy in Neckarstadt-West and the SONNET city lab was introduced next to other activities.

The close cooperation with local stakeholders and multipliers from early on helped establishing a “coalition of the willing” and furthermore contributed to a better understanding of local needs. The design thinking workshops furthermore allowed collecting feedback and creating legitimization for existing ideas. Networking activities with different stakeholders were continued during the city lab process and regular meetings were established (see section 2.3).

Participation activities in public spaces

Further methods focused on the broader participation of local inhabitants especially through activities in public spaces. These activities were the implementation of the Mobile Green Room® on different locations in Neckarstadt-West, a Pop-up event and the City Lab closing event. These methods were chosen in order to integrate citizens’ needs and raise awareness for energy related issues. In contrast to the formats including professional actors, these activities were less targeted towards specific actor groups.

For all activities held in public space interview partners highlighted the need to broaden the scope of questions beyond topics related to energy only in order to gain greater attention of the citizens in Neckarstadt-West. Previous experiences in Mannheim have shown that energy as a topic on its own is not enough connected to everyday life in Neckarstadt-West to attract the attention of citizens. This is especially relevant in Neckarstadt-West which is faced with social problems so that energy is often not considered the most important topic. Topics discussed focused furthermore on sustainability and climate change with a specific focus on pressing topics of the neighbourhood, namely mobility, urban green and the improvement of living conditions in Neckarstadt-West. Especially the Mobile Green Room® was describes as a suitable method to gain attention for all those topics by providing a platform for exchange. In terms of the innovativeness of the method, the Mobile Green Room® was described as one important

possibility during the times of the pandemic to create a space in public where people could meet. The Mobile Green Room® was described as an eye-catcher that created awareness for urban green and climate protection. Furthermore, it was a good occasion to invite local stakeholders to events taking place around the Mobile Green Room® and therefore helped bringing actors together. In this sense, the Mobile Green Room® might also be understood as a tool and platform rather than a 'method' on its own. The success of the Mobile Green Room® was supported by the way it was organized in close cooperation with local organizers such as a church community or the Neighbourhood management in Neckarstadt-West.

While the Mobile Green Room® was described as a successful way to increase awareness, both the pop-up as well as the City Lab closing event faced difficulties in attracting participants. This might be the case because activities were not target group specific and not directly linked to local initiatives. In contrast, the KliMAthon closing and clean-up event that was organised together with the local Surfrider Foundation attracted about 60 people. This supports the need to organize events in cooperation with local initiatives and focus on concrete activities rather than on dialogue settings.

Digital participation and gamification

The KliMAthon competition and app was chosen for two reasons. The obvious one was that the app allowed digital engagement and awareness raising without physical contact and was therefore considered a good opportunity to increase engagement in times of the pandemic. Furthermore, the idea to test gamification approaches existed earlier in the Climate Strategy Office of The City of Mannheim and the Covid-19 situation further pushed the importance of digital participation formats. However, the experiment was not directly part of the ideas collected during the design thinking workshops and the city lab launch event. Rather, the opportunity to use the app rose during the lab process when the company Worldwatchers GmbH promoted their pilot app via the Network 'Climate alliance' and through a personal contact between the founder of the app and members of the Climate Strategy Office.

As a method, the app offered a supplementary opportunity for citizens to engage in local energy transitions and knowledge sharing via a digital tool. However, interviewees especially criticized that the app missed playful, communicative and interactive aspect. Furthermore the app did not allow for communication either from the city towards the users via push messages or between the app users. This limited its innovativeness as the app rather presented already existing information in a digital way but no incentives for continuous engagement was provided. The participation of Neckarstadt-West teams were quite low. Two main reasons seem that the app was not well suited to persons not already interested in the topic (as well as to persons who could not engage due to language barriers) but also that communication on the app was not possible in the extent needed in Neckarstadt-West due to time constraints. However, interviewees describe a need to use innovative and digital methods and were also positive about testing other forms of digital applications in the future. In the overall process of the lab, the KliMAthon app supplemented other formats with a digital tool that was directed towards a broad engagement of citizens. For future projects, more time should be planned for to better adapt the app to local contexts and specific challenges as well as needs of the neighbourhood.

2.7 Outcomes evaluation

The city lab Mannheim was embedded in a broader process that will continue after the end of SONNET with the establishment of an energetic urban renovation management in the neighbourhood Neckarstadt-West. In this sense, the SONNET city lab was rather the start of activities in Neckarstadt-West in an ongoing process. The outcomes that we evaluated as part of this report concentrate on the question how the chosen activities contribute to changing social relations. Three main areas could be found in which SONNET activities contributed to this:

- Establishing new networks between institutional stakeholders (city administration) and multipliers in the neighbourhood around the new topic of climate change / energy transition
- Establishing new communication channels between city administration and the neighbourhood
- Raising awareness for climate protection and energy transitions in the neighbourhood (multiplier and to some extent citizens).

