UNLOCKING
SOCIAL ENERGY
THROUGH RELATIONAL GIVING

**A CONCEPTUAL ECOSYSTEM FOR AN
INCLUSIVE ENERGY TRANSITION IN
AMSTERDAM ZUIDOOST**

VICTORIA TOELLNER, MASTER THESIS
DESIGN FOR INTERACTION, DELFT UNIVERSITY OF TECHNOLOGY

UNLOCKING SOCIAL ENERGY

Victoria Toellner

October 2022 - May 2023

PREFACE

With this graduation thesis I conclude my studies as a Design for Interaction masters student at TU Delft.

Since the start of my studies I have been driven by socially meaningful design which empowers and brings people together, and this project allowed me to explore just that!

From diving into a completely new and broad context, to exploring the role of design in transitions, to discovering my own transition towards a social and systemic design thinker and researcher, this project has been a great learning journey. Certainly challenging but equally rewarding, this project would not have been possible without the contribution of many lovely people. Thus, I would like to use this space to extend my thanks to those have been there alongside me for the journey.

First of all, thank you to my TU Delft supervisors for their support and guidance. Dave, you helped me to reflect and find direction in my work by asking the difficult questions. Abhi, you introduced me to the world of Design Anthropology and inspired me with your passion and dedication to this field. Thank you for your encouragement and enthusiasm as I ventured into this unfamiliar space.

Secondly, thank you to Lena. Navigating the social energy transition in an individual design project is no mean feat, but luckily I wasn't alone! You helped to make the complexity of this project more manageable and less daunting. Our many collaborative research expeditions and experiments were great fun and reaffirmed my passion for participatory research-through-design. Thanks for the reflective train journeys, the many coffee breaks and for being someone to run late with!

A big thank you to the LIFE Project team for this opportunity and for allowing me the freedom and flexibility to shape my own project and follow my interests. Thanks too for your participation and readiness to get on board with my (sometimes crazy) design tools and methods! A special thank you to my company supervisor Hans Roeland for your energy, your quick thinking and for reminding me to look at the bigger picture. Many thanks to Esther for your empowering words and for helping me to organise sessions. Thanks Gijs for all of your help and your willingness to listen and give input.

In the process of this project I found opportunity in connecting energy exchange with local tokens. I likely would not have followed this path without the enthusiasm of the Lokaal Geld team. Doede, in particular, thank you for your time, valuable input and openness to new possibilities.

I would like to express my gratitude to everyone else who participated in my research activities, shared their knowledge and insights and connected me with others.

Thank you to my parents, my siblings, family and friends for being my cheerleaders and for all the messages of support. Your unwavering belief in me kept me going when times were tough. A big thank you to Rens for putting up with me and all of the Post-Its everywhere, and for giving me a push when needed. Melissa and Neva, thank you for the laughter and light-heartedness and for always giving a helpful hand. Managing hii next to graduation was not easy but the adventure has been super inspiring. I can't wait to see what we do next!

Finally, thanks to you, dear reader, for stopping by and for having the curiosity to delve into the work which has kept my brain busy for the past eight months.

Happy Reading!

Vicky

17.05.2023

EXECUTIVE SUMMARY

The Dutch Government has set an ambitious goal for Amsterdam Zuidoost to become energy neutral by 2040. While technological advancements and infrastructure developments are progressing, the current transition risks widening social inequalities and leaving vulnerable groups behind. Thus, an inclusive transition, which recognises that not everyone can afford to invest in an energy-sustainable future, is crucial. In a bid to accelerate the transition, the Local Inclusive Future Energy (LIFE) Project is, amongst others, working on utilising local and sustainable energy to ensure the inclusion of local residents in the low-income district of Amsterdam Zuidoost.

In the context of the energy transition, inclusion typically refers to participation in energy exchange. Energy exchange is taking shape through the development of local, decentralised energy systems. Emerging in neighbourhoods and based on Peer-to-Peer and Transactive Energy models, these Local Energy Market Systems (LEMS) enable local production, storage and distribution of energy. However, designed to prioritise the interests of the grid, LEMS frame energy exchange solely as a transaction or trade, subjecting residents to the roles of profit-motivated buyers and sellers and thereby overshadowing the potential for fostering active inclusion and creating social value. With its unique mix of entertainment venues, social housing and large renewable asset owners, Amsterdam Zuidoost poses unique challenges and opportunities for becoming a pioneer in a socially inclusive transition.

To move beyond the rational and market-driven constraints which govern current energy exchanges, this project takes a new anthropological approach, framing it as a primarily social, community-based and relational practice.

By means of extensive ethnographic and research-through-design activities, the potential for socially inclusive energy exchange in Amsterdam Zuidoost is explored. Characterised by tight-knit social silos, residents stick within their own circles and thus social cohesion and a sense of community is lacking. Whilst entrepreneurial behaviour is evident, it remains behind doors and the skills and capabilities of local neighbourhoods is hidden and untapped.

To tap into the overlooked potential of local expertise and to expand social networks, this project suggests a new type of exchange, coined as 'relational giving'. Through the giving of services and actions in return for local tokens, opportunity is created for the formation and strengthening of social relationships. 'Relational giving' translates in the concept of 'energy actions': local energy related actions such as handy work and education. Local tokens are introduced as a tool to support relational giving, incentivising energy actions, recognising contributions and, importantly, facilitating exchange between the socially distant.

The vision for relational energy exchange is told through the mix media outputs of this project. Besides video, an energy actions enactment game is designed to activate stakeholders and a framework for a 'Social Local Relational Energy Ecosystem', which considers the roles of multiple actors in unlocking social energy, is presented.

Ultimately, this project aims to inspire and offers a new perspective on energy exchange, introducing tangibility to an entangled and unexplored space. Energy is repositioned not as a commodity to be bought and sold, but as an agent for building inclusive and socially cohesive communities.

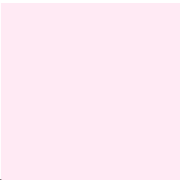# TABLE OF CONTENTS

READING GUIDE

PHASE INTRODUCTION
CHAPTER INTRODUCTION
PROJECT APPROACH
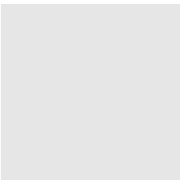**METHODS**

KEY FINDINGS
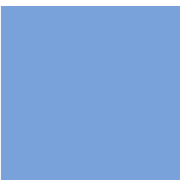
SUMMARIES
OVERVIEWS

IDEAS
CONCEPTS
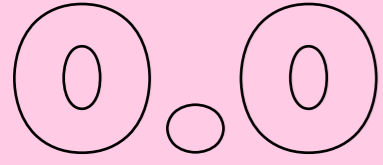
THEORETICAL EXPLANATIONS,
FRAMEWORKS & DIAGRAMS

REFLECTIONS

0.0

INTRODUCTION

This preliminary phase introduces the project context, initial scope and design goal, and outlines the approach taken.

0.1 | PROJECT INTRODUCTION

IN SHORT

This chapter introduces the broader context of this graduation project and its positioning within the Local Inclusive Future Energy Project. The initial project scope for re-imagining energy exchange is outlined.

PROJECT CONTEXT

THE DUTCH ENERGY TRANSITION

The energy transition is the move from fossil fuels to renewable energies with the aim to reduce C02 emissions. The speed and scale of this transition depends greatly on both global dynamics and the societal response to climate change (Deloitte Digital, 2021). The Dutch government aims to reduce the Netherlands' emissions of greenhouse gases to zero by 2050 and advancements are being made in the development of low-carbon energy sources such as solar, onshore and offshore wind, geothermal heat and hydro-power. Dutch solar energy is growing particularly fast and with more than 48 million solar panels installed the Netherlands is the European frontrunner in this sector (Solar Power Europe). However, concurrently, energy poverty is being highlighted through the transition with the realisation that not everyone can afford to invest in an energy sustainable future. In the Netherlands there are 650,000 households (8% nationally) affected by energy poverty (TNO, 2022) with this number likely to be increasing in response to rising fuel prices. Whilst the energy transition carriers potential and possibilities for greater economic prosperity in the long run, in the short term it creates risks for escalating energy poverty and social inequality (AMS, 2021).

A SOCIO - TECHNICAL TRANSITION

"The energy transition is often perceived and framed as a technoscientific challenge" (Buscher, 2018) but the focus needs to shift from purely technical solutions to include social ones. Shifting to renewable energies calls for fundamental development in our society: changes to our environments, our interactions and daily behaviour. New services, business models, governance arrangements and policies (TU Delft, social innovation society, n.d.) are arising as our reliance on clean energy sources becomes greater and more imminent (Deloitte Digital, 2021).

AN INCLUSIVE TRANSITION

"The transition will be fair or it will not happen." As frankly stated by Frans Timmermans, Vice-president of the European commission, without a system of equality we cannot transition from greenhouse gases to renewable energy sources. Achieving this 'fair' or 'equal' system requires **"the re-emphasis of social inclusiveness as a key value for the very success of our pursuit of a climate neutral energy system"** (Timmermans)**.** The energy transition will bring economic, social and environmental advantages and disadvantages and these will not be evenly distributed amongst (groups of) citizens, businesses and localities but will have the most detrimental impact on vulnerable people who are already struggling and will hence suffer a further decline (Correlje, 2021). As Ursula von der Leyen, EU president, presented it to parliament in her European Green Deal **"we can all be involved in the transition and we can all benefit from the opportunities."** The real question is: how?

THE LIFE PROJECT

The Local Inclusive Future Energy (LIFE) Project is taking on this challenge with the aim to accelerate the Dutch energy transition by utilising local sustainable energy (heat and electricity) via smart and equitable distribution to the surrounding neighbourhood. This means that residents and communities can benefit from the renewable energy generated in their own area, helping them to move away from natural gas to climate-friendly alternatives. At its core, the LIFE Platform aims to resolve grid problems whilst providing a flexible system which actively includes local residents and businesses in local energy assets. The two key project goals outlined in the LIFE project plan are 1) reducing net congestion and 2) **"achieving maximum social acceptability" and inclusion.**

SOCIAL CONTEXT

The 'LIFE Social Platform', is being developed as part of LIFE, to provide focus and research specifically on inclusion. Amsterdam Zuidoost (Southeast), the chosen target district, consists of some of the biggest entertainment venues and headquarters in the country as well as large numbers of social housing residences which are home to low-income residents from over 109 different nations. **The diverse and dynamic social, cultural and economic composition of Zuidoost presents multiple challenges for inclusion along with the opportunity for novel approaches to inspire other like regions across the country.**

STAKEHOLDERS

LIFE is a multi-disciplinary project with a large project consortium including the Municipality of Amsterdam, Amsterdam Institute for Advanced Metropolitan Solutions, TU Delft, Spectral, Alliander, Utrecht University, Co-Force and the Johan Cruijff Arena. **This project is conducted in collaboration with these partners, specifically within the research of the LIFE Social Platform and under the supervision of TU Delft and AMS Institute.**

INITIAL PROJECT SCOPE

RE-IMAGINING ENERGY EXCHANGE

In the context of the energy transition, the term 'inclusion' commonly pertains to active engagement and participation of residential end-users, increasingly through 'energy exchange'. 'Energy exchange' is by defined by Singh (2017) as a "transaction or an exchange between an energy-giver and energy-receiver" and is taking shape in the transition through the emergence of local decentralised energy systems. Based on Peer-to-Peer and Transactive Energy models these Local Energy Market Systems (LEMS) enable local production, storage and distribution of renewable energy. The LIFE Project is developing a new decentralised and local system for Zuidoost and is **considering creative approaches such as the distribution of surplus solar energy from the Johan Cruijff Arena to nearby low-income neighbourhood Venserpolder**. Thus, there is the opportunity for the exploration and design of novel and **fundamentally inclusive energy exchanges**. Taking a anthropological and research-through-design perspective, the aim of this project is to re-imagine energy exchange for the social inclusion of local residents. **Ultimately, the purpose of this thesis to explore new possibilities for inclusive energy exchange in Zuidoost and offer concepts and recommendations to inspire and inform the design of a new local energy system.**

INITIAL RESEARCH QUESTIONS

1. What <u>factors</u> influence opportunities for **socially inclusive energy exchange** in Amsterdam Zuidoost?

2. How can we <u>facilitate</u> socially inclusive energy exchange in Amsterdam Zuidoost?

INITIAL DESIGN GOAL

"To design an energy exchange system which is **socially inclusive** for <u>residents</u> in Amsterdam Zuidoost."

0.2 | PROJECT APPROACH

IN SHORT

This chapter outlines the project approach and the four key phases which are inspired by the Systemic Design Framework summarised on the following page. The 'description' and 'systemic approach' sections derive from this framework (Design Council, 2021). The approaches Design Anthropology, Research through Design and Participatory Design are also outlined. The chapter concludes with an overview of the key research and design methods used throughout this project.

PHASES OF THE SYSTEMIC DESIGN FRAMEWORK

0.0 INTRODUCTION
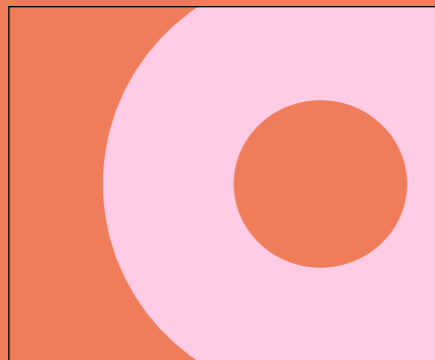
1.0 EXPLORE

DESCRIPTION

Explore widely and deeply the subject-specific, theoretical and locational context of the project. Look at what is already happening and identify where there is potential for a new vision and something different within the project scope and focus.

SYSTEMIC APPROACH

- Dive into the existing systems
- Gather knowledge from different perspectives
- Explore the connection between key themes
- Start making & identifying opportunities

METHODS & PRACTICES

- Literature research
- Research ethnography
- Interviews
- Observation
- Boundary object/ research artefact
- Personas
- Vision in design (context factors)
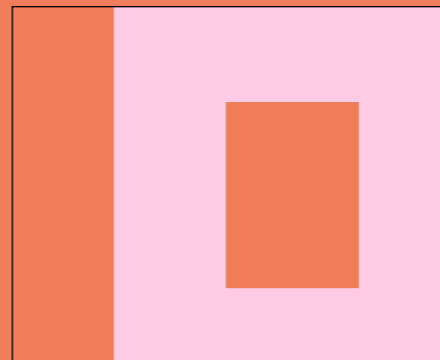
2.0 REFRAME

DESCRIPTION

Reframe the system by opening up a new space for design. Bring stakeholders and project partners together to first consider different options, identify specific opportunities and challenges and then formulate a direction to move in and vision to move towards.

SYSTEMIC APPROACH

- Bring people together and synthesise insight
- Look at and reframe through different lenses
- Remap the system with a new goal or purpose
- Highlight opportunities, challenges, questions

METHODS & PRACTICES

- Creative problem solving methods
- Literature and theoretical research
- Analogies and metaphors
- Reframing
- Future visioning
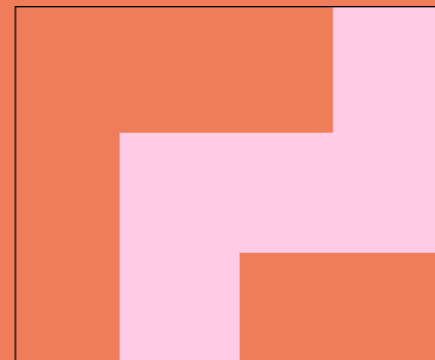
3.0 CREATE

DESCRIPTION

Create big and small ideas for interventions to the system, designing on different levels. Think about the bigger goal and how to move towards it. Create things which can help people to re-imagine what might be possible.

SYSTEMIC APPROACH

- Generate ideas on a micro, meso, macro level
- Prioritise which actions are most important for moving towards the vision
- Create (small) interventions with potential for big impact

METHODS & PRACTICES

- Fragment generation
- Journey mapping
- Prototyping (low - fidelity)

4.0 CATALYSE

DESCRIPTION

Move through the complexity of the system by making things. Show people internal and external to the project what a new vision looks like in a tangible way. Prototype and 'mock-up' the idea(s) to communicate it to others, test and explore what else it connects to.

SYSTEMIC APPROACH

- Prototype, test and iterate upon the ideas
- Be open to change and developments
- Validate and evaluate the idea(s) with stakeholders and potential users of the system
- Tell the story in a visual and engaging way

METHODS & PRACTICES

- Prototyping (low - mid fidelity)
- Analogies and metaphors
- Generative methods
- Storytelling
- Enactment

5.0 CONCLUDING

CONTINUING THE JOURNEY

DESCRIPTION

The work is never done in dynamic systems, there is always room for further exploration, experimentation and new directions. Make sure to create outcomes which are open-ended and invite further work. Reflect on the project overall, the design outcomes and key findings and pass on learnings to others. Lay out possible actionable next steps for continuing the journey and moving towards the vision for a future system.

SYSTEMIC APPROACH

- Recognise the achievements
- Reflect and learn from the process
- Share new knowledge and insights
- Excite and create momentum to keep exploring and experimenting
- Strengthen the connections made throughout the project

DESIGN APPROACHES

SYSTEMIC DESIGN

The four key phases of the Systemic Design Framework (Design Council, 2021) have already been outlined and structure the research and design activities done in this project. This framework is a revision of the original Double Diamond and has been updated in acknowledgement of the direction design is taking in tackling complex, dynamic and systemic challenges, such as the energy transition. Apart from explore, reframe, create and catalyse, four more phases have been added to the approach and these have been addressed and embedded in activities at various stages of the project. A summary is presented here:

ORIENTATION AND VISION SETTING

Create a collaborative vision of what you want to achieve and begin in a value-driven way.

> The LIFE Partner Event takes place early on in the project and the sessions are designed and facilitated with the aim of aligning stakeholders and creating a shared vision for the LIFE Social Platform in particular.

LEADERSHIP & STORYTELLING

Work openly and share your approach and stories with others. Be proactive in connecting people and stakeholders to the vision and work you are doing.

> Throughout this project interactive and collaborative sessions and workshops are held together with project stakeholders and partners. Design methods are used to visualise and 'tell the story' and encourage future thinking. Initial ideas are already shared early on to gain a wide range in perspectives and keep the opportunity space open.

CONNECTIONS AND RELATIONSHIPS

Create a shared understanding and trust, build empathy and empower others to design with you. Act as a translator, mediator and connector between different groups.

> This project is undertaken in collaboration with many different people and their perspectives. Events and happenings with the community and context are attended to build (local) connections, network and involve more people and their expertise. Activities are undertaken, where possible, with co-researchers and designers.
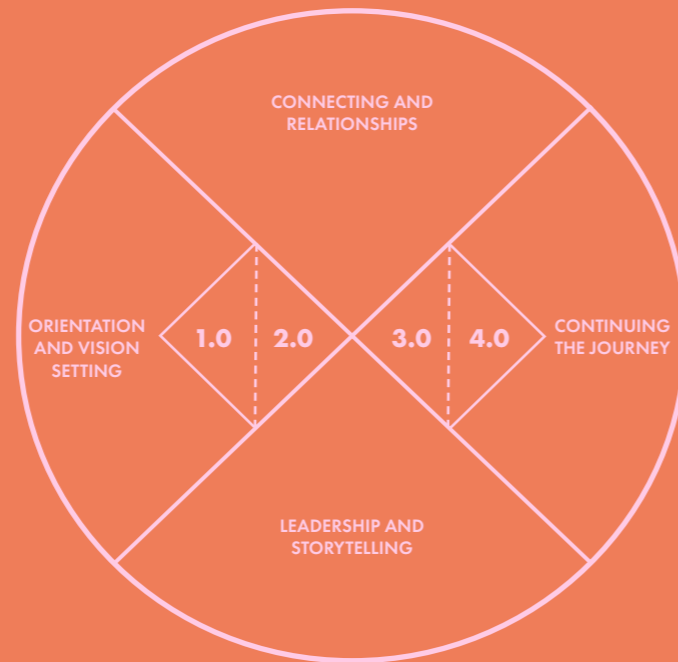

Fig 1. Systemic Design Framework (Design Council, 2021)

CONTINUING THE JOURNEY

Accept that your work is never finished and be open to change. Design project outcomes which inspire and activate others to continue with the project.

> The final design outcomes of this project are created with the intention of providing inspiration and opening the door to new possibilities and exploration. Recommendations and steps to move forward conclude this project and enable others to take it forward.

It should be noted that although this systemic framework inspires the project approach overall and more specifically in the latter phases when trying to find tangibility in the complexity, a mixture of approaches, methods and practices are used throughout. The initial broad scope of this project provides freedom and in flexibility in experimenting with and 'mixing and matching' methodologies. The framework was first used in a looser sense and was later more closely applied, as the true systemic nature of the project revealed itself.

DESIGN ANTHROPOLOGY

Design Anthropology is a interdisciplinary field that combines the principles of anthropology with the practice of design. It involves utilising anthropological theories, methods, and insights to gain a deeper understanding of human behaviours, cultural contexts and societal practices. Anthropology looks to understand societal change and how people envision the future, but lacks the practical tools and methods to do so (Smith et al, 2013). This is where design comes in. Typical to design anthropology are practices and methods such as research ethnography, observation and informal contextual interviews, using design tools like artefacts and props to guide participants.
> In this project Design Anthropology informs the first 'Explore' phase and field activities undertaken. From a theoretical perspective, anthropology on 'exchange' and 'barter' lays a foundation for the design direction taken.

RESEARCH THROUGH DESIGN

A research-through-design approach to conducting research utilises the methods, practices and process of design practice with the intention of generating new knowledge (Zimmerman & Forlizzi, 2014). Design is a reflective practice (Schön, 2010) and RtD draws on this approach by making and critically evaluating (speculative) artefacts that pose as proposed solutions (Ritel & Webber, 1973, Schön, 1983).
> A RtD approach flows throughout this project and low fidelity prototypes and games are created to gain a deeper understanding of the proposed concept and to identify opportunities, challenges and uncertainties.

A MIXTURE OF METHODS & PRACTICES

Multiple design methods are used and adapted in the key phases of this project. Briefly summarised below are two of the methods employed which require a short description. The choice of ethnographic field research methods used is explained in more detail in chapter 1.2.

CREATIVE PROBLEM SOLVING

The Integrated Creative Problem Solving (iCPS) approach (Heijne 7 v.d. Meer, 2019) is based on the three diamond structure of 'problem finding', 'idea finding' and 'solution finding'. Each diamond involves the processes of diverging, reverging and converging and various methods and tools are available to support participants in creatively coming up with options, ideas and design directions.
> iCPS informs the workshops and sessions designed and facilitated throughout this project.

PARTICIPATORY DESIGN

Participatory design is an approach which actively involves stakeholders and potential end users in the design process. The word 'active' is key here in differentiating participatory design from user - centred design (Stappers & Visser, 2007). Participatory design revolves around collaboration and working together, where different perspectives, knowledge and preferences are included.
> A participatory design approach is crucial in the context of this project, and especially in the bid to design more inclusive exchanges and systems. Tools, canvases and props are designed and used as a means for engaging stakeholders and inviting them to be active co-researchers and designers.

VISION IN DESIGN

Vision in Design (ViP) is a design approach and philosophy developed by Hekkert and van Dijk (2011) and supports the intentional design of a future vision or 'raison d' être'. The detailed and extensive VIP process guides designers and creators through the stages of understanding the domain/time, formulating the context factors and structure, creating a personal statement and vision for the human-product/ service interaction, defining the product qualities and finally designing and detailing the concept.
> This is a process which takes time and thus in the scope and constraints of this project ViP is not followed as described. However, elements of the process are used: specifically at the end of phase 1 'Explore', where emergent themes are clustered into contextual factors, and in phase 2 'Reframe' where a vision and interaction qualities are designed.

FRAMING (USING ANALOGIES & METAPHORS)

Kees Dorst's frame creation method (2015) employs metaphors and analogies to aid idea generation by drawing comparisons between selected themes and other domains or contexts.
> This method is used to realign the design direction with the created vision in the ideation phases of the design process.

0.3 | GLOSSARY

IN SHORT

This chapter briefly describes and defines the key terms and abbreviations used throughout this thesis.

KEY TERMS

SOCIAL INCLUSION

Defined in this thesis as the active inclusion of local (and vulnerable) residents by addressing their specific needs, preferences and capabilities.

ENERGY EXCHANGE

Described as the exchange of energy between a 'giver' and 'receiver'. The form of 'energy' is not specifically defined but open to different interpretations.

LARGE ASSET OWNERS

Organisations and institutions which have large flex renewable energy assets, such as solar panels and batteries.

LOCAL RESIDENTS

In this project 'local residents' refers to the people living in neighbourhoods in the district of Amsterdam Zuidoost.

ABBREVIATIONS

LIFE
Local Inclusive Future Energy (Project)

LSP
LIFE Social Platform

LTP
LIFE Technical Platform

AMS
Amsterdam Institute for Advanced Metropolitan Solutions

JCA
Johan Cruijff Arena: a football stadium and large asset owner in Amsterdam Zuidoost

SME's
Small and medium sized enterprises

VVE's
Vereininging eigenaars / housing owner associations

DSO
Distribution system operators

LEMS
Local Exchange Market Systems

ZUIDOOST
The district of Amsterdam Zuidoost (South East)

GEMEENTE
The Municipality of Amsterdam

1.0

EXPLORE
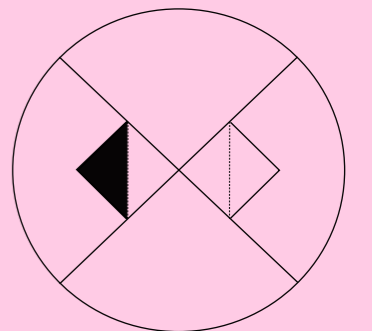
PHASE 1

This section is a compilation of the key literature and field explorations undertaken to dive into the project context.

1.1 | EXPLORING LITERATURE

IN SHORT

In this chapter literature within the scope of the project is reviewed and discussed. The chapter concludes with a summary of key findings and identifies a knowledge gap for further investigation.

GOAL

Existing literature and research is explored to gain a deeper understanding of the context, to review existing systems and bring an anthropological perspective to the research through design process. Reviewing studies already done in the target area and context ensures work is not repeated but instead is built upon.

APPROACH

Relevant literature was found through contact with other researchers within the project and by searching for keywords in academic journals and browsers. Words searched for included: energy transition, decentralised energy systems, inclusion, peer-to-peer energy, energy systems, exchange, barter, energy exchange, collective barter and energy communities. It should be noted that the literature review forms a basis for the deeper and richer field and ethnographic work and is not an in-depth and complete study by itself.

1.1.1 | LOCAL DECENTRALISED ENERGY

LOCAL ENERGY MARKET SYSTEMS

In the move from centralised to decentralised (and local) energy three different types of **Local Energy Market Systems (LEMs)** are emerging in the Netherlands: Peer-to-Peer (P2P), Transactive energy (TE) and Community or Collective self-consumption (CSC). In the literature the definitions of these three models vary somewhat due to the multi-disciplinary and evolving nature of the energy field, and some studies openly allude to the absence of a universally accepted definition at all (Adams et al, 2021). However there are several characteristics which differentiate these three types of LEMS and help to describe their primary goal. **P2P** systems allow for the "direct trading of energy without an intermediary" (Cappern et al, 2022) and aim to incentivise the "bilaterally negotiated" (Hutty et al, 2021) sharing of energy between households. P2P energy trading occurs both on a local scale and on a regional scale. **TE** models place greater emphasis on the system benefits and services, e.g. balancing demand and supply and providing flexibility, and function on different levels and scales of the energy grid to include many different kinds of participants (Adams et al, 2021). **CSC** market systems, on the other hand, are very much locally bound to a specific small area and most commonly involve shared ownership of energy assets and the collective action of participants in a community. Despite their differing scales and operating structures two factors are common to all three LEMS types: **1) energy is locally produced, stored and distributed and 2) residents are identified and labelled as active members of these decentralised energy systems** (Singh et al, 2017).

P2P systems, and more specifically their potential for significant technical and economic benefits, dominate literature on decentralised energy systems. Numerous examples of these market-like, transactive bidding systems (Hutty et al, 2021) are described and their technological capabilities detailed. In contrast CSC systems, deemed as "placing the most focus on community benefits and sharing those benefits across the community" (Adams et al, 2021) are poorly represented and case studies focused on this collective model are lacking (Capper et al, 2022).

The **spotlight on technological and financial market systems,** which overshadows the potential of community-based and social energy systems, is not only evident in literature but is representative and an indicator of the current design, development and progression of decentralised local energy systems in The Netherlands. In comparison to other EU countries the Dutch are making very slow progress in this regard (v.d. Schoor & Scholtens, 2015). According

to Eurostat only the UK and Luxembourg are performing worse when it comes to the Eurropean shift away from a centralised energy system. The limited availability of case studies suggests that the slow progress in the development and implementation of decentralised energy systems is not due to technological limitations or complications, as the required technology is already widely accessible (v.d. Schoor & Scholtens, 2015). Rather, the primary bottleneck lies in the **inadequate attention given to community engagement and inclusion in the process of system development, and the subsequent failure to translate these efforts into effective governance policies**.

SMART FLEXIBLE ENERGY PLATFORMS

In tandem with the development of LEMS is the growing trend in the **development of smart and flexible energy technology platforms.** Energy service companies are building these ICT platforms to support local energy market systems in "enabling access to the flexibility market, facilitating energy trade and promoting community members engagement." (Boekelo & Beukers, 2022). The result is that **residents, "ordinary people - formerly mere consumers" (Boekelo et al, 2022) , are being catapulted into the management of their own complex energy systems.** Whilst the intention and goal may be to 'include residents' and 'engage communities' in local decentralised energy, the study of three different pilot cases (in 'City-Zen' - a suburb of Amsterdam, in the floating neighbourhood of Schoonship in Amsterdam North and in the small energy positive district Voorhout) have proven otherwise. In fact, these **smart technology systems have "been experienced more as a hindrance than as empowerment"** (Boekelo & Beukers, 2022), for the most part due to the innate complexity of flexible energy.

Entangled, multi-layered, technocratic and described by a resident in one pilot case as "a black box", smart energy platforms have been shown to be, for even the more technically minded user, not understandable or intuitive (Boekelo & Beukers, 2022). **Being unable to understand ones own energy system leads to a (sense of) loss of control and ultimately disengagement and detachment from the system.** Compounding this lack of understanding is a lack of transparency not only about

what is happening in the system, but also who is benefiting from it (Boekelo et al, 2022). In the study of the pilot cases mistrust was evident amongst many of the residents who asked "what is actually being developed for us?". Residents **did not feel taken seriously or valued as central and important collaborators in these systems**, dashing initial hopes of a platform which would empower them to make well- informed decisions as a community.

Designed almost exclusively "to respond to the interest of an energy system" (Boekelo et al, 2022), **flexible energy platforms are currently built without regard for the preferences and capabilities of residents and users.** The value for the grid has been considered and designed for but the value for residents has thus far "been quite poorly imagined" (Skjolsvold et al 2017; Mourik et al 2019; Mourik et al 2020; Hansen & Hague 2020). The assumption is that residents will enagage in systems with the sole intention of financial gain and whilst there is some expectation of lower electricity bills (Adams et al, 2021) and an obvious need to not be "worse off" (Boekelo & Beukers, 2022), when tasked with choosing and making trade-offs between community, economic and environmental values almost all participants in a workshop (of a pilot case) **prioritised community values.** 'Community values' in this workshop were defined as 'community cohesion' and 'local vitality' and residents expressed the importance of a local decentralised energy system and platform which **takes social relations into account, enables collective action and allows residents to "do something with or do something for the neighbourhood"** (Boekelo & Beukers, 2022). This desire for working together was also highlighted through residents (strong) aversion to the proposal of a gamified platform which would see residents compete with each to for instance, provide the most flex to the grid. Instead a 'sharing' approach to the design and development of a local decentralised energy system was highlighted as a possible community driven value proposition which would "bring people together and allow them to exchange ideas" (Boekelo & Beukers, 2022).

The workshop itself showed that residents, instead of just providing "behavioural demand response" or "accepting an automated operation" (Boekelo & Beuters, 2022), want to **be more active** in their local energy system (Adams et al, 2021). **Learning** more about the system and being able to provide input for their ideal platform already proved effective in helping residents to re-gain a sense of control and feel included. **There is an opportunity for residents and communities to carve out their own role in this decentralised energy 'system-in-transition'.**

ENERGY EXCHANGE

The promotion of **social engagement** within energy systems is crucial for enhancing participation, sustainability, and scalability of decentralized models. A significant aspect in engaging residents in their local energy communities is the cultivation of a **"sense of control"** which, as discussed, can be partly achieved through the creation of **transparent and comprehensible local platforms that enable collective action.** Attaining a 'sense of control' is closely intertwined with the notion of **'choice'**, as these concepts are interdependent. A feeling of control can empower individuals to exercise greater autonomy over their choices, while the ability to make choices can reinforce one's sense of control.

The concept of **energy exchange** can be described as **"a transaction or an exchange of energy between and energy-giver and energy-receiver"** (Singh, 2018). 'Energy exchange' is a mechanism which enables residents to exercise choice and control in decentralised systems, and the most obvious example of this can be seen in P2P systems where households choose with whom to trade energy. Although P2P systems, and other similar models, permit choice and control through energy exchange, this is always framed in the context of a **'market' wherein energy is bought and sold.** With their fluctuating prices, underlying dynamics of supply and demand governance by regulatory bodies, energy market places constrain the extent to which residents can exercise choice and control. The limitations of a 'market - like' energy exchange structure also extend to the role which residents can take on in local decentralised systems. **'Markets' subject residents to the role of 'buyers' and 'sellers' and presumes them to be predominately financially motivated individuals (singh) who are pursuing profit-making opportunities for self-interest.** Yet, empirical evidence from pilot cases of smart flexible platforms suggests that **community value propositions are often prioritised over financial ones** (Boekelo & Beuters, 2022), and that 'collaboration' is valued over 'competition'. This indicates a preference amongst community members for **non-monetary, collecitve and social benefits and outcomes, as opposed to purely financial gain.**

'Mutual energy exchange' (MuEE) defined by Singh (2017) as "a social and personal transaction of energy between energy-giver and energy-reciever" offers a new perspective on energy exchange and takes into account the **cultural and relational dynamics that underpin these exchanges**. By moving beyond the strictly economic and rational considerations that govern energy trading, MuEE

offers new possibilities for **"informal, unregulated, mutually structured"** (Singh et al, 2017) 'giving' and 'receiving' in the energy context.

The results of an ethnographic study into electrification in rural India showed that MuuE can take the form of either 'mutual energy sharing' or 'mutual energy trading' (Singh, 2018). Both are forms of **'social and personal energy exchange'** but 'sharing' takes places in the mutual realm of economy"compared to 'trading' which operates in a market context (Singh, 2018). The form chosen is dependant on the **social relationship between 'giver' and 'receiver':** socially intimate relations call for 'sharing' whereas a transactive 'trade' is likely to be mutually chosen between those who are socially distant. Social relations also determine a preference for the **type of 'return'** given in exchange: either 'in-cash' (money or notes), 'in-kind' (thing or work of economic value) or intangible' (unmeasured and unquantified social gestures and actions') (Singh, 2018). The selection of the type of return shows that constructing such a mutual energy exchange is far from a straightforward economic act, but rather is a **intricate sociocultural process** (Singh, 2018).

SOCIAL AND ECONOMIC VALUES

Participants in local decentralised energy systems are looking for social, but also often some form of economic value, at least in the sense that they are not 'losing money'. As previously discussed, **economic values are typically prioritised and advocated in the narrative of local energy market systems**, promoting the "potential to make electricity less expensive" by providing energy flex to system operators and electricity networks (Adams et al, 2021). Other potential economic values of local decentralised systems can take the "form of community wealth, job creation and new revenue streams" (Adams et al, 2021).

There is confidence and assurance in the (significant) economic benefits of decentralised systems (Hutty et al, 2021). **Social values, on the other hand, are typically less quantifiable, making them more difficult to determine and communicate.** Nevertheless, research conducted by (Adams et al, 2021) suggests that social values such as energy independence, local benefits, social relations, environmental responsibility, participation, and purpose can be generated through peer-to-peer energy sharing interactions.

The social values-based assessment framework (ref) identifies 194 individual social values and 33 macro themes that can be linked to decentralized energy systems. This framework highlights the **potential for decentralized energy systems to create a diverse range of social values.** However, **designing systems that prioritize specific social values is complex due to the influence of cultural, economic, and institutional factors, as well as the power (im)balances, political tensions, and stakeholder relationships involved** (Adams et al, 2021). Consideration then needs to be taken for the complex interplay of various contextual factors.

The **importance of considering context,** in the process of designing and developing local decentralised energy systems, is underscored by the characterisation of residents typically involved in them. Notably, the majority of participants in P2P systems tend to be homeowners, possess a higher socioeconomic status, possess a higher level of education, exhibit digital literacy, and display a keen interest in technology (Adams et al, 2021). Thus, literature shows that **local decentralised energy systems do not enable the inclusion and participation of low-income, uneducated residents of a lower SEP who are living in rented socially housing.**

Whilst increased autonomy in local decentralised systems can bring a greater sense of choice and control and thus potentially engage more residents, the move from autonomous, centrally controlled systems concurrently **enhances the risk of exacerbating existing social conflicts and discrimination** and could ultimately "widen the 'energy wealth' gap between poor and rich" (Adams, S et al, 2021).

DEFINING INCLUSION (AND EXCLUSION)

In literature the term 'inclusion' is not clearly defined and its meaning is often left to the interpretation of the reader. This **lack of clarity on the meaning of 'inclusion'** has turned focus instead to the definition of exclusion (Cameron, 2006) as it is easier to conceptualise what it means **not to be included**, than to be included. Although commonly perceived as "inseparable sides of the same coin" Cameron (2006) argues that this view of 'inclusion' and 'exclusion' has resulted in a limited and negative understanding of 'inclusion' as merely meaning 'to not be excluded'. The nuances of and between these terms are lost by only defining them in relation to each other (or simply put 'as opposites'). For instance, often not considered or forgotten is that, "inclusion can also produce exclusion" (Jackson, 1999) by driving out or framing another group as 'the excluded'.

Whilst there is debate around defining inclusion on the basis of exclusion, it is helpful to understand what is meant by the latter, specifically 'social exclusion'. **'Social exclusion' is a concept which is likened to the concept of poverty, but "takes into account more dimensions of people's lives"** (Aasland & Flotten, 2000). Described as a 'multi-dimensional phenomena' Aasland and Flotten outline four key living conditions which are indicators for social exclusion: 1) Exclusion from formal citizen rights, 2) Exclusion from the labour market, 3) Exclusion from participation in civil society and 4) exclusion from social arenas.

The concept of inclusion is closely related to other terms such as **diversity and equity,** which provide further insight into its meaning. These terms are often interconnected in academic literature as well as in our daily lives. Whilst 'diversity focuses on "the condition of being different or having differences" (Harvard) and equity is described as "a fair treatment for all while striving to eliminate inequalities and barriers " (Harvard, 2020) all three terms overlap under the label of **'belonging.'** Described as a 'fundamental human need', 'belonging' expresses our desire to be part of a social group (Desmet et al, 2017) and thus **frames inclusion as a predominately social concept.**

However, inclusion can also be discussed in terms of **'financial inclusion'** which is defined as "delivery of banking services at an affordable cost to the vast sections of disadvantaged and low-income groups [and access towards] other financial services such as savings and insurance" (Mahendra, 2006). Central to financial inclusion is thus **access to affordable and low-threshold services which meet the financial needs of (vulnerable) groups**. In addition, financial inclusion is about promoting 'financial literacy' to guide individuals and communities in making informed decisions about their finances.

Whilst various interpretations and descriptions of the broader (and socially and financially encompassing term) 'inclusion' can be found Oxford dictionary provides a simple definition: **"**Inclusion is the practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized, such as those who have physical or intellectual disabilities and members of minority groups." In other words, **inclusion is a social process that seeks to empower vulnerable individuals and groups by providing them with access to resources, services, and opportunities necessary for full participation in society.**

INCLUSION IN THE ENERGY TRANSITION

In the context of energy, inclusion most often refers to **participation**: the design and development of new local decentralised energy systems and the implementation processes and policies which **enable residents to participate in the energy transition**. LEMS are emerging and giving residents a new **active role** and a "direct stake in producing, consuming and/or sharing energy between each other" (Directive (EU), 2019). Not only are residents being placed in the management of their local energy systems, they are also being encouraged to move away from isolated individual action, towards **collective actions** in 'energy communities' and 'energy initiatives'. This community-level energy (Electricity Directive, 2009) presents opportunities for **incentivising participation and thus including more residents**, households and neighbourhoods in the transition.

While there is a clear intention, evident in literature and practice, to integrate inclusion into the transition, literature highlights **numerous obstacles to achieving the inclusion of vulnerable residents and groups** in particular. Current interventions for inclusion tend to be 'passive': such as adopting an open door policy or implementing a standardised smart energy platform which offers the same opportunities for all (Grossmarnn & Creamer, 2017). Whilst taking such steps could help increase participation overall, it is unlikely to facilitate the most inclusive form of participation (Fung, 2016) and will still leave behind those who are less educated and have a lower income (Fiorina, 1999). Instead **'active' inclusion which addresses the specific needs of vulnerable people and 'the excluded' is needed.**

INCLUSION IN AMSTERDAM ZUIDOOST

In her graduation thesis (Interventions for an inclusive energy tranistion in Amsterdam Zuidoost, 2022) Alisa van Gent explored how inclusion in the energy transition can be addressed specifically in the district of Amsterdam Zuidoost where one in five households are already living in energy poverty. More concretely De Bijlmer, a district in Zuidoost, has the highest percentage of energy poverty in the capital. Here 19% of households are energy vulnerable (TNO, n.d.). Energy poverty is really just a result of poverty itself and in Venserpolder, a neighbourhood in Zuidoost, 20% of households have an annual income below €9,249 and 10% of households receive social care benefits. These figures are in high contrast with most of the rest of the country and highlight the necessity for an inclusive energy system in Zuidoost, where the consequences of leaving residents behind in the transition will be hardest hitting.

Defined in her work as **"the active involvement of citizens in the energy transition"** Gent (2022) identified inclusion to be a "reflexive process in which the competence and desires of the excluded are put at the centre." She investigated inclusion through literature and ethnographic research in the community and the results of her findings were collated in a framework of nine conditions for interventions for an inclusive energy transition. As they have specific relation to Zuidoost these conditions can be seen as considerations for designing for inclusion, when re-imaging and designing energy exchange systems in the later phases of this project. The conditions are summarised as:

Conditions for interventions in an inclusive energy transition (Gent, 2022):

1. Agency: local ownership
"The feeling of ownership has the potential to engage citizens in the long term in the project. This will contribute to its inclusivity."

2. Identification of the community: neighbourhoods' capacities
"By means of an approach based on equality and looking for the opportunities instead of deficiencies of the neighbourhood, inclusvity can be enhanced."

3. Skill development: building capacity and knowledge
"Capacity and knowledge building has the potential to engage inhabitants in the project for a longer term. Also their involvement has the potential to increase with workshops and skill training, therefore it increases the inclusivity of the project."

4. Multi-objectivity: seeking co-benefits
"The usage of multiple objectives in an intervention can increase the amount of people that are involved and in favour of a certain measure. For that reason multi-objectivity can contribute to inclusivity."

5. The need to feel safety: safe spaces
"Safe spaces are very important in Amsterdam Zuidoost. Therefore they need to be taken into account when intervening in the neighbourhood."

6. Communication methods: personal connections
"Personal networks are essential in communication in Amsterdam Zuidoost. For that reason these communication methods are identified as a condition for an intervention that aims to be inclusive."

7. Light-heartedness: a gentle approach
"While complicated technology or terminology can scare people away, and therefore be excluded. A gentle approach, in which small steps are taken has the potential to include more people in the transition."

8. Practical examples: visual and tangible
"Since visual and tangible examples speak more to certain people than (long) text, the usage of them increases the inclusiveness of communication."

9. Youth: the new generation involved
"The involvement of the next generation has several benefits with regards to inclusivity. Firstly, there is the network around the youth that can reach the community within families. Secondly, by involving the youth the next generation can be included in the transition."

EXCHANGE FROM ANTHROPOLOGY

'Exchange' forms another core research theme in this project. Knowledge and literature on exchange is taken from the work of anthropologists and social scientists and is used as the primary theoretical foundation for the succeeding body of work. The subsequent introduction to exchange derives predominately from the work of British anthropologist John Davis.

Exchange is a universal activity (Davis, 1992) and is the primary way in which "useful things move from one person to another." However, beyond the transfer of 'things' exchange provides insight into, determines and shapes the **social relationships** between those involved in the exchange. Despite the significance and influence of exchange on our (social) lives many of us fail to recognise and regard our actions, out-with a commercial concept of buying and selling, as examples of exchange: "it is rather easy to ignore all our exchanges which we make with friends and relatives rather than in a market or shop" (Davis, 1992). As a society we are inclined to reduce seemingly these 'small' and 'unimportant' exchanges to "trivialities" (Davis, 1992) which are sporadic, unplanned and unintentional. However, social anthropologists strongly disagree: the day-to-day exchanges which we make with friends, family, neighbours, strangers... are "not arbitrary, casual or random" (Davis,1992) but are **symbolic and deeply ritual-like actions which are defined and characterised by other person(s) and relations.** These everyday exchanges are distinguishable from the rational market transactions that we engage in, which are comparatively more straightforward to describe and recognize as exchanges and which align with the marketist perspective of exchange as being motivated by profit (Davis, 1992). In fact, the political and emotional ramifications of an exchange carry a significant weight for the persons involved, independent of the tangible material gains or losses made as a result of the exchange (Davis, 1992). Thus, an anthropological approach to exchange stresses the importance of exchange as an **embedded and ubiquitous social activity.**

NON-MONETARY & IN KIND EXCHANGE

There is debate amongst anthropologists about whether different kinds of exchange exist or if all exchange is inherently the same. Davis argues that "we have available to us a range of different kinds of exchange - a **repertoire of socially acceptable practices which are culturally, morally and even economically distinct**." The variations

and nuances in exchange are traced back to and prelude studies of "potlatch" and "kula" exchanges. Today exchange can, grossly, be characterised as 'monetary' or 'non-monetary'/ 'in-kinds'. Monetary' exchanges are self-explanatory and customary in today's society. 'Non-monetary' exchange can be described as 'barter' or 'gift' like. Whilst there are notable differences between the two, they exist in a continuum and all non-monetary exchanges are believed to contain elements of both 'barter' and 'gift' (Humphrey & Hugh-Jones, 1992).

UNDERSTANDING BARTER

This project centres its focus and scope on the broadest interpretation of the exchange type **"barter."** Nevertheless, it is worth noting that the concept of **"gift"** is intimately linked with and overlaps with "barter," and as such, will still be discussed in relation to "barter" throughout. The features, elements, dual-nature and contexts and conditions of and for barter are outlined.

A DEFINITION

When asked for an explanation barter can be described as **"the direct exchange of goods or services for each other without the medium of money"** (Heady, 2005) but literature from anthropology argues that "attempts to produce a universal definition or model of barter usually involve stripping it from its social context and results in imaginary abstractions that have little or no correspondence to reality." (Humphrey & Hugh-Jones, 1992). In essence it is not possible to create one definition for barter as it is so **closely tied to the social context in which it occurs**. Instead barter can be deemed as a **'polythetic category'** (Humphrey & Hugh - Jones, 1992) meaning many, but not all, of its properties are common to each barter exchange. Nevertheless, there many different interpretations of barter and although it is ubiquitous (Humphrey & Hugh-Jones, 1992) and appears everywhere, many of the barter exchanges we carry out are not recognised as such.

Barter exchange may not have a clear cut definition itself but to have a better understanding of barter, we need to understand the different **features** of this exchange type. What does a barter exchange look like? It should be noted that all of the five features outlined below originate from the work of social anthropologists Caroline Humphrey and Stephan Hugh-Jones in the book 'Barter, Exchange and Value: An Anthropological Approach' (1992).

FEATURES

1. In barter exchange **two different goods and services** are exchanged.

"Demand for particular things which are different in kind."

2. **Neither party is tied to a barter exchange**. They are free to 'quit' at any time and once an exchange is completed both parties can be regarded as being 'even' with each other.

"The protagonists are essentially free and equal."

3. The exchange is agreed upon, arranged and takes place between two parties who want something the other has. **No numerical calculations or scales** are used here to 'calculate' this exchange and it can not be judged against an external 'criteria'.

"There is no criterion by which the exchange can be judged from the outside. Some kind of bargaining is taking place, but not with reference to some abstract measure of value or numeriare; each simply wants the object held by the other."

4. Partners in a barter exchange can 'give' and 'receive' the goods/services at the same time or at different times. Barter exchanges can **take place over different time frames.**

"The two parts of the transaction can occur simultaneously; sometimes the two may be separated in time."

5. In barter, both partners of the exchange often see the goods/ services which are being exchanged 'in a different light' to each other. Not only is the value of the goods or services seen differently, this **value changes through the act of exchange.** As an example: A horse is exchanged for an art piece. For the person receiving the horse the value changes from a farm animal to a ploughed field, and for the person receiving the art piece the value changes from being just that to something which can be auctioned at high price. Often these transformations in value take place when the persons in exchange come from different cultures.

ELEMENTS

Features which are common to barter have been outlined, now the **elements** which constitute a barter exchange are briefly described.

The exchange set up in barter describes a situation where two persons each have something which is valuable to and needed by the other.

The rate of exchange is in essence the agreed 'price' of on good for another. Individuals will judge if a barter exchange is 'of equivalent value' or 'fair', based on the other exchange rates offered in the area.

The opportunity cost refers to the time (and resources) which are lost in producing, obtaining and/ or sourcing the goods to be exchanged.

The transaction cost is determined by the opportunity cost and rewards the person in exchange for their time and effort in receiving the goods.

'The coincidence of wants' is in literature often the focus of barter exchanges and "dis-utility" (Humphrey, C. et Hugh-Jones, S., 1992) and refers to the arguably inconvenient and difficult situation of bringing together exchange partners who each have something the other wants.

THE DUAL NATURE OF BARTER

The features and elements which form the basis of barter have been described, but still the style of a barter exchange can vary. This difference lies in the relation of barter exchange to other exchange types: commodity exchanges and gift exchanges. To better understand the relationship between these exchange types, a short introduction to 'gift' and 'commodity' exchanges is needed.

Gift exchanges are explained as a situation where two parties "present each other with goods and services which are basically alike in order to reinforce the **social relationships** between them." (Heady, 2005)

Commodity exchange can be described as the exchange of unlike goods and services for the benefit or profit of that good or service. Here the focus in the exchange is on the **material item** itself."

Gift exchange, commodity exchange and barter are all their own 'exchange type' but "there are not always hard and fast boundaries between them... and it is not useful to analyse barter as an isolated phenomenon." (Humphrey & Hugh - Jones, 1992). Barter typically shares many characteristics with gift-exchanges: both are non-monetary exchanges which "derive from, and create, relationships." (Humphrey & Hugh-Jones, 1992). Commonly barter takes a gift-like form when exchange partners are 'ritual friends' themselves or belong to a group whose social leader is 'ritual friends' with the other party. But the main characteristic which makes barter 'gift-like' is that it would not occur without "the existence of secure social relationships." (Heady, 2005). Like in gifting, gift-like barter creates a **foundation for moral commitment** between the exchange partners.

It should be mentioned that despite their overlap barter and gift exchange are seen to have two notable differences: **compulsion and balance**. Gift exchange creates a sense of **obligation** (the receiver feels indebted to return the gesture) whereas barter does have the same effect. In barter there is a weaker or no sense of compulsion and the exchange feels more two-sided, partly because the goods/ services which are exchanged do not need to be alike. Although each barter exchange varies, likely due to the **context** which it happens in, Heady (2005) argues that all barter exchanges share aspects, to a lesser or greater degree, of both gift and commodity exchange and this **'dual nature'** can be described as both **'material transactions' and 'signs of relationships'**.

Gift exchanges are explained as a situation where two parties "present each other with goods and services which are basically alike in order to reinforce the **social relationships** between them." (Heady, 2005)

A NOTE ABOUT LANGUAGE

As discussed, barter is often very gift-like in execution, but it is most commonly associated with the 'adversarial bargaining' style of exchange which is more in line with commodity exchanges. Here the focus of the exchange is on the goods/ services themselves and not on the social relationship between the exchange partners. Commodity exchanges are linked with 'negative reciprocity' (an attempt to trick or coerce an exchange partner in trading something valuable for something of, knowingly, less value). Therefore language used in relation to 'barter' often reflects this negative connotation and despite being a non-monetary form of exchange, has makes **transactional and financial impression**.

BARTER EXCHANGE COMPARED TO MONEY

Barter has been compared to other exchange types, but how does it relate to the exchange type perhaps most familiar to us, **monetary** exchange? The linguistic link between the word 'barter' and monetary exchange has been mentioned, but that is where the similarities end.

The platform and institutions underpinning our economy approve the transactions and exchanges made in money exchanges. But in barter exchange partners are on their own, deciding what a good/service is worth: things are swapped based on **"an internal balance" and not against external criteria.** (Humphrey & Hugh-Jones, 1992).

In barter the goods and services exchanged have a **direct 'consumption value'** and can be used instantly to fulfil a certain goal. Money on the other hand does not have a direct use of its own, it is more of a means to an end.

CONTEXTS AND CONDITIONS FOR BARTER

Different styles and forms of barter have been described, but in which **contexts** can barter take place and when is barter even favourable over other exchange types, such as money exchange? Listed below are contexts and conditions, taken from literature, when barter exchange is likely to happen and what is needed for these exchanges to take place. Barter exchange happens:

Where money is scarce and people have a low-cash income and cannot afford to hold onto their money.

When security and trust in the monetary system is weakened e.g. due to inflation or global events such as political unrest.

To avoid the tax regulations which monetary transactions are subjected to.

When the 'coincidence of wants' is not problematic and it is easy to find a suitable trading partner. The 'coincidence of wants' also ceases to be an issue when there is demand for one good from everyone, necessities such as energy. If one can provide this 'universally needed' good, then finding an exchange partner becomes much more straightforward.

Between communities or within 'an economically weak' one.

REQUIREMENTS FOR BARTER EXCHANGES

The **requirements** for barter exchange to take place, as stated in literature from anthropology, are listed as the need for:

Information
"In the real world there are many kinds of social relationships where sufficient information is present."

The option of delay
"A system of simultaneous barter (where goods and services are exchanged at the same time) is a virtual impossibility."

Credit
"Credit increases the range of opportunities for barter... and it implies trust."

SOCIAL CONDITIONS FOR BARTER EXCHANGES

Also taken from literature, and again from the work of Humphrey and Hugh-Jones, are the **social conditions** of barter exchanges. These conditions highlight the "not stable and self-regulating, but rather dynamic, self-contradictory, and open-ended" nature of barter exchanges.

Discontinuity
"The relationships created by barter are in themselves discontinuous and unstable."

The creation of trust
"It is comparatively quite rare for opportunities for barter to happen quite spontaneously and by pure chance and then never occur again. People may often wish, or need to, repeat a transaction at a later date."

Interaction with dissimilarity
"The objects which are exchanged are dissimilar. I want to give up something I have because I want something else more. Not only are the goods alike, they are also frequently incomparable."

The bid for equality
"When unlike, and therefore in some sense unequal, things are exchanged, the lack of precise balance is of the essence."

SUMMARY

LIMITATIONS
FOR INCLUSION IN LOCAL ENERGY SYSTEMS

Smart flexible energy systems are highly complex and whilst the intention is to empower residents, the result is often **disengagement and distrust.**

Developed to respond to the interest of the grid and energy system, local energy platforms are **designed without regard for the preferences and capabilities of users.**

The market like nature of energy systems **presumes and subjects residents to the roles of 'buyers' and 'sellers'**, labelling them as profit-motivated individuals.

Peer-to-peer models create a **competitive market environment** and **risk straining and damaging existing social relationships.**

Creating space for social connections and autonomy in local energy systems **increases the risk of exacerbating existing social and economic inequalities.**

OPPORTUNITIES
FOR INCLUSION IN LOCAL ENERGY SYSTEMS

Case studies have shown that residents prioritise community values over financial ones, and want to take an **active and collective role in** their energy systems.

Active inclusion, by **addressing the specific needs of vulnerable residents,** is needed to include 'the excluded' - low-income and low-educated groups.

Local decentralised systems **can create social value**, but these values are heavily shaped by the **context specific** cultural, economic and institutional factors present.

Mutual energy exchange creates opportunities for **empowering vulnerable groups** in particular to have choice and control in their energy systems.