SONNET gave the opportunity to launch a process of change and test different methods and activities with regard to their suitability for the Neckarstadt-West neighbourhood. In terms of the Mobile Green Room®, all local organizers draw a conclusion that was overall positive. The Mobile Green Room® was well perceived by local citizens and activities helped to promote the topic of climate change, sustainability and urban renovation locally. In terms of network building, it was possible to establish new cooperative relations between local groups as results of the activities conducted. Activities that were particularly relevant for the network building were the Mobile Green Room which included local organizers, the regular Jour Fixe between the most important parties and the city lab launch event with a variety of organized and professional stakeholders participating. For example, a local gardening project could be brought a step further to its realisation and the neighbourhood manager reported from new connections to a local organization that works on cleaning rivers and lakes. These newly established social relations often happened among organised or professional actors. Especially among already established groups, topics around climate protection could be spread. Both of the local organizers in Neckarstadt-West are working in the district for less than a year and therefore used the activities to build local networks.

In terms of the KliMAthon, the achieved outcome was mainly on testing a new method of digital participation. One conclusion was that more time should have been planned for contacting local teams and encourage them to participate as well as for adapting the app to the local context in Mannheim, and even more to the specific needs of a neighbourhood with the specific characteristics of Neckarstadt-West. Overall, local organizers understand the app as a first step towards the use of gamification and digital approaches that is important and useful but had to be adapted and further improved. In terms of changes in social relations it remains unclear how long lasting the intended changes in behaviour are that might have been triggered with the app.

One major success of the city lab was that it was possible to institutionalize activities and continue the work on a local energy transition in Neckarstadt-West with the energetic urban renovation management. A regular Jour Fixe between member of the department of climate protection, the energy agency, the Neighbourhood management and the unit local urban regeneration was

established that guarantees regular exchanges between the most relevant parties for a local energy transition. Furthermore, experiences and findings from the SONNET city lab were also included in the Climate Action Plan 2030. The embedded approach of the lab in this sense helped with using learnings from the city lab beyond the neighbourhood for future activities in Mannheim, especially in urban neighbourhoods with characteristics similar to Neckarstadt-West.

The aim of the lab was to test which activities work well in this district with its specific challenges related both to the building stock and the social structures of the neighbourhood and to adapt existing methods to the needs of the area. One central finding was that processes in neighbourhoods shaped by well-established structures are time intensive and require good communication with existing stakeholders. Another difficulty was that it seems difficult to gain attention among a broader public with a narrow focus on energy transitions only. Therefore, the scope of the activities was extended to focus more broadly on sustainable living and improving the qualities of urban spaces. This allowed to raise awareness; direct impacts e.g. on energy consumption in Neckarstadt-West were however more difficult to achieve within the short timeframe but can be a 'pilot' that might serve as a blueprint for other inner-city neighbourhoods.

4. ANALYTICAL REFLECTION AS A SUMMARY

The interaction of different activities, made it possible to create in Neckarstadt-West an experimental space related to energy transition in a densely populated urban area. In this overall process of change in Neckarstadt-West, SONNET has successfully contributed to creating a network of partners on the topics related to energy transition and to creating new social interaction mechanisms. Taking existing structures and local conditions into account first, was central for Neckarstadt-West characterised as lively and active. This lessons learnt (see table 2 at the end of this chapter) can inform future processes in other districts presenting characteristics similar to Neckarstadt-West. Building a new network in an already existing environment, however, turned out to be a time-intensive process that would have required more time to develop activities in an iterative way together with local initiatives. Especially the stakeholder process helped to get to know local needs in the district and gather important knowledge on future possibilities for citizen's engagement but it seemed to be too early to plan activities towards specific target groups.

The city administration with its Climate Strategy Office took a central role in the city lab process as enabler and incubator of different activities. It created space for establishing novel network relations among local stakeholders and, in doing so, contributed to changing social relations in the neighbourhood Neckarstadt-West. Activities such as the design-thinking workshops and the launch event were used to co-create activities. While the city lab was very successful in involving organized actors and interest groups in this co-creation process, it proved to be more difficult to find ways to engage citizens in the design of concrete activities. The strong role of the city administration also contributes to the dilemma of designing a top-down induced process that aims for bottom-up engagement.