BRIDGING ENERGY AND BARTER FOR INCLUSION

Local decentralised energy systems are emerging but are developed to respond to the interests of the grid and do not account for the preferences and capabilities of residential end-users. Whilst P2P models facilitate 'energy exchange' by enabling residents to buy and sell, this individual market-like system limits opportunities for the creation of social and community values and thus the inclusion of vulnerable groups in particular. Barter exchange is a socially embedded and universal process which derives from, and creates relationships. Mutual energy exchange (MuEE), which can include 'barter', or the exchange of 'in-kinds' and 'intangibles', presents possibilities for empowering residents to have choice and control in their local energy system. Missing from literature, and practice, is **the intentional design and integration of barter exchange into local decentralised energy systems as a means for the active inclusion of vulnerable residents and groups**.
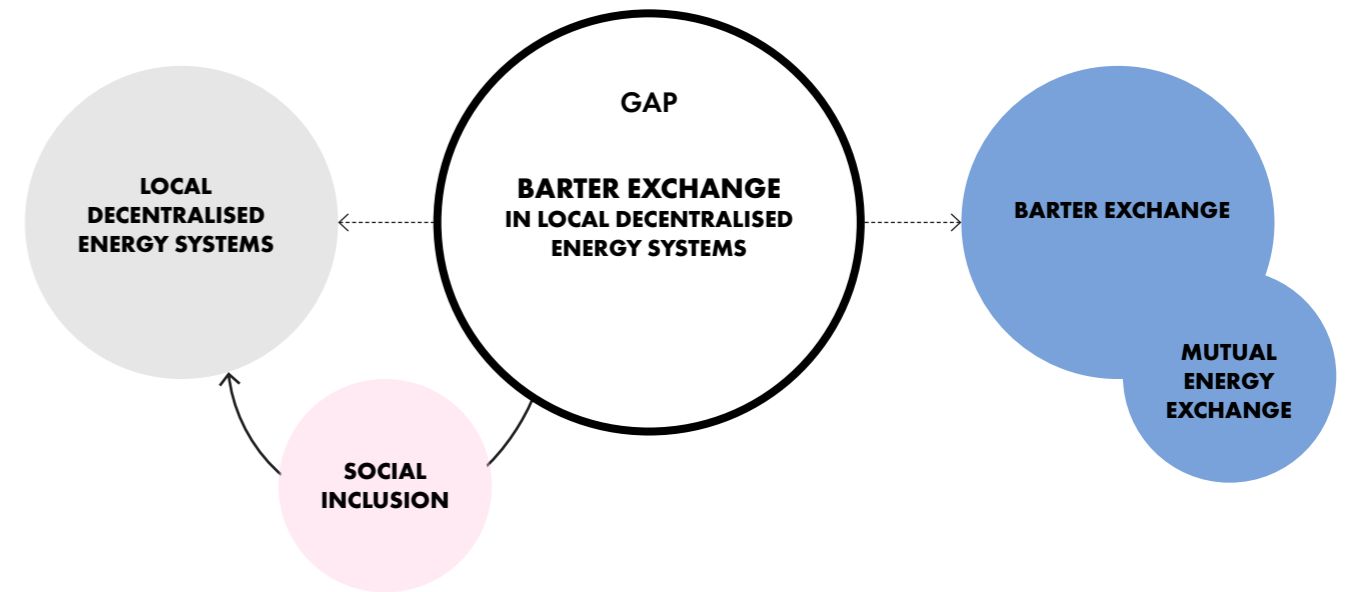
Fig 2. Identified research gap

A NEED FOR CRITICAL COMPARISON

The residential users of all of the case studies and existing systems referred to in literature are 'middle-class', highly educated homeowners. This shows that, by design, local decentralised energy systems are not inclusive for vulnerable residents, but it also calls into question the solidity and relevance of the findings presented in literature for a low-income district such as Zuidoost. For example, studies showed that residents in 'energy communities' prioritise social values over financial ones, but is this also true for residents living in poverty? Similarly case studies highlighted a desire from residents to learn about energy, but is this a priority for struggling families? Potential contradictions exist between what is written in literature and the context of this project, meaning that constant critical comparison is key.

1.2 | EXPLORING THE FIELD

IN SHORT

Described in this chapter are the field explorations carried out as part of this 'Explore' phase of the project. The chapter ends with a summary of key findings and six emergent key themes.

GOAL

Research-through-design activities in the field, or rather within the project scope meaning both the physical context (Amsterdam Zuidoost) and the theoretical context (energy exchange), are undertaken to bring insight into the current local (energy) situation and discover the needs and wants of potential end users of a new system. The aim of this fieldwork is also to introduce a research through design approach to the LIFE project and in doing so inspire stakeholders to start to imagine new and novel energy systems.

APPROACH

An ethnographic approach was deemed most appropriate for the context of this project as it allows for low-key and non-invasive observation and interaction with the neighbourhood and local people. Zuidoost is labelled as an 'ontwikkelingsbuurt' or 'developing district' by the municipality of Amsterdam and as a result much research has and is being done in the area. Residents are used to being 'questioned' and often feel like 'research subjects'. One local resident described it as "We give, give, give and we don't get". To avoid tension and breaking the 'safe spaces' in their community (listed as Gents 5th condition for interventions for an inclusive energy transition, sub-chapter 1.1.2) it was important that the approach taken was simple and socially sensitive. Therefore much of the ethnographic research was conducted at and during

events where people were already gathered and generally more open and willing to have conversation and answer questions. This approach to the fieldwork required spontaneity and willingness to exploring wide, as well as deep. As a result many different explorations into the field were taken, but not all were of enough relevance to the project to include in this thesis. Where research was conducted with LIFE project partners and stakeholders a more formal generative research approach was taken in the form of planned creative sessions and experiments. Semi-structured interviews were also conducted with field experts, some of which were initiated after a more informal conversation at an event or workshop.

1.2.1 | EXPLORATION APPROACH

A WHOLE LOT OF EXPLORATION

Explorations in the field were made into four different relevant areas: inclusion, exchange, energy systems and context. Due to the iterative process taken, different investigations into these areas occurred simultaneously and across different research approaches. To aid understanding and the clarity of connection between these overlapping events, key findings of presented field explorations are categorised under these four research areas. Some of these areas are explored more extensively than others, in line with the scope and focus of the project.

The four research groups refer to the following questions. They were used to guide reflection, analysis and alignment of findings during and after research activities.

INCLUSION

HOW IS INCLUSION ADDRESSED?
WHAT DOES INCLUSION MEAN IN THIS CONTEXT?

EXCHANGE

WHERE IS THERE MENTION OF EXCHANGE?
WHAT TYPES OF EXCHANGE ARE SUGGESTED?
WHAT IS REVEALED ABOUT THE CHARACTERISTICS OF EXCHANGE?

ENERGY SYSTEMS

HOW DO CURRENT ENERGY SYSTEMS APPROACH INCLUSION?
HOW DO THESE ENERGY SYSTEMS ADDRESS SOCIAL VALUES?

CONTEXT

WHAT IS LEARNED OVER AMSTERDAM ZUIDOOST?
WHERE IS THERE REFERENCE MADE TO LOCAL COMMUNITIES?

Fig 3. An impression of the field trips taken in Amsterdam Zuidoost

1.2.2 | EXPLORING THE COMMUNITY

APPENDIX B6
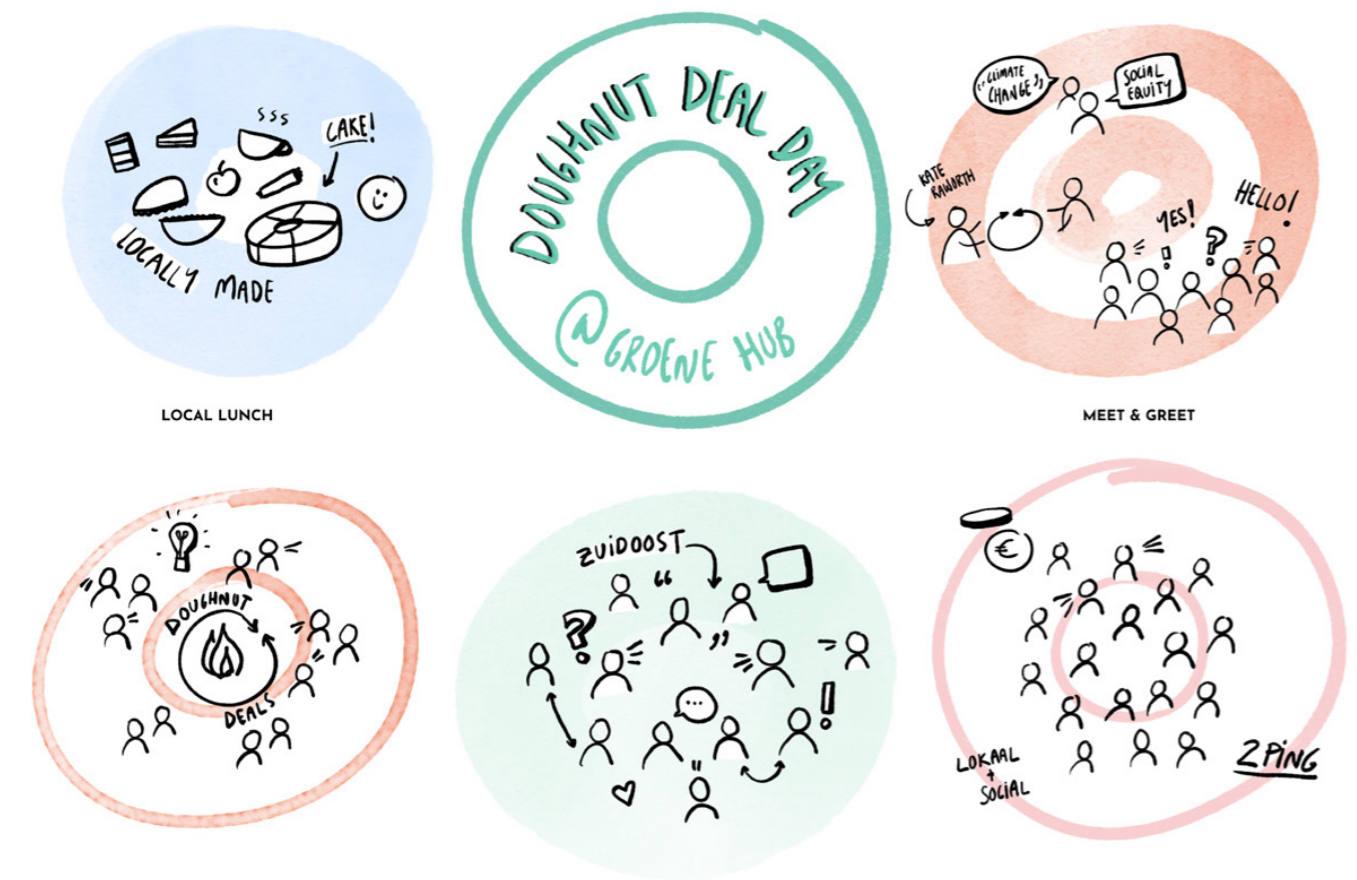
Fig 4. Summary of Doughnut Deal Day at the Groene Hub

AIM	TO ENAGGE WITH THE LOCAL PROACTIVE RESIDENTS IN ZUIDOOST & OBSERVE INTERACTIONS AT AT THE HUB
WHEN	18.10.2022, 09:00 - 17:00
WHERE	GROENE HUB, HOLENDRECHT, AMSTERDAM ZUIDOOST
WHO	ANNA STIJKER AND MAARTJE BOS (GROENE HUB), LOCAL RESIDENTS, RESEARCHERS, ACADEMICS, ENTREPENEURS

THE DOUGHNUT COALITION DAY

FIELD NOTES IN SHORT

The event revolved around the exploration of the Doughnut Economy framework and encompassed an inspiration session as well as a workshop highlighting the recently formulated 'Doughnut Deal' with the local cooperation 'Lokaal Geld'. Led by Anne Stijker and Maartje Bos from the Groene Hub, the participants were introduced to the principles of the Doughnut Economy and engaged in discussions regarding the essential conditions for the emergence of local and grassroots initiatives as 'Doughnut Deals'. The primary objective of the inspiration session was to provide attendees, including local residents, academics, and experts in the field, with a comprehensive understanding of the challenges, opportunities, and potential of this model. In addition, the session aimed to encourage co-creation and generation of innovative ideas for potential future 'Doughnut Deals' in Amsterdam Zuidoost.

INSPIRATION SESSION

Approximately sixteen people took part in the inspiration session. Diverse sub-groups were formed to facilitate collaboration between local residents, researchers and local entrepeneurs. Notably, the residnets who participated in the session were frequent visitors of the Groene Hub, utilizing the space for learning, social engagement, and receiving local support. Considering their potential vulnerability and lower socio-economic status, characterized by an absence of stable income and reliance on social care benefits, these residents represented an important demographic within the context of the event. Additionally, their status as foreigners occasionally presented communication challenges in the mix of Dutch and English speakers in the group.

Fig 5. Doughnut Day opening

KEY FINDINGS

AN ENTREPRENEURIAL MINDSET

Residents in the community have a lot to give. From the group discussions it was clear that there are many local people with skills and services which are of value to others. Guidance and a platform is needed to help these local entrepreneurs put themselves out there, make connections and test their business ideas.

DISCOVERY AND PERSONAL DEVELOPMENT

Many of the residents who move to Zuidoost, perhaps from overseas, need to settle into this new neighbourhood and the different way of living. For them support is needed in discovering what their own personal strengths are. What are they good at and how can they contribute to this community?

DOUGHNUT ECONOMICS MODEL
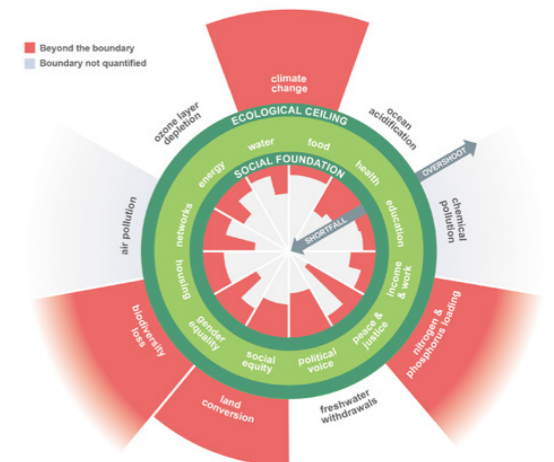
Fig 6. Doughnut Economics model
(Kate Raworth)

The doughnut economy model, developed by economist Kate Raworth, is a framework that balances social needs and environmental limits. It aims to meet basic human needs while respecting ecological boundaries, creating a safe and just operating space for humanity.

REFLECTION

There was a feeling of enthusiasm and a sense of wanting to take proactive action to improve the neighbourhood and the quality of life of people living there. As an outsider of this community I got the impression that the residents here are very resourceful and are willing to seek out practical solutions for creating new value in the community.

APPENDIX B 13

Fig 7. Transform. Hackathon event

AIM	TO LEARN ABOUT CURRENT DUTCH ENERGY SYSTEMS & PROJECTS WHICH ARE RE-IMAGING THE TRANSITION
WHEN	31.10.2022 - 02.11.2022
WHERE	FOORT VOORDORP, UTRECHT
WHO	OVER 200 RESEARCHERS AND EXPERTS IN THE FIELD OF THE ENERGY TRANSITION

TRANSFROM. HACKATHON

FIELD NOTES IN SHORT

The Hackathon was primarily sponsored by RES (Regionale Energie Strategie) Netherlands, while also receiving support from governmental organizations and energy network operators such as Alliander and Stedin Group. With over 200 participants and experts in attendance, the event spanned three days and focused on four distinct challenges related to the transformation of the Dutch energy transition: institution, stewardship, value, and space. Each team was assigned to work on one of these challenges while also addressing the barriers and opportunities associated with the other three. As part of a multidisciplinary group comprising of students, energy experts, and innovation and project managers, my specific focus was on the challenge of space, which aimed to tackle the insufficient integration and visualization of land use for different activities in the Netherlands. The event followed a structured three-stage process consisting of problem finding, idea finding, and solution finding, culminating in a final pitch to other teams and a jury.

KEY THEMES

DESIGNING FOR RESILIENCE

Uncertainty is certain in our future and the future of energy. Therefore it is important to design for resilience when re-imagining energy systems and services. When systems and services collapse vulnerable people are the first to face the impact of this. Thus inclusion is bound to resilience. Without the latter a new system or service cannot be inclusive in the long run.

ENERGY LITERACY AND LANGUAGE

The language used around the energy transition is techocratic and exclusive for many people. New language and narratives are needed in an inclusive energy exchange system. Language too has the ability to transform perspectives and incentivise behaviours. For example, exchanging for X kilowatt hours becomes more relatable and inspiring when transformed to 'exchanging for a month of heating in your home.

LOCAL AND NOT STANDARD INCENTIVES

Motivating residents to participate in a new system requires meaningful, relevant and local incentives. The word 'local' is key here. Standard incentives are, by nature, not inclusive. They generalise the users of a system and in doing so leave behind marginalised and vulnerable sections of society. Therefore in designing an inclusive energy exchange system incentives should speak to the people you want to include. In line with 'normalisation' of a new system, incentives should first take inspiration from existing reward schemes or approaches in the local area, before introducing something different.

DYNAMIC AND DIVERSE SOLUTIONS

A future energy exchange system cannot be a 'one-size fits all' solution but instead a multifaceted and multi-channel approach is needed to balance the interests of all involved stakeholders and users. Dynamism and diversity are conditions which support resilience and thus inclusion.

NORMALISATION OF A NEW SYSTEM

New and different systems carry assumptions from people who are 'doing it the normal way'. An inclusive system is not inclusive if the people who need to be involved do not want to. There are social stigmas and pressures around participating in a different system, and fear of not belonging to a certain group. Thus it is crucial that a new energy exchange system is normalised and does not become regarded as a help system for vulnerable people.

ENERGY AS A COMMON AND LOCAL GOOD

Energy is for all but as the premise for this project shows, current systems are not inclusive. The concept of energy as a common good can be placed within an inclusive energy system by utilising existing communal spaces such community centres and hubs and public parks.

KEY FINDINGS

NOT EVERY CONSUMER WANTS TO BE A PROSUMER

Residents can sit in different places on the scale of full autonomy to complete dependence on their energy system. For instance some residents may be enthusiastic about becoming a 'prosumer', whilst others may have no interest in producing their own energy. These differences in levels of participation and effort are strongly tied to people's own values and priorities in their everyday lives. It is crucial to be sensitive to these nuances in designing a new energy exchange system.

ENERGY DONATION IS NOT RESILIENT EXCHANGE

Energy donation, although mostly welcomed by vulnerable residents, especially in hard times, is not a resilient or balanced form of exchange. Rather it is viewed more as a 'quick fix' which does not tackle the core of the problem and is liable to break down. The imbalance of donation lies in the impact and consequences of stopping the exchange for both involved parties: for the 'giver' of energy it is fairly easy to stop donating without personal consequences, but for the 'receiver' of energy the impact of this is great, especially is they are reliant of this source of energy.

VALUE IS ACCESSIBILITY AND AFFORDABILITY

The two key priorities for residents, when it comes to their energy, are accessibility and reliability. Ultimately these are the factors which determine whether someone can heat their home or not.

PEER TO PEER TRADING HOLDS SOCIAL IMPLICATIONS

A peer-to-peer energy system can foster competition between community groups and collectives, instead of bringing them together. The focus of an inclusive energy exchange system should be cooperation, not competition!

REFLECTION

There is much to be optimistic about in regards to what we can do to transform the transition, but still a lot of work has to be done. From a personal and design perspective I learnt how methods such as creative facilitation and low-fi digital prototyping can help understanding and imaging of future scenarios by making complex systems tangible and relatable. From a project perspective I realised that I can look at exchange more than the practical facilitation and form of the exchange, but also the impact that these exchanges can have for the people involved.

1.2.4 | **EXPLORING THE LIFE PROJECT**

APPENDIX B11

Fig 8. LIFE Partner Event

AIM	TO EXPLORE POSSIBILITIES FOR SOCIALLY DRIVEN ENERGY EXCHANGE WITH LIFE CONSORTIUM STAKEHOLDERS
WHEN	25.10.2022, 13:00 - 18:00
WHERE	AMSTERDAM INSTITUTE FOR ADVANCED METROPOLITAN SOLUTIONS
WHO	15 LIFE CONSORTIUM STAKEHOLDERS AND PARTNERS

LIFE PARTNER EVENT

FIELD NOTES IN SHORT

The LIFE Partner Event was organised by the LIFE Social Platform and was a continuation of a previous workshop which was held earlier in the year. Overall, the goal of this event, from the perspective of LIFE, was to create alignment among partners about the LIFE Social Platform, and its relationship to other system components. The consortium stakeholders and project partners were split into four groups for the workshops which were facilitated by TU Delft/ LIFE Social project members and research students. In summation the stakeholders reflected and ideated upon value and energy exchange in the context of the project and together stated what the LIFE Social Platform could look like and how it might be constructed.

SIGNIFICANCE

The LIFE Platform event was a significant exploration in this first phase of the project and resulted in rich data and insights. The initial ideas which arose from the creative workshop were used in the 'inspiration sessions' outlined in the subsequent 'reframe' phase. The findings from this session were also used to create the 'characteristic cards' used in the 'inspiration sessions'. Only key findings from the event are presented in this sub-chapter.

SESSION STRUCTURE

The session was created according to the iCPS approach (Heijne & v.d. Meer, 2019) and followed the diverging and converging phases of the creative diamond model.

KEY RESEARCH QUESTIONS ADDRESSED IN WORKSHOP

1. WHO IS INVOLVED?
1a. How is Lokaal Geld aiming to tackle inclusion?

----

2. WHAT VALUE IS EXCHANGED?
2a. What do different stakeholders 'give' and 'get' in energy exchange in Zuidoost?

----

3. WHICH VALUE EXCHANGE IS MOST IMPORTANT?
3a. What drives the stakeholders to participate in this exchange?

----

4. HOW MIGHT WE REALISE THE SELECTED EXCHANGE IN THE LIFE PROJECT?
4a. How might this exchange be facilitated?
4b. How do we govern these exchanges?
4c. What does it mean for the form of the LIFE Social Platform?

REFLECTION

The sessions and event overall proved very fruitful and sparked new thoughts and perspectives. However, apparent through observation and facilitation of a workshop, and discussion in the plenary sessions, was that the perspective of residents is currently not well represented within the LIFE project. Whilst some participatory activities have taken place, the engagement of potential end users is still at an early stage. Therefore, being mindful of the assumptions made about their needs and preferences is essential in exploring and designing a new system.
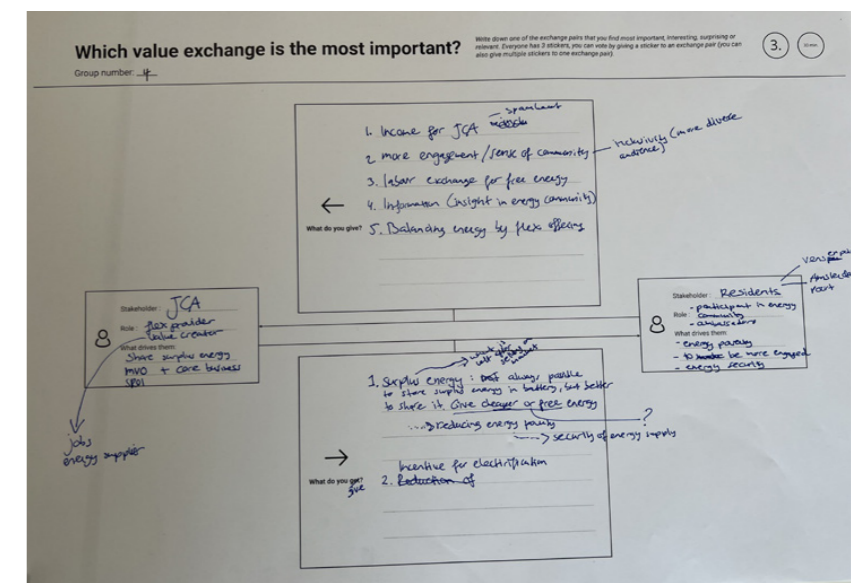

Fig 9. Exploring value exchanges

PARTNERS IN EXCHANGE

LARGE ASSET OWNERS HAVE SURPLUS ENERGY

The Johan Cruijff Arena as well as other larger venues and organisation have energy assets in the form of solar panels and storage batteries. They produce enough renewable energy that there is a surplus of supply, which has the potential to be distributed locally.

POSSIBILITIES FOR DIRECT EXCHANGE UNCLEAR

Residents and single households likely do not have sufficient energy 'flex' to engage in direct energy exchange with a large asset owners. Possibilities for enabling the distribution of surplus energy to local surrounding neighbourhoods remain unclear.

INCLUSION OF VULNERABLE RESIDENTS IS A PRIORITY

All partners unanimously agreed that inclusion of the most vulnerable in society is essential in the LIFE project. Their engagement defines the success of the LIFE Social and Technical Platforms.

REACHING PAST THE EARLY ADOPTERS

For a new local energy system to be successful the majority of residents need to participate. Therefore it is important to engage 'exchange partners' beyond the early adopters, who form a minority of the local neighbourhoods.

INCENTIVES FOR PARTICIPATION IN LOCAL ENERGY EXCHANGE

LARGE ASSET OWNERS CAN SHOW SOCIAL AWARENESS

The incentive to participate in local energy exchange from the perspective of large asset owners, such as JCA, is that they can fulfil their social responsibility requirements and goals, and showcase this.

FINANCIAL INCENTIVES

Local residents are primarily motivated by financial incentives and would be more likely to engage with a new system if they energy costs are reduced and/ or covered.

REQUIREMENTS FOR A LOCAL ENERGY EXCHANGE SYSTEM

RECORDING EXCHANGES

To regulate and record local exchanges a system for measuring, mapping and visualising them is needed. Recording exchanges is crucial for measuring effect and impact of the system and understanding potential for scaling and replicability.

LOCAL ENERGY ASSETS

Energy assets are needed in a local energy exchange system. However, the ownership of these assets can take different forms from private, to collective and common. Whilst some project partners see local and residential ownership of assets as essential for socially inclusive energy exchange. Others believe this will have the opposite effect.

NEED FOR INFORMATION

In order to effectively facilitate energy exchange, information is required about and from both parties involved. In essence, information exchange needs to happen in tandem with and for energy exchange.

DIFFERING LEVELS OF PARTICIPATION

A local energy exchange system and platform should enable differing levels of participation from potential end-users to enable flexibility and increase acceptance

ENERGY SECURITY FOR THE VULNERABLE

The incentive for local (vulnerable) residents to participate in a new local energy exchange system could be to gain more energy security. Large asset owners, like JCA, could provide this feeling of stability for residents who live short-term and cannot be certain of their financial situation in the coming months.

SOCIALLY DRIVEN ENERGY EXCHANGE

Local clusters and in groups in Zuidoost may be driven by energy exchange which extends beyond energy itself to include possibilities for job creation (e.g. in installing and maintaining assets). Familiarly residents may choose an 'energy exchange partner' based on their commitment to addressing other social and local issues, such as mobility.

EXCHANGE TYPES

ENERGY DONATION: A MORE JUST FORM OF EXCHANGE?

Many of the vulnerable residents living in Zuidoost already struggle to make ends meet. Thus energy donation is seen by some project partners to be a more socially just form of exchange which does not expect residents to 'give back' in return.

LOCAL TOKENS AND CREDITS

An local energy system could use local tokens or credits as a means for including residents who are financially vulnerable and have little disposable income.

VALUE DRIVEN EXCHANGE

Local energy exchange can offer more than financial reward or profit. There are possibilities for creating new social and ecological value flows through energy exchange.

BARTER: A PERSONAL FORM OF EXCHANGE

Barter exchange, of goods and services, can address the specific needs and preferences of local residents, whilst connecting people and places.

DATA EXCHANGE

In return for access to affordable and renewable energy, residents and small local business owners could offer information about their energy usage and consumption habits.
.

FORM OF ENERGY EXCHANGE

MULTI-FORM ENERGY EXCHANGE

A combination of multiple physical and digital touch-points are needed to make a local energy exchange system and platform accessible and inclusive for a range of potential end-users.

PHYSICAL EXCHANGE STORE

Local energy exchange could operate and be arranged through local stores existing stores in neighbourhoods. Alternatively new physical locations for facilitating energy exchange could be introduced.

TANGIBLE ENERGY TOKENS

Local energy exchange can offer more than financial reward or profit. There are possibilities for creating new social and ecological value flows through energy exchange.

A DIGITAL PLATFORM: A GATEWAY TO ENERGY EXCHANGE

A digital application could provide the gateway for local residents to access a local energy exchange system.

IN SUM

The key energy exchange, and where project stakeholders saw the most potential for the LIFE Social Platform in Amsterdam Zuidoost, was labelled as the **exchange between large asset owners, such as the Johan Cruijff Arena, and residents in the surrounding neighbourhoods.** The surplus solar energy stored in JCA's battery could be shared and in doing so tackle both key goals of LIFE at once: stabilisation of the grid and inclusion of local residents. Stakeholders also regarded the Johan Cruijff Arena as a front-runner here who could set an example for other organisations in the district who have large flex assets (such as ING). Many different ideas arose and were discussed involving the Johan Cruijff Arena. Potential was identified for creating a system which lowers the energy bill for residents and enables JCA to actively work on their own Economic, Social and Governance factors. However, alongside the ideas and possibilities some uncertainties and concerns also surfaced, specifically regarding the 'central position' JCA would have in such a system and how surplus energy could be distrusted justly.

"If we can prove that an asset owner in the area, Like JCA, can provide something to local people and create value then that is an example for other asset owners."

"Maybe the energy is cheaper if you take it from JCA, than if you take it from the grid operator. It could be a cheaper energy price if you buy off flex."

"Maybe the Johan Cruijff Arena become monopolists, like they get too much power."

1.2.5 | EXPLORING VALUES IN ENERGY EXCHANGE

APPENDIX B12

Fig 10. What would you give for 1 day of energy?

AIM	TO DISCOVER WHICH VALUES ARE ATTACHED TO ENERGY AND HOW ITS WORTH IS DETERMINED
WHEN	25.10.2022, 13:00 - 18:00
WHERE	AMSTERDAM INSTITUTE FOR ADVANCED METROPOLITAN SOLUTIONS
WHO	LIFE CONSORTIUM STAKEHOLDERS AND PARTNERS

THE ENERGY SWAP SHOP

FIELD NOTES IN SHORT

During the LIFE Partner Event, a low-fidelity experiment was conducted alongside the main workshop to actively engage stakeholders in the concept of non-monetary exchange. The experiment aimed to explore the values people associate with energy and their perceptions of its worth. Using a cookie as a metaphor for energy, informal exchanges were facilitated to initiate a dialogue on energy exchange. This activity not only stimulated creativity but also encouraged stakeholders to envision future energy exchange systems. The "Energy Swap Shop" allowed participants to make exchanges, with each cookie representing a day's worth of energy. Fourteen participants made a total of seventeen swaps, indicating multiple exchanges by some individuals. The analysis revealed that the majority of exchanges were made using the "skills" token, followed by "money". It is important to note that not all swaps were observed since the swap shop was set up at the back of the plenary room, providing attendees with the freedom to visit in their own time, such as during breaks.

INTERACTION SCENARIOS

Three 'energy shop swaps' were observed and these exchanges are illustrated in the interactions scenarios below.
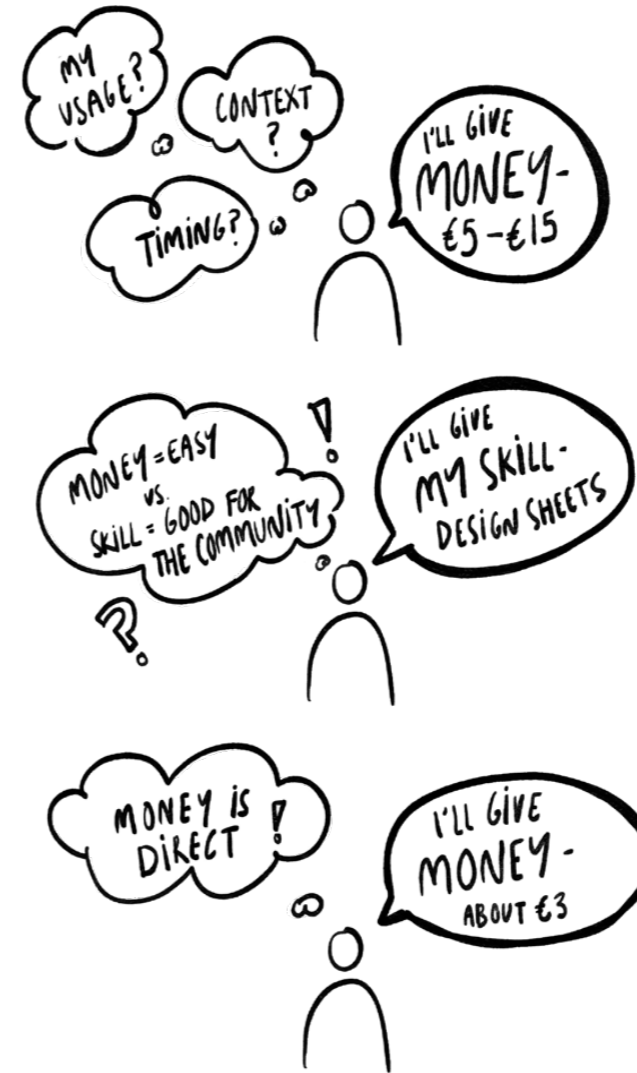
Fig 11. Observed interactions at the 'Energy Swap Shop'

KEY FINDINGS

THE INFLUENCE OF CONTEXT

Factors such as energy prices, economic situations and their own energy usage patterns influenced what participants were willing to exchange in return for one days worth of energy. In making their decision they weighed up the cost-effectiveness and convenience of different options.

GAP BETWEEN INTENTION & REALITY

Whilst some participants expressed the intention to 'give back' or contribute their skills, they found that practical considerations led them to ultimately still choose for monetary exchange.

MORAL CONFLICTS IN CHOICE OF EXCHANGE

Some participants experienced moral conflicts between their desire to give back to the community and the easiest or most convenient choice. They deliberated between monetary exchange and contributing their own skills, deliberating between the value of their own time (and how they spend it) and the satisfaction derived from helping others.

EXPLORING THE PEOPLES PERSPECTIVE

APPENDIX B 17

Fig 12. 'Boundary object' used on the streets of ArenApoort

AIM	TO GATHER THE PERSPECTIVES OF LOCAL PEOPLE & GAIN INSIGHTS INTO THEIR NEEDS AND PREFERENCES
WHEN	29.11.2022, 11:0 - 17:00
WHERE	STREETS OF ARENAPOORT, AMSTERDAM ZUIDOOST
WHO	RESEARCH CONDUCTED TOGETHER WITH LENA DE ROUW, ENGAGED WITH LOCAL RESIDENTS AND PASSERS BY

ARENAPORT

FIELD NOTES IN SHORT

The experiment took place in the busy shopping street of ArenApoort, chosen for its high footfall due to nearby entertainment venues. Twenty residents participated throughout the afternoon, with some approaching the stand out of curiosity and others invited to participate. The focus was on engaging with local residents, although unintentionally, no interactions occurred with visitors or employees in ArenApoort. Most interactions involved current or former residents of Zuidoost, with some participants residing in neighbouring districts. The questions and posters were in Dutch, considering the assumption that most local residents would be Dutch speakers. However, some non-Dutch speakers participated, and communication took place in English.

The participant group represented a diverse demographic range, including individuals of different ages, backgrounds, and ethnicities. The gender distribution was approximately 35% female. Interactions varied in length, ranging from a couple of minutes to over 15 minutes.

SIGNIFICANCE

This field exploration is of note in this project overall and influences the final restated design goal and ultimately the design direction taken. Of all the field explorations done this experiment gives the most insight into the needs and wants of potential end users of local and socially inclusive energy exchange system in Amsterdam Zuidoost.

BOUNDARY OBJECT

A 'boundary object' in the form of wooden, plastic covered board, displaying questions and visuals, was used. Participants of the experiment were asked to paste a sticker in the option which best correlated to their own answer to the question: 'Wat zou jij geven voor 1 maand energie in je woning?' ('What would you give for 1 month of energy in your home?')

DIALOGUE & QUESTIONS

Outlined below is an example of the dialogue and questions posed to participants.

> *"...Now we will talk more about the energy which comes out of the socket. Imagine that there is a local 'Marktplaats for Energy' here in Zuidoost (or in your local neighbourhood). Imagine that you receive solar energy from your community centre."*
>
> *"What would you give for one month of energy in your home? Would you give:*
> *A) Money*
> *B) A small job/ service*
> *C) Things*
> *D) Something else?"*
>
> *"Why did you choose this option over the others? (What would you choose other than money?)"*

RESULTS

The number of 'votes' or stickers for each option were:
'Een klusje'/ service = 9 votes
'Geld'/ money = 7 votes
'Spullen'/ things = 2 votes
Don't know = 2 votes

Fig 13. What would you give for 1 month of energy in your home?

REFLECTION

Standing on the street and preparing to approach people to discuss their relationship with energy and exchange was initially daunting. Given the current economic climate, I anticipated encountering individuals eager to vent their frustrations about sky-rocketing energy prices. However, to my surprise, the majority of participants were not only willing but enthusiastic to take part and share their thoughts. Rather than solely focusing on the present challenges, participants showed a genuine interest in exploring future possibilities and discussing their aspirations. What struck me most was the friendliness and openness of the passers-by. Many took the time to greet me before continuing with their daily routines. As a design-researcher, this experience reaffirmed my belief that local residents have a strong desire to be actively involved in their community and contribute to its development.

1. What is one month of energy worth to residents? How do they value it?

High energy prices are increasing the value of energy
Many residents mentioned that they struggle to pay their energy bills, which are extortionately higher than previously. These soaring prices influence behaviour: people are more conscious and cautious about their energy usage and are more aware of their reliance on energy. Thus the value of energy is becoming more apparent and top of mind.

The worth of energy is uncertain for young people
For young people who are not yet paying their own energy bills, knowing and discerning the worth of energy is difficult. They struggle to put a cost or number to their monthly energy usage.

2. What types of exchange are mentioned?

MONETARY EXCHANGE

Monetary exchange is most beneficial for local people
Residents value having 'cash in hand': it provides flexibility and freedom to purchase what they want and need and enables them to pay off debts and bills.

Monetary inflow benefits community wealth
Those who can pay in money, should. This was the reasoning of several local residents who feel that money that is earned should also be spent in the local community (for instance on energy) in order to support the local economy and the most vulnerable people.

Monetary exchange is the easiest option
Exchanging money for energy is the quickest, most convenient, and low hassle type of exchange.

Giving money is just not an option
For some, exchanging money for energy is not even considered as an option. They do not have the financial means to participate in a monetary energy exchange. Currently these residents rely heavily on social care benefits to heat their homes, they do not pay for energy directly 'out of their own pocket.'

Money is needed to support family
There are many immigrants living in Zuidoost, some of which still have family living overseas who rely on their financial support. These residents recognise the real need to have a monetary income and were aware that others in their neighbourhoods need money for the same reasons.

Simply put: energy costs money
Those who can pay in money, should. This was the reasoning of several local residents who feel that money that is earned should also be spent in the local community (for instance on energy) in order to support the local economy and the most vulnerable people.

Monetary exchange is general, not personal
A local energy exchange system could provide the opportunity to make more local connections. Money, however, is an impersonal and general form of exchange and does not lend itself to building new relationships with others. Other forms of exchange can be representative of the 'giver' and 'receiver'.

EXCHANGE OF SERVICES

Skills can be put to practice
In doing a service in exchange for energy, residents can learn, utilise, practice and develop existing skills. The added value is in gaining work experience and having the opportunity to grow as an employable person.

A local system of caring and sharing
Residents are incentivised to care for others in their community if they receive energy in return for their efforts and time, for example buying groceries for an elderly neighbour.

Ability to do a service is asset dependant
More is needed, than just time, to do a service for others. Assets in the form of tools or certain equipment are required to carry out these jobs such as mowing the lawn, cutting hair, or catering.

Some services are for everyone & can be done by almost anyone
Giving a service in the form of a practical job such as washing cars or cleaning windows can be of use to many residents in the neighbourhood and usually these jobs do not require specialist skills to be acquired first.

Conflict between time and helping the community
Many would like to 'give back' to their community by doing a service but do not have the time alongside a full-time job, needed to pay the bills and get by day-to-day.

Pair existing jobs and services with energy exchange
Some residents already provide a service to the local community (e.g. cooking and catering). For these residents it would be logical to continue with these endeavours but also connect them to an energy system. It is easy to give your time and service, if you are doing so anyway.

EXCHANGE OF (MATERIAL) THINGS

Giving away or getting rid of?
There is a clear distinction between giving away something precious and useful versus getting rid of a surplus of items or being freed of unwanted items. The latter is easier to engage with than the former, especially for vulnerable residents who may not have many possessions and feel pride and ownership over the things which they do have.

An opportunity to bring joy to others
Exchanging material 'things' for energy can bring others immediate joy, especially if it is something they need or want. Unlike money, 'things' can be very personal and speak directly to a person's character.

Everyone needs different things
It is not straightforward to match the things people have to give away with people who need them, and vice versa.

3. What is learnt over Amsterdam Zuidoost?

The importance of work
Many young people in Zuidoost are already working or want to work. They take pride in contributing to the local area and are keen to share their skills with others.

PERSONAS

Four personas were created as a result of this exploration. They illustrate the different values and experiences of residents in this diverse district and give examples of energy exchanges which are most fitting to their needs.

High school student

Persona:
Selena is a teenager living at home with her parents. She grew up in Zuidoost and will finish high school next year. She wants to start working afterwards.

Values:
- working experience
- learning new skills
- earning own money
- time with friends
- meeting new people
- being creative

Energy:
She does not pay the bills at home so does not know how much energy is worth. But she is aware that the costs are rising!

Exchange:
Selena would want to exchange her service for energy. She could cut and style hair or create social media content and design logos for local businesses. She flexible with her time after school and on the weekends.

Unemployed newcomer

Persona:
Pedro has recently moved to Zuidoost and is living in a social housing. He worked in construction in his home country but is now looking for work here. This is proving difficult, especially with the language barrier.

Values:
- meeting new people
- a feeling of belonging
- working and doing things with his hands
- being able to financially support his family abroad

Energy:
Pedro is very conscious about his energy usage and tries to use as little as possible. The prices here ar much higher than what he is used to. He tries to spend time outside the home to keep costs down.

Exchange:
Pedro has very little 'cash in hand' but would like to put his skills in construction to good use and meet new people. He could give his time and service.

High school student

Persona:
Selena is a teenager living at home with her parents. She grew up in Zuidoost and will finish high school next year. She wants to start working afterwards.

Values:
- working experience
- learning new skills
- earning own money
- time with friends
- meeting new people
- being creative

Energy:
She does not pay the bills at home so does not know how much energy is worth. But she is aware that the costs are rising!

Exchange:
Selena would want to exchange her service for energy. She could cut and style hair or create social media content and design logos for local businesses. She flexible with her time after school and on the weekends.

Working parent

Persona:
Julia lives in a rented flat in Zuidoost together with her husband and three young children. She works six days a week as a cleaner at the Johan Cruijff Arena. Her husband is looking for work and together with her parents cares for the youngest children during the day.

Values:
- spending time with her children and family
- her faith and social group
- being outdoors in the community garden

Energy:
They are struggling to pay the rising energy bills and often have to go without heating. She needs to wash the children's clothes often but using the washing machine is too expensive.

Exchange:
She would like to give back to the community but has no time to do so. Giving money for energy is easiest.

Fig 14. Four personas created based on ArenApoort research findings

1.3 | A CASE STUDY FOR LOCAL INCLUSIVE EXCHANGE

IN SHORT

This chapter explores a case study for local inclusive exchange in Amsterdam Zuidoost: Lokaal Geld. The relevance of 'barter - like' exchange for Zuidoost is described. The chapter concludes with an overview of key findings and a summary.

GOAL

The goal of exploring 'Lokaal Gled' as a case study for inclusive exchange was to gain more awareness and understanding of the context-specific challenges and opportunities in Amsterdam Zuidoost.

APPROACH

A research-through-design approach was undertaken. Information was gathered and insights were gained through participation in local event and through generative interview sessions. Existing documentation and reports were also referred to.

1.3.1 | LINK TO LOKAAL GELD

THE RELEVANCE OF BARTER

Based on theory outlined in chapter 1.1 barter-like exchange is favourable in the following conditions: when two different goods/ services are being exchanged, when money and 'cash-in-hand' is scarce, in 'economically weak' neighbourhoods and when 'secure social relationships' are present, making it easy to find a person with whom to exchange in a face-to-face setting. Whilst most of these 'conditions' for barter exchange are synonymous with Zuidoost, and thus make it a relevant exchange type for this context, others are not. Notably, 'barter' is primarily described in contexts where tight social relationships have already been formed and thus a strong sense of community is evident. However, in Zuidoost there is first and foremost a need for the formation of social relationships (not just the strengthening of existing relations). Lokaal Geld provides an example of an exchange ecosystem in Amsterdam Zuidoost which uses a digital platform to facilitate (non face-to-face) 'giving' and 'receiving' of local tokens for goods and services, and aims to connect residents in doing so.

VALUE-DRIVEN EXCHANGE

The Lokaal Geld ecosystem cannot be described as 'barter' in the conventional sense of directly exchanging goods and services for one another. However, where Lokaal Geld does draw parallels with the concept of barter is in the 'transformative nature' of the exchange: the ability to create and assign new and multiple values to local tokens. Both persons exchanging in the Lokaal Geld ecosystem are free to decide the worth and value of the goods and services being given and received. The name 'Lokaal Geld' (Local Money) is perhaps misleading as although these tokens are still connected to the monetary system, their purpose and intended impact extends far beyond 'simply' an exchange medium of economic value. For this reason Lokaal Geld is referred to not as an example of barter exchange or alternative currency exchange, but as **'value-driven exchange'** which takes elements from both of these concepts.

EXPLORATION AREA

Whilst the literature review in chapter 1.1 provides a strong theoretical foundation and understanding of barter, it lacks relevance to the specific context of Amsterdam Zuidoost. As discussed by Humphrey & Hugh-Jones (2005) context makes all the difference: barter exchange is closely tied to and influenced by the social context in which it takes place. So to be able to imagine and design future barter-like, or 'value-driven', exchanges in Zuidoost, learnings from this context are needed. As previously described the main misalignment between barter and the context of Zudioost is the lack of strong social and community connection which is a typical condition of successful barter exchange.

KEY QUESTIONS

How is Lokaal Geld addressing social inclusion in Amsterdam Zuidoost?

How is Lokaal Geld facilitating 'value-driven' exchange in socially uncohesive neighbourhoods?

How is Lokaal Geld enabling digital (non face-to-face) 'value-driven' exchange?

'Lokaal Geld', translated from Dutch as 'Local Money', is an initiative run by an open consortium of local entrepreneurs, social institutions, local government, knowledge institutions and residents. This diverse group is committed to "doing things differently" and aims to "make our own rules and choices about money: so that it is inclusive, equal, social, sustainable and circular."

This goal is driven by a deep concern for how current economic systems are leading to, and fuelling, poverty and inequality in Amsterdam Zuidoost. Social scientists and economists, from Kate Raworth to Katherine Trebeck to Kees Klomp, are highlighting how these systems are becoming increasingly exclusive and work only for the 'happy few'. Forming part of Zuidoosts diverse composition are the large multinational companies and organisations which operate there. They exist in stark contrast to the social housing blocks where many residents live in poverty. The money made by these multinationals is described as "flowing out of the neighbourhood, just as quickly as it enters" and thus providing no advantage to local entrepreneurs and residents. Lokaal Geld aims to change this and in line with the principles of 'Community Wealth Building' is introducing a local currency, called '2Ping', to benefit people, planet and profit.

Lokaal Geld sees '2Ping' as a means for empowering local people and businesses, in the socially and economically disadvantaged district of Zuidoost, to be able to "make conscious choices about who they want to exchange their values, their own energy, attention and power with." Supporting their vision is the notion that money is not just "a universally accepted medium of exchange"' (Willem Opmeer), but it is also a medium "that creates social relationships and assigns value" (Kate Raworth).

The four opportunity areas which Lokaal Geld envisions with the implementation and circulation of '2Ping' in the local district are:

1. Making volunteer work more visible and acknowledging and rewarding volunteers (for example, volunteers receive 2Ping as a reward for their service to the community).
2. Creating shorter supply chains with less import and less transport needed.
3. Creating new local jobs and organisational structures.
4. Producing and consuming more local and biological and organic goods.

Since starting the project in 2020 the Lokaal Geld team has spent the last few years making connections, forming partnerships with local organisations and businesses, and carrying out initial research and ideation phases in the form of local 'hackathons'. Recently Lokaal Geld has entered into a pilot phase of testing out the functionality of their app (developed by 'Co-Town' - a start-up focused on technical solutions for citizen participation) through small scale user trials and focus groups. The plan is to then officially launch '2Ping' later this year.

With a shared goal and vision to foster social and financial inclusion in Amsterdam Zuidoost, Lokaal Geld and the LIFE Project signed a 'Doughnut Deal' together. This formal working agreement and partnership means that Lokaal Geld and LIFE are committed to collaborating with and learning from one another. Currently Lokaal Geld is focusing on the context of voluntary work as a way to 'earn' local tokens, which can be spent locally. However future contexts could include transport, mobility and most relevant for this project, energy.

1.3.2 | **LOKAAL GELD WORKSHOP**

APPENDIX B7

Fig 15. Lokaal Geld workshop

AIM	TO LEARN ABOUT THE AMBITIONS OF THE PROJECT AND HEAR INITIAL REACTIONS
WHEN	18.10.2022, 13:00 - 18:00
WHERE	GROENE HUB, HOLENDRECHT, AMSTERDAM ZUIDOOST
WHO	LOKAAL GELD TEAM, THOMAS SIDERIUS, LOCAL RESIDENTS & ENTREPRENEURS, RESEARCHERS, ACADEMICS

FIELD NOTES IN SHORT

Hosted by the Groene Hub this workshop formed part of the 'Amsterdam Doughnut Coalition Day'. After an introductory ice-breaker round Lokaal Geld presented their project and revealed that the new local currency will be given the name '2Ping'. The presentation was followed by an animated question session before the group split into two sub-groups to focus on and discuss the use of local alternative currencies in two different locations in Amsterdam: Nieuw West and Zuidoost.

REFLECTION

The most notable moments happened during the question sessions and focus group discussions. The diversity of participants in the workshop led to animated discussions with conflicts in viewpoints and preferences. In particular I noticed that residents had strong opinions on the impact and possible negative effects that such a local token might have for them and their neighbourhood. It was clear that residents were intrigued and curious to learn more, but also ready to challenge assumptions made about them and to provide a practical and realistic perspective. Overall there was a great sense of pride in the district of Zuidoost. Residents were quick to point out that new developments and projects should not come in 'looking for a problem to solve' but rather seek 'an opportunity to make fly'!

How can a local token be inclusive for local residents?

A local token will not interfere with social care benefits

A local currency will provide a means for employed residents living in poverty to 'earn', without risking cuts to their social care benefits. Acquiring local coins will not directly equate to an income in Euros and thus residents will still receive the same benefits as before.

A local token is inclusive for undocumented people

Local undocumented people, who are thus unregistered and do not have a personal bank account, could use local currency to purchase the goods and services which they desperately need.

A local token promotes spending and sharing value

A local currency has more value 'spent than saved': residents multiply and extend the value of their local coins by 'using' them (and thus continuing the cycle of exchange). This circular exchange system incentivises residents to keep 'spending' their local coins and in doing so share and spread value throughout the district (including to socially and financially vulnerable residents).

A local token directs financial behaviours

The boundaries of where and what a local currency can be redeemed for can help to nudge residents' financial behaviour to prioritise 'exchanges' which are locally, socially and financially beneficial e.g. visiting the neighbourhood psychologist instead of purchasing high-street fashion wear.

A local token can boost self-esteem of the excluded so encourage participation

Skills and abilities can be acknowledged and put to practice with a local currency system which rewards residents' socially beneficial behaviours.

What opportunities does a local token provide for fostering social cohesion?

A local currency can help to build the community through shared values

Zuidoost may be lacking a sense of community and social cohesion overall, but some residents are very active in their own smaller social circles and groups. Given the opportunity, structure and guidance there is enthusiasm from these local proactive people to come together and help to create wider and more interconnected social networks in Zuidoost. A local currency can be a means to achieve this by tying different people together through shared values.

A local currency can make residents more visible and present in the neighbourhood

By engaging in this local exchange system residents may become more active, and physically present within 'hubs', venues and central places within the neighbourhood. This increased presence can increase residents' awareness and recognition of others and thus foster a sense of belonging and cohesion in the district.

A local currency can recognise and connect existing initiatives

By becoming part of the local currency system existing initiatives and services are identified and connected with one another. This creates space for the expansion of social networks and possibilities for collaboration.

A local currency can help to tackle other local social issues

Residents can be brought together in collective action and to achieve a shared goal. A local currency offers the possibility to combat and appease existing issues in the neighbourhood through the circular system e.g. turning food waste into bio-gas to reduce vermin and pests (rats and mice) in residential areas.

What are the challenges of introducing a local token in Zuidoost?

The financially vulnerable could be limited by a local token

The most vulnerable residents live on a very tight, fixed monthly budget with which they need to consume all of their monthly necessities. A local currency which is not widely adopted and accepted by many stores/vendors could actually risk excluding these residents even further. The challenge is ensuring that the local coins can still provide adequate flexibility and choice to residents (as is the case with Euros)

Normalisation of a local token to ensure widespread adoption

Residents do not want to be identified as vulnerable and 'needing help' and thus engagement with a local currency will only be effective if it becomes 'the norm' and is framed as an attractive option, not a 'last resort' for the poor.

Voluntary work does not appeal to the younger generation

The youth of Zuidoost often do not see the value in voluntary work and do not connect this with the opportunity for new experiences and possibility to learn new skills. A local currency which is offered in return for voluntary work needs to speak to the younger generation. The challenge is in making these other (and non-monetary) values tangible and concrete.

Earning a local token feels less rewarding than cash

Receiving physical Euro notes and coins (e.g. after doing a job or service) gives people an instant sense of gratification and achievement. This achievement can also be immediately shared and made visible to others. Receiving a digital coin does not create the same feeling and is likely less evident to others. The challenge is how to transfer the emotions tied to physical currency to a digital one.

1.3.3 | GENERATIVE INTERVIEWS

APPENDIX B16

Fig 16. Community centre Grubbehoeve, De Bijlmer

AIM	TO GAIN A DEEPER UNDERSTANDING OF HOW LOKAAL GELD IS AIMING TO TACKLE SOCIAL INCLUSION IN ZUIDOOST
WHEN	24.11.2022, 14:30 - 16:00
WHERE	GRUBBEHOEVE
WHO	DOEDE SIMONS, TEAM MEMBER AND FOUNDER OF LOKAAL GELD COOPERATIVE, RESIDENT OF ZUIDOOST

AMSTERDAM ZUIDOOST

FIELD NOTES IN SHORT

Hosted by the Groene Hub this workshop formed part of the 'Amsterdam Doughnut Coalition Day'. After an introductory ice-breaker round Lokaal Geld presented their project and revealed that the new local currency will be given the name '2Ping'. The presentation was followed by an animated question session before the group split into two sub-groups to focus on and discuss the use of local alternative currencies in two different locations in Amsterdam: Nieuw West and Zuidoost.

GENERATIVE INTERVIEW

This research activity is referred to as a 'generative interview' because it combined generative research methods with a semi-structured interview format. Canvases were created for the session and acted as a 'boundary object'. The canvases also supported the data collection process as notes and ideas could directly be structured and mapped out under each relevant question, during the session. The interview consisted of eight primary questions which all connected to at least one of the research areas.

INTERVIEW QUESTIONS

1. How is Lokaal Geld aiming to tackle inclusion?

2. Who do you see participating in the Lokaal Geld ecosystem?

3. Which social groups/ collectives are evident in Zuidoost?

4. What are the use cases for Lokaal Geld exchanges?

5. What are the characteristics of Lokaal Geld exchanges and how are they bring addressed?

6. What are future scenarios of use for Lokaal Geld exchange?

7. How is Lokaal Geld Dealing with these challenges in exchange?

8. What are the ingredients of a Lokaal Geld ecosystem?

REFLECTION

The feeling, overall, was one of enthusiasm and energy to make changes in the district and to build a system for creating new value in Amsterdam Zuidoost. Doede spoke of the neighbourhood fondly and recounted the special and culturally diverse nature of Zuidoost where people from many different walks of life come together. This diversity brings both opportunities and challenges for Lokaal Geld : they can work together with many different people and be inspired by their perspectives, but trying to reflect the composition and needs of the district as a whole, through a new local currency, is very difficult. Also evident throughout the conversation was the poverty and struggle which many residents living in the district face, and thus their strong dependency on social care benefits to get by day-to-day.
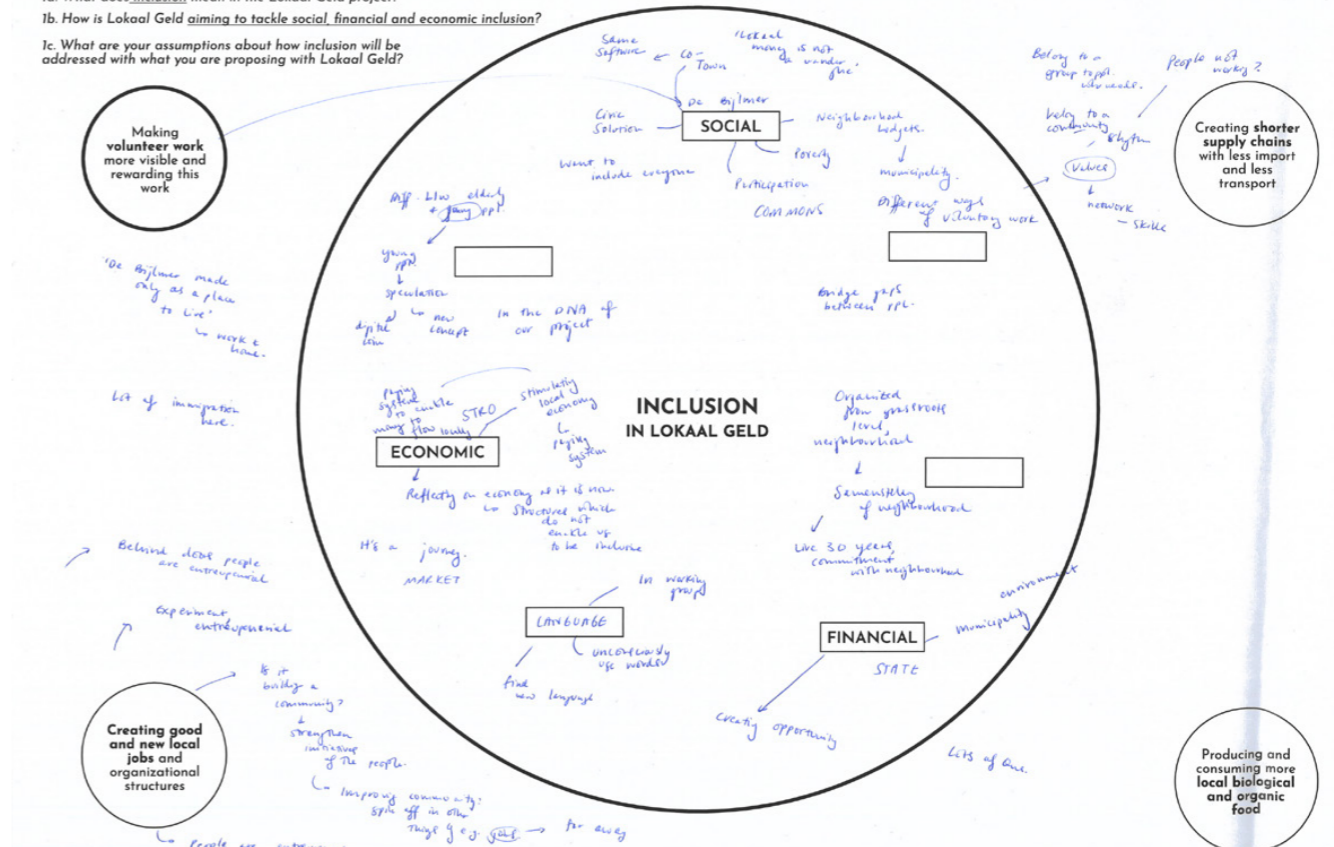
Fig 17. Canvas completed during generative interview

APPENDIX B 18

AIM	EXPLORE THE CHALLENGES AND OPPORTUNITIES WHICH 'CONDITIONED DIGITAL CURRENCY' PRESENTS FOR INCLUSION
WHEN	02.12.2022, 11:00 - 12:00
WHERE	TEAMS, ONLINE
WHO	THOMAS SIDERIUS

AMSTERDAM NIEUW WEST

FIELD NOTES IN SHORT

A second generative interview was conducted with a partner of Lokaal Geld who is working on introducing so called 'conditioned money' or 'a network of local payment accounts' in the Nieuw-West district of Amsterdam. This district is comparable to Zuidoost in that it has also been labelled by the municipality as a 'development district' where poverty, unemployment and crime is prevalent.

REFLECTION

The structure and set up of the 'conditioned money' being developed in Nieuw-West is different to that of Lokaal Geld in Zuidoost and Thomas described it as being "a little bit less alternative, a little bit less radical and a little more simple to grasp" but still having the "potential for changing economic dynamics." Despite the differences in approach the core goals of social connectedness and cohesion were central to Thomas' narrative. There was a strong feeling of wanting to support and empower localities to overhaul our current capitalistic systems which are draining value from neighbourhoods, closing SME's and forcing people to move.

OVERVIEW OF KEY FINDINGS FROM GENERATIVE INTERVIEWS

INCLUSION	EXCHANGE	CONTEXT	ENERGY

OPPORTUNITIES

INCLUSION

Empowering local 'entrepreneurs behind doors'. A local token ecosystem could enable residents to test out their ideas in the community by both lowering the financial threshold to start and by mitigating the risk of exploring the product or service concept.

"People behind doors are entrepreneurial... But you don't see things develop."
- GI 1

"Creating opportunities for creation and exploration."
- GI 1

Making it easier to start new projects and clubs. Local tokens could enable residents to host community events by hiring communal spaces in exchange.

"The space is empty now. But it could be used... you could propose that people who hire it for a local coin can have a discount."
- GI 1

Creating opportunities for low income residents to 'earn' through voluntary work. The tokens could support their larger bills.

"There are also ideas to enable people to earn local money to pay their bills."
- GI 1

Fostering a sense of belonging by becoming part of a joint ecosystem and connecting with other locals.

"It might attract more people to start belonging to a community."
- GI 1

Connecting local people and groups across the district, expanding social networks.

"We want to involve everyone and bridge the gap between people."
- GI 1

Fostering a sense of 'purpose and place' by helping the vulnerable to regain a sense of self worth.

"...you get to network, you develop your skills and you get into a rhythm in the community."
- GI 1

EXCHANGE

Regulation of exchange through existing organisations. Exchanges can be regulated and verified through existing local organisations which can act as a third party or 'ledger'.

"...it is connected to voluntary organisations."
- GI 1

Flexibility in the continuity of exchange. The digital local money platform gives residents more freedom in barter exchange as they can give back to the community on a flexible basis depending on their own availability and preferences.

"The software enables us to promote voluntary jobs or tasks and gives people the freedom to do one thing just once."
- GI 1

Assigning and determining worth independently. A local money system can allow for autonomy in determining the value or worth of a 'good' or 'service' in an exchange, away from the centralised economic systems of today.

"You give more value to the things you appreciate. It's a social thing."
- GI 1

Creativity in the 'rules of exchange'. The nature of 'barter' can be adapted and moulded by the conditions given to the local money, presenting new opportunities for exchange.

"Certain dynamic that you create by being able to alter and design these rules."
- GI 2

Possibility of acquiring credit through the exchange of goods and services. This is beneficial for the entire local network.

"So actually the entire network benefits if I get credit."
- GI 2

CONTEXT

Showing commitment to the local community. By supporting and partnering with a local money system local SME's can make their commitment to the community visible and so build a stronger connection to the neighbourhood.

"...entrepreneur can express their commitment to the community. [Local tokens] are a way to make it visible."
- GI 1

Expressing involvement and being recognised for contributions. A local money/ token system allows all of the residents who are already contributing to the neighbourhood to show and share this with others. It is a means for showcasing and boosting the work of local people."

"It is also a means to express your involvement in the neighbourhood because you let the money circulate."
- GI 1

"...for the people that are very active."- GI 1

Showing commitment to the local community. By supporting and partnering with a local money system local SME's can make their commitment to the community visible and so build a stronger connection to the neighbourhood.

"I organised festivals here... and I always trust that people will come and help."
- GI 1

"With the neighbourhood budgets we have... a motivation to build further on this neighbourhood."
- GI 1

ENERGY

Going beyond the financial. Incorporating local money or tokens into an energy system can create new values which are socially and locally focused.

"It's a level further than only delivering the energy... can a local coin be a means to stimulate a transition?"
- GI 1

Connecting large asset owners to local initiatives. The energy transition brings together different stakeholders and users for one common goal. This is an interesting and relevant space to introduce local tokens.

"Connecting large local asset owners to local initiatives has many more values. You bring people together to this place."
- GI 1

CHALLENGES

INCLUSION

Disparity between rented social housing and private ownership which creates barriers for decision making and organisation.

"Half of the building is private... the other is a cooperative. There is a gap between these two."
- GI 1

Inclusion in the long-term and sustaining this currency to include more residents and provide stability and security is a challenge.

"It's a challenge. Lokaal Geld is not some kind of wonder glue.."
- GI 1

Including the digitally illiterate in a digital platform and currency.

"It's digital so that's tricky for some of the population...who are not very digitally able."
- GI 2

Providing flexibility and choice so that there is appeal for residents to participate in a local token exchange platform and network.

"People are not going to join until there's enough diversity in where they can spend it."
- GI 2

EXCHANGE

Timing and flow of value in exchange which affects how the local money is perceived: as a reward or as an 'unfair return' or 'low pay'.

"People will say that it is slavery work..."
- GI 1

"What happens if [people] get tokens at the beginning of the month and then work?"
- GI 1

Connection of local money to the national currency. 'Conditioned money' cannot be described as alternative money as it is still connected to the Euro. This means that there are limitations as to how this money can be exchanged and with what intention.

"It's not going to solve the problems that are inherent to the Euro and the bigger monetary system."
- GI 1

CONTEXT

Silos of small close-knit groups. Many residents in Zuidoost have large families and tend to stick within their small tight-knit circles. The challenge for Lokaal Geld/ a local token is encouraging connection between these social groups and expanding networks to spread and multiply value.

"When there is a party here, you see a lot of organisational skill. But it's focused on the family. It's not focused on local initiatives."
- GI 1

Rewarding volunteers own goodwill. Voluntary work is already apparent in Zuidoost and many of the existing groups are connected to faith and places of worship. These volunteers 'give back' to the community with no expectation or want of 'reward'. A local money system is not applicable in these contexts and can create tension.

"People in churches volunteer out of goodwill, not for something else. I don't know if a local coin can work in such a community."

ENERGY

Re-imaging local community driven energy. The challenge in pairing a local token with energy is to create a system which encourages collaboration and not competition. A novel approach is needed.

"Co-operation instead of competitiveness."
- GI 1

"You can't make a 'market' of it."
- GI 1

Fig 18. Bijlmer Flats

1.3.4 | **SUMMARY OF KEY FINDINGS**

How is Lokaal Geld addressing social inclusion in Amsterdam Zuidoost?

By empowering 'entrepreneurs behind doors' to explore and test out their ideas *GI 1.*	By creating opportunities for low - income residents to earn, without sacrificing their social care benefits *GI 1. E3.*	By creating employment opportunities and encouraging local 'hiring' *GI 1. GI 2.*
By fostering a sense of 'place and purpose' and enabling active contribution to the community *GI 1. E3.*	By choosing and involving a diversity of local initiatives, businesses and partners *GI 2.*	By promoting and increasing local spending to spread and circulate value *GI 2. E3.*
By enabling undocumented people, who do not have a bank account, to participate and acquire local goods and services *E3.*	By enabling local people to 'give back' to the community on a more flexible basis *E3.*	

How is Lokaal Geld trying to facilitate 'value-driven' exchange between the socially unconnected?

By partnering with community spaces to increase the presence and viability of residents in the neighbourhood *E3.*	By lowering the threshold for hosting community events and starting new projects, which bring residents together *GI 1.*	By connecting and bridging different existing community and cultural groups *GI 1.*

How is Lokaal Geld enabling digital (non face-to-face) 'value-driven' exchange?

By regulating exchanges through existing voluntary organisations (who are part of the platform) *GI 1.*	By providing an app where volunteer 'jobs' / tasks can be posted *GI 2.*	By enabling flexibility in the 'rules of the exchange' and allowing for the value of the service to be mutually decided *GI 1. GI 2.*

IN SUM

Lokaal Geld is addressing social inclusion in Amsterdam Zuidoost primarily by **connecting people, places and local initiatives through voluntary work**. Voluntary work is not only a way to contribute to the community but a means for **fostering personal development and ultimately strengthening social cohesion.** The i**nvolvement of central hubs,** community centres and communal spaces is key to bringing together and including **socially disconnected groups** who otherwise do not interact with each other. **The Lokaal Geld app enables digital exchange**, and exchange which is not constrained to outside regulations, to take place. The flexibility in determining the value of certain voluntary 'jobs' or 'services' empowers (vulnerable) residents to have ownership, choice and control.

1.4 | EXPLORATION CONCLUSIONS

IN SHORT

In this final chapter of the first phase 'Explore' the key findings are summarised and six emergent themes are presented, which inspire the work in subsequent chapters.

1.4.1   SYNTHESIS OF FINDINGS

APPENDIX D4

GOAL

The goal of synthesising the data is to find key emergent themes to provide direction to the next 'Reframe' phase. Synthesis brings fragmented findings together and clusters them to reveal patterns or tensions.

APPROACH

A spontaneous clustering approach was taken and is described in sub-chapter 1.4.1.

1.4.1 | SYNTHESIS OF FINDINGS

SYNTHESIS APPROACH

To collate and synthesise the key findings of all four research groups, and from all relevant literature and field explorations a 'spontaneous clustering' approach was taken. Key findings were written on different coloured 'Post-Its' in relation to their corresponding research group; the findings were first clustered by research group and later collated under key themes identified throughout the spontaneous and iterative process. It should be noted that several of the findings could have fit under two (or more) groups e.g. 'inclusion' and 'context' but choosing one group over another did not influence this synthesis process and so in these cases a group was selected based on intuition. In this chapter an overview is presented of the key findings for each research group. Ten different key findings, which are most relevant for the following cycle, were selected for 'inclusion', 'exchange', 'energy systems' and 'context'. Whilst these groups were crucial in guiding the research, analysis and synthesise process they paint a more fragmented picture, than an telling summary. The VIP (Hekkert & v. Dijk, 2011) step of generating and then clustering context factors was used to a produce a clearer 'story line' to inspire the next cycle. Six emerging themes are outlined.

INCLUSION

EXCHANGE

ENERGY SYSTEMS

CONTEXT

Interventions for 'passive inclusion' exclude the vulnerable and unaware	Conflict between giving back to the community and the convenience of money	Young people value work experience and the opportunity to learn	Not every consumer wants to be a prosumer
Local money creates opportunities for low-income residents to earn	Exchanging services enables the practicing of skills	Need and desire for personal development and reflection	The value of local energy systems for residents is accessibility and affordability
A local money ecosystems help to foster a sense of 'purpose and place'	Local trusted organisations can act as regulators of exchanges	Newcomers in particular want to build and expand their social networks	Energy donation systems are not balanced or resilient
Local and familiar incentives speak to residents and motivate participation	Opportunity to pair existing jobs and services with energy exchange	District is a mix of many different cultures and customs	Ownership (and distribution) of local assets is uncertain
Inclusion by characterising energy as common and local good	A local money ecosystem gives freedom in determining worth and value	Many residents have little disposable income and 'cash-in-hand'	Opportunity to connect energy systems to other social initiatives
Vulnerable residents do not want to be identified as such by the way of a new system	Money is more than a means it is freedom and flexibility	District can be described as 'silos of close-knit groups'	**Current systems do not consider the needs and wants of residents**
Digital platforms can deter participation for the vulnerable	Contrast between the finality of money and the ability to create time	Entrepreneurial behaviour is evident but ideas do not develop or grow	**Peer-to-peer energy trading systems foster competition and not collaboration**
Residents feel constrained and limited without options	'Sharing and caring' intention is not practiced in communities	Many residents are not visible or socially 'present' in the neighbourhood	**Complexity of smart flexible systems creates a sense of 'loss of control'**
Crucial to reach past 'the usual suspects' and early adopters	The timing of an excange implies either a 'reward' or a payment	Zuidoost was built as a place to live and not to work, so value flows out	**Potential social value of energy systems is shaped by the context and users**
Increasing autonomy in local systems increases the risk of exacerbating inequalities	The timing of an exchange implies either a 'reward' or a payment	Voluntary work is organised and carried out by local groups	**False assumption is that residential users are solely profit motivated**

FROM FIELD EXPLORATION

FROM LITERATURE EXPLORATION

PARTICULARLY INFLUENTIAL
IN SHAPING THE SUBSEQUENT DESIGN DIRECTION

SIX EMERGENT THEMES

1. FINANCIALLY VULNERABLE

Financial support is really needed by many residents in Zuidoost

Residents have little or no disposable income

Money earnt by local residents does not stay or circulate locally (they work elsewhere, outside the district)

Zuidoost is a financially vulnerable district with high unemployment rates. Those who are earning tend to travel to other regions or parts of the city so income is not circulated locally.

2. SKILLS AND IDEAS TO OFFER

Local residents are not simply beneficiaries, they have more to offer

Desire for personal and skill development amongst residents (especially the youth)

Entrepreneurial behaviour is evident, but most ideas do not develop or grow to fufil their potential

Existing entrepreneurial behaviour (in the form of handmade goods, own services and small businesses), as well as a desire to gain new skills is evident in Zuidoost (especially amongst the youth). However these ideas and talents tend to remain hidden 'behind doors' and are not realised to their potential because there is little financial flexibility to test, validate and eventually scale them.

3. 'DEVELOPMENT' AREA

New projects are constantly starting, but they fail to utilise existing systems and practices

New projects label neighbourhoods as being 'in need of fixing'

There are many existing services, initiatives and projects in Zuidoost

Labelled as a 'development neighbourhood' by the city, new local projects and initiatives are constantly arising in Zuidoost. These initiatives often fail to gain traction because a) their impact is not visible, b) they do not recognise the potential of local people and c) they do not connect with existing locally placed systems and practices.

4. LACK OF COMMUNITY & COHESION

Community and social cohesion is lacking in Zuidoost

Residents stay within their own tight-knit social circles

Residents cannot afford to invest time into community building

Zuidoost is a diverse district with residents living in various housing situations (social, rented, owned)

General 'caring and sharing' mentality

Zuidoost is made up of a diverse group of people and culture plays a large role here. Although, in general, there is a 'caring and sharing' mentality residents cannot afford to 'give back' to their neighbourhoods. Residents have their own tight social circles but there is little connection between these groups and so a sense of community and social cohesion is lacking.

5. DETACHMENT FROM ENERGY SYSTEMS

Energy (and it's source and destination) is invisible

The value of energy is ambiguous

Energy systems are complex and difficult to understand and relate to

Residents do not have agency and ownership over their energy

Residents feel a (sense of) loss of choice and control

Residents are disengaged with and mostly disinterested in energy. Energy systems, and platforms, are complex, technocractic and difficult to understand. As a result residents distance themselves from systems which they can not relate to, or seemingly have no influence or control over.

6. FRAGMENTED ENERGY LANDSCAPE

Market-like energy systems foster competition, not collaboration

Local asset owners have surplus energy and the potential to distribute this to surrounding local neighbourhoods

There is limited access to energy assets on a local and neighbourhood level

Residents who live in shared housing blocks have little influence on possibilities for energy sharing and investment

The mix of housing associations with social housing and private ownership is a bottleneck for decision making

Large local asset owners, such as the Johan Cruijff Arena, have surplus renewable energy which could be distributed to surrounding local neighbourhoods. Current models for decentralised systems are market-like and depend on an infrastructure of local assets. However local residents cannot afford to invest in their own panels or battery. The mixed housing situation in Zuidoost limits possibilities for energy sharing and communities.

2.0
REFRAME

PHASE 2

In this section an opportunity space is identified, energy exchange is reframed and a vision is created for a new system.

2.1 | GETTING INSPIRED

IN SHORT

This chapter describes the six inspiration sessions held with LIFE Project stakeholders and partners at the start of the second 'Reframe' phase.

GOAL

The goal of facilitating a series of 'inspiration sessions' was to share and unpack four initial ideas for value driven energy exchange with different project stakeholders. The main goal of the inspiration sessions was to lay the most obvious ideas, deriving from the first 'Explore' Phase, out onto the table in a tangible and visual way in order to prompt discussion, stimulate new ideas and test assumptions (about which ideas would be most popular amongst the project consortium). The sessions also allowed certain knowledge gaps to be filled, challenges to be highlighted, opportunities to be identified and remaining uncertainties and questions to be listed.

APPROACH

Six inspiration sessions were conducted with different partners, stakeholders and/ or knowledge experts from within the LIFE Project. To maximise opportunity for discussion and reflection the sessions, where possible, were held in pairs with both participants coming from the same perspective (e.g. from the technical perspective). Five of the sessions were held in person in a physical setting, and one was conducted via Teams, using Miro as a collaboration tool. The set up and structure of the sessions and analysis approach are described in sub-chapter 2.1.2.

2.1.1 | FOUR INITIAL IDEAS FOR VALUE DRIVEN EXCHANGE

IDEA CARDS

Idea cards were created to depict the four initial ideas. These ideas all derive from the explorations in Phase 1 and are mostly inspired by the results of the LIFE Partner Event . The four separate ideas are a combination of many more closely-related ones. The purpose of forming and presenting only four key ideas came from the need to keep the sessions within a maximum of 60 - 90 minutes and allow enough time for in-depth discussion. Idea 1 and 2 concentrate on the exchange of services/ behaviours in return for energy. Idea 3 and 4 are about access to personal data and devices in exchange for energy.

CHARACTERISTIC CARDS

Along with the four idea cards, nine characteristic cards were also created. The characteristic cards are drawn from the key findings of the LIFE Partner Event. Originally 15 dynamic characteristics were identified but upon reviewing these it became apparent that several of them overlapped with each other and thus could be combined and condensed in number. A description was also given to each characteristic (based on the original data source) and to ensure ease of understanding all nine cards follow the same written format. The descriptions were revised several times to ensure they were clear and did not leave too much space for interpretation (which would impede the ability to compare responses between sessions and participants). These cards were used for the final part of the inspiration sessions which asked participants to take one idea card and, going through all of the characteristic cards one by one, discuss the challenges of applying each characteristic to that idea.
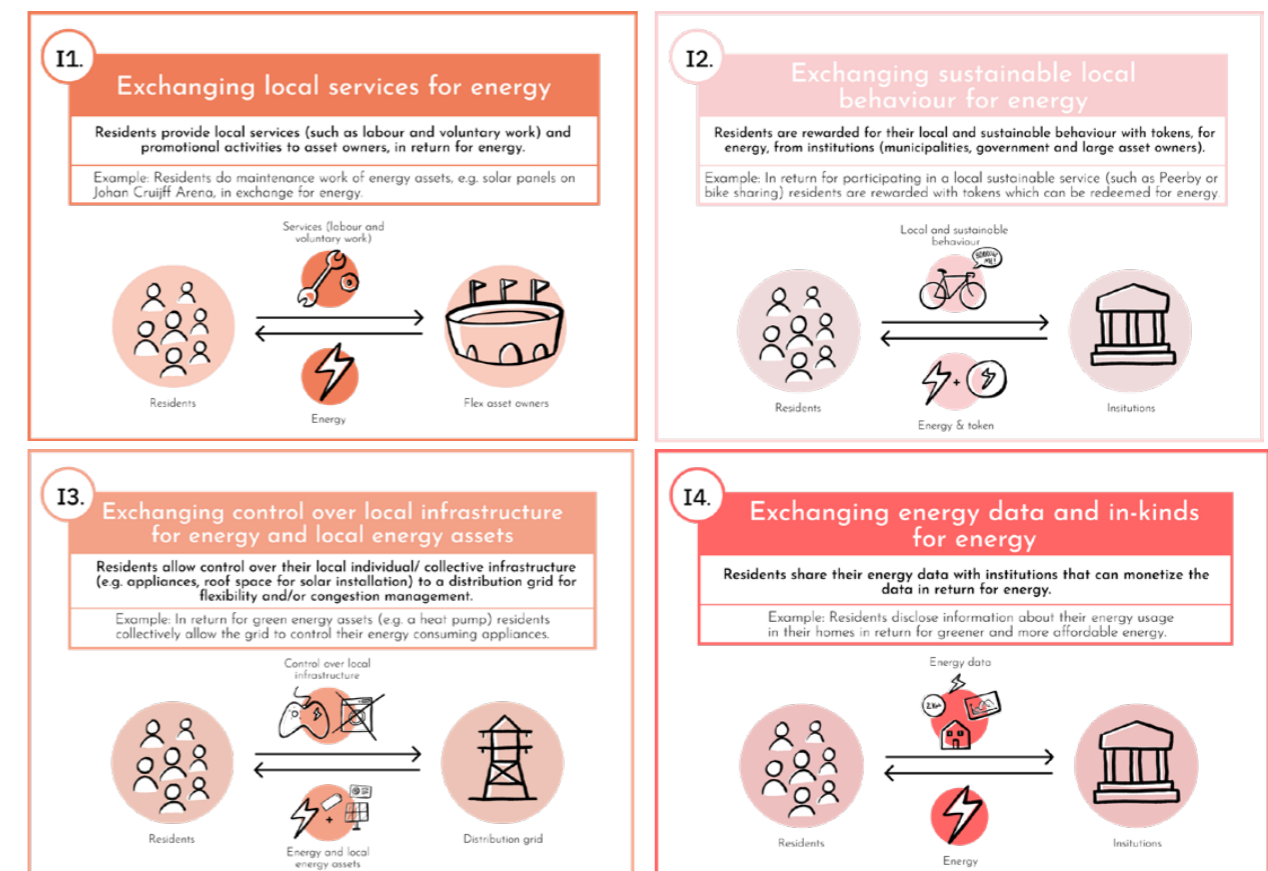
Fig 19. Four initial idea cards - deriving from LIFE Partner Event

UNDERSTANDABILITY

- An energy exchange system which is quickly accessible, easy to use and recognisable by all.
- The idea of energy exchange is made tangible and concrete with a simple and understandable narrative and language.

PERSONALISATION

- Energy exchange which allows participants to fit the exchange to their needs and wants.

INCLUSIVITY

- Energy exchange which enables financially vulnerable and socially excluded people to participate.

TRUST

- Energy exchange where participants have trust that they will receive a return for their efforts/ labours/ goods.
- Energy exchange that builds trust between people who are not already socially connected with each other.

TRANSPARENCY

- Energy exchange where there is transparency about the participants and beneficiaries of the exchange.
- Energy exchange which is transparent about the data flows involved in the exchange.

SOCIAL RELATIONS

- Energy exchange which builds upon existing social relationships of people.
- Energy exchange which enables people to form social relations with others.

BENEFICIAL FOR LOCAL ECONOMY

- Energy exchange that supports the local economy of goods and services.

BALANCED RECIPROCITY

- Energy exchange where people receive a fair and just return for the goods and services which they offer.

CHOICE & CONTROL

- Energy exchange which gives participants choices in the exchanges they participate in and in the way in which they partake.

Fig 20. Nine characteristic cards - deriving from LIFE Partner event

2.1.2 | INSPIRATION SESSIONS

AIM	TO SHARE AND UNPACK FOUR INITIAL IDEAS FOR INCLUSIVE ENERGY EXCHANGE WITH DIFFERENT STAKEHOLDERS
SESSION 1	CITY PERSPECTIVE, 10.01.23, HUIS VAN DE TOEKOMST, ESTHER JANSEN, ANNOESJKA NIENHUIS (GEMEENTE AMSTERDAM)
SESSION 2	SOCIAL PERSPECTIVE , 17.01.23, HUIS VAN DE TOEKOMST, WOUTER METHOORST (CO-FORCE)
SESSION 3	SOCIO- TECHNICAL PERSPECTIVE , 17.01.23, AMS INSTITUTE, PABLO DECELIS, GAYATHRI ANGOU (RESEARCH INTERNS LIFE)
SESSION 4	TECHNICAL PERSPECTIVE , 18.01.23, TEAMS (ONLINE) , DIGVIJAY GUSIAN (DIGITAL TWIN, TU DELFT), REINER (ALLIANDER)
SESSION 5	ECONOMIC PERSPECTIVE , 19.01.23, IDE FACULTY - TU DELFT, HANS ROELAND POOLMAN, ABHIGYAN SINGH (LIFE PM & SOCIAL)
SESSION 6	ASSET OWNER PERSPECTIVE , 24 .01.23, HUIS VAN DE TOEKOMST, TIM OOSTEROP (JOHAN CRUIJFF ARENA)

PLANNING

The planning of the inspiration sessions took an iterative approach. Three revisions were made of the plan before conducting the first session. Directly after each session reflections were made not only about the content and discussions which were had, but also about the process and structure of the session itself. This was key to ensure that the setup was designed to effectively elicit the desired information and thinking from participants. Small amendments were made to the session plan throughout the course of all six sessions.

SIGNIFICANCE

These inspiration sessions form a significant part of this project as a whole. The rich data, spanning across six different perspectives and including the knowledge, views and values of 10 participants, results in a key research outcome of the project. Not all of the data collected has a direct influence on the design direction and resulting concept, nor does it all lie within the scope of this project. However, all of the data and findings are transferable and of value to the LIFE project and development of the platform going forward.

SESSION STRUCTURE

Again the creative problem solving diamond (Heijne & v.d. Meer, 2019) was used as a guiding method for the structure of the session and as inspiration for the creative activities included (such as the C-Box).

ACTIVITY	GOAL	MATERIALS
1. Introduce project and inspiration session	To explain the project focus and goal of the inspiration session	Presentation slides
2. Consider and discuss idea cards	To get stakeholders initial impressions and thoughts about each idea	Idea cards 1 - 4 Trigger questions sheet
3. Place idea cards in C-Box	To consider the novelty and ease of realisation of each idea	Idea cards 1 - 4 C-Box
4. Select two ideas	To choose the two ideas which are, from the stakeholders perspective, the most inspiring and important	Idea cards Trigger questions sheet
5. Consider and discuss characteristic cards	Reflect on the challenges in applying specific characteristics of local energy exchange to the favoured idea	Idea card (chosen idea(s)) Characteristic cards 1 - 9

KEY TOPICS FOR DISCUSSION

The structure and creative problem solving methods used in the inspiration sessions were designed to help stakeholders discuss, reflect and give responses on the following topics:

> **The opportunities which the ideas present**
> **The challenges which the ideas present**
> **The uncertainties, related to the ideas, which arise**
> **The perceived novelty of the ideas**
> **The perceived ease/ difficulty of realising the ideas**
> **The challenges in applying characteristics of local energy exchange to the ideas**

ANALYSIS APPROACH

STATEMENT CARDS

Each statement card is a combination of data (a quotation) and the researchers interpretation on the essence of what is being said.

FRAMEWORK

After analysing each session individually, the statement cards were sorted and placed within the corresponding cell of the table. Some overlap could be seen between the rows: for instance row 2 'implementation/ feasibility' and row 5 'challenges'. In these cases the statement card was duplicated and placed in both sections. One table was created per idea card allowing the six perspectives to be reviewed and compared side-by-side. Any initial patterns which were noticed, or key findings, were recorded and added to the final column of the table. It should be noted that statement cards deriving from the characteristics cards activity were also included under the related idea.

ANALYSIS ON THE WALL

Once all of the statement cards were sorted into four tables, the most relevant and important information was dissected. For this step another method 'analysis on the wall' was used. 'Analysis on the wall' (Sanders & Stappers, 2020, 5th ed.) helps in making sense of the "messy data" and allows the researcher to literally and physically 'step back' and look at the data analysis with a fresh perspective. Key findings were written onto Post-It Notes and clustered under three subheadings 'challenges', 'opportunities' and 'questions'. Post-Its from idea 1 and 2 and from idea 3 and 4 were grouped together.

Fig 21. Example statement card

APPENDIX D6

"The stadium really has no community in terms of fans or fan base or whatever. Yeah, the club has that, but building itself doesn't. All we have is the neighborhood that we are situated in and we create a lot of problems for them." - Tim

| Idea card 2 | Inspiration session 6 | JCA | 📅 Jan 24 |

The Johan Cruijff Arena itself does not have its own fans or community. Therefore the neighbourhood and residents there should be JCA's community, but this is a challenge.

The eight sections in the framework are:

1. General comments, reactions, interpretations
2. Implementation/ feasibility/ realisation
3. Roles
4. Opportunities
5. Challenges
6. Design directions/ examples/ metaphors
7. Further questions/ more clarity needed
8. Characteristics which are mentioned

Fig 22. Framework for idea card 1

IDEA CARD 1

During the inspiration sessions, participants expressed concerns about the power imbalance in the first idea, where labour was exchanged for energy. They viewed it as outdated and incompatible with modern values. Additionally, stakeholders tended to view the proposed ideas as singular options, overlooking the potential for multiple approaches to energy exchange. Idea 2 was favoured due to its emphasis on rewarding sustainable behaviours rather than "working for energy." Idea 3, which focuses on technical solutions, was favoured by stakeholders, but it overlooks the needs of vulnerable residents. Idea 4 was interpreted at a higher level, neglecting the individuals behind the data. In future sessions, it would be beneficial to present a wider range of scenarios to demonstrate flexibility and collaboration in energy exchange systems.

IDEA CARD 3

Vulnerable residents are not front of mind and many assumptions are made by others regarding their needs and wants in the system. This is, in part, due to the, as yet, limited participation of residents and potential end-users in this project overall. Idea 3 was favoured by almost all stakeholders, indicating that technical solutions are more appealing and appear more feasible than the ideas which concentrate on creating social impact.

IDEA CARD 2

The second idea was favoured in comparison to the first idea, largely due to its framing. Rather than positioning residents as "working for energy", the idea emphasized rewarding and recognising sustainable and local behaviours. The framing and positioning of actors within a new service or system are crucial factors that can significantly impact the reception of an idea.

IDEA CARD 4

While the original idea focused on local community centres providing insight to their local municipality representative through round table discussions, most participants in the inspiration sessions interpreted it at a higher level. They discussed how user information could be utilised and monetised on a regional or even national level. The importance of the individuals behind the data appeared to be overlooked, with privacy laws and regulations being the only mention of potential constraints.

Fig 24. Impression of inspiration session 2 (social perspective)
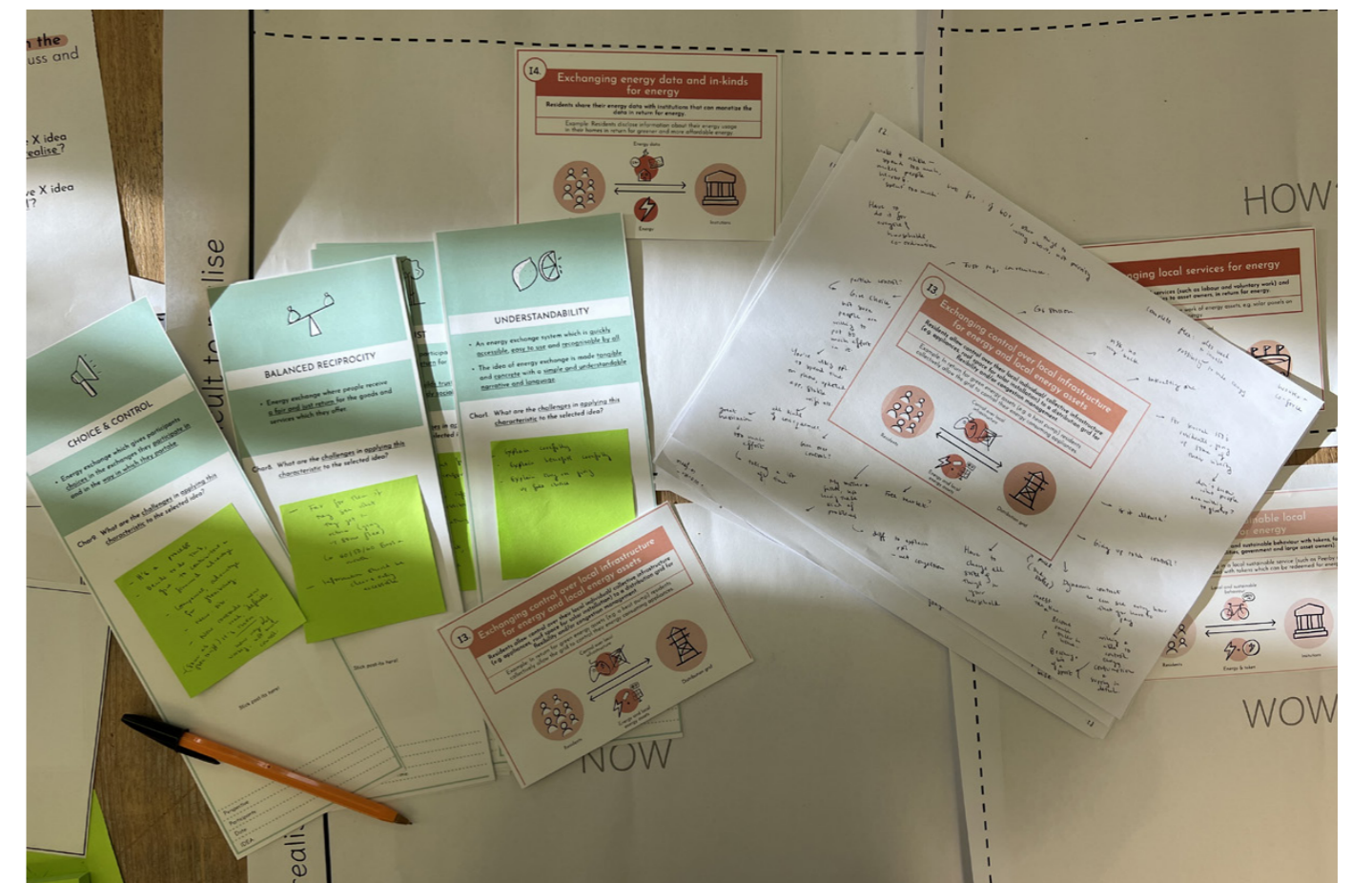
PRESENTATION OF KEY INSIGHTS

The inspiration sessions resulted in a huge amount of rich data and, as already discussed, not all of these findings fit within the scope of this project or carry huge significance for the work which follows this research-through-design activity. Nevertheless the quantity of relevant data is still vast and for the purposes of conciseness only the most influential findings are presented here. Influential because they shaped the design thinking and subsequent directions. The findings presented relate to the 'Key Topics for Discussion'. Important to note is that only the combined findings from Idea Card 1 and Idea Card 2 are presented in this thesis as they were deemed to be the ideas which require the direct involvement and action of people, and thus are more closely related to the initial design goal.

NOVELTY AND EASE OF REALISATION

Step 3 in the session structure describes placing the four idea cards into a 'C-Box '. A C-Box is a 'sequencing' method used is the 'reverging' stage of the iCPS basic module (Heijne & v.d. Meer, 2019). 'Reverging' refers to the process of reviewing and sorting options (or ideas) with the goal of "revealing and refining the problem and solution space."(Heijne & v.d. Meer, 2019). Essentially a C-Box is a grid which allows ideas to be mapped out along two axis. In case of these inspiration sessions the idea cards were mapped according to:
x) the novelty of the idea
y) how easy the idea is to realise

Important to mention is that both the dimensions novelty and feasibility, or ease of realisation, can be interpreted in various ways. It was up to the participants themselves to define these dimensions and place the cards relative to their own perspective and expertise in the project. Of course this means that direct and quantitative analysis could not be done between the different sessions, but the focus was rather on eliciting values and tensions from the stakeholders promoting discussion between the pairs. Figure 25. presents an overview of the C-Box exercise, across all six sessions. After placing the four cards and explaining their placement, participants were asked to select the two most and inspiring ideas.

As the overview shows, the results of the C-Box exercise were very scattered and do not reveal a clear pattern between the sessions. However what is indicated is the great variety in opinion between the different project perspectives regarding the novelty and ease of realisation of all four ideas. Furthermore, despite the dispersed placement of the cards, four of the six project perspectives choose idea card 3 as the most inspiring idea and idea card 2 was selected as the second choice three times. A brief summary of the perceived novelty and ease of realisation for each idea is outlined.
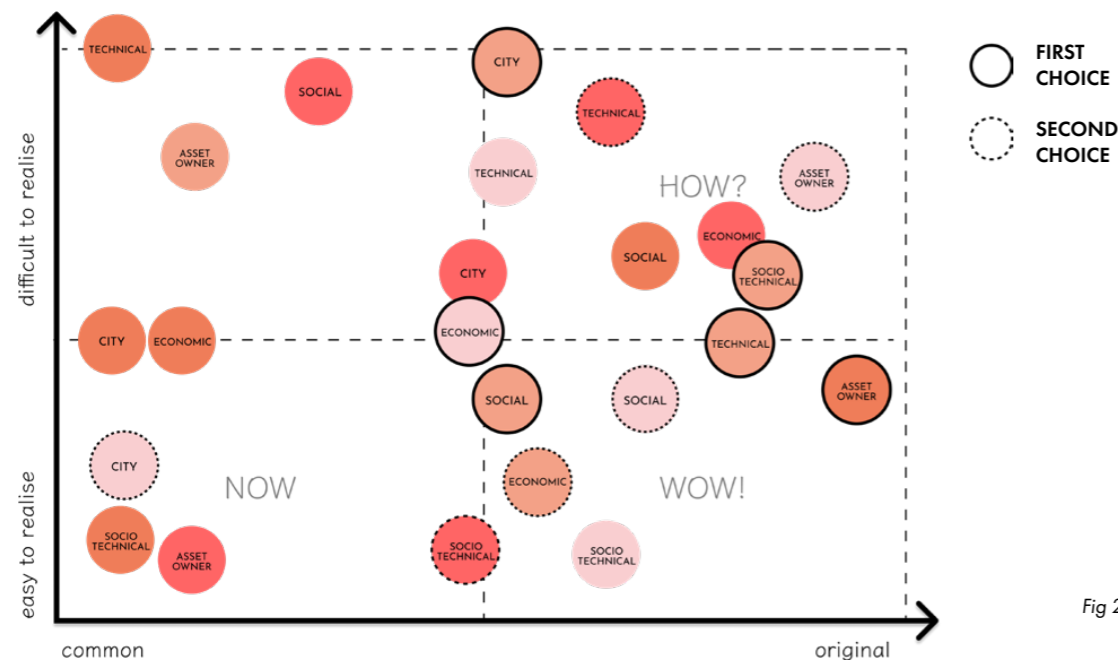
Fig 25. Results of the C-Box activity, across all six inspiration sessions

IDEA CARD 1

Perceived novelty

Overall idea 1 is not seen as a novel idea across the six perspectives and is widely regarded as "unjust", "imbalanced" and feels akin to "cheap labour". However, the social perspective (session 2) and the perspective of the large asset owners (session 6) do see originality in the idea of 'exchanging local services for energy'. Although this idea may not be original in general, in the specific context of Amsterdam Zuidoost and Venserpolder, it **creates the unique opportunity to enable vulnerable, employed and even undocumented residents to 'earn'** and simultaneously gain new skills, without cuts to the social care benefits which they depend on.

"Definitely forced labour, modern day vibes."
S3, P5

"This could be a way to exchange energy for people who do not have a lot of money."
S6, P10

Perceived ease of realisation

In general, idea 1 is seen as fairly easy to realise, because for many of the participants it feels like this is something which could be set up without much added effort. Where difficulty is perceived in the realisation of this idea, from the social perspective, is in the **organisation of residents and regulation of the exchanges** taking place. From a technical perspective idea 1 is deemed as very difficult to realise because of the ambiguity around quantifying work or labour and relating this to a measurement or value of energy.

"This is something which you can immediately start doing...at the end of the day it is a very straightforward transaction."
S5, P8

"It is more difficult and create something with residents...You need a small group of residents to be responsible, like a small board..."

IDEA CARD 2

Perceived novelty

The perceived novelty of idea 2 varied across the six sessions and perspectives. The city regarded idea 2 as significantly less novel than an idea 3 and 4, based on their own involvement with behavioural change and sustainable projects as a municipality. Initiatives to stimulate local and planet friendly behaviour is nothing new for them. From an economic perspective idea 2 is regarded as a fairly original set up, especially in comparison to idea 1, because of the potential for including many different partners and services. When keeping the possible wide scale and sustainable impact of idea 2 in mind, **Johan Cruijff Arena, providing the asset owners perspective, deemed idea 2 as a very novel idea.**

"We, as a municipality, are constantly busy with changing people's behaviour..."
*S1, P2*

"From an originality perspective, I think it's a lot newer [than idea 1]"
S5, P8

"In terms of creating impact, this is of course number one."
S6, P10

Perceived ease of realisation

The use of local tokens in idea 2 means that the actions of people can be easily rewarded and this reward can then be converted into energy supply or an energy discount. The addition of local tokens to the system provides a **means of exchanging something intangible, like a sustainable action, for something more concrete**, like kilowatts of energy. From the asset owners perspective idea 2 seems very complex to implement because residents are being asked change their own behaviours, a difficult task in any context, but especially so in lower socioeconomic areas like Zuidoost. As with idea 1, the technical stakeholders foresee big challenges in **quantifying residents behaviours in an energy exchange system.**

"The tokens and the infrastructure is all there. It is more just about connecting the dots..."
S5, P9

"Here you actually tell them to take the bike instead of the car. I think a lot of people will say that's not going to happen... I lead my life the way I want to."
S6, P10

IDEA CARD 3

Perceived novelty

As previously mentioned idea 3 was chosen as the most inspiring idea in four of the six sessions and is seen to be highly novel. This perceived novelty is mostly related to the potential for saving and/ or making large financial gains by exchanging the control of local infrastructure (and assets) for energy. Almost all project perspectives commented that idea 3 is **the best technical solution for mitigating and preventing grid congestion** (one of the primary goals of the LIFE project). The stakeholder representing Johan Cruijff Arena, was the only one to regard idea 3 as a fairly common idea with the reasoning that this system is already being trialled and used in other parts of the country.

"It is one of the best things you can do to prevent congestion, to mitigate congestion, to get a lower price for your energy, to solve frequency regulations...You can do everything with it."
S4, P7

Perceived ease of realisation

The majority of stakeholders regarded idea 3 as **not too difficult to realise**. This is mostly due to the technical nature of this idea, meaning it is perhaps easier to identify and estimate the steps and processes which need to be taken in order to implement it. **The essence of this idea is fact already being explored** and worked on by technical partners of the LIFE project. Where hesitations do remain about the ease of realisation, are the **high costs** associated with this energy management system and with the regulations surrounding data and privacy.

"This is directly connected to LIFE."
S5, P8

"It has a price... "
S4, P7

"It's difficult to realise because of the regulations."
S1, P2

IDEA CARD 4

Perceived novelty

The perceived novelty of idea 4 ranged from a fairly common idea to a very original one. Both the technical and socio-technical perspectives chose idea 4 as the second most inspiring idea, whereas the social and asset owner perspectives deemed it to be not very original at all. The perceived novelty of the idea lies mostly in the **wide variety of ways in which the gathered data could be used,** and notably what insight it could give into the grid.

"If you have a lot of data you can do so much with it."
P4, S7

"You can show the potential of the energy grid..."
S4, P7

Perceived ease of realisation

Overall idea 4 was regarded as **relatively difficult to realise** because of the current privacy and data regulations which prohibit the selling of energy data in this manner. However, should regulations change the idea was deemed to be a plausible, and likely, possibility in the future. **The ability to quantify and measure data** contributes to making the implementation of idea 4 appear relatively straightforward.

"If you strictly interpret it now then it would be impossible because of privacy."
S4, P7

"This is the more measured one, it's more segmented."
S5, P9

CHALLENGES

PARTICIPATION IN THE EXCHANGE SYSTEM

C1: Including people who do not have the possibility to offer social/ sustainable behaviours
"How can we include all the vulnerable residents who do not have the option to do sustainable actions?"
- S5, P9

C2: Organising and engaging (collective) residents in the system.
"I hear the different stories about the people now in the VVE's. I see that they are struggling with getting all of these things organised and in the end not a lot of people are not willing to join the meeting..."
- S2, P3

SET UP OF THE EXCHANGE SYSTEM

C3: Structuring and regulating the exchange
"The challenges are in how to structure it, because you have to plan it out..."
- S5, P8
"I'm pretty sure there are going to be some regulatory problems there."
- S5, P8

POSSIBILITIES FOR EXCHANGE IN THE SYSTEM

C4: Recognising a diversity of behaviours and actions in the system
"How can different actions and services we included?"
- S2, P3

VALUATION OF ACTIONS/ BEHAVIOURS IN THE SYSTEM

C5: Determining a suitable/ fair return for the behaviours or actions done
"For me there is no way to quantify the efforts in idea 1 and 2..."
- S4, P6
"How to determine how much work or voluntary work is equal to how much energy?"
- S5, P9

C6: Accounting for the fact that 'fairness' varies with context
"Maybe you reward people for using bikes instead of cars. But then there's a guy that cannot bike from here to his job."
- S3, P4

REALISATION OF THE EXCHANGE

C7: Ensuring that involved persons will actually 'get' the energy that they have in tokens
"You could set a certain amount of power for every hour you work, but then the power has to be available."
- S6, P10

C8: Showing and distributing collective value
"We need to do more for the neighbourhood - but how?"
- S6, P10

CONTEXT OF THE EXCHANGE

C9: Making the connection of the local token to energy clear, visible and relevant
"Need to be clear about what the actual intervention is."
- S5, P8

SOCIAL RESPONSIBILITIES OF INVOLVED PARTIES

C10: Safeguarding and monitoring vulnerable persons in the service/ system
"People might work their ass off to get some energy, but that's unhealthy for them. You need to guard or monitor that."
- S1, P1

C11: Managing the power (im)balance between different parties
"It feels kind of abusive."
- S3, P4
"How can we tackle that it gives too much financial power?"
- S5, P8

C12: Building trust between residents/ the community and organisations and institutions
"Who do people trust? That's a very good question."
- S2, P3
"They had bad experiences with the municipality or the tax company or Vattenfal..."
- S2, P3

MORAL AND ETHICAL IMPLICATIONS OF THE SYSTEM

C13: Considering the moral and ethical implications of influencing people's behaviour
"You try to make a connection between having energy fed to your house and your behaviour... that's a morally difficult one."
- S6, P10

C14: Ensuring that the service/ system does not 'favour' those who are already financially secure
"It's always cheaper for rich people to be sustainable and then you're rewarding them with more energy..."
- S4, P7
"I can afford to insulate my house from a net level G to A, but a lot of people don't have money for that."
- S4, P7

OPPORTUNITIES

COLLECTIVE BENEFIT AND ACTION

O1: Empower collective actions and distribute the benefits in the community
"It encourages collective action, which collectively brings benefit to the city. They can redistribute some of these benefits through this token programme."
S5, P9
"Also maybe it motivates you to contribute to the community, to be sustainable or use bike sharing services."
S1, P1

O2: Working towards a common and shared goal
"What I like about it is that people get involved with the energy transition even though they don't have their own energy assets."
S1, P1

O3: Community building and growth
"People get to know each other so you also build on the community."
S1, P2
"...it brings the community closer together."
S4, P7

CONNECTING AND UTILISING EXISTING SERVICES

O4: Connecting and utilising existing services in the neighbourhood
"You can go to the repair cafés which are already there and use existing things."
- S1, P2
"There are companies like Sixt or Share now, or Green Wheels."
S5, P8
"It's nice if the Johan Cruijff Arena can hire local SME's."
S1, P2

O5: Creating possibilities for new businesses to thrive
"It could maybe also stimulate the local economy by people introducing new sharing services or sustainable initiatives..."
S1, P1
"Creating value on a local level."
S5, P8

ENCOURAGING & RECOGNISING SUSTAINABLE ACTIONS

O6: Acknowledging and rewarding residents who are already doing local actions
"We are legitimizing and recognising their actions, sustainable actions, which often do not get recognised."
S5, P9
"I think there is already quite some work being done in neighbourhoods, there are a lot of enthusiastic people doing things."
S2, P3

O7: Increasing awareness about energy consumption and saving
"You make abundantly clear that energy is part of life and that it shouldn't be used excessively."
S4, P7

O8: Providing opportunities for making changes with long term impact
"In terms of creating impact, this idea [2] is the number one. If you can change people's behaviour that creates the most amount of impact."
S5, P8
"...that there will be structural renovation, all kind of things... it's a more long lasting change in a way."
S2, P3

CREATING OPPORTUNITIES FOR VULNERABLE RESIDENTS

O9: Enabling the financially vulnerable to participate in the transition
"This could be a way to exchange energy for people who do not have a lot of money."
S6. P10
"I like that you get some points and then you get something else in return, so it's bartering. Because you have people that don't have an income and if you give them money their benefits are cut."
S1, P2

O10: Guiding and supporting financial behaviours
"If you directly give people money it's quite a risk... They will probably spend it on something else."
S2, P3

O11: Creating new purpose and incentive for the unemployed
"Maybe it is also a great thing to get rid of unemployment..."
S4, P7

UNCERTAINTIES

RECOGNISING ACTIONS & BEHAVIOURS IN THE SYSTEM

Q1: Which behaviours and actions should be recognised in the system? *"What do we actually mean by sustainable behaviour? Is it sustainable behaviour of residents towards their community or towards their energy system?"*
S4, P6

Q2: How is the behaviour or action recorded? *"I'm not going to scan every wrapper I pick up to get credits."*
S4, P7

PARTIES IN THE EXCHANGE

Q3: Which initiatives, organisations and institutions should be included in the system? *"From the institution side, who gets involved? How do you determine who participates? Municipalities would be happy with a more social system... but asset owners maybe they just care about flexibility?"*
S4, P6

VALIDATION OF ACTIONS IN THE SYSTEM

Q4: How are actions and behaviours valuated in the system? *"Maybe some activities are rewarded with more points and then, how do you quantify it?"*
S3, P5

Q5: How can we determine balanced reciprocity? *"How cab we asses the level of balance (or lack of) to determine true reciprocity?*
S5, P8

Q6: What energy prices are used to determine the value of a token? *"Because energy prices fluctuate, does it mean that the remuneration (return/reward) is also flexible?"*
S5, P8

FORM AND TOUCH POINTS OF THE EXCHANGE

Q7: What form(s) of the exchange are most suitable and accessible? *"How does the transaction look like?"*
S5, P8

EFFECT AND IMPACT OF THE SYSTEM

Q8: How can the impact of the system be made visible? *"There is a group [of residents] who are really suspicious and who are not willing to contribute. Like with voting, they don't see any difference or effect between voting or not voting..."*
S2, P3

IN SUM

Idea card 1 and 2 present opportunities for encouraging **collective local and sustainable actions** in the neighbourhoods in Amsterdam Zuidoost. The addition of **local tokens** poses the added opportunity of **including vulnerable groups and guiding (financial/ spending) behaviours** to prioritise the creation of social value. Exchanging services and bahviours has the potential to **foster long-term change** in the district. However, in the short term **questions remain regarding the practicalities** of such a system e.g. **which behaviours and actions** should be recognised in the system and **how can they be recorded?** Foreseen challenges revolve around **organising these exchanges** and **ensuring (power) balance and equality.**

Fig 26. C-Box exercise in inspiration session 1 (city perspective)
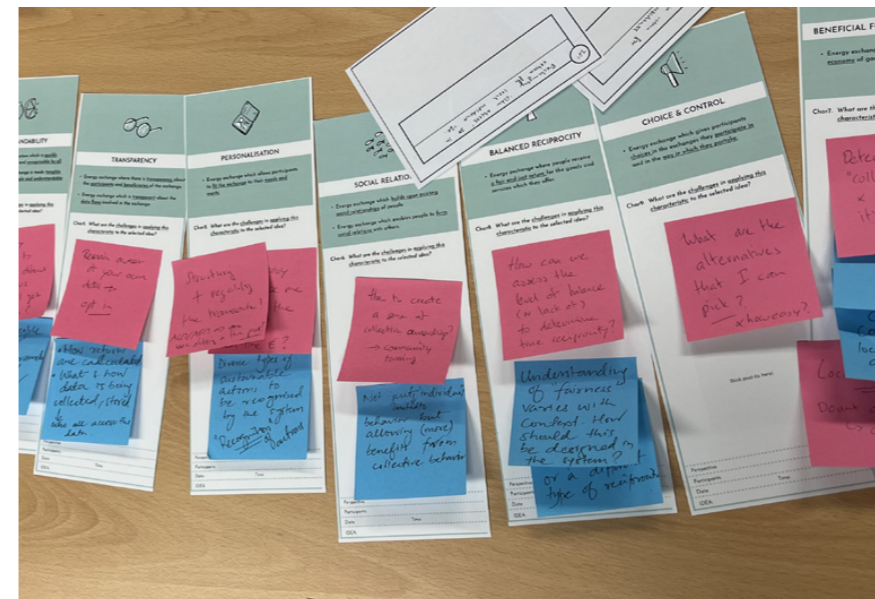
Fig 27. Comparing idea card 2 to the 9 nine characteristic cards in session 5 (economic perspective)

2.2 | A NEW OPPORTUNITY SPACE

IN SHORT

In this chapter a new opportunity space is identified, as a result of the research outcomes of the 'Explore' phase and the inspiration sessions outlined in the previous chapter. A scenario session held to explore this space is described and the resultant findings are presented.

GOAL

Building on the outcomes of the inspiration session the sub-chapter 2.2.1 discusses the use of local tokens as a means for inclusive energy exchange. To dive deeper into this new, more specific opportunity space a 'scenario session' was held with two members of the Lokaal Geld team as well as two participants from the LIFE project consortium. The goal of the session was to share some initial ideas for using local tokens in the context of energy exchange and to together brainstorm further about the scenarios and contexts where this could be relevant and valuable in Amsterdam Zuidoost. The aim was to encourage 'future thinking' and inspire the session participants to consider new and novel possibilities.

APPROACH

The scenario session was held in the community centre in Grubbehoeve in Bijlmer-Oost in Amsterdam Zuidoost. The format of the session loosely followed that of the inspiration sessions, but instead of using idea cards five different scenarios were presented and discussed. This session was a collaboration between Lokaal Geld and the LIFE Project and set the scene for future workshops and the next steps to explore in their shared 'Doughnut Deal'. The data collected in the scenario session was analysed using a framework.