The evaluation concludes that the overall process of the Mannheim city lab was truly 'experimental' (see chapter 3) in character insofar as innovative methods could be tested in a result-open process. Especially the open character of the lab allowed testing the possibilities and limits of different approaches such as design thinking workshops, gamification, events in public and the combination of online and offline activities with a special focus on the conditions of Neckarstadt-West. Furthermore the city lab can now be used as blueprint for engaging in an energy transition process in "old" urban districts. In the context of the City Lab Mannheim, social innovation was understood in a processual way, highlighting the joint and interactive process of actors from different societal spheres to develop solutions for social or environmental problems. While the overall definition of social innovation in SONNET highlights the role of new ways of doing, thinking and organising for changes in social relations, here, it is neither the novelty nor the outcomes but the process itself that is at the core of social innovation. The initial aim of the Mannheim city lab was to develop novel governance structures and practices for enabling SIE. It focused on the development of socio-political governance aspects. That lab especially allowed to gain knowledge on enabling and impeding conditions for SIE for example by identifying relevant stakeholders, testing (new) formats for participation or by establishing new communication processes between stakeholders. In this sense, the lab itself can be understood as an SIE that contributed to SONNET's overall objectives, especially to:

- Objective 2: Identify and analyse enabling and impeding conditions for SIE processes, with a focus on socio-economic, socio-cultural (incl. gender) and socio-political issues and their interrelations with socio-technical aspects.
- Objective 5: Encourage successful SIE through co-creating socio-political strategies to enhance governance arrangements and policy networks as well as SIE-related power and policy dynamics.
- Objective 6: Accelerate sustainable energy transitions through transdisciplinary co-creation of SIE in urban areas.

To summarize, methods that worked best were the ones that were clearly directed towards certain target groups such as inner city administrative actors or other professionals. In this sense, the City Lab launch event was a successful way to collect actors around the topic and regular meetings with local stakeholders could be institutionalized. In contrast, rather open formats in public space faced difficulties with motivating citizens to participate. A successful way of reaching out to the broader public for engagement were small events hold around the Mobile Green Room® which were organised and promoted by the Climate Strategy Office, the Climate Action Agency, the Neighbourhood management and other local stakeholders.

Lessons learnt that can be drawn based on the results of the labs are, first of all, to plan more time resources for establishing new relations and acknowledge that especially in heterogeneous inner-city neighbourhoods it takes time to kick-off change processes. In this sense, it might be more effective to reduce the number of activities but to calculate time to plan and prepare them well. In the context of SONNET, two different kinds of target groups dominated: first, local multipliers and second, the broad public of residents in Neckarstadt-West. Especially for reaching the second group, activities had to be broadened beyond targeting energy only (e.g. towards sustainable consumption and living quality of urban spaces) in order to test which topics related to energy are most pressing in Neckarstadt-West. These topics can then be continued as already foreseen in the context of the Neighbourhood management. While it seems very helpful to communicate activities from early on to a broader public, these activities could be supplemented with formats tailored towards very specific target groups in Neckarstadt-West such as tenants, caretakers or local businesses. The city lab was very successful in establishing a network among local multipliers and raise awareness for the topics of climate change and energy transitions. This network could be extended in a quite targeted way by including actors that are especially responsible for energy related facilities (homeowners, caretakers, local businesses, tenants).

Summary: Lessons learnt

1. plan more time resources for establishing new relations
2. reduce the number of activities but calculate time to plan and prepare them well
3. embed and frame activities target group specific
4. reflect on strategic further actors to involve in the process
5. integrate experiments in a long-term process, if possible

Table 2: Summary of lessons learnt

Appendix 1: EC summary requirements

Changes with respect to the DoA

There has been good progress towards the lab's objectives, but the covid-19 pandemic has led to some delays and required substantial efforts to address lockdown limitations for F2F engagement. More precisely, as the lab focusses on developing novel urban governance structures and practises for enabling social innovation in the energy sector a very interactive process was planned for the Mannheim lab, for which the urban, creative and active neighbourhood of Neckarstadt-West has been chosen as ideal setting to experimenting with possible participation formats. However, due to covid-19 restrictions several events had to be postponed or changed (smaller number of people, different locations, distances, etc.). In particular, our kick-off event had to be delayed from June to December 2020 and had to be held as an online event (16.12.2020: Neighbourhood talk in NW: Full of energy! Innovative ideas for the energy transition in NW). In addition, due to the pandemic situation we held more events in the public space (outdoors) and in the virtual space (online meetings and conferences) in 2020.

Dissemination and uptake

This deliverable will be made publicly available on the SONNET website (https://sonnet-energy.eu) as well as via Zenodo.

Short Summary of results (<250 words)

The aim of the Mannheim city lab was to develop, test and instigate an organisational governance process, which includes stakeholder interaction as well as an inner-administrative dialogue and the use of innovative methods to foster dialogue and participation. As part of the lab, different activities were conducted such as design thinking workshops, activities in public and digital spaces to allow for new ways of interaction between local stakeholders as well as for citizen participation in the local energy transition. Insights gained by conducting the lab show that especially for an inner-city district facing social challenges such as Neckarstadt-West it was crucial to take existing local networks into account when developing activities. The engagement of local stakeholders turned out to be a time-intensive task, mainly because local stakeholders were facing a variety of other challenges that limited the time resources to engage in local energy transition. However, the lab allowed to test innovative methods (such as digital participation and gamification or design thinking) and to establish novel social relations, especially among professional actors working in the neighbourhood that can work as multipliers for engaging local citizens.

Evidence of accomplishment

This document.