2.2.1 | LOCAL TOKENS FOR INCLUSIVE ENERGY EXCHANGE

IDENTIFYING AN OPPORTUNITY SPACE

Idea card 1, 'exchanging local services for energy', and idea card 2, 'exchanging sustainable local behaviour for energy', were selected as the most promising initial ideas for achieving local **inclusive** energy exchange in Amsterdam Zuidoost. Not only do both of these ideas incorporate barter as a form of non-monetary exchange but they carry the potential to **transform the transition** by placing residents and their actions and services at the core of the energy exchange system. Sub-chapter 2.1.2 details eleven opportunities which these ideas present. Opportunity 3, 'community building and growth', and opportunity 9, 'enabling the financially vulnerable to participate in the transition', both address the original design goal of this project "to design a socially inclusive energy exchange system for residents in Amsterdam Zuidooost."

Further to the previous chapter, idea 1 and 2 were labelled as being 'one and the same' but the addition of local tokens, and focus on local sustainable behaviour in idea 2 makes it, according to project stakeholders, both a more novel idea and one which is easier to realise. Although exchanging actions or services remains somewhat ambiguous and was described as being "difficult to quantify" local tokens provide a tangible solution for marrying residents' behaviours with energy.

'Lokaal Geld' features as a case study in the first cycle of the project and gives a real and environment specific example of how local tokens have the potential to facilitate inclusive exchange in Zuidoost. Missing, however, is the connection between local tokens and the context of energy.

In this gap lies an interesting and undiscovered space for exploring the opportunities of using local tokens as a means for local inclusive energy exchange. Directing the project towards the use and exchange of local tokens for energy offers room for a fresh social design approach to a typically technically dominated field.

"I give you one hour of my time and my expertise and in return I get tokens which could be redeemed [for energy]. So an ecosystem of sorts."
S5, P8

OPPORTUNITY SPACE

How can <u>local tokens</u> be a means for socially inclusive energy exchange in Amsterdam Zuidoost?

2.2.2 | SCENARIOS FOR LOCAL TOKENS IN ENERGY CONTEXT

SCENARIO SHEETS

The five scenarios for the use of local tokens in energy exchange derive from the ideas and design directions which arose during the inspiration sessions. After diverging and coming up with many different potential scenarios, they were combined and collated into the following five. These scenarios were presented and discussed in a collaborative session with both LIFE and Lokaal Geld team members.

Fig 28. Scenario 1

S1. Exchanging local tokens as compensation for local event disturbances

Fig 29. Scenario 2

S2. Exchanging local tokens as a reward for purchasing local goods

Fig 30. Scenario 3

S3. Exchanging local tokens as a return for services and work

Fig 31. Scenario 4

S4. Exchanging local tokens for commitment to personal and community development

Fig 32. Scenario 5

S5. Exchanging local tokens as a reward for sustainable behaviour
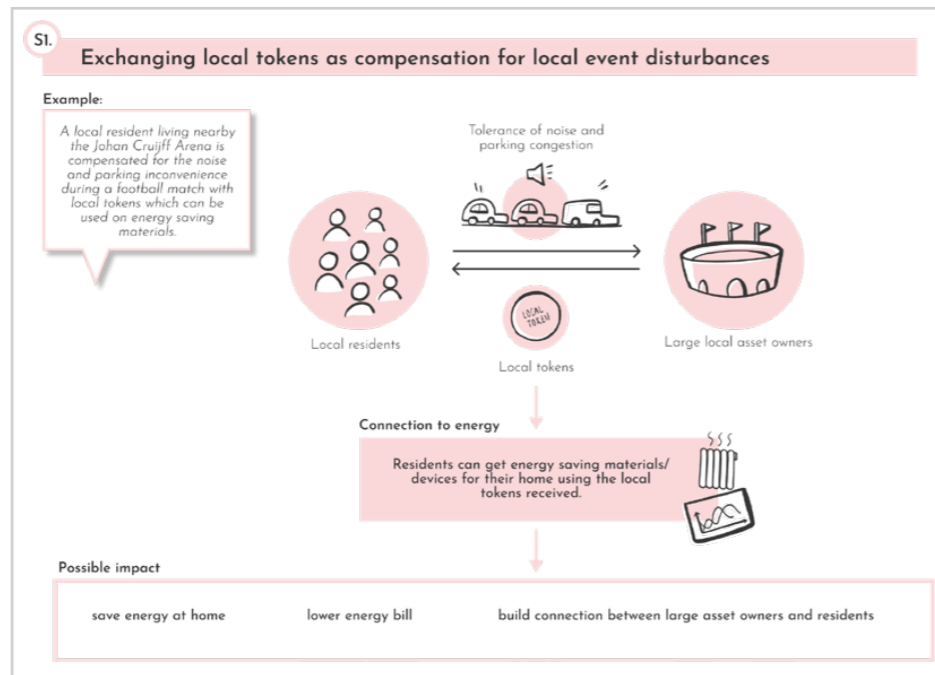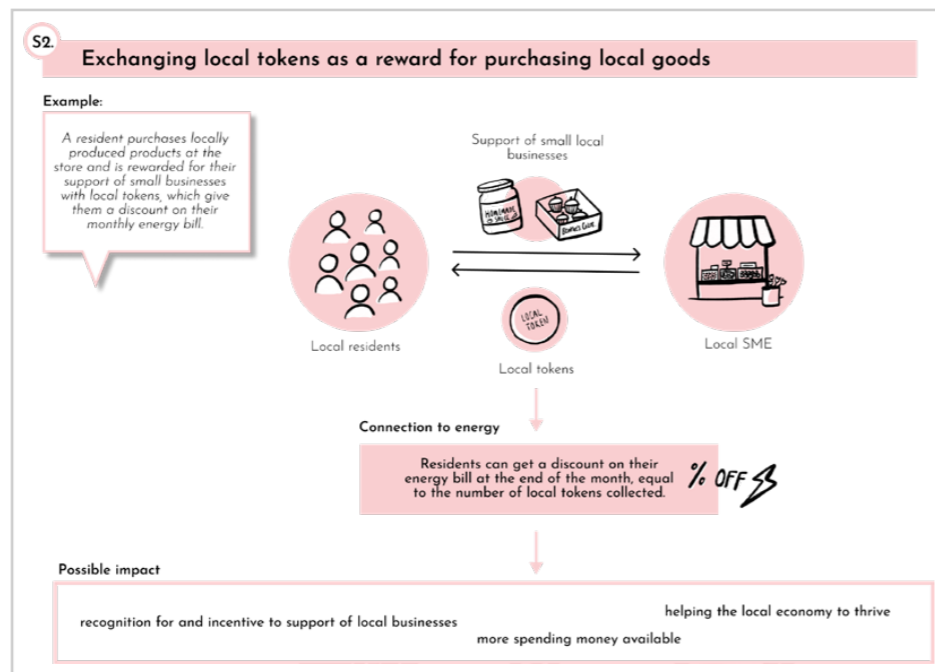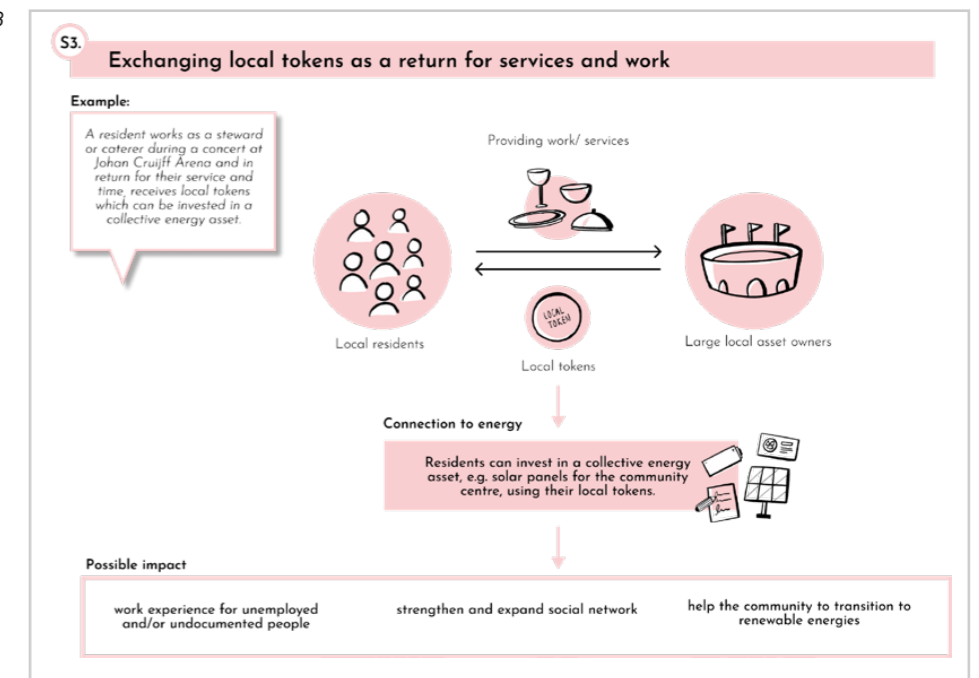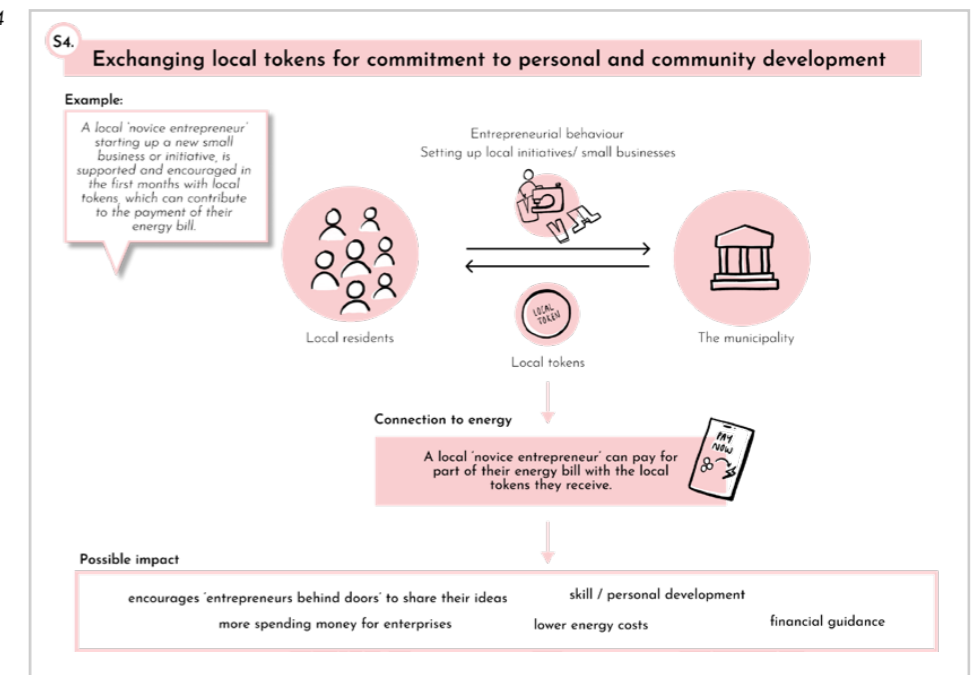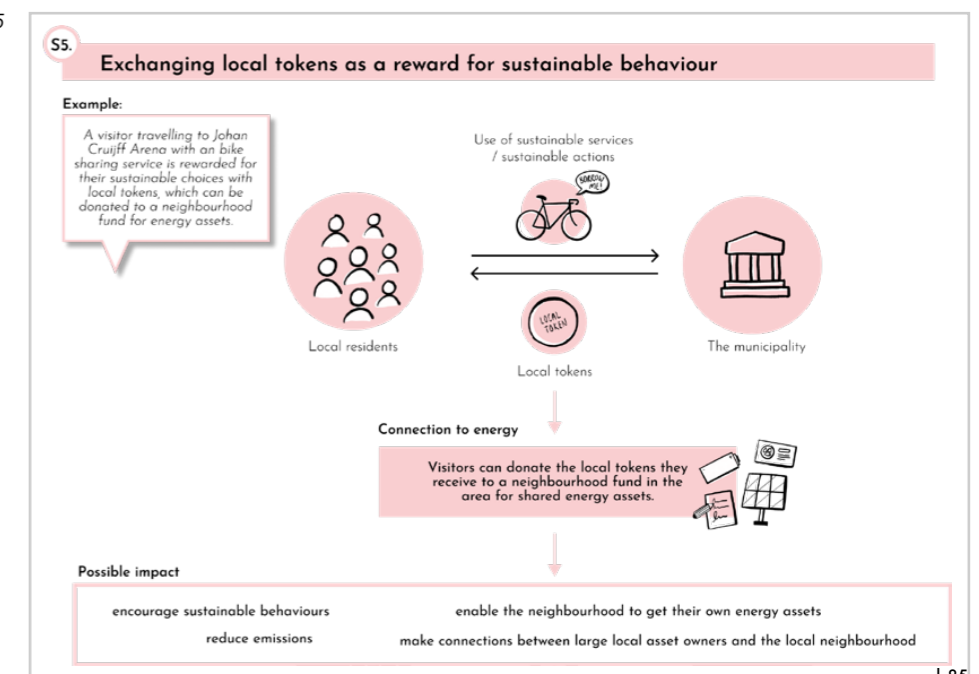
Fig 33. Impressions of the scenario session

SCENARIO SESSION

AIM	SHARE SCENARIOS & BRAINSTORM FURTHER ABOUT POSSIBLE VALUABLE CONTEXTS IN ZUIDOOST
WHEN	02.02.2023, 15:30 - 17:00
WHERE	GRUBBEHOEVE, AMSTERDAM ZUIDOOST
WHO	DOEDE SIMONS & MAARTJE BOS (LOKAAL GELD), ABHIGYAN SINGH & HANS ROELAND POOLMAN (LIFE)

SESSION STRUCTURE

ACTIVITY	GOAL	MATERIALS
1. Introduce project, scenario session & problem statement	To explain the project focus and goal of the scenario session	A3 sheets (with problem statement and session plan)
2. Read and discuss scenario cards	To give initial impressions and start thinking about new possibilities	Scenario sheets 1-5, Post - Its
3. Final discussion and reflection	To collectively determine which scenarios are more valuable for this context	A3 sheets (reflection questions)

KEY QUESTIONS

1a.   How are these scenarios relevant for social inclusion?

1b.   How are these scenarios relevant for the implementation of local tokens?

2.   What is the value of using local tokens in these scenarios, instead of money?

3.   What are the challenges of bringing local tokens into the energy context?

2.2.3 | KEY FINDINGS OF SCENARIO SESSIONS

APPENDIX D7

1a.   How are these scenarios relevant for social inclusion?

S1. **Opportunity to include low income-groups in Venserpolder** who are living in badly insulted social housing near to the Johan Cruijff Arena.

"The houses close to the spots with a lot of noise or other things are cheap houses."

S1. **Opportunity to involve residents in creating a governance system** and determining how value should be distributed locally.

"I think that makes it extremely strong on the inclusivity part. The ownership and decision making..."

S2. **Local tokens can enable a discount or saving on local goods and services** supporting low-income residents with their expendable income.

"Does it allow me to increase my expendable income?"

S3. **Organisations which can afford to give their time voluntarily can earn local tokens and then invest these in supporting the neighbourhoods.**

"This could work for an organisation with budget fir voluntary work..."

S4. **By committing to personal and community development residents can 'give back'** their own personal energy to the community, for instance through the skills they have learnt.

"You're actually building up an inventory of 'energy' that you could then redistribute to others..."

1b.   How are these scenarios relevant for the implementation of local tokens?

S1. **Local tokens can allow the revenue generated by parking costs to flow directly back into the local economy** meaning that visitors to the stadium, Arena and event facilities ae 'giving back' to local people.

"To get the revenue of the parking cost...that will be very interesting. How can that flow back into the token system?"

S4. **Local tokens facilitate the sharing of value** between residents who have time and means to invest in the neighbourhood, and those who do not.

"...they can get tokens, which they can donate to some other causes..."

2.   What is the value of using local tokens in these scenarios, instead of money?

S1. **Local tokens can reduce the work load and speed up the process of distributing value** back to the community as they are not bound to the same regulations as the Euro.

"...instead of it coming from a big pot and calculating how it can flow back to the neighbourhood, it goes straight to Lokaal Geld..."

S1. **Local tokens give residents much more flexibility and freedom,** in comparison to money, over how to distribute and invest value into the community."

"...they can decide how the actual distribution works, either every household gets the same amount or they do something for the collective."

"...when you give people ownership they can see what they want to do, also with other things."

3.   What are the challenges of bringing local tokens into the energy context?

S1. **Local tokens can help to compensate residents and support them in paying their energy bills, but** that does mean the neighbourhood will transition to sustainable and renewable energies.

"It will not change the system of those residents who have energy level 'D' ad 'E'... It'll help them to compensate, but how do we get them to the next level?"

S4. There are many possible contexts where local tokens could bring value. However, the challenge is in connecting tokens to energy is **creating a visible and understandable link between the two.**

"It's a bit complicated. I don't necessarily see the direct chain..."

"The circularity is interesting, but also complex."

"What is needed for people to see the link?"

2.3 | FRAMING LENS: ENERGY TOKEN EXCHANGE

IN SHORT

In this chapter the first framing lens is described. A selection of current eco-coins as well a relevant case study are summarised. A short and fast dive is taken into the possibilities of energy token exchange.

2.3.1   ECO-COINS AND LOCAL ENERGY TOKENS

GOAL

The goal of investigating this first framing lens is to become familiar with existing sustainability and or energy related coins to inform the opportunity space further. The aim is not to explore widely but to validate the potential feasibility of a local token in a local energy system by means of comparison to existing systems and networks which share similarities with the context of this project.

APPROACH

A short literature study was undertaken as well as generative interview with Hugo Schönbeck who is, amongst others, a trustee of the EnergyCoin Foundation. To explore the Viladecans case example a meeting was set up with students from the Vrije Universiteit Amsterdam (ResMa Societal Resilience) who undertook an intensive four day project studying this example, and relating it to the LIFE Project and Lokaal Geld. Their insights were valuable and provided validation for bringing local tokens into a local energy system.

2.3.1 | ECO-COINS AND ENERGY TOKENS

EXAMPLES OF ECO-COINS

A brief summary of a selection of existing 'eco-coins' is given below:

ECOcoin (ECO)
The EcoCoin is an initiative by the Dutch company Circular Collective. It aims to encourage and reward sustainable behaviour and is based on block-chain technology.

REScoop MECISE (Renewable Energy Sources Cooperatives Mobilizing European Citizens)

This European Union-funded project supports the development of renewable energy cooperatives. It involves the creation of a local currency in some projects to incentivise and facilitate the use of renewable energy.

EnergyCoin Foundation

The EnergyCoin Foundation utilises block-chain technology to record measurable daily climate actions, and exchange this value in energy coins. The value is calculated and based on the units of avoided CO_2 emissions of the particular action. One example of an initiative partnered with the EnergyCoin Foundation is 'Ring - Ring'. The block chain stores miles cycled (per 100 miles), translating this into the tokens equal to the avoided emissions of carbon dioxide.

VILADENCAS - VILAWATT CASE EXAMPLE

SUMMARY
Viladecans in Spain implemented the Vilawatt project (Urban Innovative Actions Lab Europe, Oct.22) to improve energy efficiency in the Montserratina neighbourhood. The project focused on retrofitting buildings, providing energy advice, ensuring energy supply, and introducing an alternative currency called Vilawatt. The governance structure of the project was based on a Public-Private-Citizen Partnership (PPCP), which involved the municipality, local businesses, and citizens. The Vilawatt project aimed to create a new governance model that could deliver energy efficiency solutions more effectively at the local level. The PPCP oversaw various aspects of energy management and facilitated coordination between different stakeholders. The project retrofitted three apartment buildings as demonstrations and engaged citizens through the use of the Vilawatt currency, which rewarded energy-saving behaviours and could be spent locally.

RELEVANCE FOR AMSTERDAM ZUIDOOST
Vilawatt is a relevant example for the collaboration between Lokaal Geld and LIFE because local tokens are applied to the context of energy. Furthermore the target location of the Vilawatt project, Viladecans, is comparable to the district of Amsterdam Zuidoost. It is a low-income neighbourhood with poorly insulated homes which are thus energy inefficient and costly. Another similarity between this case example and LIFE is the multi-stakeholder nature of the project where collaboration is required between both large organisations and institutions, private companies and local cooperatives and research groups.

KEY RECOMMENDATIONS - VILAWATT

Three key recommendations are made in the report, from the Urban Innovative Actions Lab (UIA), summarising the Vilawatt project and results. These recommendations are listed below:

1. The value proposition for joining Vilawatt should not focus solely on the financial and economic benefits, but should highlight energy savings and opportunities for energy audits and trainings as incentives to join.

2. There is no guarantee that the energy price offered will be lower than the market price, thus emphasising the necessity to focus on the social and local value, not the financial ones.

3. Create a Vilawatt council to assign formal roles to this system.

2.4 | FRAMING LENS: SOCIAL EXCHANGE

IN SHORT

The second framing lens is introduced in this chapter and explores the added social value which local tokens can provide over money. 'Local Exchange Trading Systems' are described. To further explore the social potential of exchange, theory on gift and commodity relationships is summarised.

2.4.1   LOCAL EXCHANGE TRADING SYSTEMS

2.4.2   COMMODITY AND GIFT SYSTEMS

GOAL

This chapter does not aim to give a complete and detailed explanation of gift and commodity relationships, rather key pieces of information have been dissected from literature and structured as 'qualities' which are used to guide the design process going forward.

APPROACH

Reference to literature on 'LETS' (Local Exchange Trading Systems) and alternative currencies is made to gain a better understanding of local token systems. Alternative currencies, such as the Totnes 'Acorns', are not described in depth rather they are mentioned to provide examples of the possible impact of Local Exchange Trading Systems. 'LETS' can, in some respects, be described as 'gift-like' barter systems or 'gift - relationships'. Although the focus in 'LETS' remains on material items (goods) being 'given' and 'received' (as in commodity exchange) this act of exchange can form a basis for social connection which aligns with the relational focus of 'gifting'. Building on the theory summarised in the literature exploration (chapter 1.1) on barter exchange, this chapter dives deeper into the qualities of commodity and gift-like exchange systems. Taking a generalised view, our past and present exchange system are outlined, and a future digital gift-like exchange system is proposed.

2.4.1 | LOCAL EXCHANGE TRADING SYSTEMS

UNDERSTANDING LETS

As described by C. Williams in 'The New Barter Economy: An Appraisal of Local Exchange and Trading Systems', LETS are "local associations whose members list off their goods and services in a directory and then exchange them priced in a local unit of currency." Deemed a 'multi-lateral' barter scheme, LETS enable local people to choose what they want to trade, with whom and how frequently. Although LETS use their own local alternative currencies, this local unit is still connected to the national currency and usually has a 1:1 exchange rate. A LETS currency can be described as a "pure means of exchange, rather than a store of value" and "facilitates reciprocally beneficial 'trade out." (Pacione, 1997).

OBJECTIVES OF LETS

Individuals motivations for starting and/ or joining a Local Exchange Trading System are often economically grounded. However, case studies have proven that the "real role of a local currency may actually be social restoration, rather than direct economic regeneration per se"(Clayton, 2010). The main objectives of LETS can be categorised as:

ECONOMIC OBJECTIVES

1. Increasing local economic activity
2. Supporting economic regeneration
3. A safeguard from external economic instabilities

SOCIAL OBJECTIVES

1. Increasing social interactions
2. Reconstructing social relationships
3. Reducing social inequalities

COMMUNITY-BUILDING OBJECTIVES

1. Improving social cohesion
2. Developing and fostering a sense of community

POTENTIAL IMPACT

The objectives of LETS have been outlined above, but do they, in practice, really meet these objectives and what is their effect? In literature several different alternative currencies and LETS, such as 'Acorns' in Totnes, have been reviewed and compared to discover the real impact that LETS can have on a local area. The measured and potential effects are described with the above objectives in mind.

Totnes 'Acorns' are no longer in circulation but a study into the effect of the system at the time came to the conclusion that: **"LETS do appear to benefit those living in relatively low income households"** (Williams, 1996). LET systems enable economically impoverished people to access credit to purchase basic necessities such as food and clothing, and on occasion pay for essential maintenance work like plumbing.

On another level, and with the potential of longer-lasting impact, LETS can be a mechanism for reducing unemployment in low-income areas by **"helping to support fledgling local businesses"** get off the ground (Clayton, 2010). The effect of local businesses in a neighbourhood, other than creating more jobs, is that they can encourage a sense of **"self-reliance"** and trigger a **"multiplier effect"** where more and more individuals can benefit from the circulation of 'money' and value (Clayton, 2010).

The promotion of entrepreneurial behaviour, through LET systems, **"appears to encourage persons to offer services out with their normal trade or profession"** (Clayton, 2010). In Totnes, 38% of participants in the study responded that LETS **"enabled them to use skills which they would not otherwise have used"** (Williams, 1996). Thus LETS can be seen as a sort of incubator allowing residents to develop skills through new experiences, as well as promote and channel existing services. This space for personal growth enables the most vulnerable in a community to **"rebuild a sense of worth",** feel valued and **"regain control of their lives"** (Clayton, A., 2010).

"Restoring social trust" (Clayton, 2010) is another key factor in reconstructing social and economic relationships and ultimately achieving a socially cohesive community. LETS enable the building of trust by acting as **"a kind of community bulletin board and putting people in touch with each other"** (Clayton, 2010). The frequent and repeated social interaction involved in a Local Exchange Trading System brings different people in a neighbourhood together and **"can improve the position of the poor by expanding their network of social contacts"** (Pacione, 1997).

The opportunity for expansion of social networks is of special importance in areas of high unemployment where individuals typically stay within their own small groups, **"leading to the unemployed 'falling out' out the local social structure"** (Williams, 1996). LETS are, by concept,

inclusive as **"membership of LETS is not dependant on money, occupation, status, housing etc."** (Pacione, 1997) and in practice participants have described feeling more connected to the community once becoming involved in the system: **"It gives you a sense of belonging"** (Pacione, 1997). Communities do not naturally exist but are constructs of social behaviours (Williams, 1996) and thus require intentional and active effort to form. A Local Exchange Trading System can provide a neighbourhood with the system and tools needed to build a greater sense of community or even, as was the case in Totnes, construct one in the first place.

In summary, LETS and local alternative currencies have the potential to add and create numerous values in a community, over what money can provide. The positive effects which were found and described in literature, and based on the study of real LETS, can be collated into the following list:

LETS ADD VALUE TO THE NEIGHBOURHOOD BY:

- **Enabling all residents to participate** (irrespective of socio-economic positioning, income or assets)
- **Keeping and circulating value** in the local area
- **Providing the vulnerable with a means to access necessities** through the use of credit
- **Promoting and supporting entrepreneurial behaviour**
- **Providing an outlet for existing skills and services**
- **Enabling residents to practice and develop new skills**
- **Providing the unemployed with (formal or informal) work experience**
- **Helping to build self-esteem and sense of purpose**
- **Fostering a sense of self-reliance and independence**
- **Expanding residents' social networks** through increased social interaction with one another
- **Enabling the creation and building of trust** between unfamiliar people
- **Providing system of reciprocal support**
- **Helping to build a sense of community** and belonging

LIMITATIONS OF LETS

This sub chapter has described Local Exchange Trading Systems and pointed to the many benefits such as system can have bring a neighbourhood, especially a low-income one. Why then are there not more LETS systems in operation and existence in our cities, towns and districts today? LETS and alternative currencies, despite all their potential positive impact, have some key limitations. These limitations impede the acceptance, implementation and most crucially the scalability and sustainability of LET systems in the long run.

THE MAIN LIMITATIONS, as given by Michael Pacione in 'Local Exchange Trading Systems as a Response to the Globalisation of Capitalism', can be outlined as:

- **Lack of awareness and understanding:** people do not know how the LETS system works or how it can be relevant for them
- **Lack of self-confidence:** people tend to dismiss or undermine their own abilities and are reluctant to "make the first move" and reach out to people they do not yet know
- **Lack of system confidence:** people do not trust a system they do not know and which has different regulations
- **Lack of confidence in the pricing mechanism:** people are hesitant about the calculations made and used and if these are 'fair' or 'proportional'

APPLICABILITY OF LETS TO AMSTERDAM ZUIDOOST

A Local Energy Exchange Trading System seems fitting for the district of Amsterdam Zuidoost where poverty is noticeable and social cohesion is lacking, but where people do have goods and services to offer others. There are parallels between the objectives of LETS and the overarching goal of this project: "to facilitate the social and financial inclusion of residents in Amsterdam Zuidoost." LETS stimulate the formation of both social and economic benefits. A local energy exchange system which is modelled on the concept of LETS could have the potential to create similar impact for residents and bring new value to the neighbourhood. However, as discussed in the limitations of LETS, the threshold needs to be lowered for including and engaging residents in the system.

2.4.2 | COMMODITY AND GIFT SYSTEMS
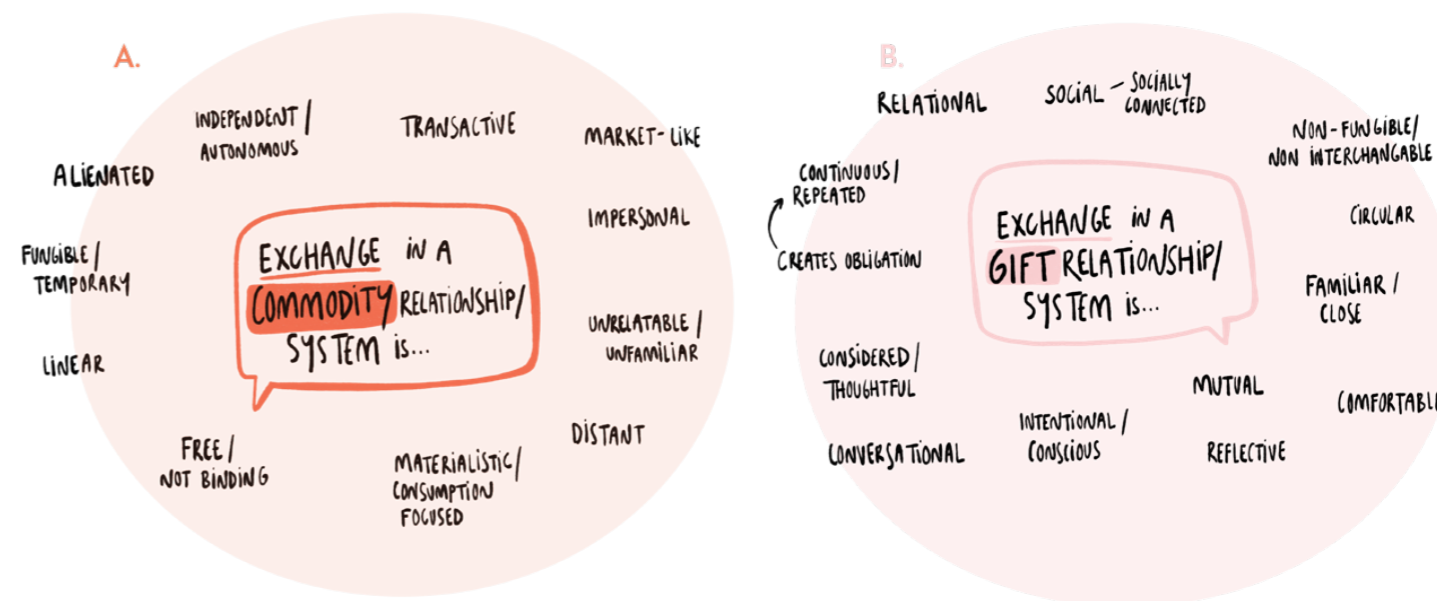
Fig 34. Comparing properties of commodity and gift relationships and systems

INTRODUCTION TO COMMODITY & GIFT SYSTEMS

LETS are an example of a local exchange system which has the potential to create social, as well as economic values, for people and communities. However, these LET systems are not related to the context of energy and to be able to design a new and novel system which uses **local tokens as means for socially inclusive energy exchange,** we need to return to the theory of exchange itself. The broader background and origins of 'exchange', and the different types of exchange, are already covered in the literature exploration in Phase 1. The theory of 'barter' is also outlined here: a **description of barter as a 'polythetic category'** (Humphrey & Hugh-Jones, 2005) and it's dual nature and relation to other exchange types is given. In short, barter exchanges are described as always sharing elements of both commodity and gift exchange making it simultaneously a 'material transaction' and a 'sign of relationships.' Although both elements are always present, a barter exchange can lean towards being more gift-like or more commodity-like, depending on the properties of the system in which the exchange takes place. This sub-chapter dives deeper into the **properties of both commodity and gift systems** and the relationships they pertain to or form, through the act of exchange. Also discussed in this sub-chapter is the transition which already happened: the general shift from a localised gift-like system to the centralised commodity system which we mostly experience and exchange in today. The factors which contributed to this shift, and which conversely can help to transform our exchange system once more, are outlined. Finally a systemic view is taken to consider the exchange system of the future and the challenges involved in getting there.

A MATERIAL OR A RELATIONAL FOCUS

As mentioned in the introduction, commodity-like barter or exchange can be described as a 'material transaction' and gift-like exchange can be referred to as ' a sign of relationships'. These descriptions pertain to the different focuses in the exchanges. In commodity systems the spotlight is on the item (or commodity) itself which is being exchanged. In gift systems attention turns instead towards the people involved in the exchange and their relationship (or potential relationship) with one another, and the item is secondary to this. A commodity or gift 'relationship' refers specifically to the relationship between the 'giver' and the 'receiver' in the exchange and thus determines the exchange system itself: for example two friends share a 'gift relationship' and are expected to 'give' to each other in the appropriate circumstances, whereas a shopper and the check-out assistant share a 'commodity relationship' because neither is expected to create or maintain a social connection with the other. Of course there are instances where a commodity relationship can turn into a gift relationship, but this requires the repetition and thus continuation of the exchange. In this sub-chapter the terms 'system' and 'relationship' are used interchangeably.
.

PROPERTIES OF COMMODITY & GIFT SYSTEMS

Figure 35. visualises the different **properties** belonging to gift and commodity exchange systems. It should be noted that although these properties have been divided and placed under either A) commodity system or B) gift system in these visualisations, the properties in fact form more of a continuum or a spectrum, rather than two separate groups. Take the property 'personal': simply put a gift-system is personal and a commodity system is impersonal, but the level of personality (or impersonality) is not fixed and can vary per exchange. All of the properties originate from literature, predominately the work of anthropologist James G. Carrier in the book Economic Anthropology.

A SHIFT IN OUR EXCHANGE SYSTEM

'Trade' or exchange transitioned from a highly personal and relational action to the commercial, economic situation which we now live in and which is almost exclusively impersonal (although in recent years 'buying local' has gained traction and become more popular, driven by the desire for climate conscious consumption). Figure 36. illustrates, grossly speaking, the changes which both people, places and products underwent in the shift from a local and relational gift system to our current centralised and materialistic commodity system. As the figure shows exchange ('giving' and 'receiving') was largely limited to the neighbourhood which you lived in or the nearby market town. This locality of exchange created a relational system where "people bought and sold with people who they knew, with whom they transacted repeatedly and with whom they shared understandings of how transactors ought to act" (Carrier, 2021). Over time larger stores and standardized production meant that people travelled for their goods making "buying more impersonal so that what people bought began to resemble commodities." Today we exchange, for the most part, in the digital world and with people who live in different cities, countries and even other continents than us. Globalisation and the expansion of our digital networks has "meant only the further reduction of any human contact in [exchange] and the reinforcing of the impersonality of circulation." (Carrier, 2021).

SYSTEMIC CHANGE

Figure 37. presents a simplified time-line of our exchange systems and presents a future vision where exchange moves towards a gift-like system. Important to realise, however, is that this is not a step back to the gift systems of the past where goods were solely bought and sold in markets. Rather this is a transformation in a digital era where we are increasingly 'giving' online and in non face-to-face scenarios with people whom we do not know. Whilst digital social media enable us to 'connect' with hundreds of people, we arguably are less socially connected than ever and a sense of community is waning and becoming lost. Our physical social disconnection calls for a radical change to the way in which we exchange. How can we bring the focus of exchange back to people and relationships, and away from commodities?

COMMODITY TO GIFT: A SPECTRUM OF PROPERTIES

A COMMODITY RELATIONSHIP/ SYSTEM	B GIFT RELATIONSHIP/ SYSTEM
Impersonal	Personal
Urelatable/distant	Familiar/ close
Materialistic	Relational
Free/not binding	Obligatory
Independent	Socially connected
Alienated	Collective
Fungible/ interchangeable	Non - fungible/ emotionally connected
Unplanned/ unintentional	Intentional/ considered
Temporary	Continued/ repeated
Linear/ flat	Circular
Completing the exchange dissolves the relationship between giver and receiver	**Completing the exchange reaffirms and recreates the relationship between gives and receiver**
The relationship between person and thing = property	**The relationship between person and thing = possession**

Fig 35. A spectrum of properties

THE SHIFT FROM GIFT TO COMMODITY

B GIFT SYSTEM: LOCAL & RELATIONAL		A COMMODITY SYSTEM: CENTRAL & MATERIAL
Self-sufficiency and localsim were written in the law and people's values	**Less self-sufficient**	People buy more of what they need, instead of making it
Local produce went to local people	**Less local**	People travel out of their local area to purchase goods
People could only sell what they bought, if they transformed it in some way	**Less 'bespoke'**	Due to market places and product standardisation, goods do not need to be transformed
'Getting goods' involved conversing with the market-seller	**Less conventional**	Things are sold with fixed, non-negotiable prices
Things were stamped with store identities	**Less personal**	Things are alienated from the people who 'make' and 'give' them
People only exchanged with known and trusted people	**Less relational**	Things are 'given' and 'gotten' between strangers or through devices
People went to specific stands and sellers in their market town	**Less intentional**	People impulsively buy goods and 'drop in' to stores

Fig 36. The shift from gift to commodity systems

A SYSTEMIC CHANGE

B. GIFT SYSTEM ⟶ **A. COMMODITY SYSTEM** ⟶ **B. FUTURE GIFT SYSTEM**

DIGITAL GIVING, NON - FACE TO FACE, IN A SOCIETY WHICH IS LESS SOCIALLY CONNECTED & COMMUNITY FOCUSED

Fig 37. Can we move towards a digital gift system in the future?

2.5 | FRAMING LENS: HYBRID EXCHANGE

IN SHORT

This chapter delves into the world of digital money to discover how these practices can foster social connectedness. The Bristol Pound is given as an example of a hybrid alternative currency system and using this example the design and dimensions of these systems, for supporting social interaction, are discussed.

GOAL

The goal of investigating this framing lens is to gain insight and inspiration into how the design of hybrid (physical/digital) exchange systems themselves can create opportunities for eliciting social value.

APPROACH

The literature sources which are referenced in this chapter stem from the ACM digital library and combine research on digital finances, interaction design, computing and social practices. The findings from this chapter point towards a hybrid exchange system (one which combines physical settings with digital services) as a system which has the potential for supporting social interaction and connectedness. The ability for money and financial systems to facilitate social interaction as well as the influence of increasing digital payment media is discussed. The focus when reviewing literature on digital money and payment systems was on the connection between these transactions and social values. Although money forms a central part of the literature, the examples given and referred to in this discussion concern local alternative currencies and so the findings remain relevant for the opportunity space identified and presented in chapter 2.2. It should be noted that in this chapter the word 'transaction', which has strong economic and commodity based associations, is swapped for the word 'exchange'.

2.5.1 | DIGITAL MONEY PRACTICES

FINANCIAL TRANSACTIONS AS A MEANS FOR SOCIAL INTERACTIONS

Ferreira and Perry (2018) describe money as being more than a simple store of value and means for exchange but rather **"a system of relationships, a chain of promises, and a record of people's transactions with one another."** The manner in which we make financial transactions is dependant on the relationship we share with the other in the exchange, thus **"economic practices are embedded in social relations."** However, the use of money to make purchases and payments also facilitates moments of interaction with unfamiliar people, thus creating potential for building new social relationships. This opportunity is magnified by the repetition of and frequency with which we make financial transactions (for most of us this is a daily occurrence). Not only is the frequency of the transaction a factor in determining potential for the strengthening and creation of social relations, but the actual form of the payment media itself shapes the social interaction (Ferreira & Perry, 2018).

"Financial transactions are seen as a means of co-ordinating social and community relationships through the exchange of value."
(Simmel 1900; Zelizer 1994; Granovetter 1985; Maurer 2015).

THE RISE OF DIGITAL MONEY

Increasingly this payment media takes a digital form as **"tangible interactions with money [become] infrequent"** (Lewis & Perry, 2019). With the rise of digital money and the digitalisation of our financial transactions comes, naturally, the decline in opportunities for social interaction in our payment practices. This lack of social interaction is due not only to a decrease in cash spending in physical settings, but is also a consequence of the emphasis on efficiency and security in digitalised transactions. **"Faster transactions are not always better transactions"** (Ferreira et al, 2015), especially in the bid for creating and strengthening social relationships. For the most part, the rise of digital money means our daily financial transactions are becoming **"unremarkable and trivial events"** and **"ordinary mundane parts of our lives"** (Ferreira & Perry, 2018). The question is then **"as digital transactions remove opportunities for social and material exchange"** (Ferreira et al, 2015) how can we restore possibilities for social interaction in the design of new mobile payment practices?

"The brief act of buying a coffee or buying a magazine risks becoming an unremarkable, trivial event that soon fades as we move on, and the greeting to a shopkeeper or the mechanics of interacting with the payment technology are quickly forgotten."
(Ferreira, J. et Perry, M., 2018)

ALTERANTIVE CUURRENCIES AND HYBRID PAYMENT SYSTEMS

Alternative currencies and hybrid payment systems offer the chance to inject novel and unique moments for social interaction back into our payment practices. The 'Bristol Pound' (B£) is an example of such an alternative digital currency and hybrid payment system. Transactions with the Bristol Pound **"occur in printed notes, SMS on any mobile phone, or online via an electronic account similar to a bank account"** (Ferreira & Perry, 2018). Akin with a Local Exchange Trading System the Bristol Pound aims to stimulate local spending to keep and circulate value (money) locally, and subsequently foster community building and planet friendly behaviours. **"The mobile phone is the primary payment device for Bristol Pound transactions"** (Ferreira & Perry 2018) and a study into its use and adoption by local people in Bristol has found that the design of this hybrid payment system creates unique interaction opportunities, which **"support people in making connections, to other people, to their communities, to the places they move through, to their environments , and to what they consume"** (Ferreira, et al, 2015). In particular, the dimension of time in the exchange of the Bristol Pound was found to create space for rewarding social interactions and thus support the creation and strengthening of relationships. This deliberate slowing down of transactions, or exchanges, is discussed further in the following sub-chapter.

"The Bristol Pound intended it to be used as a means of encouraging local businesses, and keeping money in the Bristol area, strengthening community bonds, and contributing to ethical and environmental benefits."
(Ferreira, J. et Perry, M., 2018)

2.5.2 | CREATING TIME FOR INTERACTION

SLOWING DOWN DIGITAL AND HYBRID TRANSACTIONS

"Time experienced during interactions with technology has been demonstrated to hold implications for the user experience" (Ferreira et al, 2015). More specifically, and in the context of digital/ hybrid transactions, the speed of an interaction can influence individuals' experience by creating time for personal reflection, conversation, novelty and collaboration between the 'giver' and the 'receiver' in the exchange. Figure 39. illustrates the connection between time and the user experience in a hybrid exchange.

The study of users of the Bristol Pound (through the mobile system) found that **"the relatively slow and unpredictable speed of the transaction allowed its users opportunities to fill this time with ludic, or playful interactions"** (Ferreira et al, 2015). No two exchange experiences amongst participants of the study were found to be the same and this 'unexpectedness' led to positive and surprising conversations and interactions, but also retained users engagement in the service as a whole. In other words, the novelty of using an alternative currency and hybrid payment system did not wear off, but rather brought users back time and time again. The repetition and continuation of these exchanges increased users chances of creating and strengthening social relationships with other locals and strengthened their sense of connection to the community. Interestingly, users did not only return to the same stores where they had already paid with Bristol Pounds previously, but actively sought out new locations with the **"motivation to explore new areas of the city"** (Ferreira et al, 2015). This shows that a novel hybrid payment (or exchange) system and media can create closer connections in a neighbourhood, but also has the potential to widen individuals social networks. Important to note is the significance of the **hybrid nature** of the Bristol Pound system in supporting social connectedness: without physical stores or locations the digital media (in this case the mobile phone) would just replicate any other online transaction service, and offer an impersonal and individual experience. The ability to add time, and thus "open up 'interaction space'" for novelty and conversation, is a result of the amalgamation of digital and physical touch points in the exchange system (Figure 38.)

"It is very rare that you have a Bristol Pound transaction where it is just routine, where you don't really speak beyond the set of phrases."
- Participant Bristol Pound Study

"Because it's a novelty you start joking about it."
- Participant Bristol Pound Study

A CONFLICT BETWEEN TIME/ EFFORT AND EASE/ CONVENIENCE

On reflection, when considering the context of Amsterdam Zuidoost and the vulnerable low-income residents who live there, adding time and therefore effort (e.g. going to a physical location) to the energy exchange system seems unjust. As I discovered through explorations in the first phase that many residents, despite their best intentions and general willingness, cannot afford to invest time into the neighbourhood or into, hypothetically speaking, 'giving' their services in exchange for energy. A conflict arises here between designing a novel system which has the opportunity to create social connections, versus unburdening residents who are already struggling to get by day-to-day. I want to design an energy exchange service/ system which is inclusive, not one which adds unnecessary strain. Perhaps a way to address this dilemma is by utilising physical locations which residents already frequent and/ or by making the added time involved in the exchange bring visible and tangible benefits to residents.

IN SUM

Faster is not better: Digital payments and transactions are becoming faster and more efficient, but as a result the opportunities for social interaction in these exchanges are being lost.

Alternative currencies provide new opportunities for exchange: Alternative currencies and the design of hybrid payment systems can allow for novel and unique interactions between 'giver' and 'receiver'.

Slowing down exchange has social value: Adding time to the exchange creates space for social interaction by enabling moments for reflection, novelty, collaboration and conversation.

Unpredictability retains user engagement in an exchange system: Adding time to exchange also adds more opportunity for unexpected encounters and conversations which incentivises continued participation in the exchange system, so can result in a stronger sense of community and belonging.

Exchanging in physical locations can widen social networks: Exploring new places through exchange presents opportunities for creating social connections.

PHYSICAL
EXCHANGE SYSTEMS

"informal analogue interactions"

Exchanges which take place in physical settings

HYBRID
EXCHANGE SYSTEMS

DIGITAL
EXCHANGE SYSTEMS

"formal digital services"

Digital exchange media and applications

An exchange system which combines digital media with physical settings
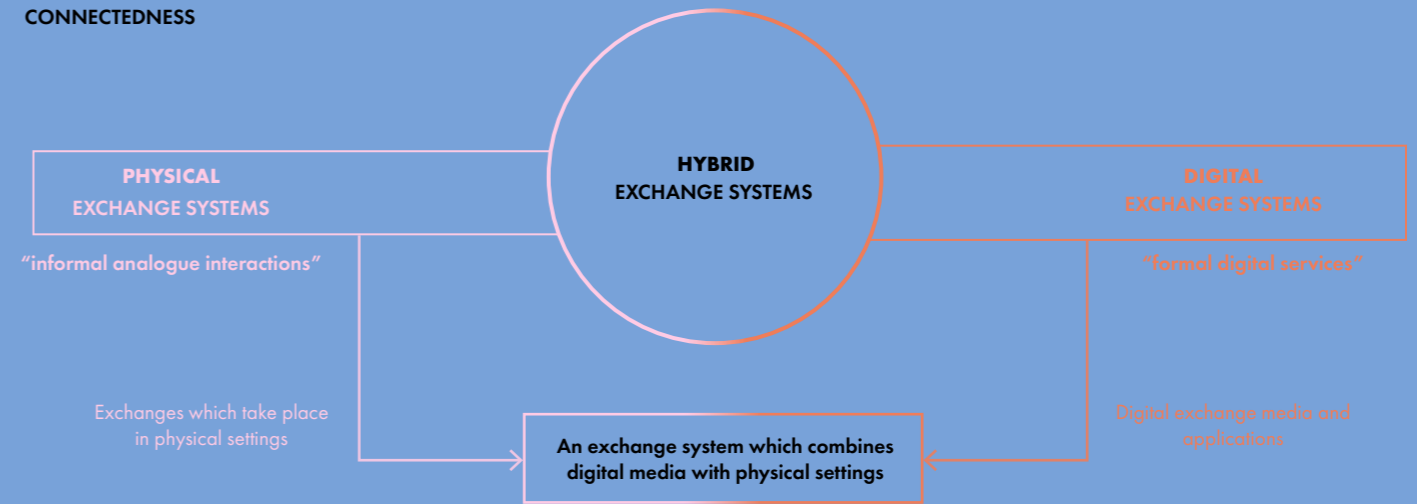
Fig 38. Hybrid exchange systems - bringing elements of the physical and digital together

CREATING TIME FOR INTERACTION

In hybrid exchanges...

TIME

allows for moments of ...

REFLECTION	NOVELTY	ACHIEVEMENT
Moments of reflection	Sense of anticipation	Feeling of collaboration
Intentionality	Playful/ ludic interactions	Celebrate small successes

and ultimately facilitates...

CONVERSATION

Build rapport

...which enables the creation and strengthening of social relationships
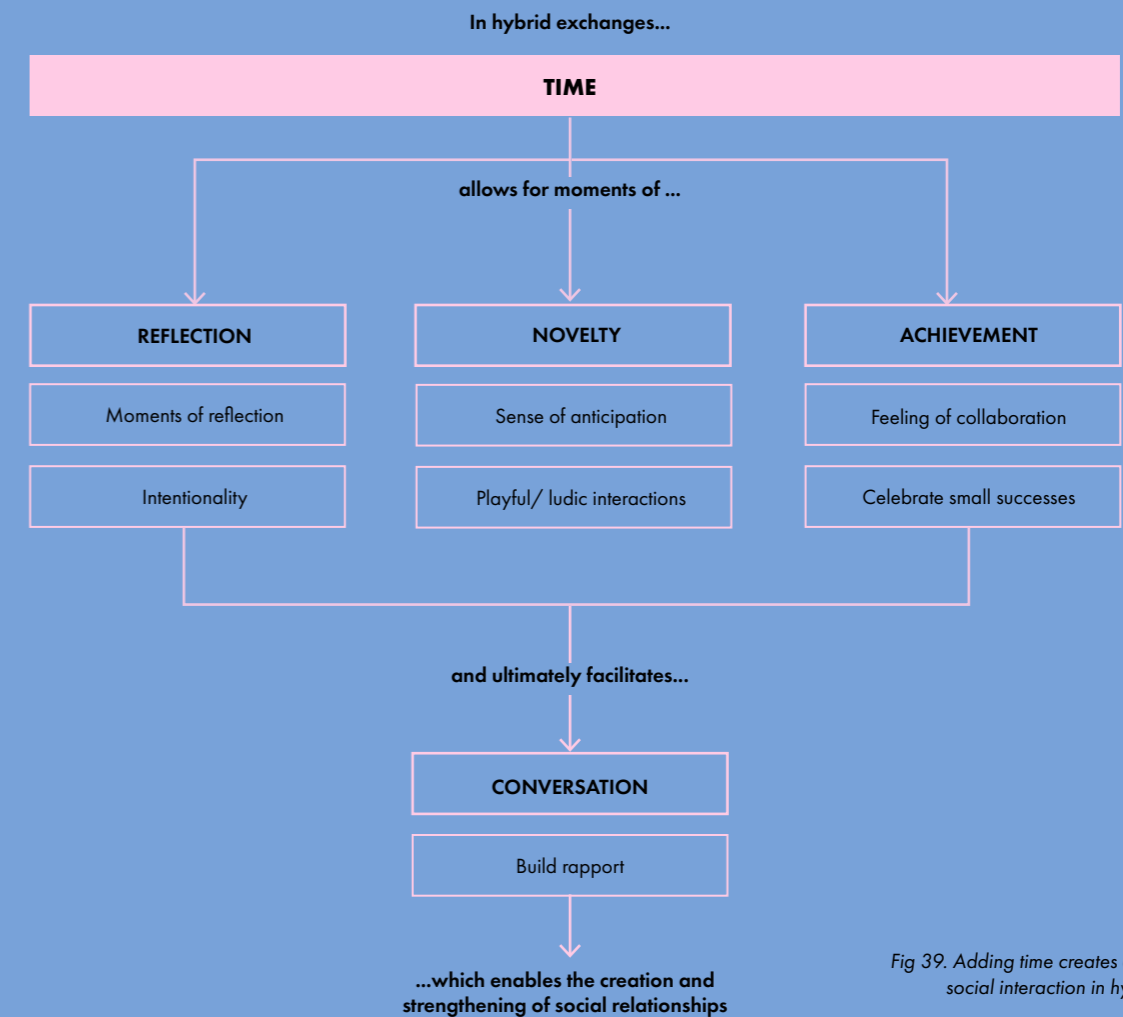
Fig 39. Adding time creates opportunities for social interaction in hybrid exchanges

2.6 | REFRAMING ENERGY EXCHANGE

2.6.1 | A RELATIONAL FOCUS

IN SHORT

In this chapter energy exchange is reframed and a relational focus is taken. A revised design goal is stated and a new term is coined to describe exchange which creates opportunities for social relationships to form. The properties and elements of 'relational giving' are outlined.

GOAL

The goal of reframing energy exchange is to provide a new perspective and thereby open up opportunities for new ideas for socially inclusive energy exchange. The design gaol is specified to give more direction for the subsequent 'Create' phase.

APPROACH

Literature and theory on gift and commodity systems and relationships is referred to. 'Relational giving' can be seen as an alternative name for 'gift-like barter exchange' and thus theory on gift-like barter is used to describe this new coined term. Properties pulled from literature on 'gift-like barter' inform the properties and elements assigned to 'Relational giving'.

REVISED DESIGN GOAL

Different 'lenses' were explored, each providing a different 'frame' for (energy) exchange and offering inspiration for designing a social-value driven system. Based on these literature insights and findings the design goal was re-formulated to specify the focus on creating and strengthening social relationships through exchange.

DESIGN GOAL 2.0

"To design a system which facilitates the **creation and strengthening of social relationships** in Amsterdam Zuidoost, through the exchange of local tokens for energy".

COINING A NEW TERM

Thus far the terms 'exchange', 'barter' and 'gift' have been used separately or in conjunction with each other, when describing and discussing findings from literature and the emergent design direction of this project. All of these terms carry strong associations and, as outlined in chapter 1.1, the word **'barter' has particularity negative connotations in our colloquial language**, despite it's 'dual nature' and broad definition in theory. Although 'barter' often takes a gift-like form it is most often likened with 'commodity exchange' and implies 'haggling' or even deceptive trading behaviours. The words 'exchange' and 'gift' also hang heavy with ingrained and somewhat sub-conscious associations. The assumption is that a 'gift' is a present given to someone to mark a special occasion such as a birthday. The origins of the word do lie here, however in anthropological theory 'gift' refers more widely to an exchange which is focused on the relationship between the 'giver' and the 'receiver', and not on the good or service itself. Finally the word 'exchange', which underpins the work and premise of this project, is implicit of a financial and economic transaction and market trade. 'Exchange' is also often interchanged with the word 'swap' which is suggestive of the immediate transfer of fungible items and so is commonly not deemed descriptive of a relational or 'gift-like' action.

The revised design goal to 'create and strengthen social relationships through energy exchange' calls for a new and novel system which is evocative of a 'gift-like' relationship and uses local tokens to create opportunities for social interaction and connection. Thus, the goal concentrates on exchange which is relational and not commodity based. To reflect this, and to shake off the connotations described above, a new term has been coined to describe the desired exchange and effect: 'relational giving'. Figure 40. depicts the process of coining this term, using the 'flower association' method from creative problem solving (Heijne & v.d. Meer, 2019).

'Gift-like barter exchange' hangs heavy with ingrained associations. A more fitting and socially orientated term is **'relational giving'.**

Fig 40. Flower association method - mapping out associations to coin a new term
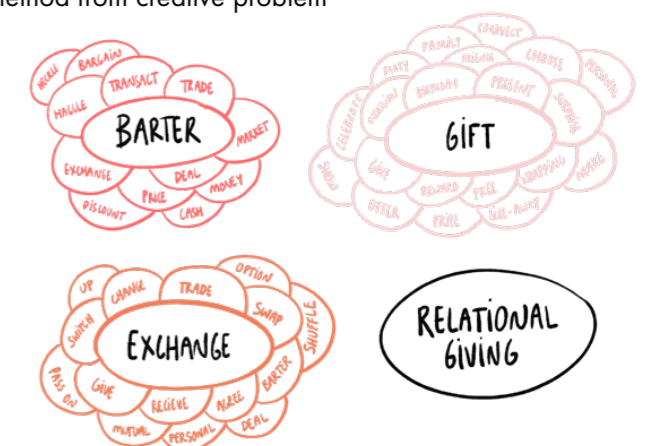
PROPERTIES AND ELEMENTS

PROPERTIES

'Relational giving' is a term coined to describe an exchange which is **focused on the persons in the exchange and not the good or service in question**. 'Relational giving' is based on a gift relationship/ system and thus the corresponding literature and theory can be used as a guideline for designing a system of 'relational giving'. Close parallels can also be drawn with Local Exchange Trading Systems and alternative currencies and digital/ hybrid payment practices which all offer the opportunity for social interaction and thus have potential for facilitating the creation and strengthening of relationships. Pulled from this literature are both **'integral properties'** and **'resultant properties'** of relational giving. The 'integral properties' are inherent to the exchange itself, and the 'resultant properties' arise as a consequence of the 'relational giving'. The resultant properties make way for social connectedness and ultimately help to build social cohesion in a neighbourhood. Figure 41. outlines these properties.

ELEMENTS

Also drawn from this literature are the varying elements which affect 'relational giving' and can influence the experience of the persons in the exchange and the chance for social connectedness. Figure 42. illustrates these elements.

THE ABILITY TO GIVE

The properties and elements of 'relational giving' have been described, but how does this form of exchange fit into the context of energy, and importantly the district of Amsterdam Zuidoost? Current LEMs or 'Local Energy Markets' "only take into account user resources and completely ignore user preferences" (Capper et al, 2022). In other words existing local decentralised energy systems such as peer-to-peer markets revolve almost exclusively around assets, commodities and predicted supply and demand. There is little regard for residents needs, wants and preferences and **notably lacking from these systems is the 'ability to give'.** The ability to give in the context of energy means to have choice and control (see Figure 43). As the name suggests 'relational giving' is reliant on the ability to give so in order to bring this form of exchange to energy, a new system must consider residents autonomy in decision making and actions. Only when enabled to make choices in their energy system do individuals have the freedom to give intentionally and to choose when, how and with whom to exchange. **Having the ability to 'give' is the first step in transforming the energy system from an impersonal and commodity based one, to a personal and relational one.**

CREATING COMMUNITIES

Figure 42. depicts the elements which can influence 'relational giving' and thus the opportunity for creating and strengthening social relationships through exchange. These three elements affect the integral properties and thus also the resultant properties of relational giving. For example giving 'surplus energy' instead of 'regular energy' impacts the intentionality and personality of the exchange. Another example is 'asking' for energy instead of 'offering' which influences and possibly decreases the option of delay in the exchange. However, the element which is perhaps most significant in determining the opportunity for social connection is element 1- the relationship between the giver and the receiver. Relational exchange already occurs between those who are socially intimate and is also more likely between those who are socially close. In these instances relational giving can help to strengthen relations, but the real challenge lies in connecting those who are socially distant in a neighbourhood.

In Amsterdam Zuidoost the need for socially distant residents to connect, and to spread their networks, is great. Although community centres are prevalent there is little sense of social cohesion and people tend to stick within their own close-knit family circles: **"Focus is on the family and not on local initiatives... They spend their time on their families"** (Doede, Lokaal Geld). Zuidoost can be described as a cluster of dispersed social silos. To achieve social (and financial) inclusion in the LIFE Platform there needs to be a strong feeling of community amongst residents, and ultimately users of the system. However, to do so **"people need to actively generate and reproduce social networks and identities, so as to construct and reconstruct community"** (Williams, 1996). Therefore, the focus is on **designing a system which enables relational giving between non-familiar and less familiar persons** (Figure 43a).

Through the act of 'relational giving', the opportunity for the creation and strengthening of social relationships is created.

INTEGRAL
For 'relational giving' the exchange needs to be...
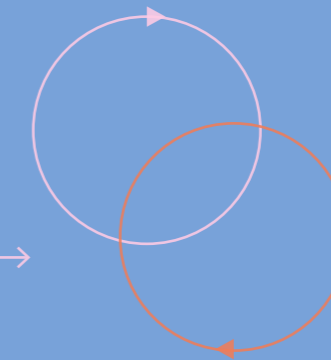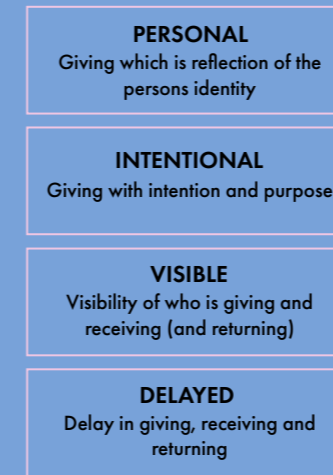
RESULTANT
The result of 'relational giving' is...

PERSONAL
Giving which is reflection of the persons identity

INTENTIONAL
Giving with intention and purpose

VISIBLE
Visibility of who is giving and receiving (and returning)

DELAYED
Delay in giving, receiving and returning

WHERE RELATIONAL GIVING HAPPENS

OBLIGATION & CONTINUATION
Feeling obligated and motivated to 'give back' and so continue the circular cycle of exchange

FAMILIARITY
Feeling more connected to people and places

Opportunity for the creation and strengthening of social relationships

Fig 41. The integral and resultant properties of relational giving, pulled from relevant literature

ELEMENTS WHICH AFFECT RELATIONAL GIVING

1. RELATIONSHIP BETWEEN THE GIVER & RECEIVER

Socially Intimate
(family & good friends)

Socially Close
(neighbours, club members)

Socially Distant
(the unfamiliar, passers by)
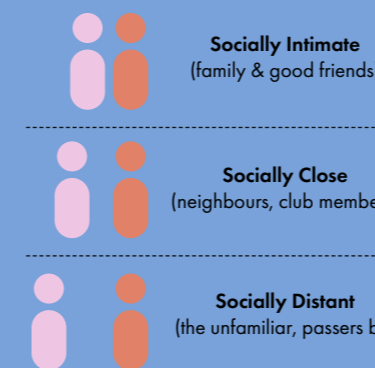
2. INITIATOR OF THE EXCHANGE

Giver initiates
the exchange (offers)

Receiver initiates
the exchange (asks)
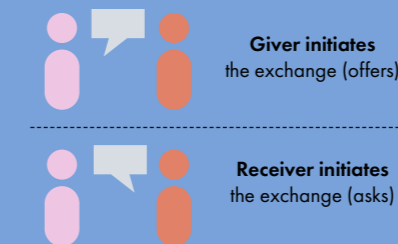
3. STATE OF THE 'GIFT' BEING GIVEN

Regular
'gift' (x to offer)

Surplus
'gift' (extra x to give)
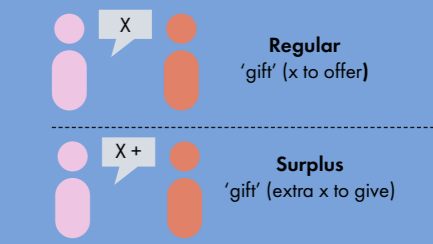
Fig 42. Elements which affect relational giving

A MATTER OF CHOICE

THE ABILITY TO GIVE
in the energy context means...

CHOICE TO GIVE
WHAT AND TO WHOM?

CHOICE TO RECEIVE
WHAT AND FROM WHOM?

CHOICE TO RETURN
WITH WHAT AND WHEN?

Fig 43. The 'ability to give' in energy exchange
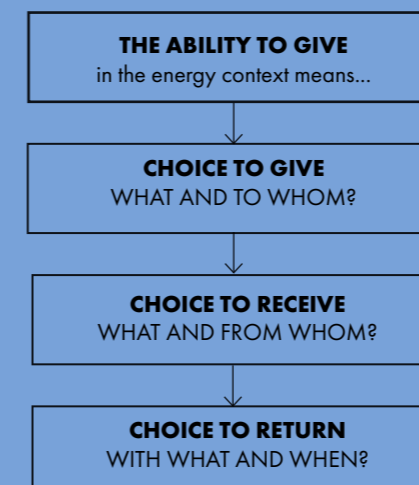
RELEVANCE OF DESIGNING FOR RELATIONAL GIVING

SOCIALLY CLOSE

SOCIALLY DISTANT

The space where relational giving needs to be designed for
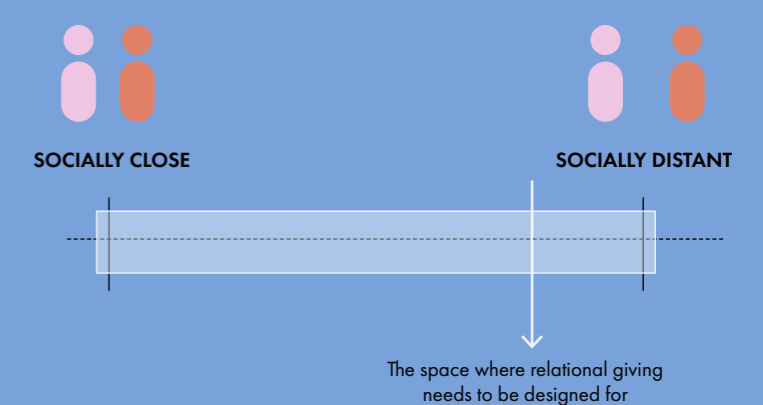
Fig 43a. Relational giving needs to be deigned for between the unfamiliar and socially distant

2.7 | DESIGN VISION & RATIONALE

2.7.1 | A FUTURE VISION

IN SHORT

In the final chapter of the 'Reframe' phase a vision for a relational energy system is created and explained by means of an analogy. A design rationale is presented for bringing 'relational giving' into the energy context.

FROM A LINEAR **COMMODITY** SYSTEM WHERE...	TO A CIRCULAR **RELATIONAL** SYSTEM WHERE...
ENERGY EXCHANGE IS **INVISIBLE, IMPERSONAL** AND **EXCLUSIVELY TRANSACTIONAL**	ENERGY EXCHANGE IS **INTENTIONAL PERSONAL** AND **SOCIALLY INCLUSIVE**

Fig 44. A vision for a relational energy system

Figure 44. describes a vision for a different energy exchange system, one which can principally be described as relational. This vision is an amalgamation of the properties and elements of relational giving and the key requirements and qualities presented in the design rationale. Through creating and explicitly stating a vision, the desired future energy exchange system is distilled to its essence and core aims. Transforming the transition means transforming our systems and our perspectives, it means viewing energy exchange not merely as the bills we pay for our heated homes, but moreover as a potential agent for social connection and cohesiveness.

AN ANALOGY FOR A RELATIONAL ENERGY SYSTEM

An analogy was created to help picture this envisioned future relational energy system and get a better grasp on how social connectedness and cohesion can be the driver to transform the transition. "Working with an analogy can help you to see the appropriate interaction from a fresh perspective" and "only serves as a 'springboard' for you to clarify the qualities of the interaction you desire" (Hekkert & v. Dijk, 2011).

What does pizza have to do with it? We can use this slice of pizza as an analogy for an inclusive and relational energy system. The stringy melted cheese sticks the pepperoni slices to the pizza base, or rather the social energy connects local residents to the local energy platform. The more cheese there is, the stringier it becomes and the more pepperoni can stick on (without falling off and being left behind). The more pepperoni there is, the more complementary the flavours of the pizza and thus the better the taste! This analogy helps to explain that the stronger the social cohesion is in the district, the more people can be included and become an integral part of the system. The pizza base and pepperoni are not in competition with each other, rather they compliment each other. One cannot be great without the other. They are partners and collaborators working together to achieve the same goal.

So, in order to create a socially inclusive energy system we need to broach people and platform not as separate ingredients but as one coherent meal. To do this we need to maximise the cheese, or rather the social energy!

GOAL

Creating a vision supports project members, design researchers and stakeholders in taking steps to move towards it. The aim of using an analogy to describe the vision is to bring relatedness to the abstract and theoretical term 'relational giving'. The goal of the design rationale is to provide design qualities and 'requirements' which can guide and inform the design of a relational energy system.

APPROACH

The qualities and 'requirements' presented in the design rationale derive from theory/ literature as well as from the research findings from the first 'Explore' phase.

WE DON'T WANT THIS...   WE WANT THIS!

Fig 45. An analogy created to explain the need for social energy

UNDERSTANDABLE	PERSONAL	AUTONOMOUS	INTENTIONAL	TRANSPARENT		INTERACTIVE	CONNECTING	SUPPORTIVE	COLLECTIVE	CIRCULAR
offers a simple and easily accessible service/ system	enables all residents to 'give' in their own way	enables individuals to decide what they give and get	allows for intentional 'giving' to another	ensures visibility who of is giving and receiving in an exchange		creates time and space for interaction	creates familiarity between persons in the exchange	boosts self-esteem of vulnerable residents	enables the participation of everyone	creates the obligation to 'give back'
increases awareness about energy consumption and the transition	supports personal development of residents	creates a sense of independence and self-reliance	creates a sense of purpose through planned action	openly communicates the terms of the system		merges digital and physical touch points	expands social networks of residents	lessens financial burdens for vulnerable residents	enables reciprocal support in the neighbourhood	promotes commitment to the service/ system
	enables residents to utilise and practice their skills	offers flexibility in participation		makes the effect and impact of the system visible			connects people to places to foster a sense of belonging	recognises commitment to the community	promotes collective action towards a common goal	utilises local tokens to circulate value locally
	provides a range of options to fit own preferences	gives residents choice and control over their energy system					connects local residents to local services/ initiatives	supports local initiatives and organisations	empowers residents to give back to their neighbourhood	incentivises sustainable behaviours
								guides and supports(financial) behaviours	distributes the benefits amongst all residents	creates opportunities for long-term impact

KEY

requirement derived from theory/ literature

requirement derived from explorations/ research

requirement derived from both

Fig 46. Guideline and design 'requirements' for a local relational energy exchange system

DESIGN REQUIREMENTS FOR A RELATIONAL ENERGY SYSTEM IN AMSTERDAM ZUIDOOST

The design 'requirements' outlined above form a design rationale for a relational and local energy exchange service/ system. The requirements derive from literature and theory as well as my own research findings, and are **clustered under ten different qualities**. Important to note is that these requirements are not fixed and imperative, but rather set a guideline for the upcoming ideation phase. This design rationale was shaped through the process of abstracting key literature and research findings from Phase 1 and 2, clustering them into groups/ themes and then assigning them with a fitting quality. Continuous cross-reference was undertaken between the literature and research studies to ensure key findings were not missed. Reference is made back to these requirements in subsequent chapters when critically analysing and evaluating ideas and concepts.

3.0

CREATE
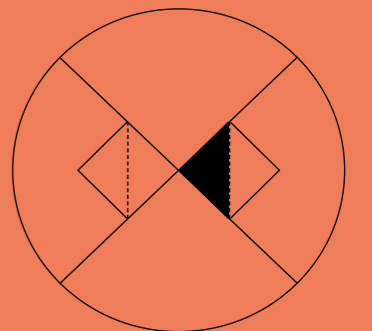
3.1 | IDEATION

IN SHORT

In this chapter the format of exchange is outlined and a first concept for relational energy exchange is described. Ideas for various touch-points are iterated up on and combined into four concepts for the form of the exchange. The chapter concludes with a critical comparison of the concept against the design rationale and 'requirements'.

GOAL

The goal of this first ideation phase is to generate ideas for relational energy exchange, in line with the vision previously presented.

APPROACH

Various design methods are used in this first ideation phase to help generate new ideas and combine them. A storyboard is created to place the concept for relational energy exchange into context and thus stimulate more consideration for the physical and digital form and touch-points of the system. 'Fragment generation' is done to iterate upon the key interaction moments identified. Finally, through the process of critical reflection the concepts are compared to the design rationale and the key challenges presented in sub-chapter 2.1.2.

3.1.1 | EXCHANGE FORMAT

SERVICES AND ACTIONS FOR ENERGY

The question **"How can local tokens be a means for socially inclusive energy exchange"** is posed in sub-chapter 2.2.1 and introduces the new opportunity space for using local tokens as a means for socially inclusive energy exchange in Amsterdam Zuidoost. This opportunity space arose from the inspiration sessions (idea card 1 and 2) and was further explored in the scenario session with Lokaal Geld. Local tokens offer a tangible and visible solution for rewarding residents' local/ sustainable actions, use of local services and support of neighbourhood initiatives. Figure 47. outlines the basic format of the exchange for giving services and actions in return for energy (through local tokens). The persons in this exchange are local residents with local large asset owners (such as the Johan Cruijff Arena) and/ or institutions (such as the municipality) and/ or other groups of residents (such as energy cooperation's and community groups). Simply put, residents 'give' their own local and sustainable actions to 'get' a supply of local (affordable) energy through local tokens. And reversely, asset owners, institutions or other residents 'give' energy (in tokens) in order to 'get' a more locally and sustainably active, and thus socially cohesive, district. It should be noted that 'energy' here refers to locally produced, and stored, renewable energy, such as the solar energy produced by the panels on the roof of the Johan Cruijff Arena. Local and sustainable services and actions (a) are not clearly defined here but could include behaviours such as: using car/ bike sharing services, purchasing locally produced goods and volunteering with organisations and initiatives in the local area.

a) Local and sustainable services and actions

A. RESIDENTS

b) Local tokens for local renewable energy

B. LARGE LOCAL ASSET OWNERS INSTITUTIONS RESIDENTS
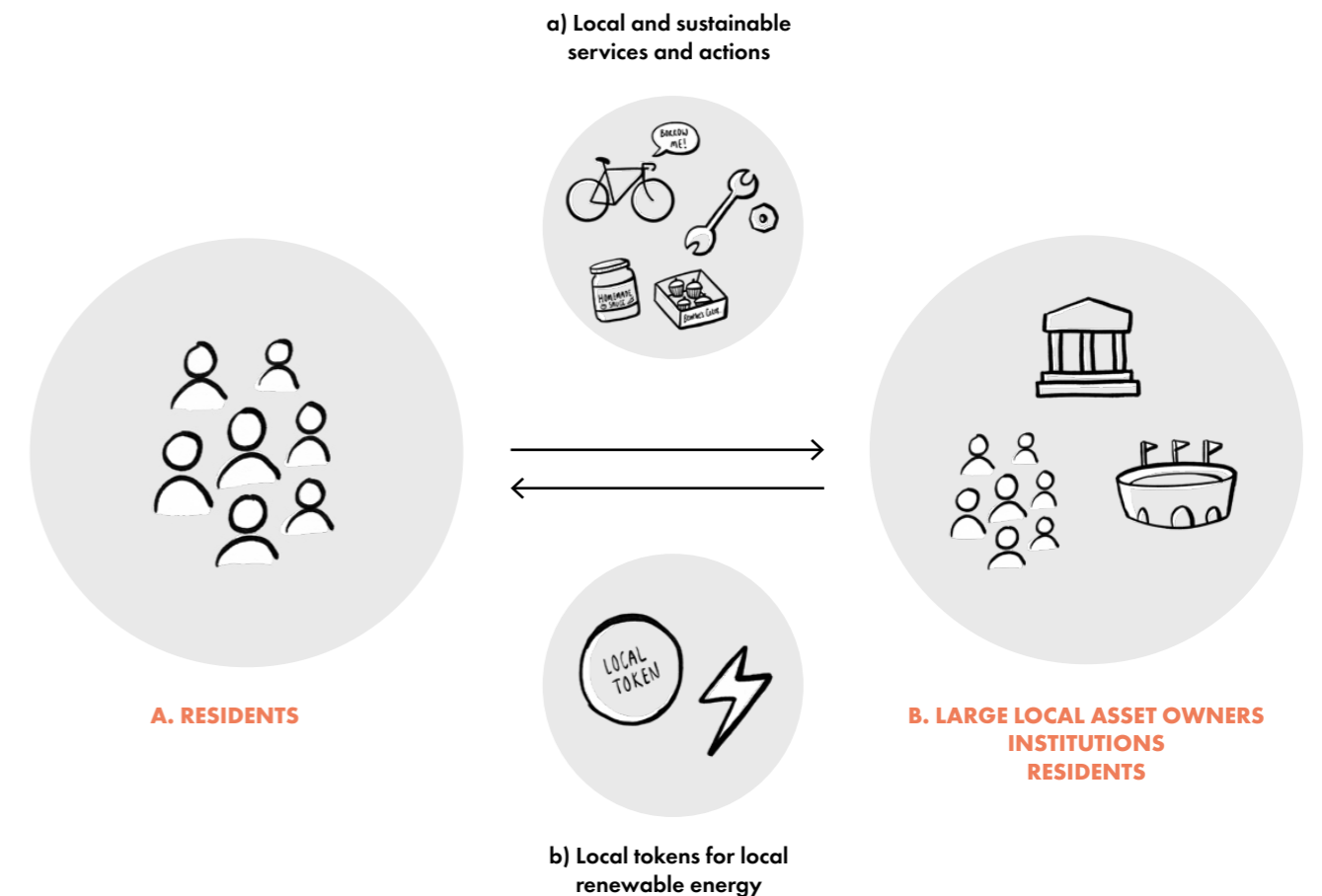
Fig 47. The format of exchange - giving services and actions in return for tokens for energy

TIME-LINE OF ACTIONS

In order to identify the main actions and correlating user needs in the exchange of services and actions for energy (through local tokens) a simplified time-line was created, from the residents perspective. In breaking down this chain of actions, it became clear that two sets of interlinked 'exchanges' or 'giving' need to happen. Figure 48. outlines these steps.
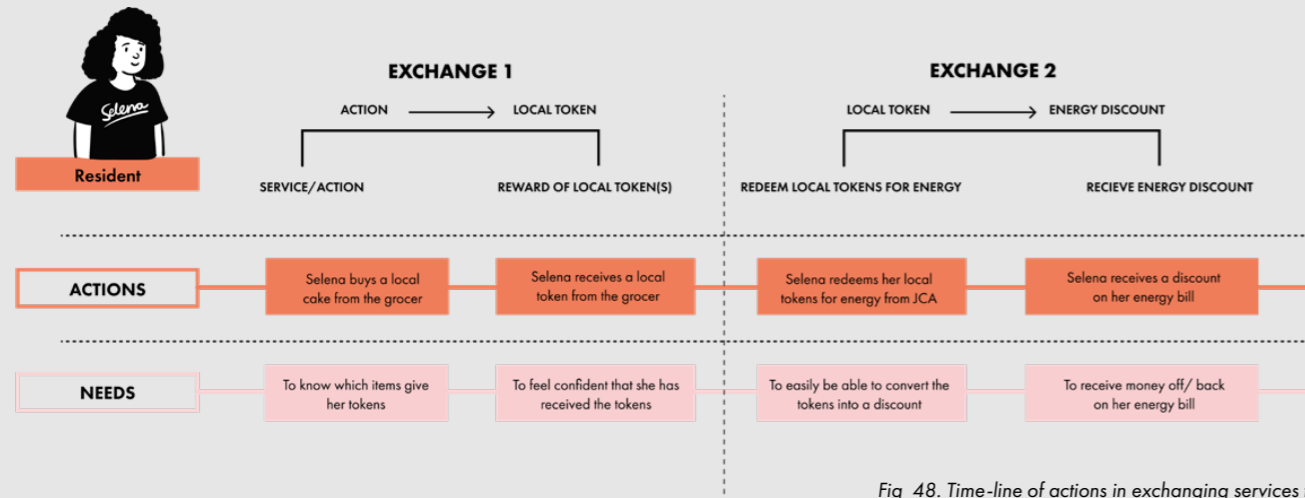
Fig 48. Time-line of actions in exchanging services for energy

KEY INTERACTION OPPORTUNITIES
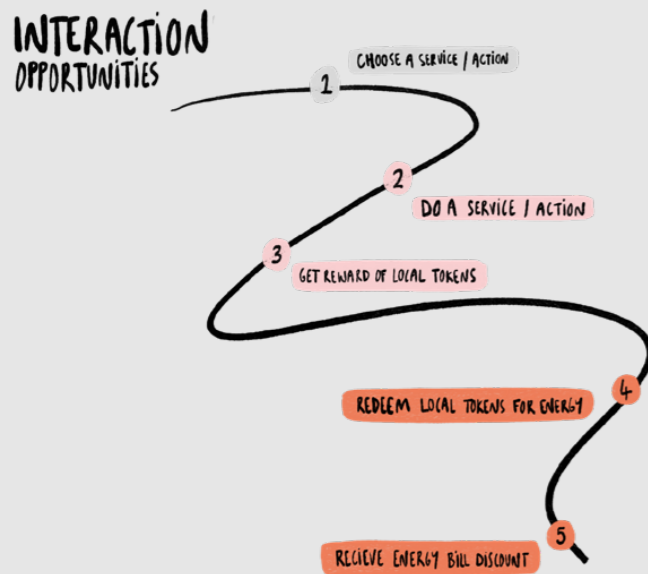
Fig 49. Key interaction opportunities in giving services and actions for tokens (for energy)

Using the above time-line five different key interaction opportunities were identified. These interaction opportunities can be described as distinct and separate moments and actions where there is potential for social interaction. Again the actions are split into two 'sets' of exchange, as outlined above. A short explanation of each of the 5 interaction opportunities is given:

1. Choose a service/ action: decide on a local and/ or sustainable action or service to do for energy
2. Do a service/ action: Use or support a local service or display local sustainable behaviour
3. Get reward of local tokens: Receive local token(s) corresponding in 'value' to action or service done
4. Redeem local tokens for energy: Swap local tokens collected for local renewable energy
5. Receive energy bill discount: The value of the local tokens is deducted from the energy bill or reimbursed

VALUE FLOW

Local tokens enable the flow of values in the system by converting actions and services done into a financial discount on local and renewable energy.

Fig 50. Local tokens transfer the value of actions and services into a financial energy discount

ENABLING CHOICE IN GIVING, RECEIVING AND RETURNING

Sub-chapter 2.6.2 discusses the 'ability to give', or rather the lack there of in our current energy systems. Being able to 'give', and thus also 'receive' and 'return', is dependant on the choice and control which we have. This first proposal for a relational energy exchange service/ system focuses on choice and enabling residents to make their own choices and decisions based on their preferences and needs. Enabling choice facilitates 'relational giving' and so opens the opportunity for creating and strengthening social relationships in the local neighbourhood. Figure 51. explains this system through a storyboard and the five steps correlate with those outlined in Figure 49. Succinctly put, this system empowers residents to choose: a) their exchange partner (who do they want to receive local energy from?); b) the service/ action(s) they want to do (is this something they already do or is it a new action?) and c) finally how they want to allocate and distribute the value of their local tokens (keep the local tokens, give them away, add them to a collective pot or redeem them for energy?). In the storyboard Johan Cruijff Arena is a used as an example of a) an energy exchange partner and who is chosen based on the services and initiatives which they support locally, a repair cafe is used for b) a local service/ action and for c) the allocation and distribution of tokens, multiple options are shown.

Choose an exchange partner based on the services, projects and initiatives they support and the local tokens available for them.

Use a local service or do an action which is approved by your exchange partner.

Service done! **Get local tokens as a reward** for your time, effort and support of the local neighbourhood.

Take part in more recognised initiatives, use local services or do certain actions throughout the pre-selected period (such as 3 months).

Receive financial benefits **for your energy bill** in the form of a discount or reimbursement.

Redeem your local tokens for energy at the end of the month to receive your energy discount.

Fig 51. Storyboard created for concept 1.0

An ideation process called 'fragment generation' was undertaken to iterate upon the various touch points in the service/system. The five key moments which were previously identified as opportunities for interaction were used to structure this ideation process. Focusing on one interaction opportunity or step at a time supports the creative process of diverging and helps to protect novel ideas as the complexity of considering the service as a whole is temporarily removed. The relevant key questions which arose in the inspiration sessions, and are presented in sub-chapter 2.1.2, were used to guide this fragment generation.

Fig 52. Fragment generation ideas for the various interaction opportunities in the exchange of services and actions for energy (tokens)

A. BEFRIEND AN ASSET

B. ENERGY IN AN ENVELOPE

C. DEEDS FOR DISCOUNTS

D. TOASTER FOR LOCAL TOKENS
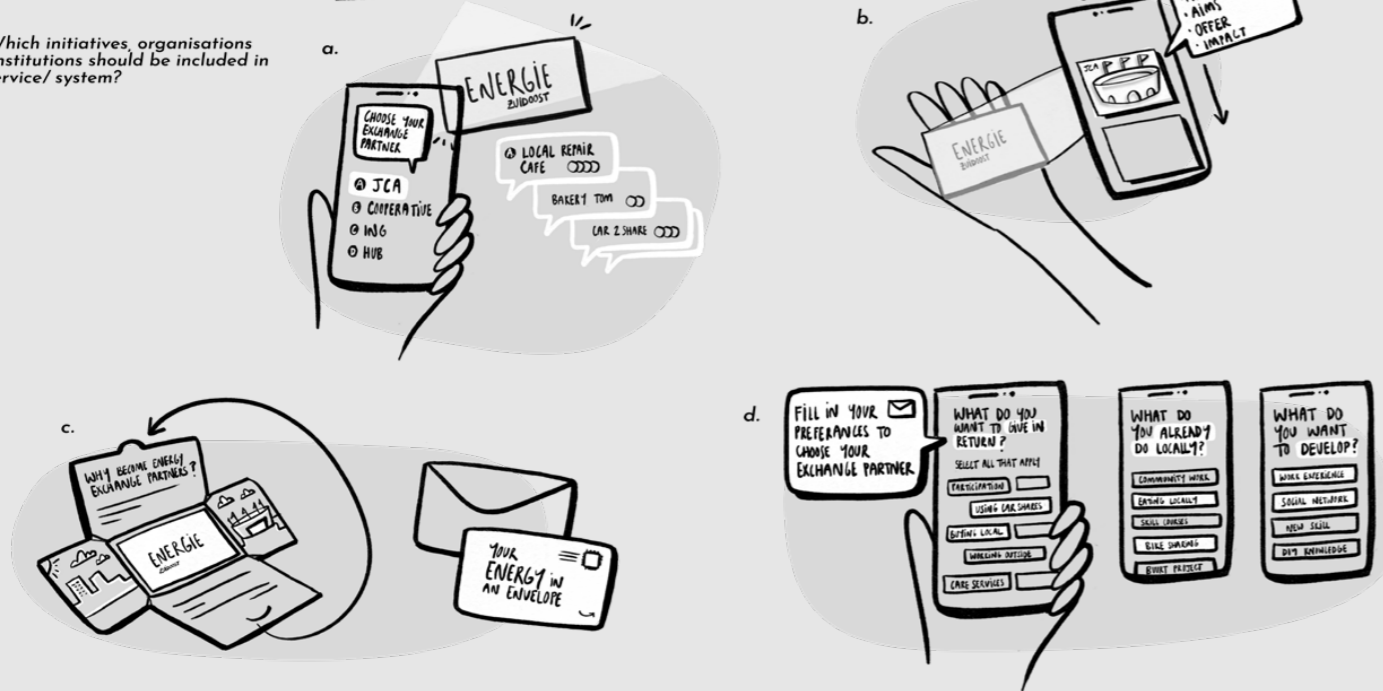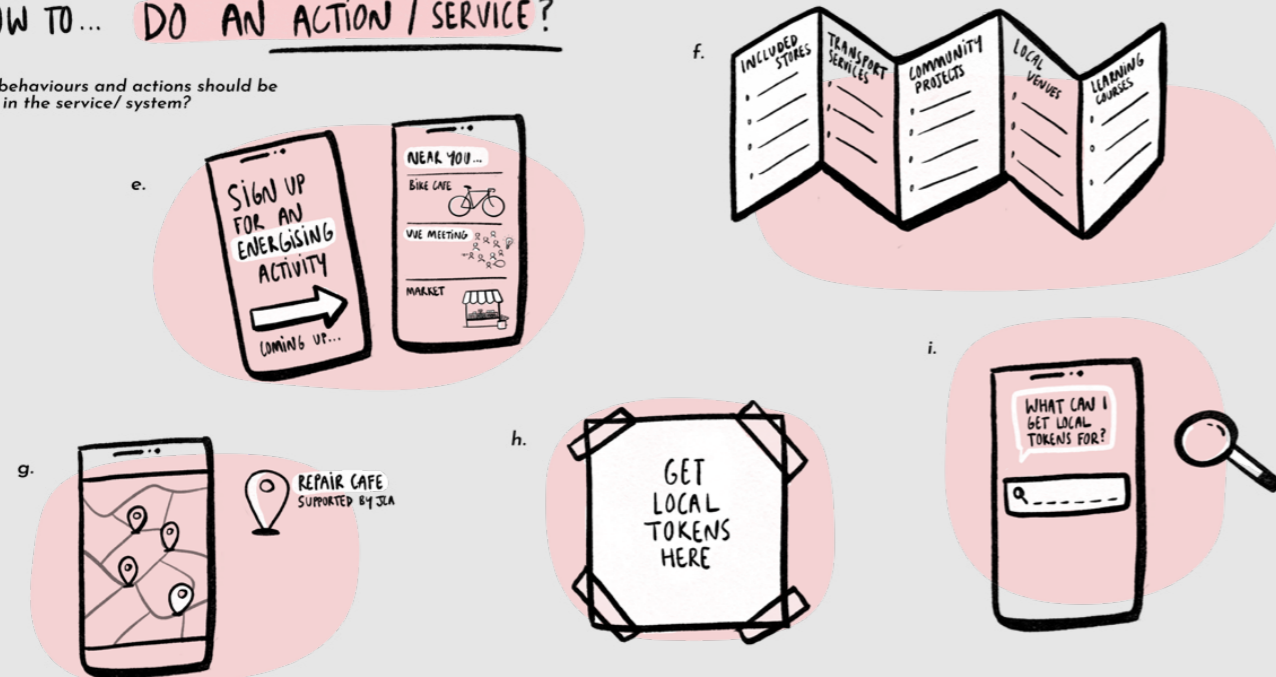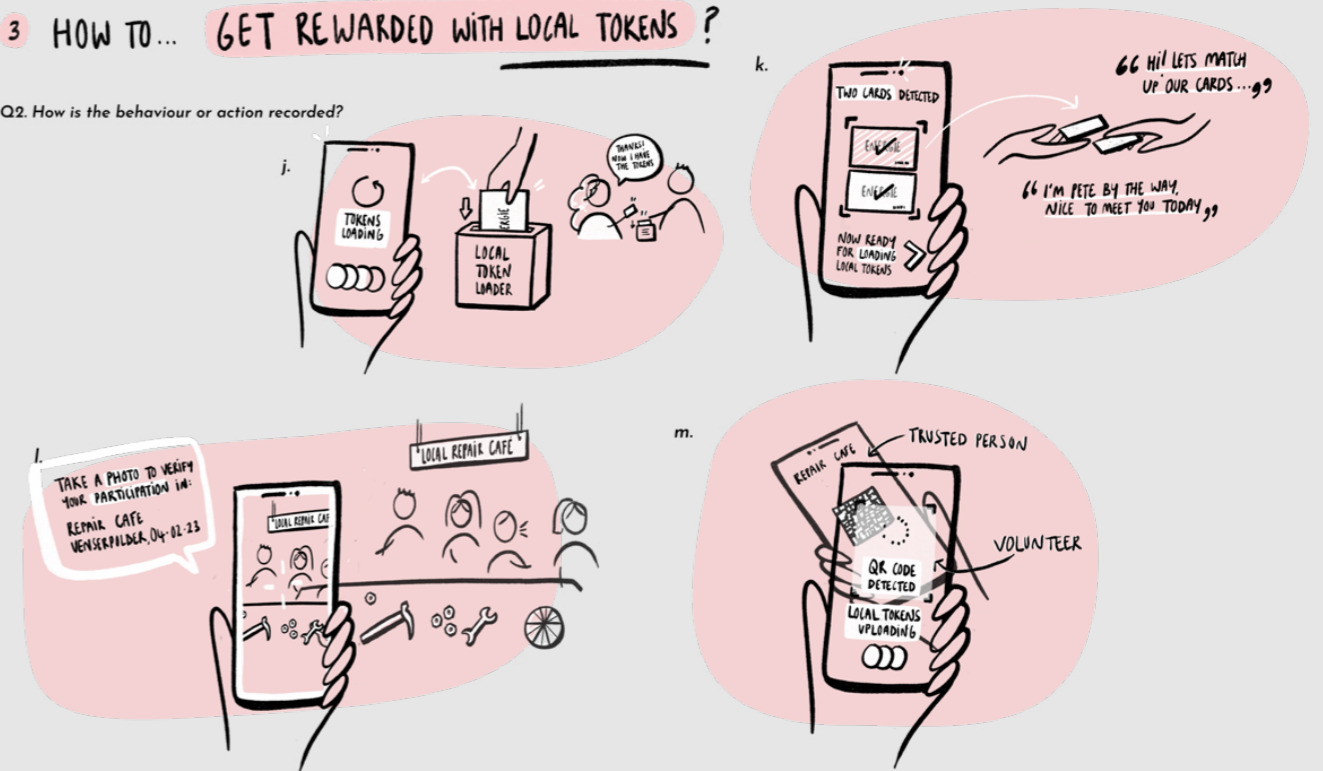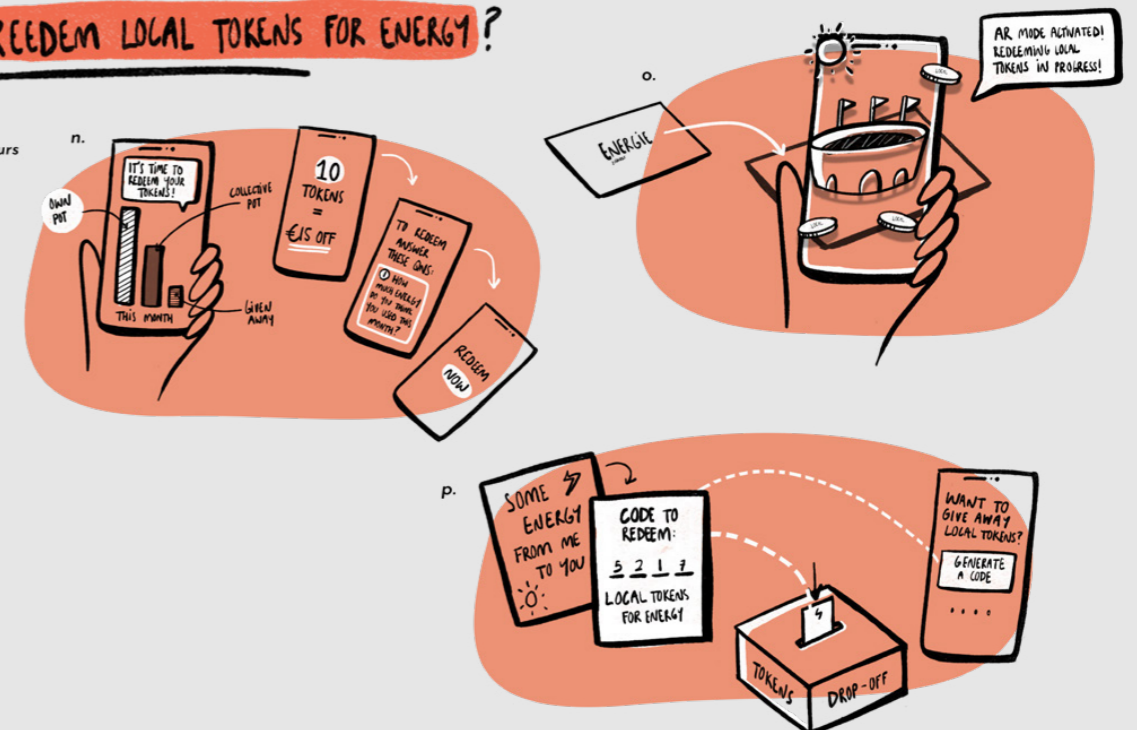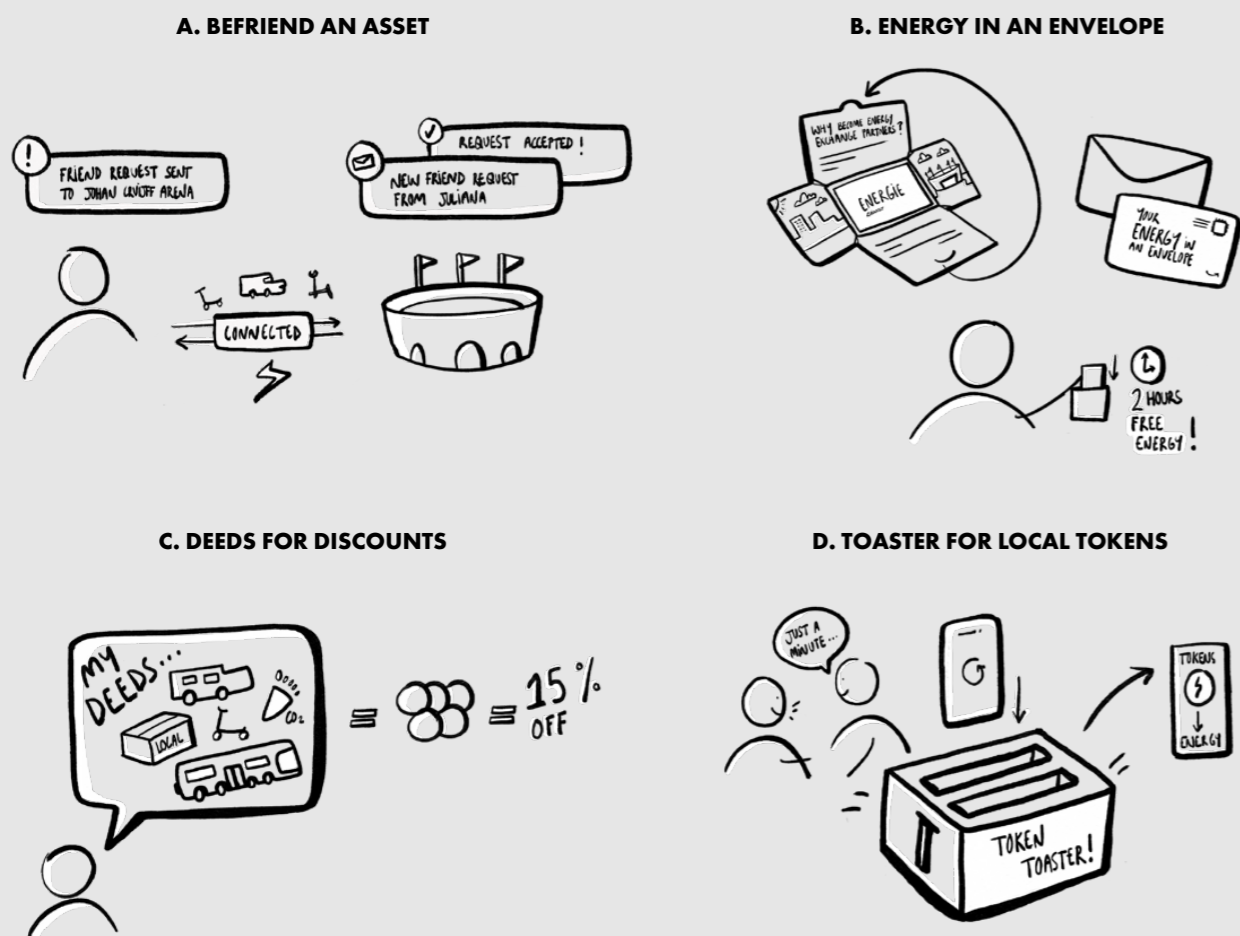
Fig 53. Concepts for physical touch points in the exchange system

The initial ideas which arose from the fragment generation were converged and combined into four overarching concepts for the physical form of the system. These four concepts all follow the system outlined in sub-chapter 3.1.2 and focus on giving residents choice (in their energy exchange partner and/or the actions and services they do and/or what they redeem their local tokens for) and thus the ability to give in energy exchange. A brief description of each of the concepts is given here:

A) BEFRIEND AN ASSET
Residents can choose which local assets they would like to 'befriend' and so receive local renewable energy from. Residents can choose from a list of local services/ actions to support or do, in return for the energy. The actions and services which can be done are selected by the owners of the asset e.g. the Johan Cruijff Arena or ING Bank.

B) ENERGY IN AN ENVELOPE
Every few months residents receive an energy card in an envelope. The envelope provides them with information about different local 'energy exchange partners' in the form of illustrations and local stories, informing them about local energy production and storage, and the energy transition. After doing a local service or action residents are awarded

with local tokens which can be loaded onto their energy card. Slotting this energy card into their energy meter at home provides them with X hours of free energy (hours/ Kilowatts of energy are linked to the number of local tokens collected). These free energy hours can be saved and used by residents when needed (for instance in the winter or in a month which is particularly tight financially).

C) DEEDS FOR DISCOUNTS
To receive a discount on their energy bill residents can undertake 'deeds' (in the form of local actions and services) which have been approved by the city. Each time another 'deed' is done residents receive a local token. At the end of the month residents' tokens are translated into a discount on their energy bill. Discounts can also be applied towards energy saving materials and community 'pots'.

D) TOASTER FOR LOCAL TOKENS
Residents receive local tokens in exchange for local social and sustainable services and actions. Once the action is complete residents are asked to collect their reward at 'token loader locations' in the district. In order to receive the tokens, ad then choose how to use them, residents need to place their phone in a 'token toaster' device. Whilst the tokens are loading their is time for conversation.

3.1.3 | CRITICAL COMPARISON

The four concepts were compared to the design rationale and 'requirements' outlined in the previous chapter to evaluate their suitability as a 'local and relational energy exchange service/ system.' A short summation is given with reference to the ten qualities identified in sub-chapter 2.7.2. Several of the key challenges presented in sub-chapter 2.1.2 are also mentioned.

The **understandability** of these concepts is called into question as there is not a clear and direct link between doing services/ actions in the neighbourhood and the supply of local renewable energy. The four concepts all concentrate on giving choice and control and thus the service/ system can be described as **autonomous**. The ability to choose and the different options available also makes the energy service/ system **personal** and moldable to residents' preferences. Although in concept A residents can choose an exchange partner, overall these concepts lack the ability to **intentionally** give to another as there is no direct interaction between the exchange partners. The concepts do provide more **transparency** about where residents' energy is coming from but fellow residents, and their services and actions in the district, are not made visible. Concept D is the most **interactive** and uses the novel 'token toaster' to merge physical and digital touch-points to create time for social interaction. However the other concepts are lacking in this respect. All four of concepts are based on 'giving' services and actions in return for local energy, and there is potential for meeting new people in doing so. **Connection** is passively addressed and could be a positive consequence of the service/ system, but has

not been explicitly designed for. As previously disused creating and re-building community is not a passive affair but requires active work. On the one hand the concepts can all be described as **supportive** in the sense that they reduce the financial burden of residents' energy bill and guide their financial behaviours by utilising an alternative currency. On the other hand, this financial benefit focuses on the individual, rather than the **collective** and fails to distribute the benefits amongst the neighbourhood. Missing is a common community goal. **Circularity** is addressed in these concepts but the 'obligation to give back' is driven by the need to receive cheaper energy, not necessarily by a commitment to the community.

Whilst there is an attempt in these four concepts to include low-income residents, by enabling choice and control, safeguarding vulnerable persons in the service/ system (C10) is not addressed. So long as doing actions and services is directly tied to monetary gain, there is a risk that struggling residents will fall victim to a system which 'forces' them to do more, rather than lessening their burdens. Likewise there is no ensurance that this system does not favour the financially secure, who are well equipped to offer sustainable actions and services (C1 and C13). In these concepts residents who 'do more', 'get more' which in itself excludes all those who cannot afford to give their time or cannot access these services. C12, building trust between residents and institutions, is also not tackled and in concept A a power imbalance is created between individuals and large asset owners, who govern their actions.

IN SUM

Local tokens as a tangible means for rewarding actions and services: local tokens act as a connector between giving actions and receiving energy.

Enabling choice and control: giving residents the autonomy and freedom to choose how they 'give', 'get' and 'return' in their energy system facilitates relational giving and can create opportunities for social connectedness.

The system concept is more financial focused, than relational: the actions/ services which residents do result in financial gain (cost savings) and thus the driver of this system is monetary, and not relational.

A linear and individual system: value created in this system is not circulated amongst the neighbourhood, instead the system promotes actions for individual monetary gain.

STILL COMMODITY FOCUSED
On reflection many of the individual qualities and 'design requirements' are somewhat addressed, but as a whole these concepts are based on a system which feels more commodity focused than relational. Underlying these concepts is still monetary gain and financial incentive, and not the relationship (or potential relationship) between the persons 'giving' and 'receiving'.

3.2 | REALIGNING THE DESIGN DIRECTION

IN SHORT

The concept and ideas generated in the 'Ideation' chapter drifted away from the vision for a relational system. Thus, in this chapter the design goal is restated and an interaction vision is created to realign the design direction with a relational focus.

GOAL

The aim of realigning the design direction is to ensure that the subsequent ideas for local energy exchange generated address the vision and are at their core socially driven, and not financially motivated.

APPROACH

Design methods from 'Vision in Design' and 'Reframing' are employed to realign the design direction. A new frame is created, using an analogy, to assign relatable qualities to 'relational giving'.

3.2.1 | RESTATING THE DESIGN GOAL

SOCIALLY DRIVEN ENERGY EXCHANGE

The critical comparison which concludes the preceding 'Ideation' stage identified that the concepts generated thus far are still fundamentally commodity based, driven by financial and economic motivation. Thus to realign the design direction with the vision for a relational energy system (as presented in chapter 2.7) the **design goal was revisited and restated**.

Restating the design goal is a necessary step in a design process where new findings and inspiration emerge and begin to shape the project, possibly pulling it in different directions. A design goal "as it has been named" (Kepner & Tregoe, 2013, p.29) is the anchor to which the ideas and work which follows it are are tied. Therefore, finding a strong starting point for ideation is a crucial step towards solving complex and open problems (Ma, 2009), like transforming the energy transition from a commodity based one to a relational one. The process of restating the design goal was done 'on the wall' and using Post-it notes. The reverging method 'Hits and Dots' was used to short-list the options, combine them into more options and then finally select the new design goal as stated below. Creating and restating the design goal has been an iterative process throughout this project. The design goal has become increasingly 'SPARKED': meaning Specific, Positive, Ambitious, Relevant, and Keep-it-simple (Heijne, 2011). Applying this mnemonic helps to create an inspiring and well-formulated design goal, which will increase the quality and originality of idea generation (Mumford et al, 1994). Reference was made back to the key findings from phase 1, Explore, and this reformulated goal links closely with emergent theme 2: 'skills and ideas to offer'. **Revision 3.0 presents the 'sharing' and 'learning' of existing and new skills as an opportunity for actively creating and strengthening social relationships, and thus fostering 'social energy' in the neighbourhood.**

DESIGN GOAL 3.0

"To empower vulnerable residents in Zuidoost to share their skills and learn from each other through the exchange of local tokens for energy."

DESIGN GOAL 2.0

"To facilitate the creation and strengthening of social relationships in Zuidoost through the exchange of local tokens for energy."

DESIGN GOAL 1.0

"To design and energy exchange system which is socially inclusive for residents in Amsterdam Zuidoost."

3.2.2 | MAKING RELATIONAL ENERGY EXCHANGE RELATABLE

FRAME CREATION

During this re-alignment stage the methodologies of 'Reframing' (Dorst, 2011) and 'Vision in Design' (Hekkert & v. Dijk, 2011) were utilised as a reference guide to dive deeper into the newly stated design goal and to help envision an entirely new system, one that is very different from our current experiences of energy exchange.

A ROLLING DINNER

Design goal 3.0 centres around the themes of 'sharing skills' and 'learning from each other' which were identified as key context factors at the end of the 'Explore' phase. In exploring other contexts and situations that incorporate these themes, the analogy of a 'rolling dinner' emerged as a new frame for the design of an inclusive and relational energy system. In this chapter the concept frame is elaborated upon and its compatibility with the restated design goal (3.0) is detailed.

If the challenge of designing a local inclusive, relational energy exchange system is facilitating the **sharing of skills** and **learning from one another**, then we should **design it like a 'rolling dinner'.**
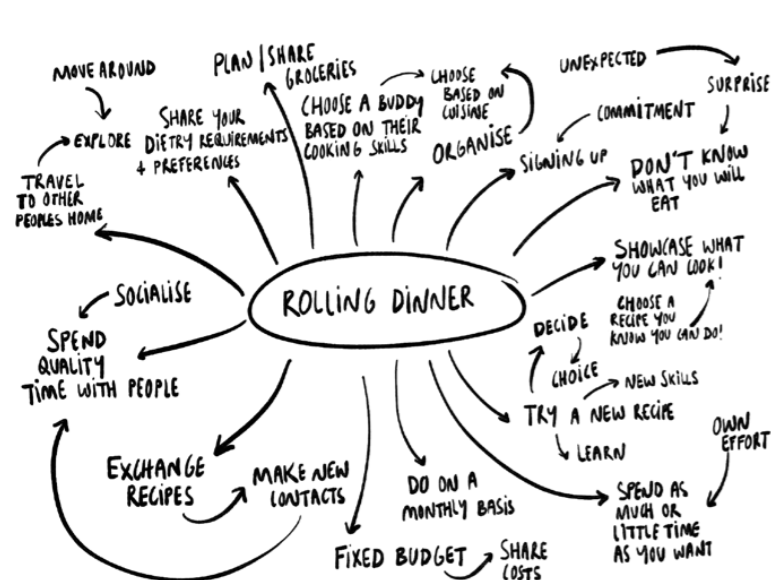
Fig 54. The process of fitting a frame and defining interaction qualities

MAKING RELATIONAL GIVING LESS ABSTRACT

Fitting a concept frame supported the subsequent ideation process, chapter 3.3 'Designing a System', and helped to keep the new ideas and concepts generated in alignment with the vision. The analogy of 'rolling dinner' makes the practice of 'relational giving' less abstract and more relatable and sparks new directions and possibilities.

STORYBOARD

The different stages of a 'rolling dinner' are depicted in the storyboard (Figure 55), but in essence the concept can be described as a three course meal collaboratively cooked by and enjoyed with different groups of (often unfamiliar) people. This analogy was chosen as a suitable frame for the revised design goal (3.0) due to the similarities this context shares with a relational energy exchange system.

You sign up to the dinner with a buddy or alone (in which case you are paired up with a 'cooking buddy')

You and your buddy, are assigned a course to make (starter, main or dessert)

Together with your buddy you discuss and decide on what to make, and where, and organise the groceries

One the evening itself you prepare the course assigned to your pair. Then you travel to the first destination to eat starters with four new people

After the first course you travel to the next location for the main course with another four new people

Finally you arrive back at your own place to prepare and serve the dessert for another four new people!

Fig 55. A storyboard for a 'rolling dinner'

Relational energy exchange is like a rolling dinner because in both contexts participants...

Socialise with new people and/or get to know familiar people better.	Have the opportunity to showcase their own skills.	Are challenged to try something new and learn new skills or practices.
Collaborate and communicate with others.	Have the opportunity to showcase their own skills.	Are actively 'doing' and/or 'making' and thus have the ability to 'give' to others.
Have flexibility and choice in what they do or make.	Can input their own preferences and needs.	'Get' something 'back' in return for what they 'give'.
Do not know exactly what they will 'get' in return.	Are able to experience (and enjoy) the efforts of others.	Can offer to make or do something or can be asked to take part by others.
Are required to sign up and commit to the activity.	Need to invest time into the activity, but can determine how much themselves.	Are working towards a collective or common goal.
Need to organise what they will make or do themselves.	Can ask for advice and share tips with others.	May feel a sense of accomplishment after completing the activity.
May feel nudged outside of their comfort zone.	Have the opportunity to explore new places.	

AN INTERACTION VISION

Figure 54. illustrates the most obvious interaction qualities of a 'rolling dinner'. These qualities paint a picture of the experiences people have (or are likely to expect) in this activity and, as these experiences are very comparable, have been used to inspire the interaction vision of a relational energy exchange. The interaction vision supports the design process by describing and determining qualities which are required to achieve the goal of the system and so enables the generation of effective and relevant ideas (Hekkert & v. Dijk, 2011).

"The interaction with the local relational energy system should be like participating in a 'rolling dinner' with local unfamiliar people."

INTERACTION QUALITIES

CONNECTING
Bring unfamiliar people together, enable residents to expand their networks, promote 'sharing and caring', foster belonging.

EMPOWERING
Enable the vulnerable to actively participate, empower residents to showcase their skills, recognise and acknowledge residents' contributions.

INSPIRING
Motivate collective action: see others sharing and learning, inspire and challenge residents to try new things.

INTRIGUING
Excite residents and make them curious to learn, foster a sense of exploration in their own district, offer surprising experiences.

COMMITTING
Foster a sense of social commitment to the community as a whole and between partners and stakeholders in the district.

3.3 | DESIGNING AN ECOSYSTEM

IN SHORT

The restated design goal, new frame and interaction vision form a starting point for further ideation. In this chapter the format of the exchange is revised, to ensure a relational focus and a second concept for a relational energy ecosystem is outlined. The chapter ends with a critical comparison of the ecosystem against the design rationale and interaction qualities.

GOAL

The aim of designing an ecosystem, rather than focusing on individual exchange interactions, is to bring a systemic approach to this project and consider the impact of relational energy exchange on the system as a whole.

APPROACH

In designing an ecosystem ideation moves from focusing on micro interactions (such as the fragment generated ideas in sub-chapter 3.1.2) to combine a holistic and systemic approach. Creation happens on different levels in this project. In this chapter the 'micro' level supports the design of the conceptual ecosystem through the making of journey maps which utilise the personas described sub-chapter 1.2.6. The critical comparison which concludes this chapter is conducted by placing the key components of the ecosystem next to the rationale and interaction qualities and examining if and how well they meet the relational 'requirements'.

3.3.1 | REVISED FORMAT OF EXCHANGE

FROM A LINEAR SYSTEM TO A CIRCULAR ECOSYSTEM

The original idea of the inclusive energy system remains the same: residents do local and sustainable actions and services in return for local, renewable and affordable energy. The difference, however, lies in the format of the system which sees local tokens as more than just a medium for exchanging services for an energy bill discount. Instead the local tokens in this system are transformed into a tool and enabler for facilitating relational giving and the creation of social energy, through the sharing and learning of skills. In essence, this new format **restructures the entire exchange system from a linear, transactional model to a circular and relational one.** Thus, **the focus shifts from individual interactions to community building and collective actions, promoting the values of collaboration and reciprocity.** In recognition of this circular structure for the flow values, 'system' is replaced by the more apt description: A relational energy exchange ecosystem.

CONCEPT DESIGN SPACE

Thus far ideas generated have fallen into either the 'micro' or 'macro' levels of creation. The distinction between these levels is based on Uri Bronfenbrenner's bio-socioecological model of human development and can be used in systemic design practices as a guide for mapping ecosystems and creating a 'bounding box' for the concept design space (Jones, 2022). A vision for a relational energy exchange system has been stated and ideas for the individual interactions within energy exchange have been explored. The challenge is in bringing these two together: in bringing tangibility to system design. **Thus creation moves in this chapter into the 'meso' level to design a conceptual ecosystem.**

Holistic overview
- Systemic vision
- Format of exchange
- Local tokens for inclusion

MACRO

HOLISTIC

MESO

Conceptual ecosystem

CONCEPT DESIGN SPACE

MICRO

Tangible interactions
- Fragment generation
- Form concepts
- Tangible touch-points

TANGIBLE
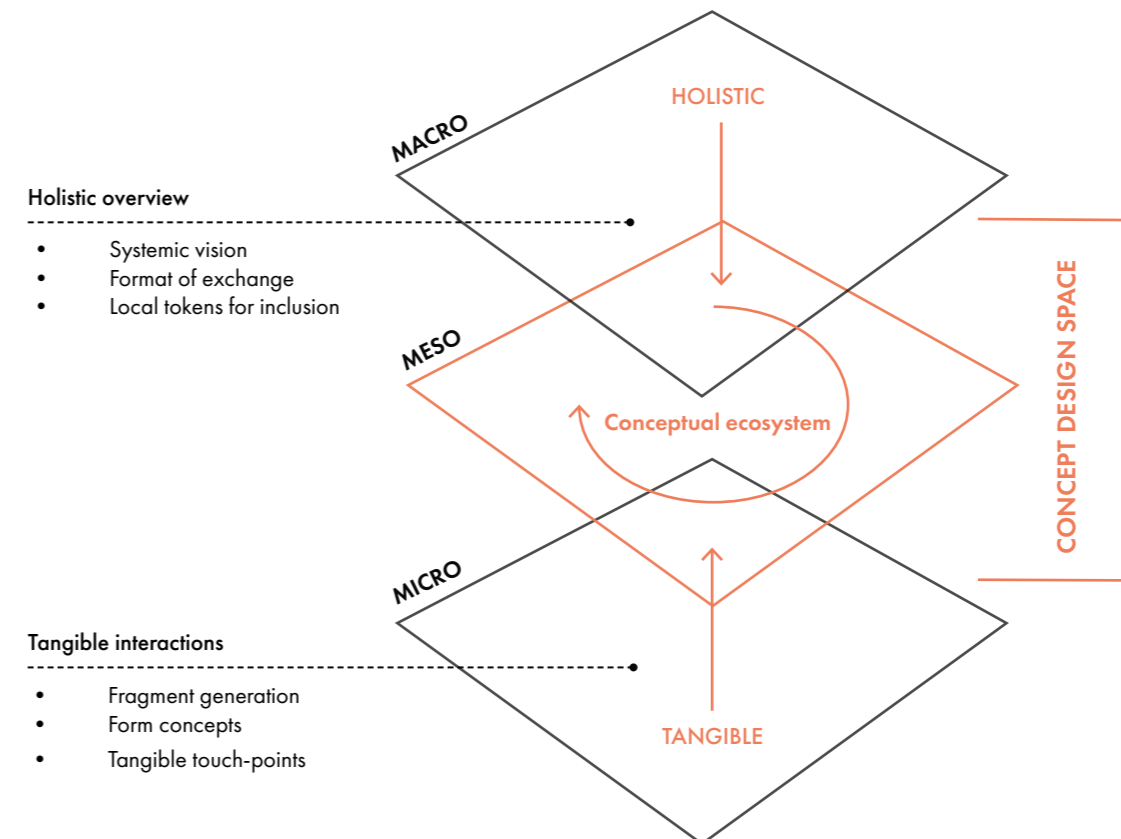
Fig 56. The micro, meso and macro levels of creation

3.3.2 | ELEMENTS OF A RELATIONAL ENERGY ECOSYSTEM

CREATING SOCIAL ENERGY

The need for creating 'social energy' is stressed and explained through the analogy of a cheesy slice of pizza. The melted stringy cheese represents 'social energy' and, in essence, the stronger the social cohesion (or energy) in the district the more residents can be actively included and become an integral part of the system. The challenge which this future vision presents is: 'How can we create social energy for local (renewable) energy?'. In this sub-chapter the key elements of the relational energy ecosystem are outlined.

ENERGY ACTIONS FOR SOCIAL INTERACTIONS

The aim is to design a circular and relational ecosystem through 'giving' actions and services to 'receive' actions and services. However, remaining unclear in this revised format is what these actions actually are and refer to. The understandability of the concepts presented in chapter 'Ideation 1.0' is compromised by the lack of a clear and direct link between 'doing actions and services' and 'energy'. To strengthen this connection and to create a simpler narrative around this new proposed energy ecosystem these actions are named 'Energy Actions'. In the broadest sense, 'Energy Actions' are local actions (and services) which are directly tied to the context of renewable energy. Many different kinds of 'Energy Actions' can be described and specific examples are outlined in sub-chapter 4.3.2. 'Energy Actions' enable 'social interactions' as they require the 'giving' and/ or 'receiving' of skills to and from others. Figure 57. provides a visual description of 'energy actions'.
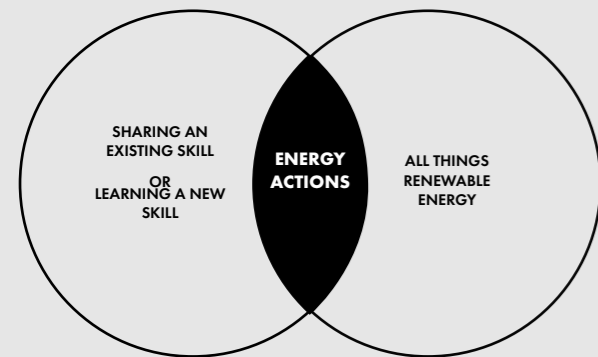
Fig 57. A visual description of energy actions

RELATIONAL GIVING

Local tokens take on the role of facilitating 'relational giving' in this local energy exchange ecosystem: they provide a means for sharing and learning skills, particularly between residents who are socially disconnected and unfamiliar with each other. Thus 'relational giving' in this conceptual energy ecosystem takes the form of 'Energy Actions'. Put simply, by 'giving' and 'receiving' Energy Actions residents can practice 'relational giving' in their neighbourhoods. Figure 58. describes, in brief, how the concept of Energy Actions addresses both the integral and resultant properties of relational giving (sub-chapter 2.6.2).

PERSONAL	INTENTIONAL	VISIBLE
Residents can decide which specific energy actions to do, based on their preferences and capabilities	Residents intentionally 'give' an energy action to a resident who wants and needs their services	'Giving' and 'receiving' energy actions is not anonymous. Residents connect digitally and physically

DELAYED	creates OBLIGATION & CONTINUATION	creates FAMILIARITY
'Giving' and 'receiving' energy actions is not simultaneous. Local tokens provide flexibility in returning the exchange and 'giving back'	Local tokens can we awarded for 'giving' energy actions. These tokens can be redeemed for other actions, encouraging continuity and reciprocity	By 'giving' and 'receiving' energy actions residents can meet new people and explore new places in their neighbourhood and district

BREAKING DOWN ENERGY ACTIONS

In designing this conceptual ecosystem a deep dive was taken specifically into the concept of Energy Actions and a journey map, developed through several iterations, was created to de-construct the process of 'giving' and 'receiving' Energy Actions into eight key phases. These phases are outlined below and described in more detail in sub-chapter 5.3.2. The four persona's, resulting from the field explorations in Phsae 1 were used to provide a 'user perspective' and create realistic examples for each phase. Figure 59. gives an impression of the various journey map iterations which were created and which inspired the design of the conceptual ecosystem presented in sub-chapter 3.3.3.

EIGHT KEY PHASES

1. Committing: Residents commit to creating social energy

----

2. Choosing: Residents choose which Energy Actions they would like to give

----

3. Arranging: Residents arrange the chosen Energy Action in their local neighbourhood

----

4. Preparing: Residents prepare to 'give' an Energy Action, or to 'receive' one from a peer

----

5. Doing: Residents 'give' or 'receive' Energy Actions to or from others

----

6. Reviewing: Residents review and describe the Energy Action to confirm that it has been completed

----

7. Rewarding: Residents are awarded with local tokens for contribution to the community

----

8. Redeeming: Residents redeem their local tokens for another Energy Action, or give them away

----

PHASE	1. COMMITTING	2. CHOOSING	3. ARRANGING	4. PREPARING	5. DOING	6. REVIEWING	7. REWARDING	8. REDEEMING	3. ARRANGING
	Commit to creating social energy for local renewable-energy	Choose which energy actions you would like to do to fulfil your commitment	Arrange an energy action in your local neighbourhood/ district	Prepare to 'give' and energy action or to 'receive' one from a fellow resident	'Give' energy action or 'receive' energy action from another	Review and describe energy action to confirm it has been done by both persons	Reward resident with local token(s) for the energy action done	Redeem local token(s) received for another energy action or give it away	Arrange an energy action in your local neighbourhood/ d

ACTIONS

1.1 Sign up to digital platform · 1.2 Create profile · 2.1 Input current skills to find matching actions OR 2.1.1 Input wanted skills to find matching actions · 3.1 Offer to do an energy action e.g. renovation OR 3.1.1 Request for an action to be done · 4.1 Confirm offer or request to do an energy action · 4.2 Set date, time and location for energy action (AND) 4.3 Collect necessary materials needed to do the energy action · 5.1 Do the energy action as arranged OR 5.1.1 Welcome a resident to do an energy action for you · 6.1 Write a short description of the energy action done AND 6.2 Leave a review of the residents work · 7.1 Get local token(s) for doing energy action OR 7.1.1 'Give' local token(s) to resident (AND) 7.2 Go to a local hub to have energy action verified · 7.3 Get local token(s) loaded into digital wallet · 8.1 Redeem local token(s) for an energy action OR 8.1.1 'Give' away local token(s) to another OR 8.1.2 Add local token(s) to collective pool/ pot · 3.1 Offer to do an energy action e.g. renovation OR

QUESTIONS

- How to sign up?
- What does the commitment look like (individual or collective)?
- How does the commitment affect the collaboration (how much energy is given)?
- What counts as an energy action?
- Is there a pre-set list of energy actions and can new actions be added?
- Is there a pre-set list of energy actions and can new actions be added?
- Do residents need experience to be able to do certain energy actions, and how to prove this?
- Do certain energy actions need to be completed before being able to do others?
- How to help residents to identify their skills?
- How to incentive residents to offer their skills and services?
- How to ensure those with less/ little experience are still chosen to do energy actions?
- How to create trust in informal/ less formally organised energy actions (resident to resident and not through an initiative?)
- How can residents be connected to existing local initiatives/ organisations and services (and their materials)?
- How to confirm an energy action through the digital platform/ application?
- How to know if and which materials are needed for the energy action?
- How to organise and get hold of the necessary materials for certain energy actions? Who supplies these and finances them?
- How to ensure the quality of energy actions done?
- How to create safe environments for 'giving' and receiving' energy actions?
- How to have confidence in the fellow unfamiliar residents and their skills and abilities?
- How to ensure credibility of confirmed energy actions and reviews given?
- How to entrust residents to be honest and responsible in conforming and reviewing energy actions?
- How to prove than an energy action has been done (especially for actions which are less visible?)
- How to find a balance between making energy actions visible but also protecting personal privacy?
- How to determine how many local tokens an energy action is worth? How is this calculated?
- Where do these local tokens come from, which institution(s) or organizations?
- How to make the (added) value(s) of these local tokens explicit and visible?
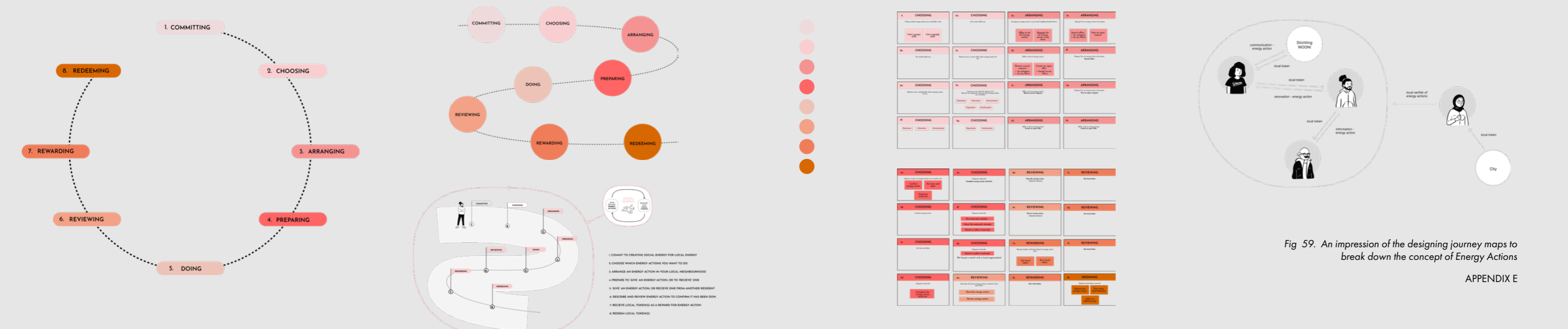- How to 'give' a local token to another resident?
- How to ensure residents receive the tokens they are entitled to/ should be given?
- How to verify energy actions done and who should be responsible for this?
- How to load the local tokens into residents personal digital wallet or profile?
- Are a residents local tokens visible to others in the platform?
- How to redeem local tokens?
- How to incentivise resident to keep doing energy actions and earning or collecting local tokens?
- How can local tokens be 'given away' to other residents?
- How local tokens be added to a collective 'pot' and how distributed?
- How to utilise/ redeem local tokens when a resident no longer requires energy actions? What are the alternatives?

IDEAS

- Energy actions starter kit/ toolbox
- Choose a kit based on your energy actions level (beginner, intermediate, advanced...)
- Set personal and/ or collective goals and commit to a certain number of energy actions
- An energy action introduction workshop which can be done at or home or can be guided by a facilitator in a community centre etc.
- An energy actions recipe book where you can mix and match actions to create your own menu based on your time availability, skill level, preferences etc.
- Energy action categories to help you find and filter actions according to what you can bring or what you would like to learn
- A tool to help you create your own personal learning journey and keep a record of experience gained and skills learnt
- A tool and/or workshop to help residents to identify their current skills and what they can offer in terms of energy actions
- Match with a local organisation/ initiative and get acquainted with the energy action (category) you would like to do
- Short questionnaire which is filled in by both persons about the materials needed
- Receive a short training to be approved/ signed off to do certain energy actions
- A digital 'suggestion box' in the platform where residents can make suggestion for new/ alternative energy actions to add to the list and which can be voted on by residents
- Digital check list to help you to prepare for the energy action you have agreed to do or give
- Short questionnaire which is filled in by both persons about the materials needed
- Based on the category of your energy action you are matched with a partner (local initiative, project, organisation) who provides you with the necessary materials needed to do the energy action
- Local drop-off/collection points for energy action materials in local communal spaces such as grocers, community centres etc.
- Regular 'energy action days', for instance on weekends, where materials can be collected from a stand at the market and many residents set out to do an energy action(s) individually or in groups
- Visual guide to help residents through their energy action (reminders on what to do and how e.g. checking a house for the potential for renovation).
- A buddy system where less experienced residents are paired with those with more experience (in the same energy action category).
- Confirm the completion of an energy action by providing visual (photo/video) and/or written evidence
- Enter a unique one-time code or scan a QR code on the others phone to collectively confirm the completion of the energy action
- Reviews for energy actions are linked to residents profiles to help individuals to build credibility and a portfolio of their experiences and skills learnt
- Energy actions are all worth one local token, regardless of the action done or skill required
- The more energy actions done the more local tokens you get for doing an action (you can level up after doing a certain number of energy actions e.g. action 1-5 you get 1 local tokens but for action 6- 10 you get 2 etc.)
- Local tokens equate to your skill and experience level of an energy action (in a specific category e.g. restoration), so the more experience (and badges received) the more tokens you receive for the action
- The number of tokens you receive for an energy action is dependant on how many energy actions have been done collectively in the neighbourhood (the more done, the more local tokens you receive)
- Local trusted people can be given formal roles as 'energy action verifiers'
- Token loader locations are placed in various central 'hubs' in teh neighbourhood/ district
- Local tokens can be added to a collective 'pot' which is distributed amongst residents (or the most vulnerable) every month
- Residents can 'send' or transfer their local token to someone else by going with them to a token loader location
- Receive monthly notifications with skill matches for new energy actions

COMMITTING	CHOOSING	ARRANGING	PREPARING	DOING	REVIEWING	REWARDING	REDEEMING	ARRANGING
Commit to creating social energy for local renewable energy	Choose which energy actions you would like to-da to fulfil your commitment	Arrange an energy action in your local neighbourhood/ district	Prepare to 'give' and energy action or to 'receive' one from a fellow resident	'Give' energy action or 'receive' energy action from another	Review and describe energy action to confirm it has been done by both persons	Reward resident with local token(s) for the energy action done	Redeem local token(s) received for another energy action or give it away	Arrange an energy action in your local neighbourhood/ district

High school student

- Selena's mum has signed the commitment and so she decides to create a profile too.
- She wants gain so more work experience and learn new skills to add to her CV and to help her find a job.
- Selena offers to help create informational materials to support the energy coaching and promote upcoming events.
- Stichting WOON! accepts Selena's offer to create informational materials for the local neighbourhood and invites her to join them at their office next week to discuss this together.
- Selena creates a poster and flyer about the upcoming 'energie market' with Stichting WOON! together with another resident who hangs the poster up around her neighbourhood.
- Selena fills in a short description of her energy action and adds a photo of the poster to confirm it's done! Stichting WOON! leaves a review on her profile and she receives one digital 'communication' badge.
- Selena receives a notification which tells her she has be awarded 1 local token. To collect it she can visit any local token loader location. Selena drops by the community garden on her way home from school. Here her energy action is verified by a local 'verifier' and the local token is loaded into her digital wallet.
- Selena tells her mum, Maria, that she was awarded with a local token. Maria mentions that she has noticed a strong draft coming in through their living room windows.
- Together with her mum, Selena requests an energy action for insulating their windows. She sees that Pedro has recently offered to do this and she sends him a message.

Unemployed newcomer

- Pedro signs up to the digital platform because he wants to expand his network and reduce his energy costs.
- Pedro wants to put his construction skills to good use, gain experience working here and give himself some more credibility.
- Pedro receives a request from Selena to do a renovation energy action and install draft frame profiles to their windows.
- He accepts the request and sets a date and time with Selena and her mum to do the renovation work. In the pre-action checklist Pedro selects the materials he needs. He is 'matched' with the Fix Brigade who provide him with a basic toolkit and the needed materials.
- Pedro visits Selena and Marias home and installs draft excluders and draft frame profiles and applies silicone tape to seal the windows. He also fits radiator foil in their living room.
- Pedro uploads photos of the work he has done and Selena and Maria comment on his post to review it. They give him 5 stars! Pedro receives a renovation badge from the Fix Brigade and this is added to his profile
- Pedro receives a notification that he has been awarded local tokens. He finds a token loader location nearby and goes to load his tokens into his digital wallet.
- Pedro is curious about energy in the Netherlands and wants to learn more so that to can become more knowledgeable and apply this to more challenging energy renovation jobs.
- Pedro posts an open request for a 'info-action energy' action, asking if someone would be able to talk to him about the Dutch energy transition and pass on their knowledge.

Elderly pensioner

- Jeppe becomes a member of the platform. He used to work in the energy sector so is curious and wants to be involved.
- He has a lot of experience and knowledge about energy systems and the transition. He is looking to meet new people and be socially active.
- Jeppe sees Pedro's post and request for an information energy action. This sounds like something he can do!
- Jeppe replies to Pedro's post and together they set a date and time. They agree to meet at the local community centre and talk there. Jeppe doesn't need any materials but Stichting WOON! sends him an info pack to give to Pedro.
- Jeppe and Pedro meet at the community centre and spend an hour talking about the transition and Dutch energy system over coffee and tea.
- Jeppe adds a short note about their discussion and takes a photo of the info pack supplied by Stichting WOON! Pedro gives Jeppe a glowing review. He learnt a lot!
- Jeppe's phone 'pings', he has been awarded a local token! He is already at the community centre so he immediately goes to load his token onto his profile. Julia, who is a member of the women's gardening group at the centre verifies his action and loads his tokens.
- Jeppe doesn't have an energy action which he wants to request at this time. Instead he gives his token to the neighbourhood fund which will be distributed to those in need.
- Jeppe now has an 'information' badge on his profile. He shares it and posts that he is happy to do the energy action again!

Working parent

- Julia signed up to the platform and to being a local verifier in her neighbourhood.
- Julia does not have much time to give but she can combine being a local 'verifier' when she is with her women's gardening group.
- Julia receives local tokens in return from being a local verifier. She decides to request a 'renovation' energy action.
- Sara replies to Julia's request and they arrange a date and time for the renovation work. Julia would like a full assessment of her home to identify what renovation work needs to be done. Sara is invited to collect an assessment guide from the Fix Brigade.
- Julia invites Sara in to do the home assessment and afterwards they discuss the results of the survey. They have identified at least 3 areas for renovation.
- Julia leaves a review on Saras profile and compliments her expertise and kind nature. Sara uploads a photo of the completed survey as proof of the energy action.
- Julia thanks Sara for her time and work and sends her one of her local tokens. Sara is asked to visit a token loader location to activate/ unlock the local token, after verification.
- Julia still has quite a few local tokens left. She adds some to the community fund, and with the others she decides to request some more renovation actions to tackle the areas that Sara identified.
- Julia searches the energy action offers under the renovation and fixing category and finds Tim who has experience in home insulation.

Fig 59. An impression of the designing journey maps to break down the concept of Energy Actions

APPENDIX E

Fig 60. Concept 2.0 for a relational energy ecosystem

1. A NEW COLLABORATION

Local residents and large asset owners jointly commit to a collaboration of creating 'social energy for local renewable energy'.

Example: Then Johan Cruijff Arena gives the local neighbourhood a percentage of surplus energy from their battery, and in return residents collectively set a goal and commit to 'giving' and 'receiving' energy actions.

2. CREATING SOCIAL ENERGY

Local residents 'give' energy actions to others in return for local tokens, which can be used to 'receive' actions. The LIFE Social (Digital) Platform offers a means for organising and recording these exchanges and for making the impact visible.

Example: Maria installs draft frame profiles in Jeppe's windows. As a reward she receives two local tokens. In the platform she puts out a request to learn more energy saving tips. Tim offers to give Maria an introduction to the energy coach course for one local token.

3. GIVING LOCAL RENEWABLE ENERGY

Local, renewable and affordable energy is distributed to residents in the neighbourhood.

Example: Tim receives a percentage of his energy from the battery of the Johan Cruijff Arena, reducing his energy costs overall.

3.3.4 | CRITICAL COMPARISON

COMPARISON TO DESIGN RATIONALE & INTERACTION QUALITIES

The proposed relational energy ecosystem was compared against the design rationale presented in sub-chapter 2.7.2. The ecosystem was also critiqued against the interaction qualities described in sub-chapter 3.2.2 and in order to do so the concept was broken down into the following three components:

NEW COLLABORATION AND COMMITMENT
Local asset owners and local residents jointly commit to creating 'social energy for local renewable energy' and create opportunities for unlocking value.

ENERGY ACTIONS
Local sustainable actions which empower residents to be active collaborators in the transition by sharing their skills and learning from each other.

LOCAL TOKENS
A tool to motivate, recognise and reward local sustainable behaviours and facilitate relational giving, (personal, intentional and visible exchange) between the socially disconnected.

KEY

++ Requirement is definitely met

+ Requirement met

+/- Requirement somewhat met

- Requirement not met

IN SUM

Overall, **the conceptual ecosystem meets most of the 'requirements' set out in the design rationale for relational giving. Relational giving translates from theory into practice in the concept of Energy Actions.** Thus, Energy Actions incorporates all 10 qualities listed in the rationale, some to a greater degree than others. The quality which is not directly addressed is 'transparency': whilst there is transparency between who is 'giving' and 'receiving' actions, **transparency in relation to the (visible) effect of these actions has not yet been considered.** In respect to the 'collaboration and commitment' component of the ecosystem, some qualities are not met. Specifically **this 'collaboration and commitment' is not clearly defined** thus influencing the understandability of the concept. Whilst receiving surplus local energy from asset owners is **supportive in the short-term**, it is arguably **not a sustainable solution for the long-run** and especially so if reliance is placed on the availability and supply of surplus. Local tokens support the exchange of Energy Actions in this ecosystem, so also address these qualities in the rationale. Where further iteration is needed is in the 'collective' requirement: **what can local tokens be used for in this ecosystem** and **how can they be circulated to include those who are most in need of them?**

DESIGN RATIONALE REQUIREMENTS	NEW COLLABORATION & COMMITMENT	ENERGY ACTIONS	LOCAL TOKENS
UNDERSTANDABLE	**-** The correlation between 'social energy' and 'local energy' is not very clear or concrete	**+** Awareness about the energy transition is increased through practical, educational and informative actions	**+** Local tokens have a clear connection to energy through specifically energy-related actions
PERSONAL		**++** Residents can choose which actions to 'give' and can utilise their own expertise and practice new skills	
AUTONOMOUS	**++** Through collaboration residents become an integral part of the system where they have choice and control	**++** Actionable and flexible, energy actions enable residents to participate on different levels	**+** Local tokens create the opportunity for determining value on a individual basis, independent of criteria
INTENTIONAL	**+** A sense of purpose is created by 'joining forces' and working together towards a common and local goal	**++** Residents intentionally choose which actions to 'give' and which to 'receive' according to their needs	**+** Intentionally giving, particularly between the socially distant, is supported through visible local tokens
TRANSPARENT	**+/-** Large asset owners are better connected to the district, but 'relational giving' is solely between residents	**+/-** Energy actions can be recorded but the impact and effect of these actions still needs to be measured	
INTERACTIVE		**+** Most energy actions involve social in-person interaction between two or more people	**-** The 'giving' and 'receiving' of local tokens in a hybrid setting needs to be explored and experimented with
CONNECTING	**+** Commitment to the local district helps to strengthen a sense of place and belonging for all parties involved	**++** Residents are connected through energy actions and are encouraged to expand their social networks	
SUPPORTIVE	**+/-** Receiving local affordable energy can lessen financial burdens for residents, at least in the short term	**+** Energy actions can boost the self-esteem of the unemployed and support their personal development	**+** Local tokens help to guide financial behaviours and make choices which are socially and locally valuable
COLLECTIVE	**+/-** Whilst in theory everyone could become a collaborator, the most vulnerable are likely still hard to reach	**+** Collective action is encouraged through doing energy actions which benefit the local community	**-** Local tokens will likely end up with those who have the most 'energy' to give, not those most in need of them
CIRCULAR	**+/-** Creating long-term impact is difficult if residents become reliant on the surplus of local asset owners	**++** Sustainable behaviours are incentivised and encouraged through an energy actions ecosystem	**+** There is obligation to continue exchange as residents need to redeem local tokens for other energy actions

INTERACTION QUALITIES			
EMPOWERING	**+** A commitment to creating social energy for local energy gives residents a more formal role	**++** Energy actions are an outlet for local skills and expertise, empowering residents to share and grow	
INSPIRING		**+** Diversity in the energy actions which are recognised can inspire residents to learn new things in new places	
INTRIGUING		**-** The novelty and perceived need for energy actions could wear off after initial curiosity and intrigue	
COMMITTING	**+/-** A commitment is made between residents and local asset owners, but the terms are still vague and unclear		**+/-** Local tokens could be seen as a limitation for flexibility and a burdensome commitment

4.0
CATALYSE

PHASE 4

This section outlines the concept iterations, through prototyping and testing, and presents the final concept and design outcomes.

4.1 | COMMUNICATING THE VISION

4.1.1 | MAKING SOCIAL ENERGY TANGIBLE

IN SHORT

In this chapter the vision for a relational energy system (as presented in chapter 2.7) is made visual by means of prototyping and making.

4.1.1   MAKING SOCIAL ENERGY TANGIBLE

GOAL

Communicating a vision clearly and highlighting the social value of the proposed relational ecosystem is key to for engaging stakeholders and inviting others to imagine this future possible ecosystem. The goal of making the vision tangible was thus to inspire and help tell the story, especially to people not already familiar with this work.

APPROACH

A mid - fidelity prototype was created to 'mock-up' the vision. Supporting informational and visual materials were also designed.

PROTOTYPING A PIZZA

Figure 61. depicts the tangible manifestation of the vision for a relational energy system. The pizza analogy described in sub-chapter 2.7.1 is developed into a 'recipe for relational energy' and helps to explain the concept of creating social energy for local renewable energy.

Fig 61. Making the vision for social energy tangible through prototyping a pizza!

4.2 | EVALUATION & VALIDATION

IN SHORT

This chapter outlines the intial evaluation and validation activity undertaken to recieve feedback on the conceptual ecosystem and crucially the concept of 'creating social energy'. The key findings and learnings are presented.

4.2.1   EXTERNAL POSTER PRESENTATION

GOAL

The primary goal of this evaluation and validation activity was to present and receive feedback on the conceptual ecosystem concept from both internal project partners and consortium members and external delegates and experts in the field of the energy transition.

APPROACH

The annual EnergieLab Zuidoost seminar coincided with the evaluation and validation phase in this project and thus presented the opportunity to gain feedback from a relevant and diverse 'audience'. The setup of the seminar consisted of a poster presentation in the foyer space, with the intention that delegates, visitors and participants could browse and learn about the current projects being undertaken and engage with researchers in between structured sessions and keynote presentations. The poster of the concept provided a, mostly visual, overview of the concept and help to start a dialogue. In addition, there was space on the poster itself to paste Post-It Notes with comments and questions. The 'tangible vision', the pizza analogy displayed in the previous chapter, was also displayed to spark intrigue and aid the communication of the concept and social motivation.

4.2.1   EXTERNAL POSTER PRESENTATION

AIM	TO PRESENT AND GET FIRST IMPRESSIONS & FEEDBACK ON 'SOCIAL ENERGY FOR LOCAL ENERGY' CONCEPT
WHEN	30.03.2023, 13:00 - 18:00
WHERE	GROENE HUB, HOLENDRECHT, AMSTERDAM ZUIDOOST
WHO	SEMINAR DELEGATES, ENERGYLAB ZUIDOOST COORDIANTORS, LOCAL RESIDENTS, RESEARCHERS & LIFE PARTNERS

PRESENTATION OF CONCEPT

The poster was designed with the aim to engage, inspire and possibly even provoke delegates and participants. In this way the poster not only provided information about the concept but acted as a boundary object to stimulate and foster conversation and reflection. The key message projected through the poster and short elevator pitch, was that transforming the transition from a commodity-based one to a relational has the potential to unlock and create social values and actively include local residents. The core of the proposed conceptual ecosystem is the 'creation of social energy' by giving and receiving 'energy actions' so this was highlighted in the concept presentation. The role of local tokens as a means to motivate and arrange energy actions was also explained and evaluated.

EVALUATION & VALIDATION QUESTIONS

The nature of this evaluation and validation activity, where individual interactions were limited mostly to five to ten minutes, meant that was feedback remained at a more general level and evaluation focused on the concept overall, rather than diving into specifics. However, questions in conversation were directed around the following key components and topics: **ENERGY ACTIONS, SOCIAL ENERGY, COLLABORATION AND COMMITMENT AND LOCAL TOKENS.** These components were also validated through presentations and participation in sessions at the seminar, where discussion around e.g. the need to use local skills resulted in key findings which support the core message of the concept.

KEY QUESTIONS

What are your first impressions, thoughts and reactions?

What do you think is missing from this system? What needs to be taken into account or added?

What opportunities do you foresee with this system?

SEMINAR SPEAKERS & SESSIONS

Relevant to this project:

EnergieSamen

Just Prepare

LIFE

Groene Hub

Fig 62. EnergieLab Zuidoost conference 2023

Fig 63. Poster presentation at the Groene Hub, for the EnergieLab Zuidoost seminar, showing concept 2.0

FEEDBACK SUMMARY

A summary of the feedback received through presenting the poster, and participating in the seminar is presented below. These key findings either validate the concept or raise questions for further development.

VALIDATION OF CONCEPT

ENERGY ACTIONS

Practical support to save energy at home is needed. Programmes like 'energy boxes' fail to make an impact because many residents don't know how to install the materials or devices.

"They get a box of stuff, it's lying somewhere but they don't know what to do with it."
"You have to help people behind the door."
- Presentation Groene Hub

Local residents have skills to offer. There is already a lot of local expertise in the district and organisations like WOON! are already trying to utilise and share local capabilities and resources through focus groups and meetings.

"Knowledge is already in the district."
- Session, Just Prepare

Concrete and actionable steps are essential. Many residents want to contribute to the local transition but need actionable steps to do so. Energy actions offer a way for everyone to take part.

"How do you make it actionable?"
- Session, Just Prepare
"There is a lot of interest, but they don't know how..."
- Stichting IWOON

SOCIAL ENERGY

A want for community and cohesion. Residents want Zuidoost to feel part of a community and for Zuidoost to be a place where individuals support each other.

"We want to be a community."
"..I don't want to live so individualistically with my own things (but help each other out)."
- Session, Just Prepare

Creating social energy is a priority. Strengthening social cohesion is the first step in transforming the transition

"If there is more social cohesion, connectivity and community then more difficult things will fall into place."
- Stichting !WOON

COLLABORATION & COMMITMENT

Residents need to be included in defining goals with local organisations. Collaboration and working together is key for creating sustainable change and impact.

"Residents should make a vision with local organisations and experts."
- Session, Just Prepare

LOCAL TOKENS

Local tokens empower residents to actively contribute. Introducing local tokens in energy opens new possibilities for low-income groups.

"...We can become part of our local energy system."
- Poster presentation, resident

Local tokens create opportunities for being awarded for time and efforts given. Local tokens recognise the actions which residents do.

"Giving (to the community) doesn't need to be free...you can ask for something in return."
- Stichting !WOON

QUESTIONS & SUGGESTIONS

Which energy actions are useful? Which actions have value for the community and collective?

"What would the Energy Actions include? And what not?"
- Poster Presentation, expert

What if you don't have time to give and do energy actions? Some residents do not have time to do energy actions so how can they still be a part of this ecosystem?

"What if you do not have the time or resources for this? What are the options?"
- Poster presentation, AMS

How to offer 'energy actions' which appeal to everyone? 'Energy' does not speak to everyone. How can the actions which are recognised be inclusive for a range of skills.

"What if you are just not interested in energy? How can you be part of this?"
- Poster presentation, expert

What is missing at a policy level to support creating 'social energy'?

"Which policies and regulations would need to be implemented?"
- Poster presentation, student

How to create a strong connection between social and local energy?

"How do they relate to each other?"
- Poster presentation, expert

Residents could commit to creating social energy within their VVEs. Increasing collaboration between residents living in the same housing blocks can help to tackle numerous social and local issues.

"Being in a VVE can be seen as an opportunity and not an pain..."
- Session, Just Prepare

Where are the local tokens coming from? Collaboration and working together is key for creating sustainable change and impact.

"Do local businesses give the tokens? Does the city?"
- Poster presentation, several participants

How does the role of local tokens change between initiatives and businesses? The value of local tokens feels different depending on who and where they are coming from.

"How does this work for volunteer organisations and for paid employees of local businesses?"
- Poster presentation, expert

4.3 | CONCEPT ITERATION

IN SHORT

This chapter provides an overview of the concept iteration process. The key areas for developing the concept are listed, energy actions are explored and detailed through enactment and game play and the conceptual ecosystem is further developed.

GOAL

Design, and conceptualisation, is an iterative process in which ideas develop through multiple loops of modification, testing and reflection. The goal of interacting upon the concept of 'social energy for local renewable energy' was to address key gaps and/or weaknesses identified through the evaluation and critical comparison activities. The key components of the concept are explored further and detailed.

APPROACH

A 'making first' approach was taken to further develop and iterate upon the concept. Low-fidelity prototypes and mock-ups helped to unravel some of the complexity of the conceptual ecosystem, and key components by making the concept tangible.

4.3.1 | PROTOTYPING & MOCKING UP

AREAS FOR DEVELOPMENT

The key areas for developing the concept are outlined below. These areas derive from the critical comparison and evaluation and validation activity (the external poster presentation and participation in the EnergieLab Zuidoost seminar). The proposed ecosystem and concept of energy actions is still very much in a conceptual phase and thus many questions and possibilities for further exploration remain. A level of ambiguity is inherent and typical of social deign concepts, particularly those dealing with 'wicked problems' (Rittel & Webber, 1973) and which are set in the future. Therefore the unknowns are embraced, to a certain extent, and the concept iteration revolves mostly around the communication of the proposed social, local and relational ecosystem. The ecosystem is re-formulated in response to feedback received and re-considers and refines the role of key actors involved. Energy actions are made more tangible and specific examples are given. 'Social energy' is not listed as a separate key component here but is incorporated in the other areas.

| KEY COMPONENT	GAPS EXPLORED IN CONCEPT ITERATION
COLLABORATION & COMMITMENT	**Connection between social and local renewable energy:** what is the role of the different actors and stakeholders involved?
	Plurality of options: what are other scenarios for the concept of 'social energy for local energy' in Amsterdam Zuidoost?
ENERGY ACTIONS	**Examples of energy actions:** what are the different possibilities for valuable and meaningful energy actions?
	Applicability of energy actions: who are energy actions relevant for? Who are they not relevant for?
LOCAL TOKENS	**Origin of local tokens:** where do they come from?
	Use of local tokens: what can tokens be redeemed for?

Fig 64. Creating low-fidelity prototypes to iterate ont the Energy Actions concept

MAKING

The enacting/ making/ telling model (Sanders & Stappers, 2012) was used to guide the design iteration process. A series of low-fidelity prototypes were created from cardboard, foam board and other easily sourced materials. The prototypes were used to communicate the concept to others (students and researchers) and aid the co-development process. Prototypes were created to represent the proposed ecosystem holistically and to demonstrate interactions on the micro level, such as 'giving' and 'receiving' energy actions.

I noticed that the initial prototypes tried to incorporate a lot of detail and different layers and levels of the conceptual ecosystem. They were complex, contained many different pieces and were difficult to explain. Through making and showing and testing the prototypes became simpler and more focused on the holistic overview and story, rather than the precise details.

Fig #. Mocking up the process of giving and receiving energy actions ▶
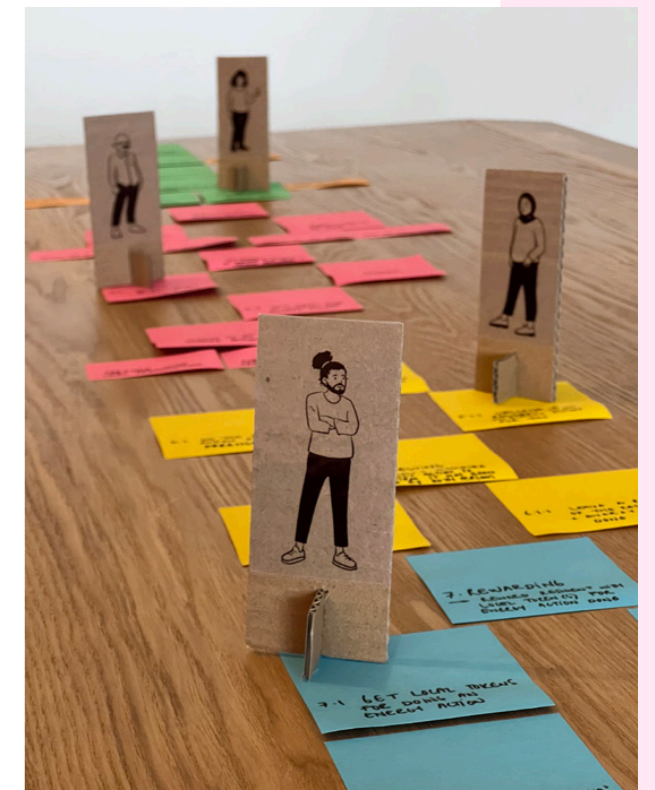
ENERGY ACTIONS TO GIVE AND RECEIVE

Thus far 'energy actions' have only been mentioned with a general definition with a handful of examples. Outlined here are more types of energy actions, arranged in categories, which have the potential to bring value to various actors in the ecosystem. Reference was made back to the resident personas created in sub-chapter 1.2.6 to further consider who, more specifically, energy actions can be relevant for. The list of possible energy action types (and examples) compiles input from LIFE co-researchers, project stakeholders and suggestions from attendees of the EnergieLab Zuidoost Seminar.

TYPES OF ENERGY ACTIONS

Examples of energy actions: what are the different possibilities for valuable and meaningful energy actions?

EDUCATION

Energy actions which focus on teaching residents about the energy transition, energy systems and the changes they can make to save energy, reduce costs and start to move towards a Net 0 Zuidoost.

Examples include: hosting energy markets and information markets, training to be and becoming an energy coach.

COMMUNICATION

Energy actions revolving around the communication and dispersion of information regarding energy initiatives, events and tips. These actions are about raising awareness and making energy more visible in the district.

Examples include: distributing flyers, creating posters and social media content, making public energy related art pieces and installations

ENERGY ADVICE

Energy actions specifically about giving advice to residents (social housing, renters and owners) about how to save energy and which devices and appliances to install.

Examples include: conducting energy audits, advising the replacement of appliances and devices and identifying opportunities for energy production, storage and/ or sharing.

HANDY WORK

Energy actions which include typically small and quick practical fixing and building jobs to take (short term) energy savings measures.

Examples include: sealing windows, changing light bulbs, placing radiator foil and eliminating drafts.

ORGANISATION

Energy actions involving the organisation of local energy initiatives, community groups, events and possible communal assets.

Examples include: bringing residents together in VVE or neighbourhood meetings, planning community actions and events, working together with the LIFE Social Committee to distribute local tokens in the district.

ENERGY ACTION TARGET GROUPS

Applicability of energy actions: who are energy actions relevant for?

RETIRED RESIDENTS

Retired residents likely have time on their hands and want to stay socially active in their neighbourhood. Energy actions which enable them to spend their time with others, doing activities they enjoy are relevant here. The elderly may not be able to 'give' energy actions themselves but could likely benefit from receiving help and support from others.

NEW RESIDENTS

Residents are coming and going in Zuidoost and with a lack of connection between different social groups it can be difficult to feel a sense of belonging in district. Energy actions present new residents with the opportunity to meet others, build a social network and explore their neighbourhood. Types of energy actions which are particular relevant for in this scenario include communication and handy work.

UNEMPLOYED RESIDENTS

Unemployment can leave vulnerable residents with low self-esteem and a lack of purpose. Energy actions can be relevant for those looking for a job. They can provide residents with the opportunity to showcase their skills and/or gain experience in new fields. In this way energy actions can be a stepping stone towards future employment and work.

ACTIVE VOLUNTEERS

Those who are already actively contributing to their neighbourhood can seek opportunities for combining their current commitments with collective action and inspire progress towards an energy neutral Zuidoost.

YOUNG PEOPLE

For the younger generation energy actions can be a means to gain work experience and gain (hard and soft) skills to prepare them for the employment. Energy actions which support entrepreneurial behaviour could help young people to test out their ideas.

EMPLOYEES WITH COMMUNITY HOURS

Energy actions can also be relevant for people who are working in Zuidoost and have assigned 'community hours' from their employers and work places. They can work together on collective actions.

GAMIFICATION

Fig 65. First energy exchange game

Based on the feedback from the external poster presentation and the critical comparison against the design rationale it is clear that energy actions hold a lot of potential for unlocking social values in the community: there are many possibilities here. To help communicate these potential value flows a series of game iterations were created. 'Gameplay' enables project members to 'experience' and enact part of this holistic system in a more tangible way. Designing and making game elements also helped to explore different types of actions and give them more detailed descriptions.

ENERGY EXCHANGE GAME 1.0

AIM	PLAY WITH ENERGY EXCHANGES!
WHEN	09.12.2022
WHERE	IDE FACULTY, TU DELFT
WHO	GROUP OF FOUR DESIGN STUDENTS

This game was designed and played at an earlier stage of the design process with goal of simply 'playing' with energy exchange to inspire ideas for non-monetary exchange in the context of energy. Although not specific to the concept of energy actions, referring back to this game iteration provided learnings and tips for designing an 'enactment game'. The key takeaway from this game was that without a clear persona and context players naturally made choices based on their own lived experiences, which affected their willingness to do or not do certain exchanges.
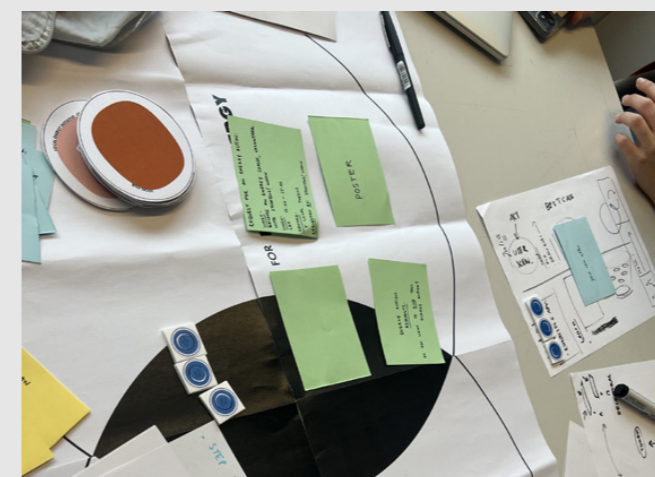
ENERGY ACTION GAME ITERATIONS

Fig 66. Iterations of the Energy Actions game

KEY LEARNINGS FROM GAME ITERATIONS

The various game iterations were played and 'tested' primarily will fellow design students and with co-researchers in the LIFE Project. Many low-fidelity paper versions were mocked-up and two of these iterations are displayed above. The key learnings from these game prototypes, and which were carried forward into the final iteration, are summarised in four main points.

1. Include the 'value' of the energy action in local tokens as this provokes discussion and influences choices made

2. Create a story around the origin of the local tokens and provide each player with a few tokens to start

3. Create detailed personas which allow the players to step into the role and made character-informed decisions

4. Focus on highlighting potential value residents can bring to the system instead of including all actors

4.3.3 | ECOSYSTEM ITERATION

CONCEPT SCENARIOS

The ecosystem, as presented in the previous chapter, was iterated upon. Tangible prototypes and mock-ups were used to imagine the three possible scenarios summarised below and to help visualise the connections and roles of the various actors involved.

Plurality of options: what are other scenarios for the concept of 'social energy for local renewable energy' in Amsterdam Zuidoost?

Origin of local tokens: where do they come from?

Use of local tokens: what can tokens be redeemed for?

	SCENARIO 1	SCENARIO 2	SCENARIO 3
WHAT IS THE SCENARIO?	Residents commit to doing and reporting on local energy actions in return for the distribution of surplus energy from JCA's battery	Residents do energy saving actions such as quick fixes. The city redistributes and invests the value saved by these local actions back into the district e.g. through energy assets	Residents do energy actions to manage and maintain a neighbourhood energy system. In return local energy communities can exchange energy with residents living in the neighbourhood
WHO ARE THE KEY ACTORS INVOLVED?	Local residents and large asset owners such as the Johan Cruijff Arena	Local residents, the municipality and local organisations focused on quick fixes and renovations	Local residents, local energy communities and cooperatives
WHAT IS NEEDED?	A structure, policy and plan for distributing surplus energy to the local neighbourhood	A means for measuring the effect of energy saving actions in neighbourhoods in the district and translating this into economic value	A network of local energy assets for producing and sharing energy in cooperatives and communities
WHICH ENERGY ACTIONS ARE RELEVANT?	A structure, policy and plan for distributing surplus energy to the local neighbourhood	A means for measuring the effect of energy saving actions in neighbourhoods in the district and translating this into economic value	A means for measuring the effect of energy saving actions in neighbourhoods in the district and translating this into economic value
HOW CAN LOCAL TOKENS BE APPLIED?	Local tokens can be sponsored by JCA and used as a means for 'giving' and 'receiving' energy actions	Local tokens can be distributed to local organisations who can award them to active local residents	Local tokens can be connected to energy supply, becoming a means for literally translating social energy into renewable energy

Fig. 67. Examples of prototypes made to iterate on the structure of the ecosystem and positioning and role of the actors involved
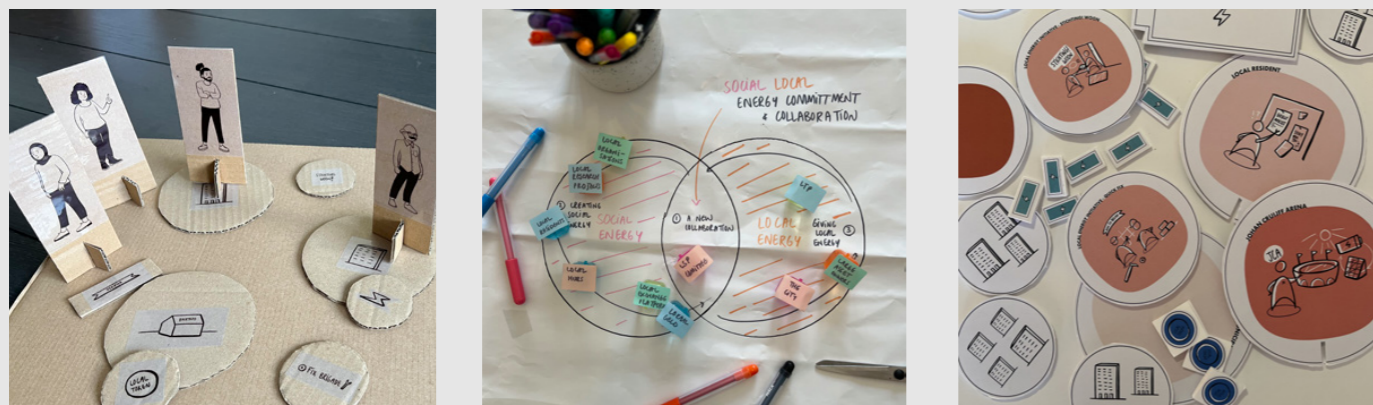

KEY ACTORS IN THE ECOSYSTEM

Connection between social and local energy: what is the role of the different actors and stakeholders involved?

LOCAL RESIDENTS

ROLE
Creating social energy by doing local 'energy actions' in return for local tokens.

VALUE
- Share, showcase and learn new skills
- Gain work experience to become more employable
- Expand local social network
- Greater sense of belonging in the community
- Sense of purpose in the community
- Reduce energy costs
- Active participator and collaborator in the energy transition
- More informed about energy and conscious consumption
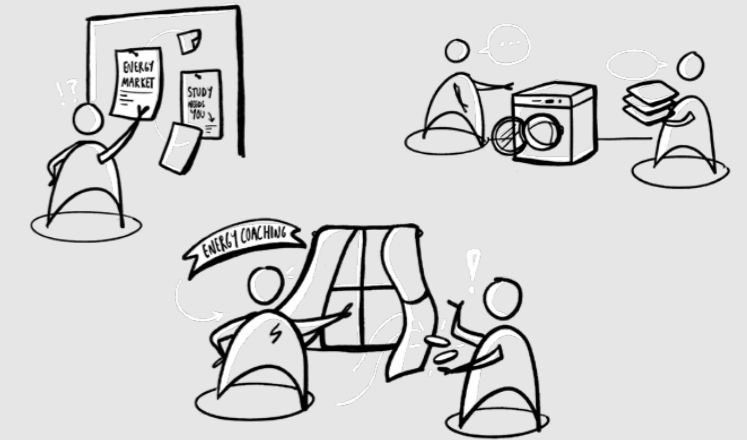
LARGE ASSET OWNERS

ROLE
Supporting the local neighbourhood by investing in local tokens and giving affordable and renewable local energy.

VALUE
- Build a connection with the local neighbourhood and residents
- Contribute to creating local social impact
- Help to alleviate energy poverty in the area
- Enable the neighbourhood and district to transition
- Able to report on their Environmental, Social and Governance factors
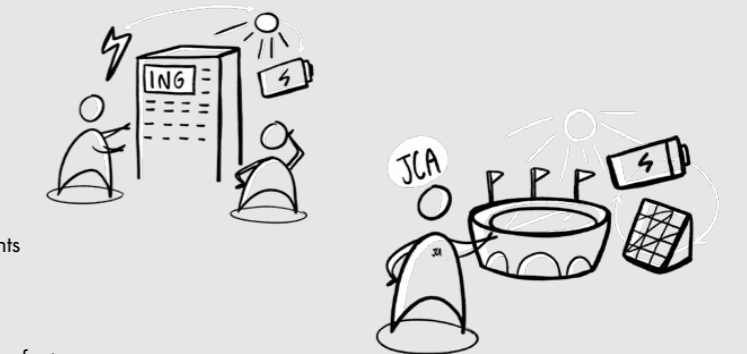
LOCAL ENERGY INITIATIVES

ROLE
Support the doing of 'energy actions' by providing training, tools, materials and opportunities. Distribute local tokens to residents who contribute.

VALUE
- Connect residents to local initiatives and organisations
- Compensation for voluntary work
- More informed and energy conscious neighbourhoods and residents
- Progress (and accelerate) the transition through increased action

THE MUNICIPALITY

ROLE
Promote 'social for local' energy collaboration and subsidise and/or invest in local tokens for the district.

VALUE
- Increased social cohesion in Amsterdam Zuidoost
- Resident engagement and participation in local, social and sustainable projects
- (Re)build trust with residents and neighbourhoods
- Save on actions like renovations and installing materials/ devices
- Progress energy transition to reach 2040 target

Fig. 68. Outlining the role and values for key stakeholders in the system

4.4 | CONCEPT PROPOSAL

IN SHORT

In this chapter the final concept is proposed. The concept can be viewed as various key components of a larger holistic ecosystem, and thus descriptions are given for the practice of relational giving, the concept of energy actions and role of local tokens. The following chapter presents the design outputs to communicate these key components.

GOAL

The different key components are explained to provide clarity on their purpose and their relationship with one another e.g. local tokens as a tool for relational giving.

APPROACH

Only a description of the key components of a 'Social Local Relational Energy Ecosystem' are given in this chapter. The design outcomes which embody these elements follow in the next chapter.

4.4.1 | A SOCIAL LOCAL RELATIONAL ENERGY ECOSYSTEM

WHAT'S IN A NAME?

Through the two ideation phases and a cycle of iterations the **conceptual local social and relational energy ecosystem**, described here, emerged. To provide an explanation of this holistic ecosystem is to clarify the meaning and interpretation of the various terms used to describe it.

TERM	INTERPRETATION & MEANING IN CONCEPT
SOCIAL	This concept is **fundamentally social** because it **places people and communities at the centre** of their local energy system, striving, in particular, for the inclusion of vulnerable groups who are consistently omitted from them. Here 'social' means the design of an ecosystem which is **driven by social values** and creating opportunities for **building and strengthening social connections**. It is all about the social energy.
LOCAL	The concept relates specifically to the **context of Amsterdam Zuidoost** and the unique factors, needs and wants which this district is characterised by. 'Local' also refers more specifically to an **ecosystem** which utilises local resources, assets, people, and capabilities. Finally, the word 'local' references a decentralised, independent energy ecosystem, designed for resilience and adaptation to the dynamics of the transition-in-progress.
RELATIONAL	'Relational' describes the **alternative approach** taken to local energy exchange where the focus is not on commodities and material gain but on the relationships between the persons involved. Thus 'relational' refers to the practice of **'relational giving'** which takes shape through energy actions. Not only does the ecosystem accentuate inter-personal relations between residents in the community, but equally considers the role and engagement and interaction between various local actors.
ENERGY	**'Energy' has multiple meanings here**. In it's most literal sense 'energy' refers to the local renewable energy produced, stored and distributed in the district: The 'energy' which powers the oven or heats the shower. But 'energy', in the context of this ecosystem, also has a **personal, collective and spatial definition:** the energy that residents put into contributing to this ecosystem (through energy actions), the energy created by working towards a common goal and the energy which brings people and place closer together.
ECOSYSTEM	'Ecosystem' was deemed a more fitting word than simply 'system' because it paints a much more representative picture of the **circular network and interconnected value chains** present in this large and multi-level context. Similarly 'ecosystem' is implicit of the multiple social, cultural and institutional factors which shape the future landscape of energy in Zuidoost. The ecosystem approach also takes note of the **relationship between various key actors and components** and ultimatley exemplifies that local decentralised energy is **much more than the technical infrastructure.**

4.4.2 | RELATIONAL GIVING AS A PRACTICE

BEYOND THE EXCHANGE OF GOODS & SERVICES

'Relational giving' derives from anthropological theory and literature on barter exchange and is a term coined to describe 'gift-like barter exchange'. A new term is needed as the words 'gift', 'barter' and 'exchange' hang heavy with associations and connotations and detract from the real focus of this type of exchange which goes beyond commodities, goods and services and instead concentrates on the persons and relationships in the exchange. In short **'relational giving' can be described as exchange which enables the creation and strengthening of social relationships.** Incidentally, relational giving is not a stagnant and singular event but is a process through which individuals 'give' and 'receive' with the intention of forming, and maintaining, social connections. Relational giving, all be it under a different or unrecognised guise, already takes place. People who are socially initiate or socially close with one another (family, partners, close friends) frequently practice this type of exchange. However, where relational giving is absent, but arguably most needed, is between those who are socially distant and disconnected. Pulled from theory and literature, both integral and resultant properties have been assigned to relational giving. These are described in sub-chapter 2.6.2 and illustrated below in Figure 69.

WHAT
IS RELATIONAL GIVING?

The practice of 'relational giving' holds relevance for designing socially inclusive energy exchanges, particularity in low-income and socially fragmented districts such as Amsterdam Zuidoost. Inclusion in the energy transition refers, in this project, to the active inclusion and participation of (vulnerable) residents. It is about enabling residents to have the 'ability to give', to have a sense of choice and control and to be able to contribute to a local energy system designed with their capabilities and preferences at the centre. Social cohesion, or 'social energy' is needed to actively include all residents in a neighbourhood and district and progress the transition. Relational giving can unlock 'social energy' by bringing people together to create and strengthen local value flows.

WHY
IS IT RELEVANT?

In the context of a social local and relational energy ecosystem relational giving, a means for unlocking social energy, takes the form of 'energy actions'. These local energy related actions empower residents to share their skills and learn from each other. In this way relational giving is practiced and social relationships are created and strengthened.

HOW
CAN IT BE PRACTICED?

LOCAL TOKENS - A TOOL TO SUPPORT RELATIONAL GIVING

Relational giving, as previously described, is practiced regularly between people who are socially close, without a need for intervention. Between individuals who are socially unfamiliar and distant from one another relational giving needs to be facilitated, at least initially until opportunities have arisen for shortening the social gap and building familiarity. This is where local tokens can act as tool for relational giving and provide a means to 'give' in a personal, intentional, visible and time flexible way, creating social obligation and familiarity.

WHAT
IS THEIR PURPOSE?

Local tokens support exchange which is **personal** and **intentional** as their value and can be mutually determined by the persons involved, and is not constrained by outside metrics or regulations. Local tokens make exchange **visible** by digitally recording the 'giving' and 'receiving' of actions and tokens and mapping this in the neighbourhood. In addition the movement of tokens requires direct communication between the involved persons. There is an option of **delay** when involving local tokens: they can be given and received at a separate moment to the energy action itself. Finally, giving tokens in return for energy actions fosters reciprocity and **obligation** triggering the **continuation** of exchange in a circular network which increases **familiarity** between people and places.

HOW
CAN THEY BE USED?

e.g. to receive energy actions

e.g. to invest in local assets or funds

e.g. to support community initiatives

4.4.3 | ENERGY ACTIONS AS A CONCEPT

AN OUTLET FOR LOCAL SKILLS AND EXPERTISE

Energy actions are local energy related actions and can take shape in a diversity of services and activities including, but not limited to: **educational** actions such as teaching young people about the transition; **communication** actions such as distributing flyers and creating social media content; **handy work** actions such as installing energy saving materials and devices and **energy advice** actions such as conducting audits and considering investment in assets.

WHAT
ARE ENERGY ACTIONS?

Fundamentally, energy actions support and reinforce **behaviour change** which is crucial for our societal and global shift towards a Net 0 way of life. But changing our behaviour is no easy task, especially for vulnerable residents whose priorities lie elsewhere. By breaking down change into manageable , flexible and actionable steps residents are supported in making **short-term progress for long-term impact.** Energy actions are embedded in day-to-day life, helping to bring the transition into the forefront and increase awareness. In Amsterdam Zuidoost energy actions are especially important in helping to **relieve vulnerable residents** from the burden of high energy costs due to poorly insulated and installed homes, outdated inefficient devices and lack of knowledge and understanding about the energy system overall.

WHY
ARE THEY NEEDED?

Beyond the potential for financial support, energy actions create **social energy** and transform the transition from techno-focused to people centred. An ecosystem of organised and recognised energy actions in a neighbourhood provides an **outlet for local capabilities and expertise.** Not only is renewable energy being produced, stored and distributed locally, but local skills are also being utilised, showcased and advocated for. Empowering residents to share their skills and learn from each other creates opportunities for social interaction and increasing social cohesion in the district. For the unemployed and low-educated energy actions offer a means for **personal development:** new skills can be learnt and practiced, opening opportunities for work and starting new local projects. A sense of 'choice and control' is absent from current energy systems: the concept of energy actions levels this power imbalance by enabling residents to practice relational giving. Fundamentally energy actions empower residents, regardless of their socio-economic position, to be **active and valuable collaborators in the transition**.

HOW
DO THEY CREATE SOCIAL ENERGY?

Fig 69. The integral and resultant properties of relational giving

PERSONAL

VISIBLE

INTENTIONAL

3 WEEKS LATER...

ALLOWS FOR DELAY

CREATES FAMILIARITY

CREATES OBLIGATION & CONTINUATION
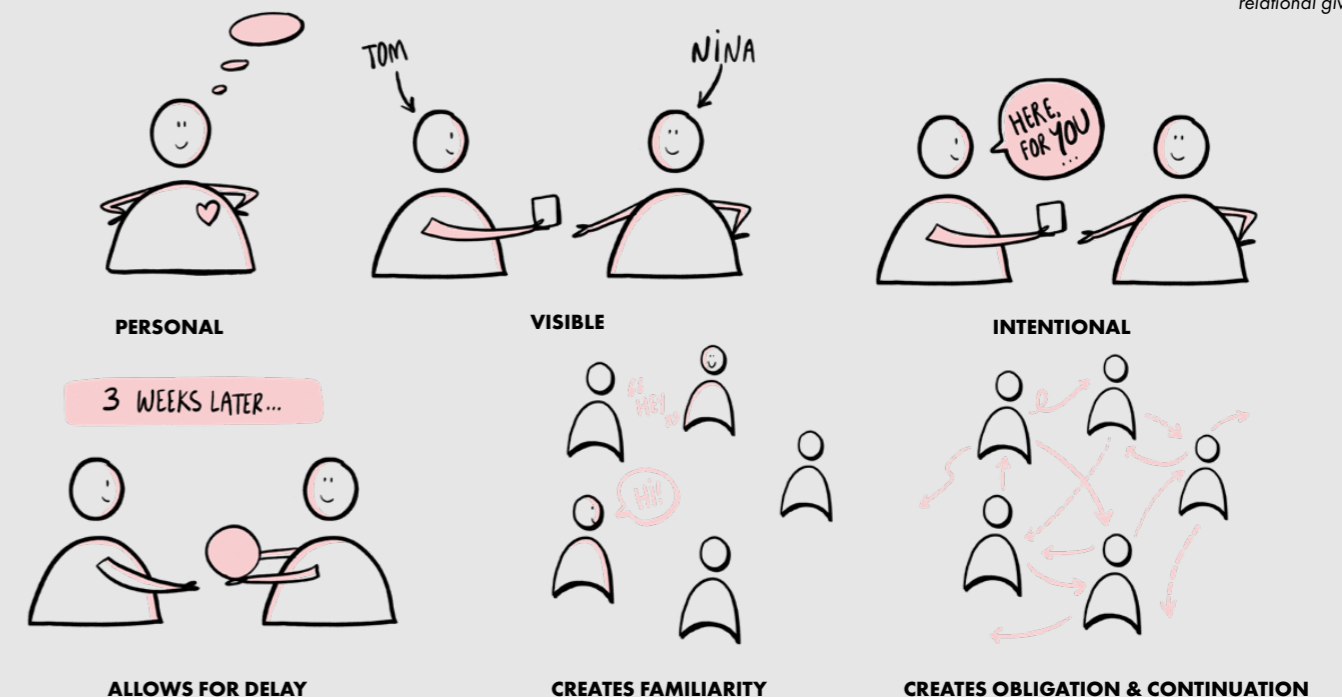
4.5 | FINALISATION

IN SHORT

In this chapter the final design outcomes are presented. A mix of media is used to communicate different elements of the concept of a Social Local Relational Energy Ecosystem.

GOAL

The goal of creating visual manifestations of the key components of the concept is to aid communication and inspire future thinking.

APPROACH

The final outcomes were designed according to their purpose and who they are intended for. Different visuals styles are used to communicate the key concepts. The outcomes intended primarily for use by other researchers and LIFE project stakeholders take a more informative and structured approach. Whereas, an illustrative and more visually engaging style is used in the video designed to storytell, inspire and spark ideas amongst consortium members and potential end-users, including local residents, asset owners and the municipality.

4.5.1 | CONCEPT PRESENTATION & COMMUNICATION

A MIX OF MEDIA

The design outcomes of this project are mixed media. The concept components are embodied in various forms, to speak to different people and serve multiple purposes. **In this way a 'mixed media approach' is an inclusive approach.** Social and systemic design projects often remain at a 'fluffy' and conceptual level and thus engaging and clear communication is key for inviting others in to learn about and take this work further. The different design outcomes, their purpose and who they are intended for are described below. Important to note it that there are other outcomes to this project, not mentioned here, including recommendations, possible design directions and next steps (chapter 5.3) as wel as the research findings dispersed throughout this thesis.

DESIGN OUTCOME

A FRAMEWORK FOR A SOCIAL, LOCAL, RELATIONAL ENERGY ECOSYSTEM

WHY? To provide a more systemic overview of the involved actors and in the ecosystem and suggest an inside-out approach, placing residents at the centre

WHO IS IT FOR? LIFE consortium members, project partners, design researchers, stakeholders

HOW CAN IT BE USED? Can be shared in the project and other ongoing research in Zuidoost to inspire and guide ideas for new organisations, structures and collaborators

THREE SCENARIOS FOR ENERGY ACTIONS IN ZUIDOOST

WHY? To provide some context specific examples for Energy Actions, and illustrate the role various actors can play in creating social energy

WHO IS IT FOR? LIFE consortium members, project partners, design researchers, stakeholders

HOW CAN IT BE USED? As conversation starters around Energy Actions and their desirability/ feasibility and viability, and as prompts for further ideation and scenario exploration

ENERGY ACTIONS ENACTMENT GAME

WHY? Acts an experiential prototype for experiencing the concept of Energy Actions and making it more tangible.

WHO IS IT FOR? LIFE consortium members, project partners, design researchers, stakeholders, local residents and potential end-users. Everyone can step into this enactment activity.

HOW CAN IT BE USED? Can be used as stimulus for co-creation and participatory design and research, including potential end users of this system

A VISION FOR ZUIDOOST

WHY? To inspire and activate and stimulate discussion and reflection and offer a new relational perspective

WHO IS IT FOR? LIFE consortium members, project partners, design researchers, stakeholders, local residents and potential end-users and anyone else working in the social energy transition field

HOW CAN IT BE USED? As a sensitizer video for future workshops, discussions and research activities to stimulate future thinking. Can also be shown to residents when doing ethnographic research and could be shared online via local platforms and websites of (energy) initiatives and organisations

RELATIONAL GIVING : EXPLAINED

WHY? To provide an explanation (in a nutshell) about relational giving and describe where it comes from
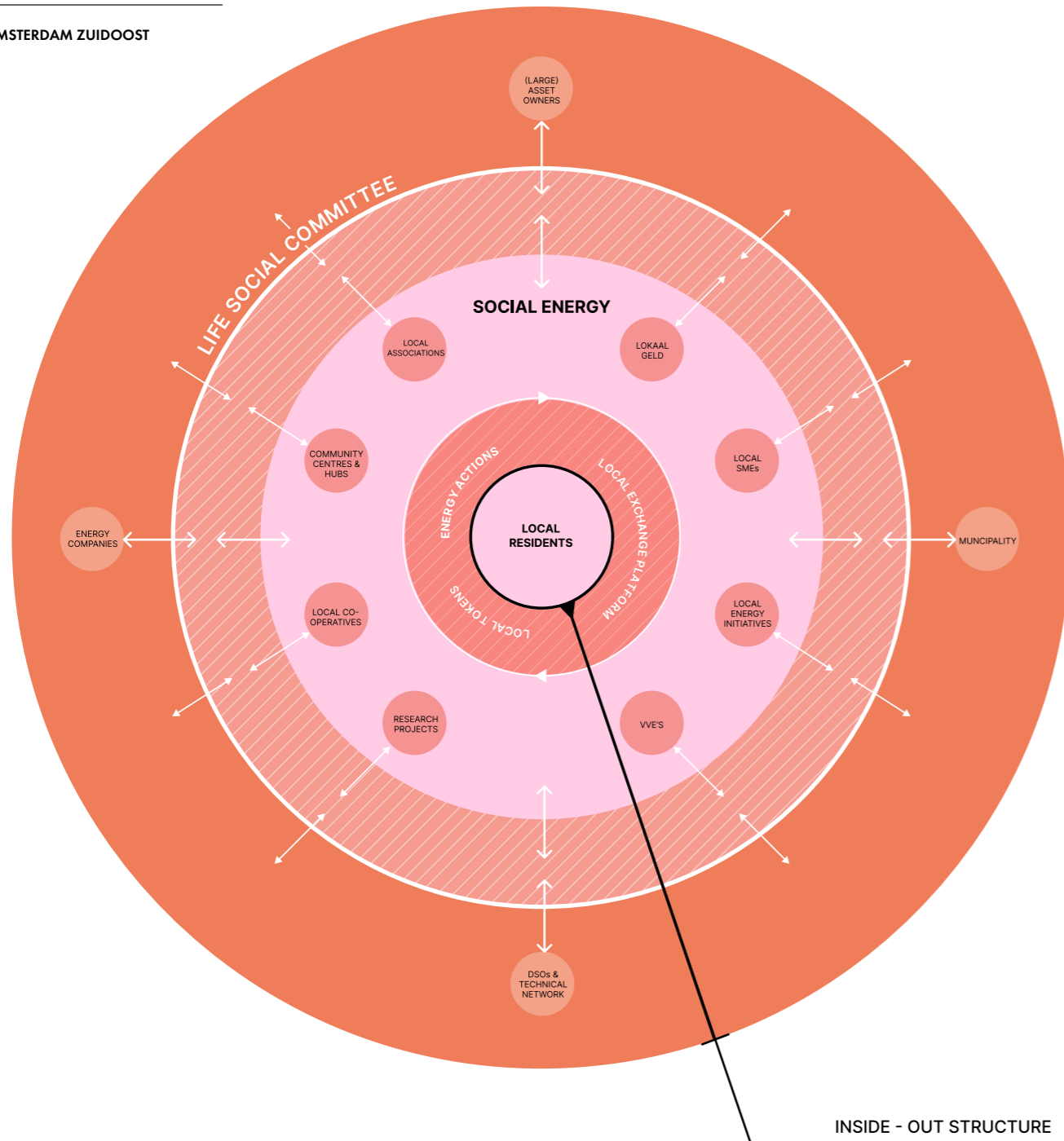
WHO IS IT FOR? Mainly future researchers and academics

HOW CAN IT BE USED? Can be shared in student and research communities to spark discussion and activate further work and development of the concept (diving in more detail into the different dimensions of exchange)

**UNLOCKING SOCIAL ENERGY
THROUGH RELATIONAL GIVING**

IN AMSTERDAM ZUIDOOST

LIFE SOCIAL COMMITTEE

SOCIAL ENERGY

ENERGY ACTIONS
LOCAL EXCHANGE PLATFORM
LOCAL TOKENS

(LARGE) ASSET OWNERS

LOCAL ASSOCIATIONS

LOKAAL GELD

COMMUNITY CENTRES & HUBS

LOCAL SMEs

ENERGY COMPANIES

LOCAL RESIDENTS

MUNICIPALITY

LOCAL CO-OPERATIVES

LOCAL ENERGY INITIATIVES

RESEARCH PROJECTS

VVE'S

DSOs & TECHNICAL NETWORK

INSIDE - OUT STRUCTURE

A SOCIAL CENTRE

This framework for Social Local Relational Energy Ecosystem revolves around a social centre. A social centre which **places local residents and their preferences and capabilities at the core,** not the energy grid. A social centre which connects local people to local organisations and initiatives to expand networks and strengthen ties. A social centre which is inclusive and enables participation and contribution in multiple forms, from actively giving energy actions to investing in local tokens. A social centre which recognises the potential of a local neighbourhood and creates space and opportunity for new ideas, partnerships and commitments. This is an energy ecosystem which expands from the inside - out, enabling relationships to form within and between layers and levels.

ENERGY ACTIONS: A GATEWAY

Energy Actions, arranged and organised through a local exchange platform, are a **gateway for enabling relationships to form** on a micro level between residents, but also on a local and systems level between organisations, associations and institutions. Local neighbourhood initiatives, community centres and even research projects can all be collaborators in Energy Action exchange, for example: a Living Lab can offer Energy Actions in the form of co-research, Community centres can provide spaces for Energy Actions such as educational workshops and trainings, VVE's can commit to doing Energy Actions to foster a sense of collective responsibility and local energy initiatives can reach more residents who are willing to give their time and skills.

LOCAL TOKENS: A TOOL

Local tokens form part of the local exchange platform and are means for incentivising the giving of energy actions, recognising local contributions and facilitating relational giving between socially distant and disconnected individuals and groups. Local tokens, in cooperation with Energy Actions, are **a way to start unlocking social energy** in neighbourhoods and allowing this value to circulate locally. Local tokens can be used in various ways in this ecosystem, for example: they can be given in return for an Energy Action, can be added to communal funds or allocated to hubs and cooperations.

LIFE SOCIAL COMMITTEE: A CONNECTOR

The LIFE Social Committee is a board or organisational party consisting of local residents and representatives from all of the actors within the social centre. They act as a bridge between outside (or exo and macro level) actors with those on the local neighbourhood (or meso) level, and vice versa. The LIFE Social Committee enables communication, transparency and collaboration between different groups and stakeholders, **connecting them through a common goal:** a socially inclusive energy transition in Amsterdam Zuidoost. Examples of this bridging role include: mediating between local (energy) communities and the Johan Cruijff Arena to make use of their battery and distributing local tokens sponsored by the municipality to trusted local decision makers and relevant organisations.
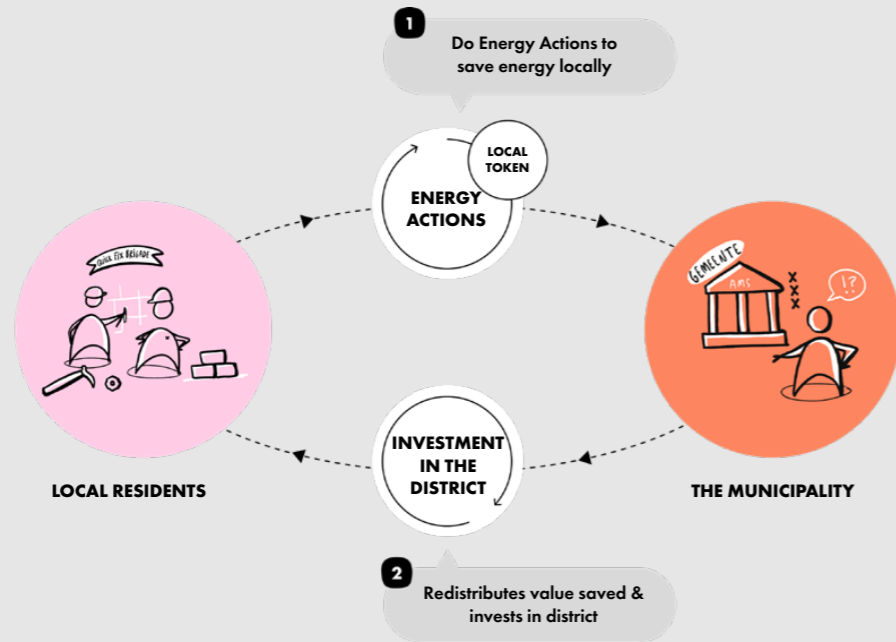
Fig 70. Framework for a Social Local Relational Energy Ecosystem

4.5.3 | THREE SCENARIOS FOR ENERGY ACTIONS IN ZUIDOOST

SCENARIO 1

ENERGY ACTIONS →
INVESTMENT IN ENERGY ASSETS

1 Do Energy Actions to save energy locally

LOCAL TOKEN
ENERGY ACTIONS
INVESTMENT IN THE DISTRICT

LOCAL RESIDENTS

THE MUNICIPALITY

2 Redistributes value saved & invests in district

STARTING POINTS

LOCAL RESIDENTS

Local residents living in Venserpolder do not have their own energy assets

Residents are socio-economically challenged

Local residents want to share and practice their skills and learn from each other

Local residents want to have choice and control in their energy system

THE MUNICIPALITY

Fixes and renovations to make homes more energy efficient are important for the city

The municipality wants Zuidoost to be energy neutral by 2040

EXCHANGE

1. Local residents do Energy Actions using local skills to **renovate, fix and save energy.**

2. The municipality **re-distributes and invests the value saved** by local Energy Actions back into the district, e.g. in energy assets.

ROLE OF ENERGY ACTIONS

Residents do Energy Actions to acquire investment in local energy assets e.g. from the municipality.

RELEVANT ENERGY ACTIONS

Energy Actions which **save costs and are valuable for the municipality.** Particularly relevant Energy Actions include **installing energy saving devices, renovation, fixing and ventilation.**

SCENARIO 2

ENERGY ACTIONS →
AFFORDABLE LOCAL ENERGY
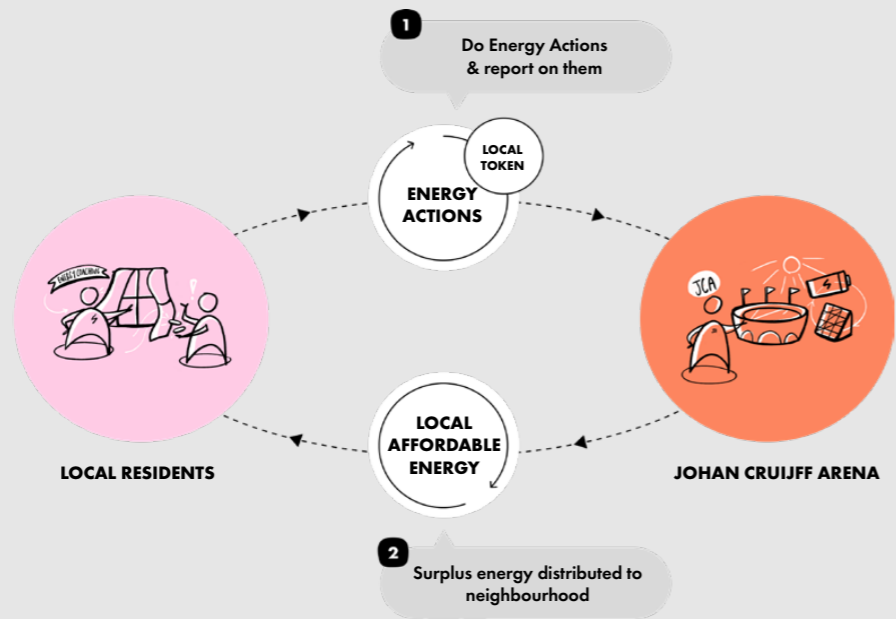
1 Do Energy Actions & report on them

LOCAL TOKEN
ENERGY ACTIONS
LOCAL AFFORDABLE ENERGY

LOCAL RESIDENTS

JOHAN CRUIJFF ARENA

2 Surplus energy distributed to neighbourhood

STARTING POINTS

LOCAL RESIDENTS

Local residents living in Venserpolder do not have their own energy assets

Residents are socio-economically challenged

Local residents want to share and practice their skills and learn from each other

Local residents want to have choice and control in their energy system

JOHAN CRUIJFF ARENA

JCA has flex assets and the means to give surplus energy

JCA needs to be able to report on Economic, Social and Governance factors

EXCHANGE

1. Local residents **commit to doing Energy Actions and reporting on them.**

2. Surplus energy from JCA's battery is **supplied and distributed to the local neighbourhood.**
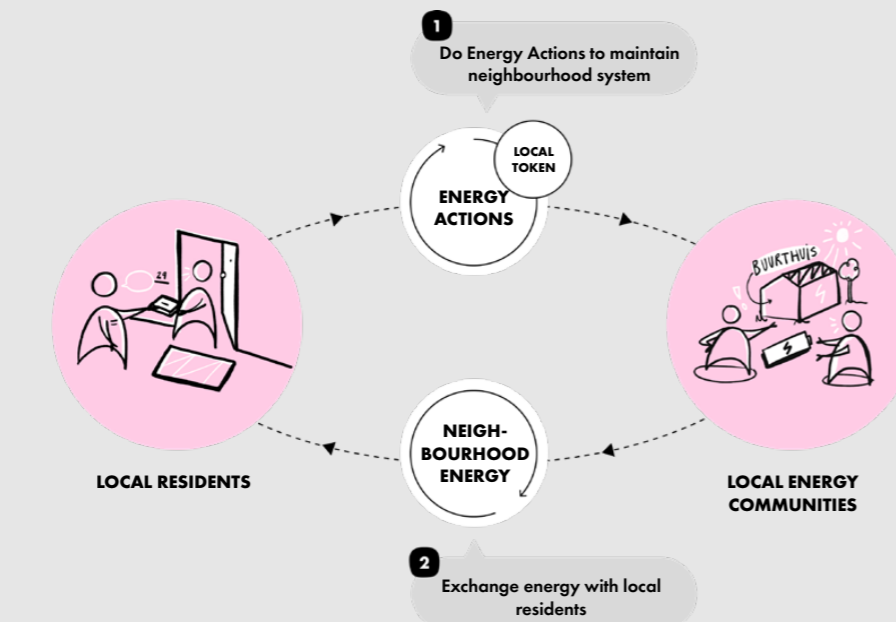
ROLE OF ENERGY ACTIONS

Residents do Energy Actions to acquire local affordable energy from the Johan Cruijff Arena/ or other large local asset owners.

RELEVANT ENERGY ACTIONS

Energy Actions which can be **recorded and reported upon.** This could include a **diversity of actions** such as handy work, fixing, education and communication.

SCENARIO 3

ENERGY ACTIONS →
ENERGY COMMUNITIES

1 Do Energy Actions to maintain neighbourhood system

LOCAL TOKEN
ENERGY ACTIONS
NEIGH-BOURHOOD ENERGY

LOCAL RESIDENTS

LOCAL ENERGY COMMUNITIES

2 Exchange energy with local residents

Fig 71. Three scenarios for integrating Energy Actions into Amsterdam Zuidoost

STARTING POINTS

LOCAL RESIDENTS

There are more local energy assets in neighbourhoods in the district

Residents are socio-economically challenged

Local residents want to share and practice their skills and learn from each other

Local residents want to have choice and control in their energy system

LOCAL ENERGY COMMUNITIES

Local energy communities need to organise exchanges and manage and maintain local assets

Local energy communities want to use local expertise and create local value

EXCHANGE

1. Residents do Energy Actions to **manage and maintain a neighbourhood energy system.**

2. Local energy communities can **exchange local energy** with local residents.

ROLE OF ENERGY ACTIONS

Residents do Energy Actions to join local energy communities and acquire local neighbourhood energy.

RELEVANT ENERGY ACTIONS

Energy Actions which **support local energy communitie**s are especially relevant e.g. managing an energy community, organisation of exchanges and maintenance of community assets.

JEPPE → Retired pensioner

MEMBER SINCE: FEB 2023

ABOUT: I am a recently retired engineer and live alone in an apartment block in Venserpolder. Zuidoost has been my home for over 40 years and I know the place like the back of my hand, but people come and go so it can be lonely.

VALUES: I am proud of Zuidoost and my neighbourhood and now that I have more time on my hands I would like to give back and meet new people. My health is not what it was so I don't get out and about as much as I want to.

SKILLS: Expertise and technical knowledge about the energy transition

WALLET ▶

1 LOCAL TOKEN
1 LOCAL TOKEN

ENERGY ACTIONS TO GIVE

ENERGY ACTION OFFER

I can share my knowledge about energy systems and the energy transition, and what this means for local residents in Zuidoost.

TIME: 1 hour

TOKENS: 4 tokens

I can prepare a presentation but as this takes time I would expect more in return.
Jeppe

ENERGY ACTION OFFER

I have years of experience in the energy sector. I can give advice on a range of things including energy audits and renewable appliances.

TIME: 1 - 2 hours

TOKENS: 3 tokens

Happy to share my knowledge where needed!
Jeppe

LOOKING FOR...

COMMUNICAITON	HANDY WORK
I am looking for someone who can make a poster/ social media post for the next VVE meeting.	I am looking for someone to seal my windows and doors. My bad back means I can't do it myself.

COMMUNICAITION

TECHNICIAN

SELENA → High school student

MEMBER SINCE: MARCH 2023

ABOUT: I was born in Zuidoost and have lived here ever since with my parents and brother. I am finishing high school next year and then I want to stay here and start working somewhere locally.

VALUES: Hanging out with my friends is important to me. I'm always up for meeting new people too but I don't think there is so much for us young people to do around here. I really like graphic design and want to be able to practice what I've learnt. I can be more independent if I start earning.

SKILLS: Graphic design, communication, social media and video creation

WALLET ▶

1 LOCAL TOKEN
1 LOCAL TOKEN
1 LOCAL TOKEN

ENERGY ACTIONS TO GIVE

ENERGY ACTION OFFER

I have lots of ideas for creating a public art piece about the energy transition in Zuidoost. Reach out if you are interested to hear more.

TIME: 2 days

TOKENS: 10 tokens

I am would love to do this and make my mark in Zuidoost!
Selena

LOOKING FOR...

EDUCATION	FINANCIAL ADVICE
I want to make a video about renewable energy in Zuidoost and am looking for someone to interview.	My family is thinking about making an investment into renewable energy, but want some financial advice about this.

PEDRO → Unemployed newcomer

MEMBER SINCE: APRIL 2023

ABOUT: I am really new to Zuidoost. I only moved here a couple of months ago and have been trying to settle in and find myself a job, but no luck so far. I have to rely on social care benefits to get by at the moment.

VALUES: I have years of experience in construction and I want to start making and fixing here. I love doing things with my hands, it makes me feel productive. It's important for me to feel like I belong here and to build my own network. Hopefully that will help me find a job too!

SKILLS: Handy work, construction, fixing and making

WALLET ▶

1 LOCAL TOKEN
1 LOCAL TOKEN
1 LOCAL TOKEN
1 LOCAL TOKEN

ENERGY ACTIONS TO GIVE

ENERGY ACTION OFFER

Through construction work I have some experience in plumbing and electrical jobs. I can at least assess the problem to see what can be done.

TIME: 1- 1.5 hours

TOKENS: 2 tokens

I have some experience, but I am not an expert, though I want to learn more.
Pedro

LOOKING FOR...

ADVICE	ORGANISATION
I am looking for someone who	I am

ENERGY ADVICE

JULIA → Working parent

MEMBER SINCE: OCT 2022

ABOUT: I live in a rented apartment in Zuidoost together with my husband and three small children. I work full-time for a catering company. During the week my husband, sister and parents help to look after the kids.

VALUES: Family time is very important for me. I love children and would love to make teaching my job, but I need to gain some more experience first. I like being outdoors too and try to help in the community garden when I can.

SKILLS: Teaching children, creativity, gardening, organisation

WALLET ▶

1 LOCAL TOKEN
1 LOCAL TOKEN
1 LOCAL TOKEN

ENERGY ACTIONS TO GIVE

ENERGY ACTION OFFER

I can give a tour of out local bio-digester and explain how we use this for the community garden.

TIME: 30 mins

TOKENS: 1 token

I am happy to do this when I'm busy in the garden anyway.
Julia

ENERGY ACTION OFFER

I can give a tour of out local bio-digester and explain how we use this for the community garden.

TIME: 30 mins

TOKENS: 1 token

I am happy to do this when I'm busy in the garden anyway.
Julia

EDUCATION

LOOKING FOR...

HANDY WORK	ENERGY ADVICE	TECHNICIAN
I am looking for someone to help me change my light bulbs to LEDs.	I am looking for someone to do a basic energy audit of my home.	I am looking for someone to take a look at my radiators which are not working properly...

Fig 72. Energy Actions enactment game

HIGHLIGHTING THE VALUE OF LOCAL RESIDENTS

The Energy Actions Enactment Game allows stakeholders, partners and potential end-users to 'step into the shoes' of residents and 'experience' the potential values which they could bring to a Social Local Relational Energy Ecosystem. The game focuses on the concept of Energy Actions and asks players to 'give' and 'receive' actions, to utilise their own skills and capabilities and fulfil their needs. Local tokens are introduced as sponsorship from an organisation or institution such as the Johan Cruijff Arena or the municipality, and can be given in return for actions and services. The aim of playing the is game mutli-fold: providing tangibility to a complex system, prompting discussion and reflection, inspiring new ideas and crucially, highlighting the value that local residents could bring to a system which is designed to actively include them.

4.5.5 | A VISION FOR ZUIDOOST

Presented are the key frames from the video designed to communicate the vision for
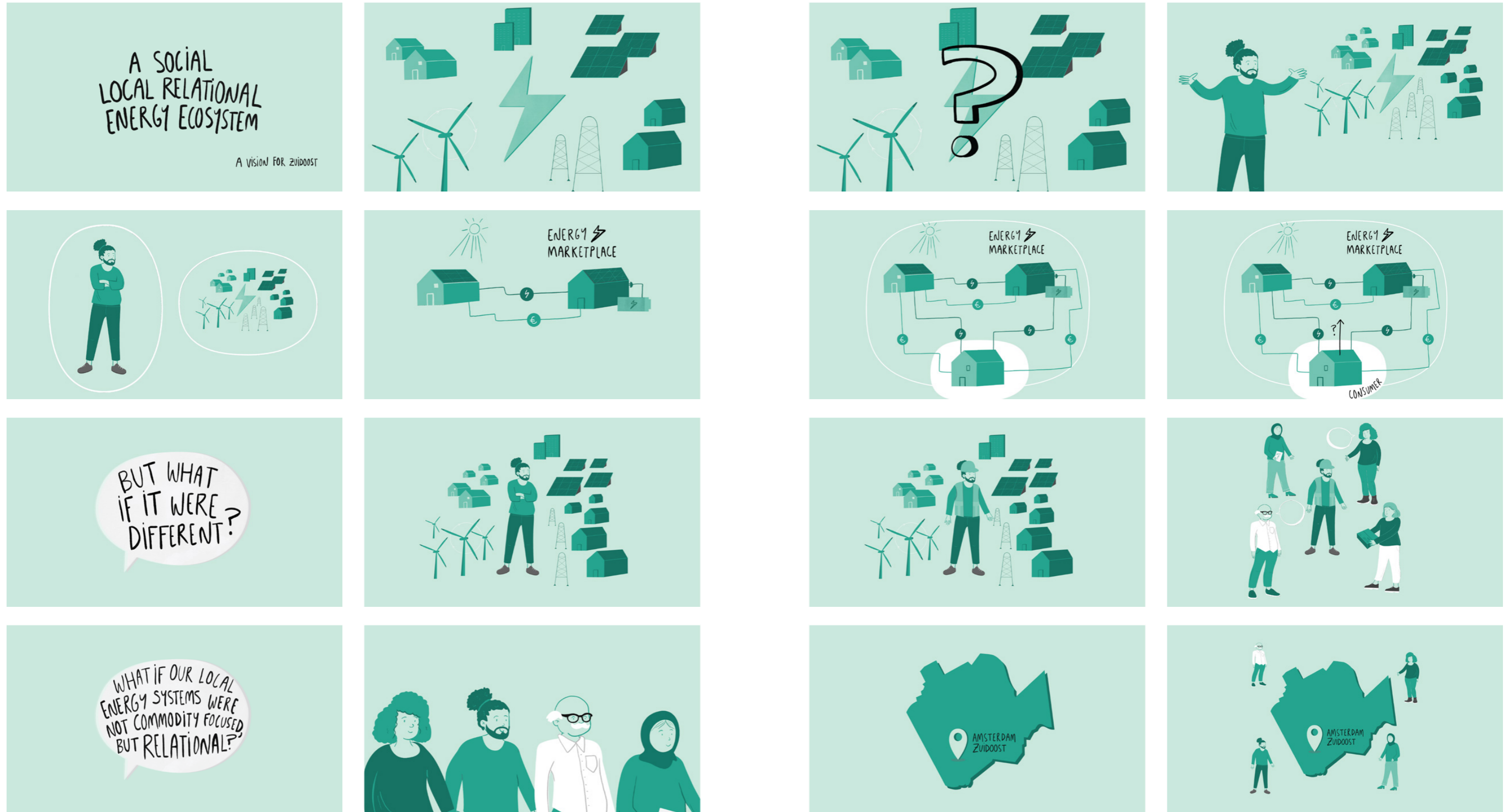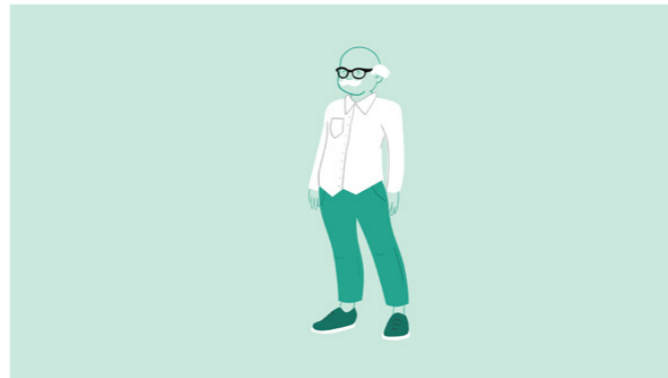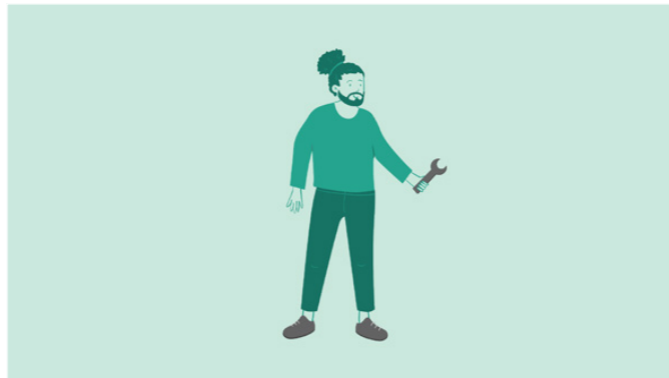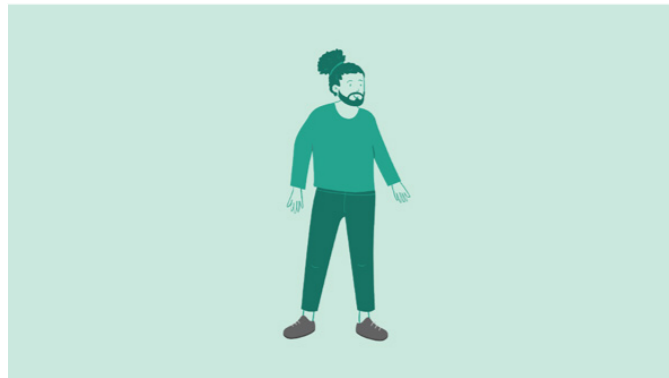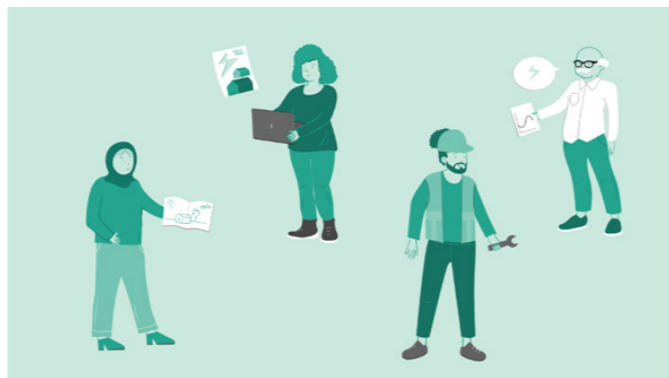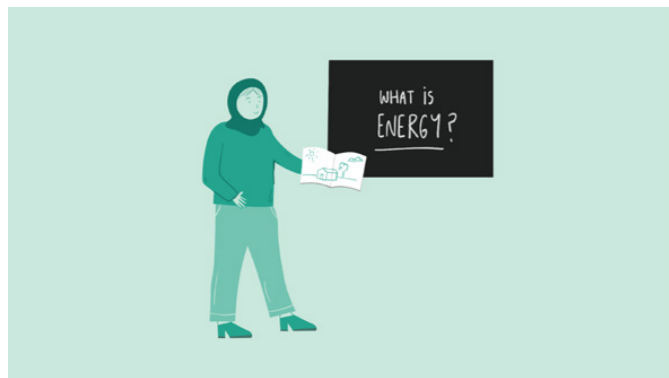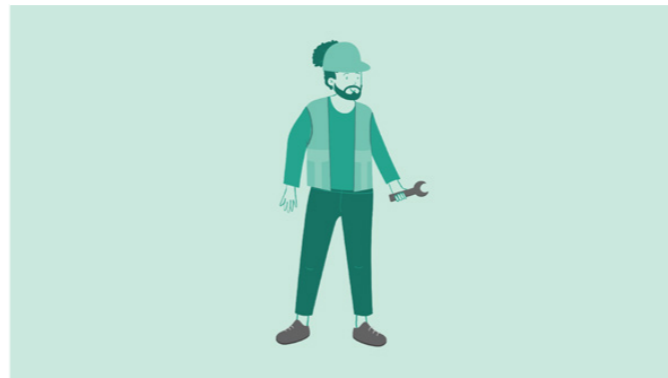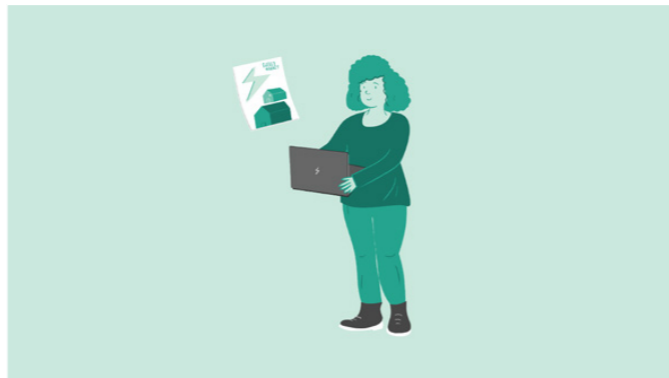'A Social Local Relational Energy Ecosystem' through storytelling.

Fig 73. Frames from the video of the vision
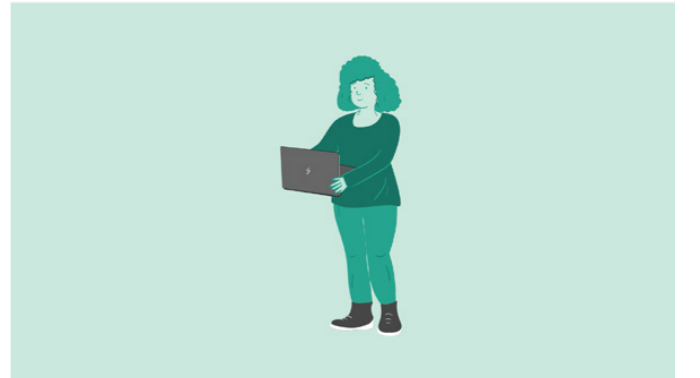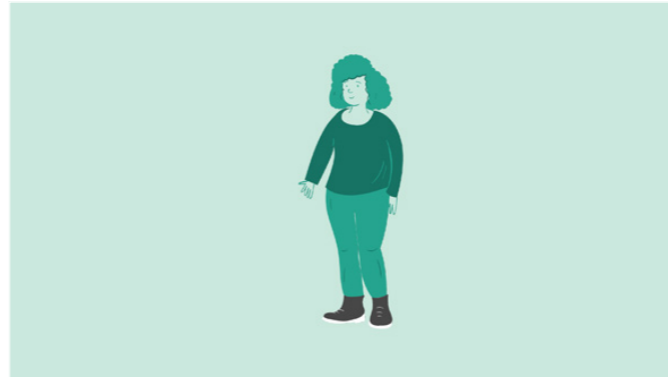
RELATIONAL GIVING
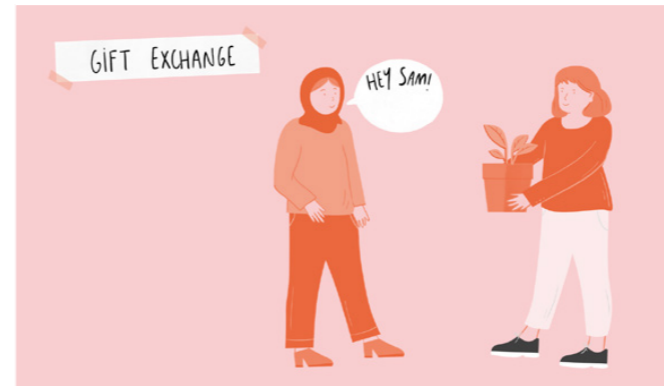= EXCHANGE WHICH
ENABLES THE CREATION
AND STRENGTHENING OF
SOCIAL RELATIONSHIPS

ENERGY
ACTIONS
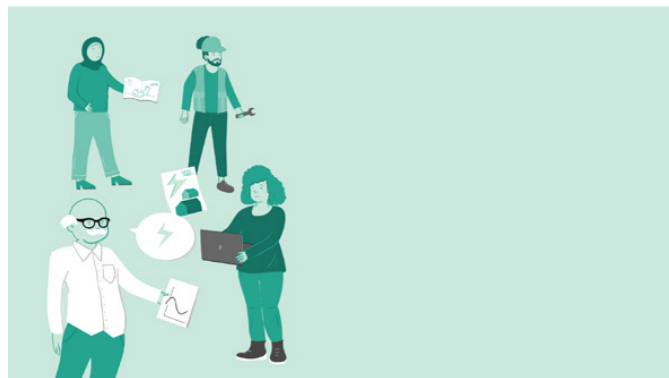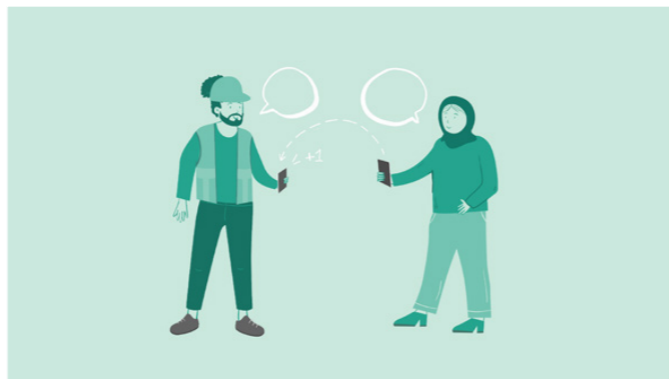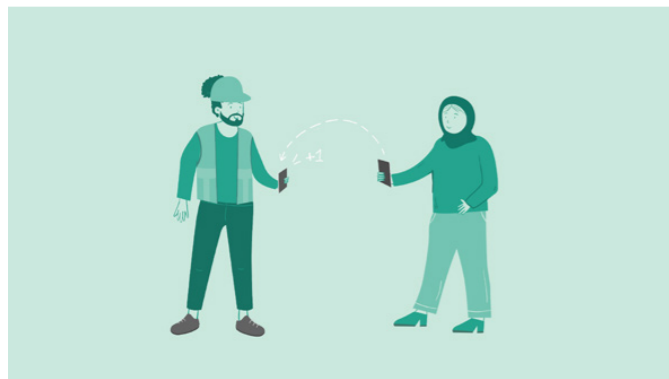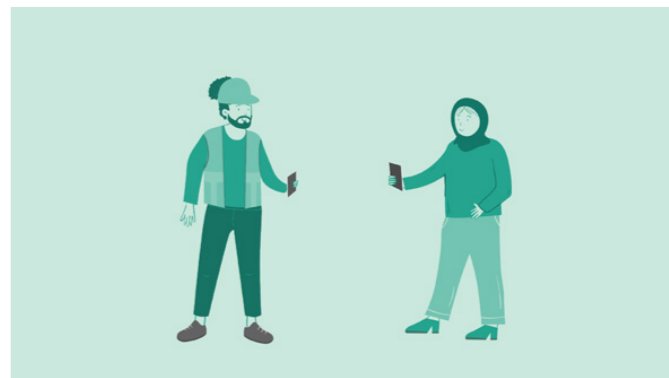
Presented in this sub-chapter are the key frames created for the video to explain 'relational giving'. *Due to the time limitations of the project these frames will be combined into a video at a later stage.*

Fig 74. Frames from relational giving explanation video

5.0
CONCLUDING

This section concludes this thesis and presents the findings from the evaluation and recommends next steps for further work.

5.1 | DESIGN EVALUATION

IN SHORT

In this chapter the concept is evaluated through multiple activities. The activities are introduced in short and the key findings are listed. The chapter concludes with a summary of the findings related to energy actions, local tokens and the ecosystem as a whole.

GOAL

The goal of the design evaluation focused primarily on evaluating the feasibility, desirability and viability of the concepts, and not the form or media they were embodied in. Although in most activities participants still provided feedback and suggestions for improvement for the design outcomes, such as the video or Energy Actions enactment game.

APPROACH

Multiple evaluation activities were undertaken to evaluate the design concept: group evaluation sessions, individuals meetings with experts from their respective perspectives and a digital follow-up form, designed to enable reflections after the sessions. The aim of the group sessions was to provoke discussion and activate stakeholders in considering potential next steps for taking the concept further. The meetings with experts focused more on one specific component of the concept (e.g. the connection to local tokens) or asked questions related to their particular role in the proposed ecosystem (e.g. how the municipality could fund or sponsor local tokens). The follow-up questions allowed for responses to the same questions to be collected from a variety of perspectives, thus enabling direct comparison between them.

5.1.1 | EVALUATION ACTIVITIES

EVALUATION QUESTIONS OVERVIEW

The key questions asked were related primarily to the desirability, feasibility and viability of the proposed concepts. As outlined in sub-chapte 4.5.1 a mix of media and design outputs were created. To communicate the proposed conceptual system, and to fit within time constraints, only some of the outputs were presented in the evaluation activities. The outputs deemed most suitable (most engaging and informative) were the video of the vision, the energy actions enactment game and the concept scenarios. The key, general, questions are listed below.

DESIRABILITY	Q1. Are energy actions valuable to project partners and potential end users?
FEASIBILITY	Q2. How feasible is implementing energy actions in Amsterdam Zuidoost?
VIABILITY	Q3. Are energy actions valuable and feasible in the long-term, in relation to LIFE?

EVALUATION SESSIONS

Two evaluation sessions where undertaken: the first session involved experts and partners from the perspective of local tokens and the second session was conducted core members of the LIFE Project consortium. Canvases and templates were created to support reflection.

AIM	TO DISCUSS, REFLECT AND EVALUATE THE CONCEPT OF ENERGY ACTIONS AND VISION OF A RELATIONAL ECOSYSTEM
WHEN	25.04.23, 10:00 - 11:30 AND 12:30 - 14:00
WHERE	HUIS VAN DE TOEKOMST, DE ENTREE 300, AMSTERDAM ARENAPOORT, ZUIDOOST
WHO	SESSION 1: DOEDE SIMONS (LOKAAL GELD & RESIDENT OF ZUIDOOST), THOMAS SIDERIUS (COMMUNITY WEALTH NIEUW WEST), MADELON TIMMERS (SOCIAL ENTREPRENEUR, RESIDENT OF ZUIDOOST) SESSION 2 : HANS ROELAND POOLMAN (STAKEHOLDER ENGAGEMENT), ESTHER JANSEN AND AVI GANSEN (PM TEAM), WOUTER METHORST (CO-FORCE), TIM OOSTEROP (JCA PARTNER), GIJS VAN LEEUWEN (LIFE SOCIAL PLATFORM), MARILOU VAN DER VLUGT (GRADUATION STUDENT)

SESSION STRUCTURE

ACTIVITY	GOAL	MATERIALS
1. Watch video of the vision for a local, social, relational energy ecosystem	To set the tone for the session and inspire future thinking and a relational approach	Video
2. Present content of session and introduce key research questions	To align the group on the goals of the session and their role in participating	Presentation slides
3. Short overview of the research process and key questions	Provide a glimpse of the project overall and the findings which led to the concept	Presentation slides
4. Play energy actions game and step into the shoes of a local resident	To experience the proposed system and consider the value residents can bring	Persona's and platform dashboards, energy actions cards, local tokens
5. Present and discuss the three possible scenarios	Place the conceptual ecosystem and energy actions into the LIFE Project	A3 print outs of scenarios
6. Collectively come up with actionable next steps to further explore this concept	To start making a move towards this vision and think more practically	Printed basic 'roadmap' / action plan template

Fig 75. Session 1 - local currencies perspective
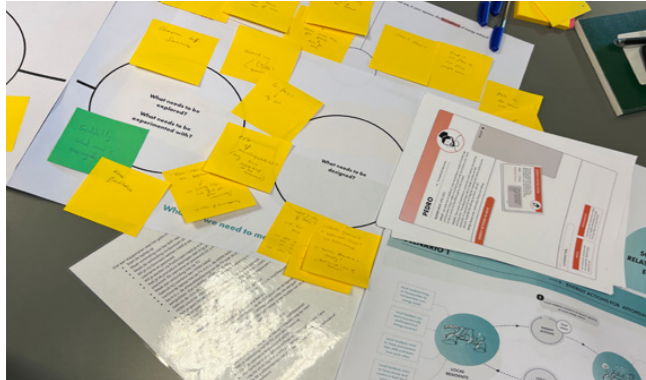

Fig 76. Session2 - LIFE Project perspective

Fig 77. Templates and canvases used in the sessions

Fig 78. The Energy Actions Game - in action!

EXPERT PERSPECTIVES

In addition to the two group evaluation sessions, three individual online meetings were also held with experts from different perspectives which are particularly valuable to the concept of energy actions and creating 'social energy for local energy'. The focus of each meeting was tailored to suit the expertise of the expert, although the general structure remained the same. The third meeting with a socially proactive resident of Zuidoost, working in the field of inclusive development, provided more insightful feedback from a potential user and collaborator in the ecosystem.

AIM	TO PRESENT AND REFLECT ON THE PROPOSED CONCEPTS WITH VALUABLE INPUT FROM EXPERTS		
WHO	MEETING 1: HUGO SCHÖBECK (TEAM LEADER MID NETHERLANDS, TRUSTEE ENERGYCOIN FOUNDATION, ENERGY & SUSTAINABILITY CONSULTANT, MEMBER OF GO-P2P NETWORK))	MEETING 2: ESTHER JANSEN, ANNOESJKA NIENHUIS (GEMEENTE AMSTERDAM)	MEETING 3: RIA BRAAF - FRANKEL (INCLUSIVE DEVELOPMENT COACH & PROJECT MANAGER, RESIDENT OF ZUIDOOST)

SPECIFIED QUESTIONS

MEETING 1: P2P & ENERGY COIN

Is it feasible to exchange energy actions for local tokens?

Are energy actions valuable for transition? How and why (not)?

What are the foreseen limitations and opportunities of social for local energy?

MEETING 2: GEMEENTE

Are energy actions relevant and valuable for the municipality of Amsterdam?

Is the municipalities support of energy actions feasible and maintainable?

Is the investment and sponsorship of local tokens valuable for the city?

MEETING 3: PROACTIVE RESIDENT

Are energy actions something residents would want to engage in? Why (not)?

Can local tokens incentivise energy actions? What are the limitations here?

Does the story and concept of creating 'social energy for local energy' resonate?

FOLLOW UP QUESTIONS

After both the evaluation sessions and the meetings with experts a short questionnaire (possible to complete in five minutes) was shared with participants. The goal of the questionnaire was to ask some more specific follow-up questions. It also gave participants the opportunity to provide additional feedback, remarks, questions and suggestions after having time to reflect on the presented concepts. Two forms were created to account for the variation in knowledge and relatedness to the LIFE Project. One form asked questions more specific to LIFE and the other was left more open and general. A definition of energy actions and a short description of the potential role of local tokens was also included. The main questions asked, and synonymous to both forms, are listed below.

ONLINE QUESTIONNAIRE

QUESTIONS

Q1. What was your key takeaway from the session?

Q2. How feasible do you think energy actions are for the energy transition in Amsterdam Zuidoost? (scale 1- 7)

Q3. Please give a short reason for your answer to Q2.

Q4. How valuable do you think Energy Actions are for the energy transition in Amsterdam Zuidoost? (scale 1-7)

Q5. Please give a short reason for your answer and explain which values you think of?

Q6. Are there specific energy actions which you think are valuable in Zuidoost? Please select all that apply.

Q7. Is there an Energy Action which you think is most valuable for the district, local residents and the transition? If yes, why?

Q8. Which of the scenarios (for Energy Actions in LIFE and Zuidoost) is most relevant, from your perspective?

Q9. Please give a reason for your answer to Q8.

Q10. Which scenario(s) do you think could be realised within the next phase of the LIFE Project (1-2 years)?

Q11. In your opinion, what value can local tokens bring to the Energy Actions concept?

Q12. In your opinion, what are the limitations of local tokens in the Energy Actions concept?

Q13. What do you think is a possible next step for taking the concept of Energy Actions forward?

Q14. How did you find the session? Do you have any feedback or suggestions?

Fig 79. Google Form with follow-up questions

Energy actions concept for creating social energy for local energy in Amsterdam Zuidoost

A SOCIAL LOCAL RELATIONAL ENERGY ECOSYSTEM

A VISION FOR ZUIDOOST

5.1.2 | EVALUATION RESULTS

EVALUATION SESSIONS

KEY TAKEAWAYS FROM SESSIONS

Participants reflected on their key takeaway both after the session and through the follow-up form. Overall the session provided **inspiration and ideas,** and the story of energy actions helped them to **imagine more and (new) possibilities.** In some cases the session even managed to change initial perceptions and doubts about socially driven and local token exchange. The relational approach gave a different perspective. Participants also took away plenty of questions and **'food for thought'** particularly surrounding the connection between energy actions and local tokens, for example the form of the tokens and how their value is determined.

"I was more enthusiastic about Lokaal Geld (after my critical input in an earlier session)."

"What value to put on a social token: time? money?"

"Energy actions represent a bigger theme, a story people can connect to, and become part of."

"Looks like collective energy actions are most successful. When thinking together about enhancing the neighbourhood, great stuff happens!"

FEEDBACK ON SESSION CONTENT

The session structure and content itself was very well perceived by all those involved. In particular participants highlighted the Energy Actions enactment game and video of the vision to be useful tools for **provoking discussion** and inspiring new ideas and thoughts. In fact, participants were so engaged in the game in the second session that they expressed some disappointment when it had to be cut short due to limited time availability (1.5 hours for the entire session)!

"Very nice! A bit short on time. But I really liked the game."

"Well done! The role-play game was excellent and triggered nice discussions."

"Very inspiring"

"The game is a good introduction and tool for reflection."

GAME PLAY

Observations made during the playing of the energy actions game were noted. Excerpts from a few of the dialogue exchanges between players, which sparked interesting discussion are outlined below (using initials of the persona names).

GAME DIALOGUE EXCERPTS

P: *"This is the relational part right?"*

J: *We don't have to swap tokens because it's the same value"*

Ex. 1

J: *"I think it's about an hour of work, maybe an hour and a half"*

J: *"If that is all you can afford I am perfectly fine. You can make me dinner once."*

Ju: *"Sure, no problem."*

Ex. 2

S: *"Maybe I can help with organising an inspiring event?"*

P: *"But I already got his help. But maybe we can do one big event together where you give advice on energy systems and we get kids involved, the we have everything."*

Ex. 3

J: *"I have to be smart and sell myself."*

Ex. 4

J: *"So then do we still exchange any tokens? Because it would be nice if I can earn another token so that I can have some handy work done at home."*

P: *"I can give you another token for the deepening of your advice."*

Ex. 5

J: *"I spent a lot on communication, so I'm hoping this communication can bring me new customers."*

J: *"Hopefully more people will get to know about my skills and I might earn some more tokens so that I can get my handy work done."*

Ex. 6

KEY FINDINGS/ THEMES

Ex. 1   **Exchanging and/or asking for local tokens did not immediately come to mind.** Players, from the offset, were more focused on swapping energy actions directly and finding out who needs something which they can offer.

"My first reaction was that I wasn't even thinking about the money. We he needed something from me I was like, oh we can just exchange."

"It felt most valuable when we didn't need the tokens. Because you can just do it in actions. I think that was the goal for me."

Ex. 2   **Used 'time' to determine the exchange rate of an energy actions for local tokens.** The value of the tokens was decided on between the individuals exchanging and no 'hard' rules were set or decided upon. It was a mutual understanding.

"We collectively determine the value of the tokens. That's not predetermined. There's not something outside of the this system. We only need what is in this neighbourhood."

"One hour is two tokens."

Ex. 3   **Teamed up and combined energy actions to include different peoples unique skills.** Several times players found opportunities to do collective actions. These were deemed more special and incentivsed the giving of tokens in support.

"I think it was more special when we had something with the three of us, compared to just two. When you're making a connection with three or four, I think you get better connected with all of you. So the actions are more collective, they're more special."

"She got 10 tokens but her purpose was very clear, it was for the community."

Ex. 4   **In-demand energy actions hold more power in the system.** Those who have skills which many others want, ultimately have more power and can get more local to. This meant that other players felt the need to 'pitch' their skills.

"I can fix everything if nobody needs anything fixed and everybody wants to know about energy systems then suddenly you've become very powerful, and I've become powerless. So it's just about what people need."

"Often handy men in these systems will accumulate a lot of coins or credits."

Ex. 5   **Tokens enable the receiving of needed actions.** In some instances players were not satisfied with doing something 'for free' (or in exchange for action which they didn't specifically need). They wanted tokens to be able to request a new action.

"You earn tokens in order to buy something, some service from someone else."

Ex. 6   **Energy actions can showcase skills and help to bring in more requests (to help get more tokens).** Players could use each others skills to increase their credibility, showcase their capabilities and become more visible to others.

"'Paying' for one energy action, like communication, could actually help you to receive more energy action requests from others. So it's not like one action for another action, but it can have a multiplier effect."

EXPERT PERSPECTIVES

The key feedback from the three expert perspectives is outlined below. These comments refer to several of the 'specific questions' listed in the previous sub-chapter. The subsequent evaluation summary contains more results from these meetings.

P2P & ENERGY COIN

Case studies, such as the Brixton Pound, have shown local tokens to be attractive and feasible. There is scope for exchanging local tokens for energy actions and it is feasible. The challenge is reaching people and knowing where to start.

" I think the feasibility is certainly there and it is certainly attractive for people."

" The story around it and that you are actually doing something against the big boys is attractive for a certain group of people."

This concept is novel: it bridges the Brixton Pound and Brixton Energy. Both local tokens and 'energy actions' (coaching, fixing etc.) exist and are working independently. This concept is a great opportunity to bring them together.

" I was the co-founder of Brixton Energy and Re-powering London... you are actually combining the Brixton Pound with Brixton Energy, which I think is brilliant because it hasn't been done before

Social cohesion is needed for participation. Energy actions and relational giving highlights that this is a crucial first step.

" The response to [energy initiatives] is much higher in neighbourhoods that have more social cohesion."

GEMEENTE AMSTERDAM

Energy actions are valuable and can be supported by the city. It is more feasible for energy actions to be funded if they are connected to existing local organisations, initiatives and cooperatives such as Co-Force.

" Anything which residents are doing to be more social and sustainable is of value to the city."

" We can provide subsidies projects and cooperatives in Zuidoost. Individuals can also apply. 75,000 Euros have been given for funding these kinds of things."

PROACTIVE RESIDENT

There is a community culture of short-term benefits. Residents want money to be able to purchase exactly what they need, they are not looking ahead to long term impact or value.

" There is a community culture that residents look for short-term benefits."

Diversity and a variety of options is more desirable. Residents want to have choice in how to use the local tokens.

" You need a very strong base of all sorts of incentives."

OVERALL RESPONSE TO CONCEPT & KEY DESIGN OUTPUTS

Overall there was a very positive response to the concept of energy actions and the vision for a social, local, relational energy ecosystem. Participants reflected that conceptually it is very strong and that the story behind it can resonate with residents and engage stakeholders. Uncertainties did arise regarding the feasibility of the concept, particularly from those from Zuidoost and who are very familiar with the context and (lack of) social relations between groups. This summary attempts to provide only an overview of the key findings of all of the evaluation activities and focuses primarily on the concept of 'energy actions' as well as the connection to local tokens. Possible next steps are presented in a later chapter.

VIDEO OF VISION

Participants found the video **engaging, inspiring and remarked that it tells a story which residents can relate to and get behind,** especially for those who are not aware of or informed about the transition.

"It's interesting that you connect social energy with solar energy. That's an engaging concept. Also it tells a story people can connect to."

ENERGY ACTIONS GAME

Participants of the session enjoyed playing the game and appreciated this form of tangible interaction as means to prompt discussion. Suggestions for improving the game included: adding a token hub for the 'inflow' of tokens, **adding a section to the dashboard for recording the number of connections and actions made and perhaps using additional props to visualise the impact of these actions.**

"What I find extremely interesting is that it allows us to engage with stakeholders to get a better understanding of their preferences and why they would engage in such an activity."

KEY QUESTIONS

DESIRABILITY	VALUE POTENTIAL	CHALLENGES FOR ENGAGEMENT
Q1. Are energy actions valuable to project partners and potential end users?	Increased awareness	Conflict of 'payment' for voluntary work
	Stronger sense of community	Providing enough flexibility and choice
All participants found energy actions to be valuable for Zuidoost. **66% found them to be very valuable.**	Spread knowledge about the transition	Culture of 'short term benefits'
	Boost energy literacy	Making impact visible
	Sense of empowerment by contributing	Including the most vulnerable
	Benefit from local skills and knowledge	Cooperation of local groups
	Inclusion of vulnerable groups	Relevant business case for local organisations
	Access to renewable, affordable energy	

FEASIBILITY	IMPLEMENTABLE BECAUSE...	DIFFICULTIES IN REALISATION
Q2. How feasible is implementing energy actions in Zuidoost?	Lot of potential for change	Including the larger energy system
	Many ongoing activities	Scaling to involve more neighbourhoods
All participants found energy actions to be feasible in Zuidoost. **77% found them to be feasible or fairly feasible.**	People seem to value community	An inter-cultural plan is needed
	Residents can contribute their own skills	Matching "supply" &"demand" of actions
	Something in it for local groups	Neighbourhoods are very fragmented
	Potential for Doughnut Economy structure	Ensuring there is enough network diversity
	More and more assets will be introduced	Contextually based and dependant
		Complex large multi-stakeholder context
		Energy: public vs. private

VIABILITY	LONG-TERM POTENTIAL	CHALLENGES FOR SUSTAINING
Q3. Are energy actions valuable and feasible in the long-term, in relation to LIFE and Zuidoost?	Lot of potential for change	Sustaining & maintaining inflow in system
	Many ongoing activities	Risk that certain actions go 'out of demand'
All participants agreed that energy actions are viable as they are **applicable to different near and further future energy scenarios in Zuidoost.**	People seem to value community	Subsidies and funds can dry up
	Residents can contribute their own skills	Maintaining strong organisational structure
	Something in it for local groups	Maintaining balance in the system

KEY OPPORTUNITIES AND CHALLENGES

OPPORTUNITIES		CHALLENGES	

ENERGY ACTIONS

Actions around saving energy (and reducing costs) will engage residents. Residents are incetivised to take part in actions which can bring financial benefits too.

"If you look at energy actions around saving energy, and the things that coaches from IWOON are doing, it's very popular."

Matching 'supply' and 'demand' of energy actions. To create an ecosystem of energy actions there needs to be a balance between what people need and can offer.

"Like how do you really match the demand and the supplier? What can people give that somebody else wants?"

Collective energy actions have real social impact. Bigger actions which involve several people, or groups, can really support the strengthening of social cohesion.

"Focusing on the social component and making something really big for the neighbourhood is attractive."

Involving sufficient diversity in skills and actions. There could be many residents with the same skill-sets which makes 'exchange' less valuable and relevant.

"Sometimes it is tricky to get enough diversity involved. By diversity I mean what the system offers."

Eagerness to build networks and bridge silos. Smaller community groups want to connect with others. Energy actions can enable this.

"We had two meeting with the Surinamese community and they cooked for us. There is an eagerness to connected to the wider community."

Balancing power dynamics which result from a disparity between popular and unpopular actions. Some actions are more popular than others meaning that those with in-demand skills have more power in the ecosystem that those with less desired skills.

"Handy work is always the most used and sought after skill."

Makes local skills visible so working partnerships and cooperatives can be formed and started. Energy actions shines a spotlight on the potential in the neighbourhood and opens the door to new possibilities and ideas.

"For instance a group of cleaners: you can bring people together with the same skills so they can work together for a bigger companies."

"Working in networks and seeing how your skills are complimentary."

Including energy actions which are not tangible/ do not have visible effect. Information and education energy actions can have long term impact and can help create systemic and cultural change, but in the short-term they do not provide visible effect meaning that residents might not see the value in 'giving' or 'receiving' these actions.

"I'm not sure if people are willing to 'pay' for information with their token... They want tangible things or things that can reduce their bills."

Supports personal development by identifying and contributing own skills. Energy actions shines a spotlight on the potential in the neighbourhood.

"It becomes more of an educational thing. What is your talent and how can you contribute to the bigger picture?"

Enable education and learning outside the school system. For young people energy actions offer a way to gain work experience.

"Students in this area can already start to work outside of their school system as a small side job, earn tokens and be trained..."

Help to break stereotypes around practical jobs/ craftsmanship. Energy actions offer way to share and pass on (practical) skills to the next generation.

"Handy men have problems passing on their skills. It's not considered a 'juicy' job but they are earning a lot of money."

LOCAL TOKENS

Enable connections to form between socially distant residents. Local tokens have the opportunity to close the social gap between (vulnerable) groups in Zuidoost by providing a tool and means for exchange. Tokens, and token exchange platform, offer the possibility to 'give' and 'receive' between new and unfamiliar people. Ultimately the tokens are a mechanism to trigger the creation of 'social tokens' by supporting relational giving.

"The purpose of a local token could be to grow, to allow transactions, not necessarily between people that know each other."

"How do you actually start stimulating that cohesion? Now if I have a few tokens I can pay her because she is willing to spend time doing something for me...at least it could get things started."

"You can work with tokens but maybe after the connections have been made, you can do without."

Determining the value of local tokens in relation to energy actions in a just way. There are numerous possibilities here but the challenge is in creating an ecosystem which empowers all residents to do energy actions, and does not favour those who are already more financially secure.

"How do you set and decide what the value is of 1 token for 1 energy action?"

Scaling a local token network. It is difficult to scale a local currency or coin because strong nested and diverse networks are needed.

"Just as the limitation with any LETS system, scaling up is very difficult."

Reward and recognise the contributions of local people and a diverse set of skills. Local tokens offer a reward or return for energy actions but can also be integrated into other local services to include as many (vulnerable) residents as possible.

Offer a way for active participation in the transition, which is not dependant on financial means. Residents who are currently excluded from the transition, because they cannot afford to invest in assets etc., can be active collaborators with the support of a local token network which retains and circulates value locally.

Provide possibilities for investing in the future energy landscape of the district. Local tokens can be given to and invested in local energy initiatives, projects and assets to see long-term change and accelerate progression.

Help to build better connections between the municipality and local neighbourhoods. The municipality can invest in local tokens and credit them to certain initiatives and organisation as means to support these neighbourhoods, whilst allowing the transition to happen 'from the inside out'.

"[Local tokens] can reward local contributions to the energy transition and embed it in a system of other skills - people who are not knowledgeable or have no skills to assist the transition can still be included and contribute now."

"Makes it more available for people who have less money to spend, but are willing to be active and creative with their actions."

"Provides an incentive to join."

"Local tokens can become part of the transition of the local neighbourhood (e.g. as a donation to a local initiative so it can save money on energy). "

"The city or government can say we want to stimulate these kinds of things in the area. So we credit this local organisation with some of these tokens. So that they can then reach out into the community and make use of and reward these skills."

"[Sponsoring local tokens] helps the city to go into an area which is unexplored."

Possible reprecussions of 'rewarding' volunteer work. The intrinsic motivation which is inherent and the driver behind volunteering work could be damaged by offering local tokens in return for services and actions.

Linking local tokens to energy prices. If tokens are to be connected directly to the value of energy (a possibility in the future) challenges need to be overcome in creating a linked 'pricing' strategy.

Including the most vulnerable groups who need financial support over anything else. Residents who are living in poverty and have very little desperately need Euros, not tokens. For these groups inclusion needs to take a different approach.

Retaining a perception of choice. Local tokens have the potential to be used in diverse ways but are often seen to be limiting, so disengage local people from interacting with them.

Giving local tokens for energy actions which are very valuable in Euros. Certain actions, such as renovation and fixing, are well paid in Euros. Therefore there may be little appeal for these skilled workers to accept tokens (likely of a lesser value).

"When rewarding volunteer work with tokens, the 'volunteer' aspect might disappear, which after a while might have negative effects on people's willingness to do actual volunteer work."

"kWh prices fluctuate wildly so fixed linking is tricky, also if the token has a Euro value you have three variables. Therefore you need to allow for time of use pricing which also helps in stabilising the grid"

"kWh prices fluctuate wildly so fixed linking is tricky, also if the token has a Euro value you have three variables. Therefore you need to allow for time of use pricing which also helps in stabilising the grid"

"One of the things I hear people say is that 'when I get money I can decide what to do with it'"

"But it's a problem that [handy work] is really expensive usually, and therefore they [handy men] might be less inclined to join..."

"Some things are too valuable or too expensive to do [for local tokens]"

Providing agency to residents in managing and determining their own (eco)system. A social local relational energy system creates the potential for new structures and local organisation and decision making, which helps to empower collective action.

Expanding beyond energy to incorporate the transitions happening. This relational ecosystem has the potential to be wider reaching if it also encompasses other transitions and societal changes such as mobility and transport.

"The third scenario gives the most agency to local residents in managing their own energy assets."

"Important to provide bottom-up agency, sense of empowerment to people like they are contributing to something."

"I think there's much potential in Zuidoost, a lot is already happening. We need to connect to ongoing activities and focus more on actions, not just energy actions."

Ensuring the security and sustainability of the system in the long term and creating 'wide reach'. Starting this ecosystem is much more straightforward than sustaining it and enabling it grow. The challenge is in creating connections in the ecosystem which are strong and reliable and foster a sense of security for stakeholders and end users.

Providing a clear value proposition for a diversity of individuals. The municipality can invest in local tokens and credit them to certain initiatives and organisation as means to support these neighbourhoods, whilst allowing the transition to happen 'from the inside out'.

"The JCA Scenario could be interesting, but it will probably remain a type of philanthropic pilot, it is not something that will likely spread widely."

"It is all about a clear value proposition that is presented in an actionable way for individuals. This is where it's a catch22 while going through the early stages of product development of a new platform."

TO CONCLUDE - DESIRABILITY, FEASIBILITY & VIABILITY

EVALUATION OF ENERGY ACTIONS

Energy Actions are **desirable for both residential end-users and larger organisations** and institutions. They **incentivise participation** through social (and financial) benefits and encourage personal and community development. **Collective Energy Actions** in particular, which have visible and tangible impact for the neighbourhood can create and unlock value through collaboration. For local large asset owners and for the city Energy Actions are needed and wanted to meet **social and sustainability goals**, and to progress the transition. **Numerous activities, projects and initiatives already going on** in the neighbourhood demonstrate the feasibility for Energy Actions (especially if they connect to these existing groups). The **likely introduction of more energy assets** into the district in the future enhances the value proposition of Energy Actions further and will offer more and different actions which are needed (such as energy management, and asset maintenance on a community level). The key hurdles in regards to the feasibility and viability of Energy Actions concerns **balancing 'supply' and 'demand'** in the system and ensuring that local central actors do not emerge as a result. Ensuring there is **potential for a wide range of actions** (and thus local skills) to be included, and to benefit, is a challenge.

EVALUATION OF LOCAL TOKENS

Local tokens are desirable for residents because they offer potential for **improving and bringing value to their own local neighbourhoods.** In the context of energy local tokens enable residents to participate and be **active contributors**, regardless of their financial situation and be recognised and rewarded for their actions. By enabling connections between socially distant residents, local tokens can help to **close social gaps and create more socially cohesive neighbourhoods.** On a higher level local tokens can also be a means for building stronger connections between neighbourhoods and the municipality or other organisations who are willing to sponsor or fund these tokens. The feasibility of local tokens lies in their **ability to retain and circulate value within the community**. By determining the value of local tokens in relation to energy actions, an ecosystem can be created that empowers all residents and avoids favouring those who are financially secure. **Integrating local tokens into other local services** can help to include as many residents as possible. Local tokens can also be invested in existing organisation and energy initiatives, supporting long term change and helping to progress the transition. There are, however, **significant challenges to overcome** in successfully implementing and sustaining a local token network as **strong and diverse nested networks are needed**. The connection between local tokens and Energy Actions also raises potential pitfalls: Energy Actions which are very popular (such as handy work) may not be attractive for these skilled workers who can make high earnings when paid in Euros. Thus, making the added value of local tokens clear and relevant to residents is crucial. Similarly, retaining **the perception of choice and flexibility** is key and for local tokens to be successful in this context, residents should be able to use them in various places/ for multiple purposes.

EVALUATION OF A SOCIAL LOCAL RELATIONAL ENERGY ECOSYSTEM

Overall, the proposal for a 'Social Local Relational Energy Ecosystem' is welcomed. The **socially driven story** is engaging and puts energy exchange in a new light. **All three scenarios are seen as feasible** with the third scenario for Energy Actions in energy communities ultimately deemed the most desirable. Scenario 1 and 2 are considered possible within the next phase of the LIFE Project. **The viability of this ecosystem depends on the scalability and reach of the LIFE project** as this influences diversity and inflow into the system: How many asset owners can be engaged? How many neighbourhoods can be included?

5.2 | DISCUSSION

IN SHORT

In this chapter the initial research questions outlined in the project introduction are revisited and discussed. The concept of a relational energy ecosystem is also discussed in relation to the three design goals which have evolved throughout the project. Assumptions and possible contradictions which the concept poses are also outlined. The chapter ends with a reflection on the project achievements, potential impact and limitations.

GOAL

The goal of this section is to critically and analytically discuss the results of this project: specifically the concept of Energy Actions, the link to local tokens and the proposed relational ecosystem.

APPROACH

The evaluation activities described in the preceding chapter supported the writing of the discussion. During the sessions and in the individual meetings participants were encouraged to 'think out loud' and openly reflect and question. Some of these possible conflicts or uncertainties are included in the 'Interpretation of the proposed concept' section.

5.2.1 | RESEARCH QUESTIONS

ADDRESSING THE PRIMARY RESEARCH QUESTIONS

ORIGINAL RESEARCH QUESTIONS

Q1. What factors influence opportunities for socially inclusive energy exchange in Amsterdam Zuidoost?

The first part of this project, 'Explore', culminates in six emergent themes. These themes provide an overview of the key context factors which can be framed as both limiting and enhancing factors for the opportunity of socially driven and 'barter-like' exchange.

LIMITING FACTOR	ENHANCING FACTOR
1. FINANCIALLY VULNERABLE	
Zuidoost is a low income district where poverty, and energy poverty, is evident. Many residents live in social housing and have little disposable income. Vulnerable people and groups desperately need money to get by day-to-day. Thus the **need for financial security** limits opportunities for socially inclusive exchange which focuses primarily on fostering social and community value, and not financial support.	Zuidoost was built as a place to live, and not to work. Those who are earning are, for the most part, doing so outside of the district in other parts of the city and thus value does not stay or circulate locally. This presents an opportunity for socially inclusive energy exchange and specifically exchange which **fosters new value flows** within the boundaries of neighbourhoods in Zuidoost, helping to boost local activity and interaction.
2. SKILLS AND IDEAS TO OFFER	
Whilst residents have skills and ideas to offer, the priority of most residents lies in finding secure and stable employment/ source of income to sustain their families. Sharing and practicing skills is not seen as a priority. The **lack of time and flexibility** to invest their own abilities limits possibilities for socially inclusive energy exchange which asks people to engage in new activities or time-demanding actions.	Entrepreneurial behaviour, especially amongst the youth of Amsterdam Zuidoost, is practiced and there is a want to showcase talents, present ideas and practice skills. This desire for personal development and **proactive behaviour** creates space for socially inclusive energy exchange in the form of 'barter like' or 'non-monetary' exchange of services and skills.
3. DEVELOPMENT AREA	
Labelled as a 'development district' by the city, new research projects and proposals are constantly arising in Zuidoost. These projects often demand time and the participation of local people, but fail to make the impact or outcomes of their work visible. Thus **enthusiasm is waning** for more 'new ideas' and can be seen as a limiting factor for introducing socially inclusive energy exchange which proposes a different approach from what is customary.	Many residents of Zuidoost are proud of their district and do not want to it to be seen as a 'development area' ('ontwikkelingbuurt') but as resilient, diverse and proactive neighbourhoods. Focusing on what Zuidoost has to offer, instead of trying to 'fix' neighbourhoods, enhances the opportunity for socially inclusive energy exchange which **recognises the potential of local people and existing groups and initiatives**.
4. LACK OF COMMUNITY & COHESION	
The lack of social cohesion and sense of community in Zuidoost poses, in some respects, as a limiting factor for socially inclusive energy exchange which is driven by the creation of social values. **Residents remain within their own close-knit groups** and forming connections between these groups is challenging, creating a barrier for energy exchange which requires the collaboration and working together of local people.	In general, there is a desire to support and build the community but vulnerable residents, in particular, cannot afford to invest the time and resources into doing so. A '**sharing and caring' mentality** sets the foundation for socially inclusive energy exchange which enhances opportunities for enabling all residents to contribute to their community.

5. DETACHMENT FROM ENERGY SYSTEMS

Overall residents are disengaged, disinterested and even distrustful of energy systems. Energy is ambiguous, technocratic and complex to understand. This **disregard for energy and energy systems** creates barriers for participation and is thus a possible limitation for introducing socially inclusive energy exchange into Amsterdam Zuidoost.

There is a sense of loss of choice and control in current energy systems leaving residents feeling powerless and unimportant. The **need for agency and autonomy** in their lives, and energy system, leverages the opportunity for socially inclusive energy exchange which gives residents the choice and control they are lacking. The detachment from current energy systems presents the opportunity to create a new dialogue and narrative around local energy.

6. FRAGMENTED ENERGY LANDSCAPE

In Zuidoost there is limited access to renewable energy assets, particularly for vulnerable groups living in social housing blocks who individually have little influence on possibilities for investment and energy sharing. The mix of housing associations with social residencies and private owners creates a bottleneck for decision making and collaboration. The current **lack of energy assets** (and technological infrastructure), at a neighbourhood level, can be seen as a limitation for socially inclusive energy exchange.

Whilst on a neighbourhood level assets are lacking, large organisations and venues in the district already have large energy assets, or the means to acquire them. The Johan Cruijff Arena with scores of solar panels and large storage capacity, has surplus energy which could be distributed to the surrounding neighbourhoods. This **energy surplus** enhances the opportunity for socially inclusive energy exchange by sharing these resources locally.

In conclusion, the context of Amsterdam Zuidoost offers factors which both limit and enhance the opportunity for socially inclusive energy exchange. Many of the limitations are rooted in our societal structures and systems and whilst energy exchange which focuses on social inclusion can make positive impact, these fundamental and ingrained cultural issues call for real systemic, governance and policy change. On a more optimistic note, local skills and ideas, and the resourcefulness and desire for increased autonomy and agency amongst residents enhances opportunities for a socially inclusive energy exchange which recognises and boosts the local potential evident in Zuidoost.

Q2. How can we facilitate socially inclusive energy exchange in Amsterdam Zuidoost?

Social inclusion is defined in the context of this project as **active inclusion which addresses the specific needs, preferences and capabilities of local (and vulnerable) residents.** The concept of Energy Actions facilitates socially inclusive energy exchange as described below.

ACTIVE INCLUSION	Residents are valued as active collaborators and contributors to their local energy exchange ecosystem and are placed in the centre
NEEDS	Opportunity is created for addressing the financial, social and personal needs of residents: By saving energy (and reducing their bill), building social connections and a sense of community and feeling valued as a contributor to their own neighbourhood.
PREFERENCES	Energy actions enable residents to have choice and control in what they choose to 'give' and 'receive' and the value of local tokens can be mutually determined, unbound from external constraints.
CAPABILITIES	Exchanging energy actions, through a local platform, provides an outlet for sharing a diversity of local skills and expertise.

Facilitating socially inclusive energy exchange also means engaging residents to participate and become involved in this proposed relational energy ecosystem. Multiple facets of the Energy Actions concept, emerging from and inspired by the 'Reframe' and 'Create' phases, support the value proposition for residents: the **narrative around energy is transformed** into a more relatable and socially driven story; **local tokens incentivise** the 'giving' and 'receiving' of energy actions and the involvement of local (known) organisations, initiatives and community hubs **provides credibility and increases trust** in ecosystem.

5.2.2 | SYNTHESIS OF PROJECT OUTCOMES

ADDRESSING THE DESIGN GOALS

GOAL ITERATIONS

DG 1.0 To design an energy exchange system which is socially inclusive for residents living in Amsterdam Zuidoost.

DG 2.0 To facilitate the creation and strengthening of social relationships in Zuidoost through the exchange of local tokens for energy.

DG 3.0 To empower vulnerable residents in Zuidoost to share their skills and learn from each other (through the exchange of local tokens for energy).

The design goal was iterated upon and became more specific throughout the evolution of this project in response to new inspiration and insights, ultimately framing social inclusion in energy exchange as the ability to 'give' and 'receive' skills and services and thereby enabling social connections to build and strengthen. The proposed concept for a 'Social Local Relational Energy Ecosystem' addresses the design goals through the concept of Energy Actions which enables residents to offer and request energy related services and activities, in return for other services or local tokens. The vulnerable are empowered to share their skills through an exchange platform which records and recognises their actions giving them active and, in a sense, more 'formal' and roles in the transition. Local tokens provide an incentive and can create opportunities for the vulnerable to access needed services and local support.

INTERPRETATION OF PROPOSED CONCEPT

AWARENESS OF ASSUMPTIONS & POSSIBLE CONTRADICTIONS

The opportunities and challenges which the proposed concept of energy actions presents have been outlined in the preceding chapter. In this section the assumptions which contribute to the concept and the possible contradictions which arise, are discussed.

ENERGY ACTIONS

Energy Actions break up the energy transition into small individual (and collaborative) actions which contribute to a larger common goal. Whilst this can enable residents to contribute in their own way, and perhaps without too much deviation from their day-to-day, **are Energy Actions only a 'sticking plaster' for the cultural, behaviour and mindset shift** which is really needed to move towards a sustainable, renewable and regenerative world? One can argue both ways: perhaps Energy Actions are a trigger for bigger change or perhaps they mask the bigger picture? The challenge, therefore, is ensuring that the effect and impact of energy actions is visible, relatable and communicated to the organisations and institutions which have the power to bring in new policies, governance and regulation.

SMALL STEPS, OR JUST A 'STICKING PLASTER'?

Whilst 'Energy Actions,' local energy related actions, provides a clear link between local services and actions and the context of the energy transition this association to energy could limit and hinder engagement of local residents. For many the topic of 'energy' is not on their radar (only more recently have rising fuel prices started to change this) and they are not interested in becoming personally involved in the transition. The question therefore is: **is it more effective to distance local services and actions specifically from the energy context,** and in doing so perhaps lower the threshold for participation? Or does losing the link to energy sacrifice clarity and the story behind Energy Actions?

LINK TO ENERGY: CLARITY OR A HINDERANCE?

Energy Actions aim to include local residents by empowering them to be active collaborators in their local energy ecosystem and neighbourhoods. However, these actions do demand time and effort (of varying levels) from local people. Rather than a source of empowerment, **are Energy Actions actually just another burden for vulnerable residents** who are struggling to get by day-to-day? For the most vulnerable energy is not a priority and expecting their active contribution to this system would be unjust. Thus it is crucial to consider how Energy Actions can still include and positively impact these groups. Further exploration into donation and distribution of local tokens or funded Energy Actions is needed.

LOCAL TOKENS

Receiving local tokens for 'giving' or doing Energy Actions can be perceived as either 'low pay' or as a 'little extra'. This changing perception is influenced by many factors including the socio-economic position of the resident (how much they need the tokens), the action which is done (how valuable and time consuming the action is) and when the tokens are awarded (receiving tokens before an action may feel more like a gesture of appreciation, rather than a direct 'payment' after completing an action). Challenging and changing perceptions is difficult and the diversity in the concept of Energy Actions provides both opportunities and limitations in relating local tokens to the time and efforts of people. Thus the design of these tokens and the interactions, systems and processes around them need to be carefully considered.

Local tokens can also be used or redeemed in the local vicinity and in certain places/ for certain actions or services. On the one hand, the 'conditions' of these tokens can guide the (financial) behaviours of local residents and encourage more conscious, sustainable and socially valuable choices. But on the other hand, the boundaries which exist around local tokens could limit flexibility and residents perception of freedom and choice. **How can we find the balance between guidance and autonomy?**

RELATIONAL GIVING

An integral property of relational giving is time flexibility or the option for delay. Individuals can decide when to 'give back' or return an Energy Action. Adding time can allows more space for social interaction and shifts the focus of the exchange from a direct 'transaction' to a relational and social obligation, which can be fulfilled at a later moment in time. However, **can enabling time also slow down the circulation of exchange in a local area** and as a result stifle the momentum needed to engage as many residents as possible? Enabling keep freedom in when to redeem or 'use' local tokens could result in the 'hoarding' or 'saving' of them by individuals, and thus limit the potential for creating and unlocking new value flows. More consideration needs to be given to the dimension of time and its influence on the ecosystem.

A SOCIAL LOCAL RELATIONAL ENERGY ECOSYSTEM

Ultimately, the assumption of this proposed ecosystem is that local people will work together, given the means, incentives and structures to do so. However, it is also important to be realistic: Zuidoost is divided into 'social silos' and bringing these groups together and facilitating collaboration and relational giving between them requires a lot of effort, dedication and organisation. This is not a simple or 'quick fix' but a process and transformation of the social terrain of the district. Therefore, important to recognise is where to start, and with whom.

The concept for a 'Social Local Relational Energy Ecosystem' places residents at the local centre, creating a decentralised energy system which does not respond solely to the interests of the grid but crucially also to the preferences and capabilities of people and users. However, it is important to be aware that d**ecentralised does not necessarily mean democratic**. Possible scenarios could arise in this ecosystem where local actors become central actors (e.g. by accumulating most of the tokens) or where a power imbalance is created (e.g. a large asset owner can decide who to distribute their surplus energy to or not to). Identifying these scenarios and designing to mitigate them is paramount for a socially inclusive energy system.

5.2.3 | IMPLICATIONS & LIMITATIONS

PROJECT ACHIEVEMENTS

Apart from the research and design outcomes of this project, this process and work...

Brought a design approach to the LIFE Project, even inspiring project members to learn more about creative facilitation and try out new methods for co-creation.

Sparked new ideas for bringing local tokens into the context of energy through collaboration with Lokaal Geld.

Facilitated stakeholder engagement and alignment by bringing different partners and perspectives around the same table in interactive workshops.

Introduced a new perspective on energy exchange by making the potential for relational giving and novel forms of exchange more tangible, and in doing so changed initial perceptions and doubts of some project members.

Stepped into an unexplored space from a human-centred perspective by engaging with and bringing focus to the value and role of residents in local energy.

POTENTIAL IMPACT

IN THE LIFE PROJECT...

Activate design researchers to further explore the potential for relational exchange in Amsterdam Zuidoost.

Engage stakeholders and potential end users in the project by providing a new narrative on energy exchange.

Enable actionable testing and experimentation of the Energy Actions concept with visual and tangible tools.

...AND BEYOND

Offer inspiration for bringing design-anthropology into transition design and development.

Provide a starting point for further exploration and research in Zuidoost and/ or comparable districts.

Encourage a shift in mindset and behaviour to see the potential value in different local and sustainable actions.

Dare design researchers to look beyond our commodity systems and instead take a relational and human-centred approach to transforming the transition.

Motivate local people to unlock social energy and progress the energy transition in their neighbourhoods.

INTEREST IN THIS PROJECT

Involving many different stakeholders, partners, researchers and experts in the field of the (social) energy transition this research and the project outcomes have sparked interest from local entrepreneurs and initiatives, but also from further afield and the concept of Energy Actions has been likened to the idea of combining the Brixton Pound and Brixton Energy.

INTEREST IN OUTCOMES

Video could be posted on local websites and platforms.

Energy actions game could be played in community and educational spaces.

LIMITATIONS

There are several limitations to this project and these are summarised as following:

Resident participation: It was unfortunately not possible to directly involve local residents in a fully participatory and co-creative process. It takes time to first build trust and form relations, especially in contexts such as Zuidoost where many residents are vulnerable. The tight time frame of this project limited opportunities for making these connections. Although the experiences of local people and entrepreneurs was valuable, some of this work is based on assumptions which need to be further validated with potential end users of a local energy system in this district.

Individual project: Whilst efforts were made to work collaboratively, where possible, this was an individual project and thus the interpretation of findings and results may have been affected by personal interest. Ideally a team of design researchers would undertake and analyse the data collectively to ensure objectivity.

Broad scope: This project started by looking into the (social) energy transition from a broad perspective. Exploring different avenues of this space was necessary to gain a fuller understanding of the challenges and opportunities. However this limited the possibility for taking this work beyond a conceptual stage. More time is needed to be dive into the user interactions and system touch-points.

5.3 | CONTINUING THE JOURNEY

IN SHORT

In this chapter considerations are made for continuing the exploration of a relational energy ecosystem. A condensed summary is given of the key findings for Energy Actions, the use of local tokens in the energy context and relational giving. Both more general and design specific recommendations are given and the chapter concludes with an overview of 16 possible 'steps to move' towards a 'Social Local Relational Energy Ecosystem.'

GOAL

In the case of dynamic systems, such as local energy systems, the work is never done. In the project planning of the LIFE Project this concept comes at an early stage and thus remains on a conceptual level where many questions and uncertainties remain. Thus, already considering the implementation of Energy Actions into Zuidoost is premature and illogical. Outlining possible next steps and providing directions for further work is much more valuable to LIFE and the broader social energy transition. The aim of social and systemic design is often not to arrive and concrete and complete 'solutions' but rather strive to make impact. Therefore, the goal of this chapter is to share key knowledge and to activate by inviting the input, ideas and further investigations of others.

APPROACH

The design recommendations relate specifically to Energy Actions and designing touch-points to explore the possible user interactions in such a system. The general recommendations for LIFE stem from personal reflections in this project and the 'steps to move' are a combination of actions or future investigations identified by stakeholders in the evaluation sessions. Input from the expert perspectives is also included.

5.3.1 | SUMMARY FOR PRACTITIONERS & RESEARCHERS

A GUIDE FOR PRACTITIONERS & RESEARCHERS

Throughout this thesis key findings, summaries and overviews and theoretical principles and frameworks are presented. These have been colour coded to help practitioners and researchers locate insights and explanations to provide suggestion for future work/ similar projects within the fields of the (social) energy transition, local tokens and (barter/gift) exchanges.

KEY FINDINGS

OVERVIEWS/ SUMMARIES

THEORETICAL EXPLANATIONS/ FRAMEWORKS
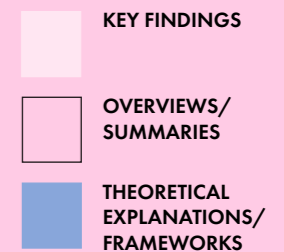
CONCEPT FINDINGS IN A NUTSHELL

Listed below are the key findings which relate to the outcomes of this project. It is important to note that these lists are by no means exhaustive and that assumptions still remain. The purpose of providing this final summary is to prompt reflection and further investigation into these areas.

ENERGY ACTIONS

WHICH ENERGY ACTIONS ARE DESIRABLE?

FOR RESIDENTS:

> Handy work and fixing
> Actions which help to save energy costs
> Actions which have an immediate/ visible effect

FOR ORGANISATIONS & INSTITUTIONS:

> Education about the energy transition and conscious energy consumption
> Communication and circulating information

FOR WHICH RESIDENTS IS IT VALUABLE TO DO ENERGY ACTIONS?

VALUABLE FOR:

> Residents who have time to give
> Residents who want to find employment in a local (energy) initiative, platform or hub
> Residents who want to build skills
> Residents who are new to the district and want to build connections
> Young people who want to gain work experience
> Residents interested in the energy sectors
> People who have a 'volunteering allowance'
> Existing community volunteers

NOT VALUABLE FOR:

> Very vulnerable groups who have are struggling to make ends
> For residents who are working full time/ have several jobs

LOCAL TOKENS IN ENERGY CONTEXT

IN WHICH SCENARIOS ARE LOCAL TOKENS VALUABLE IN THE CONTEXT OF ENERGY?

MORE VALUABLE CONTEXTS:

> Where local energy assets are present (community level or from large asset owners)
> Where there is a desire (and social responsibility) to contribute to the neighbourhood
> Where there is possibility to invest in shared energy assets (energy cooperatives)
> Where revenue can be injected directly back into the neighbourhood e.g. parking and mobility

LESS VALUABLE CONTEXTS:

> Where peer to peer trading is already happening (with money)
> Where residents are living in energy poverty and desperately need financial support
> Where inflow of local tokens can not be sustainable or secure
> Where there is insufficient diversity in the local network

RELATIONAL GIVING

WHEN IT IS NECESSARY TO ACTIVELY FACILITATE RELATIONAL GIVING (e.g. with local tokens)?

WHERE FACILITATION IS NECESSARY:

> In neighbourhoods, districts and communities and groups where social cohesion is weak
> In diverse and multi-cultural districts where many different customs come together

WHERE FACILITATION IS NOT NECESSARY:

> In neighbourhoods where there is already a strong sense of community
> Within tight social groups and circles
> Between the socially intimate and socially close

5.3.2 | RECOMMENDATIONS

GENERAL RECOMMENDATIONS FOR THE LIFE PROJECT

Presented in the following sub-chapter is an overview of actionable next steps which could be taken by stakeholders, partners and researchers in the LIFE Project to move towards a relational energy ecosystem and to explore the concept of Energy Actions further. Thus in this section more general recommendations are listed which aim to offer the LIFE Project practical advice for their continuing investigations and research into designing and developing a socially inclusive energy system in Amsterdam Zuidoost.

Prioritise engagement with local residents early on: Whilst efforts were made, where possible, to engage with and include residents and local people in the research and conceptualisation phases of this project, many assumptions still remain. Therefore, to investigate the potential of this concept further and to identify other opportunities in tandem more research needs to be done directly with potential end users of this ecosystem and platform. The explorations in this project which were conducted together with residents resulted in rich findings and inspiration for novel approaches. The explorations took a visual and interactive form, for instance by placing a 'boundary object' on the streets where passers-by could vote for a preferred object. Thus, in continuing to reach out to and actively include residents it is recommended to utilise such design methods to spark curiosity and bring tangibility to the complexity of the energy context. In addition, such activities should carefully consider the 'exchange' between researcher/ designer and resident. 'Balanced reciprocity' or 'just exchange' extends beyond energy itself: what do residents get out of these research activities and what is the value for them?

Keep collaborating with Lokaal Geld: The scenario session held with members of both the LIFE Project and Lokaal Geld proved fruitful and triggered new ideas and possibilities. Through collaborative brainstorm sessions and discussions more potential (than was perhaps initially perceived) was uncovered for the use of a local token (such as 2Ping) in a local inclusive future energy platform. Email exchanges and conversations with participants in the aftermath of these sessions showed that these joint activities provoked new considerations and connections. Therefore it is highly advised to keep exploring the potential for local tokens in energy in a co-creative form. Equally keeping note of the ideas, questions and potential challenges which arise, in a shared and easily accessible space, would benefit future work in this area.

Remain aware of the target user groups: The concept of Energy Actions is more relevant for some residents living in Zuidoost, than for others. It is important to remain aware of the applicability of this concept in exploring it further and it is recommended to start next investigations with groups for whom Energy Actions are valuable and feasible (residents who have time to give, want to learn a new skill etc.) These target groups likely do not involve the most vulnerable residents (who are struggling and living in poverty) so efforts should be made to seek solutions which can ultimately benefit these residents too.

Focus the narrative of energy exchange on social values: Energy, energy exchange and local systems do not speak to or engage the majority of residents living in Zuidoost. However initiatives and projects which aim to empower and connect local people and foster social change are more approachable and inviting. Thus the story told plays a large part in the engagement of potential end users. Finding a relevant and relatable narrative is key.

Present initial ideas to help emote values: Bring ideas, even in their rudimentary form, to discussions with stakeholders and partners. Visual cues and prompts are effective conversation starters and can help to uncover core values and goals from different perspectives. Comparing and contrasting options and ideas is helpful. Overall, a recommendation for LIFE project is to 'put more ideas to paper' to help allow for more unconventional possibilities to arise.

DESIGN RECOMMENDATIONS

A holistic and systemic approach was taken to this project and the design outcomes remain at a conceptual level. Future research and design work could focus on developing the concept of Energy Actions by designing and prototyping the various possible touch-points of this system. Bringing tangibility and user interaction into the concept will support further experimentation, testing and validation of the feasibility, desirability and viability of this concept.

DEVELOPING THE CONCEPT OF ENERGY ACTIONS

Through journey mapping the concept of Energy Actions was broken down into eight key phases. These phases offer starting points for diving further into the concept and designing and prototyping touch points for user interaction. The phases are outlined below alongside possible design directions and questions, intended to trigger new ideas and exploration.

	DESCRIPTION	TRIGGER QUESTIONS	DESIGN DIRECTONS
1. COMMITTING	Commit to creating social energy	How to commit to doing Energy Actions? What does this commitment look like? What form does it take?	An Energy Actions starter pack/ tool kit for signing up to the local exchange platform and committing to creating social energy.
2. CHOOSING	Choose which energy actions you would like to do	What are the conditions or requirements for an Energy Action? Can new energy actions be added? Is prior experience needed in order to do certain energy actions? How might we help residents to identify their skills and match them to Energy Actions?	An Energy Action introduction workshop which can be done at home or by a guided facilitator. An educational programme to help residents identify their skills and learn new ones for doing Energy Actions. Energy Action 'categories' in the local exchange platform to filter actions and find a good match.
3. ARRANGING	Arrange an energy action in your local neighbourhood or district	How to incentivise residents to offer their skills and services? How to create trust in less formally organised energy actions? Do residents need to 'approved' to do certain Energy Actions?	A digital 'suggestion box' through which residents can submit new/ alternative Energy Actions to add to the exchange platform.
4. PREPARING	Prepare to 'give' an Energy Action or to 'recieve' one from a fellow resident	How to confirm an Energy Action through the exchange platform? How to acquire the necessary materials needed for some actions? How to connect residents to existing initiatives and organisations?	A digital check-list to help you to prepare for the Energy Action. Local material drop off/ collection points or stations. Regular 'Energy Action' days where materials are provided.
5. DOING	'Give' and Energy Action or 'recieve' one from another resident	How to ensure the quality of energy actions done? How to create safe environments for 'giving' and 'receiving' Energy Actions?	A visual guide to help residents through the Energy Action. A buddy/ peer system where less experienced residents are paired with those with more experience.
6. REVIEWING	Review and describe an energy action to confirm it has been completed	How to ensure credibility of confirmed Energy Actions? How to record Energy Actions (especially intangible actions)?	Functionality in the digital platform/ app for uploading visual or descriptive evidence of Energy Actions completed.
7. REWARDING	Award resident with local tokens for Energy Action(s) completed	How to determine how many local tokens an Energy Action is worth? How to 'give' and 'receive' local tokens from others?	Creating informal/ formal community roles for Energy Action 'verifiers' or local token 'distributors'.
8. REDEEMING	Redeem local tokens	Where and what can local tokens be redeemed for? How can local tokens be donated or added to a collective fund?	A digital application for adding and collecting local tokens in community 'pots' to be distributed to initiatives, or invested.

WHAT'S NEXT?

In a dynamic 'transition in transformation' the work is never done. This project is just a start: a first dive into a relational approach to energy exchange. Through the evaluation sessions and meetings possible next steps were identified. Clustered under seven categories sixteen actionable next steps, alongside examples and key questions are proposed. Placing these steps in a pre-determined order is not logical as many of them can be investigated in tandem, and are relevant for different stakeholders and members of the LIFE Project. **These steps provide direction and intend to activate further exploration and continuation with this work, to make a move towards a Social Local Relational Energy Ecosystem.**

DESIGN

	DESIGN AND CARRY OUT LIVING LAB EXPERIMENTS	DESIGN, DEVELOP & TEST TANGIBLE TOUCH-POINTS	KEEP DIVERGING & EXPLORING MORE OPTIONS
KEY QNS	How do residents engage with energy actions and local tokens? What contexts are relevant?	What should this digital/ hybrid platform look like? How do actors interact with it?	What are the different possibilities for determining the value of energy actions/ local tokens?
EXAMPLE	Hand out local tokens as a reward for being a co-researcher of LIFE. On-board a few local SMEs/ hubs where these tokens can be redeemed	Design low - mid fidelity prototypes (applications) and to test the user experience, functionality and usability of a local exchange platform	Co-create together with a diversity of actors to explore multiple options and ideas in tandem (e.g. using time & KwH). Then compare and contrast
PARTNERS	LIFE Social team, EnergieLab Zuidoost and other local projects such as 'Just Prepare'	Design researchers, LIFE Social team, Lokaal Geld, local residents, Co-Town	LIFE Project members and partners, design researchers, Lokaal Geld

DATA

	TAKE A QUANTITATIVE APPROACH & DO OPERATIONAL	MAP CURRENT ENERGY ACTIONS WHICH ARE HAPPENING	ANALYSE THE SOCIAL & ECONOMIC NETWORK
	What could this 'balance market' look like? How might it work?	Which energy actions are going? Who is doing these energy actions? Can their effect be measured?	Where is value flowing to and from? Where should value be flowing to? What skills & capabilities are there?
	Set up and run simulations in order to carry out operational calculations regarding the economic model for local tokens and energy actions	Use mapping software to create an overview of 'official' local energy actions which are taking place (through organisations and initiatives)	Carry out a local research investigation into the skills and capabilities which residents have, and the expertise which is needed but is currently lacking
	Lokaal Geld, LIFE Technical team, large asset owners such as Johan Cruijff Arena	Local energy organisations and initiatives, local community hubs, the municipality, local residents	UWV (Dutch unemployment & job seekers organisation), Local residents, educational centres and schools

VALUE PROPOSITIONS

	EXPLORE OPPORTUNITIES FOR INFLOW OF LOCAL TOKENS	COMPARE DIFFERENT ENERGY ACTION SCENARIOS & CREATE A SOCIAL BUSINESS CASE	ENGAGE MORE STAKEHOLDERS AND GET THEIR INPUT
	How do local tokens 'come into play'? How can the inflow be sustainable? What role does the city play here?	What can local tokens be redeemed/ used for? What use cases are most viable?	What is important for larger organisations and stakeholders to engage with energy actions & tokens?
	Conduct sessions and interviews which bring together different actors and outside organisations	Create value propositions for various scenarios and compare these using qualitative and quantitative data	'Pitch' or present the concept of energy actions and local tokens and carry out a collaborative feedback session
	The municipality, LIFE Social Platform. Lokaal Geld, large asset owners e.g. ING Bank and Johan Cruijff Arena	Local SME's, local residents, LIFE Social team, local initiatives and organisations, local hubs	Large local asset owners, LIFE Project members, the municipality, Large cooperation's/ organisations

STRUCTURE

	EXPERIMENT WITH THE SET UP & ORGANISATIONAL STRUCTURE OF THE LIFE SOCIAL COMMITTEE	EXPLORE COLLABORATIONS WITH EXISTING LOCAL INITIATIVES & ORGANISATIONS	FORMULATE ENERGY ACTIONS IN THE STRUCTURE OF THE LIFE SOCIAL AND TECHNICAL PLATFORMS
	Who should for the LIFE Social Committee? Who are the active and trusted members of the community?	What do energy actions mean for local initiatives and organisations? How can new connections be made?	How can energy actions connect to the use cases of the LIFE Project? Which actions should be designed into the platforms?
	Conduct a research investigation in the organisational structures of current local platforms and initiatives to identify pitfalls and opportunities	Go into the field and shadow/ observe local organisations who are doing energy actions. Discuss and reflect on possibilities for collaboration	Use a 'force-fitting' method to place energy actions into LIFE use cases as an exercise for identify actions which could be integral to these platforms
	LIFE Social team and LIFE consortium members and partners	LIFE Social team, local energy initiatives such as Stichting IWOON	LIFE Project members, LIFE Social team, LIFE technical team

RESIDENT ENGAGEMENT

	SPECIFY THE VISION IN COLLABORATION WITH SURROUNDING NEIGHBOURHOODS	FIELD RESEARCH & CO-CREATION WITH RESIDENTS
	What are neighbourhoods looking for? What value(s) do they want to create? How can this story be communicated?	What are residents' initial reactions? Which target groups are energy actions most suitable for?
	Use visual media to communicate energy actions to local groups and facilitate a series of participatory sessions	Go into different neighbourhoods in the district and undertake ethnographic research using visual aids and props
	LIFE Social team, design researchers, local residents, local community groups	LIFE Social team, design researchers, local residents, local community groups

IMPACT

	DETERMINE THE INDICATORS FOR MEASURING IMPACT AND VALUE & EXPLORE HOW TO VISUALISE THIS
	How can the value & impact created be measured and visualised? How can energy actions be reported on ?
	Refer to current and past research project in Zuidoost to find inspiration for relevant scales and indicators
	Design researchers, EnergieLab Zuidoost, the municipality

SCALE

	DESIGN & DEVELOP A SCALING STRATEGY	COMPARE AND CONTRAST WITH SIMILAR CONTEXTS
	What are the (boundary) conditions for different actors to take part? How to scale up, out and deep?	Could this concept work in other similar contexts? How or how not? Which elements are transferable?
	Devise a rudimentary set/ sets of (boundary) conditions dependant on the intended impact. Refer to existing platforms such as Peerby and Marktplaats to design scaling strategies	Explore the comparable district of Schiebroek in Rotterdam to investigate if similar opportunities and challenges for Energy Actions are evident, or not.
	LIFE Project team and partners, design researchers	LIFE Social team, design researchers, local residents

5.4 | CONCLUSION

IN SHORT

This final chapter contains a short conclusion of the project and a personal reflection. The references can be found at the end of this thesis.

5.4.1 | PROJECT CONCLUSION

Current local energy systems are complex, ambiguous and opaque. Whilst the intention is to include residential end-users, in reality these systems lead to detachment, disengagement and a sense of loss and control, magnifying the risk for exacerbating social inequalities and leaving vulnerable residents behind. Based on Peer-to-Peer and market-like models which label residents as profit-motivated buyers and sellers, the opportunity for socially driven energy exchange has been overlooked. To explore opportunities for energy exchange which actively includes local (vulnerable) residents, an **anthropological approach** is taken and **energy exchange is reframed as a primarily relational, social and community based practice**. Relational exchange or 'giving' is embedded into the proposal for a 'Social Local Relational Energy Ecosystem' through the concept of **Energy Actions.** Arranged through a local platform these actions provide an outlet for local skills and expertise and empower all residents to contribute. Thus, this thesis highlights **the potential of tapping into local expertise as a means for achieving social inclusion in the energy transition.** Contributing to the social energy transition field this study emphasises the importance **'unlocking social energy' and building social relationships** in the bid for net 0 living.

A framework which **places residents at the centre of their local energy ecosystem** is presented, connecting local actors and initiatives through a common goal. Also investigated is the potential for alternative currencies in enabling socially inclusive energy exchange, particularly in low-income districts. **Local tokens are posed as a tool** and means for incentivsing and recognising Energy Actions and crucially facilitating exchange and interaction between the socially disconnected. Validated by various local stakeholders and potential end users as both valuable and feasible, the concept of Energy Actions provides tangible scenarios for **transforming the transition from commodity-based to relational.**

5.4.2 | PERSONAL REFLECTION

Analogies, and storytelling, I discovered, are powerful forces in our complex, entangled and rapidly changing world where we are living in constant transition. They are relatable, inspiring and provide tangibility in a sea of possibilities, questions and concerns. Therefore, it seems only fitting to wrap up my graduation project on a personal note and reflect on this journey with one last analogy, with something which gives *me* energy.

Swimming, water and being in the ocean are things which I love and last year I experienced the ocean like never before. Scuba diving opened my eyes to this amazing underwater world on, literally, a whole new level. And looking back, managing, navigating and designing on different levels, encompasses my learning journey throughout this project.

This project began with a real deep dive into the unknown. Starting with a broad scope, and in a completely new and unfamiliar context I swam through murky waters, unsure at times of where I was really going. I was diving deeper, discovering new things and exploring different areas but at the same time still not feeling like I had 'landed'. I was floating around somewhere between the seabed, the physical and tactile, and the surface where you can see the horizon and the overview. I was in uncharted waters and waters which I had not yet navigated as a designer.

For much of the project I considered myself to be solely an interaction designer with a social drive and ambition. Sometimes this bubble I had, perhaps unknowingly, placed myself in stopped me from seeing further. Often I found myself searching for the clear and concrete, and whilst making and visualising brought tangibility, I was not narrowing down the options but actually uncovering more possibilities and directions.

Continuing to dive further into the context and opportunity space the seabed came into sight towards the end of the project. When I looked back and reflected on my process and on all of the research-through-design activities I had carried out, I recognised the progress I had made. Whilst the seabed (or the known 'solution') was still out of reach I was definitely closer to the vision I had created. The really murky waters were behind me.

Now at the end of this project, I realise that this was my first real plunge into the world of systemic design and that here, whilst we can paint a picture of a future world we want, there will always be vast waters to traverse. The work is never done.

Always eager to move onto the next thing, to keep swimming forward, I learnt through this project to also take moments to pause and absorb what is around me. A design journey and process, especially a systemic one, is not a straightforward dive down. Sometimes it is important to swim horizontally too.

The different levels of this project proved a challenge, but also provided ample opportunity. I had the chance to practice my strengths in visualisation and communication and bring conceptual interaction to systems design. I conducted co-creative and participatory sessions with a host of stakeholders and partners and really saw the value of introducing design methods and approaches into societal and complex problems, outside of the typical design sphere. The vastness and multiplicity of the project context created a lot of space for experimentation and enabled me to undertake extensive research and collect, analyse and synthesise data at a level I had not done so before. Finding structure in the 'mess' of rich data was not easy and took time, but creating my own frameworks helped to guide and improve this process.

One more 'level' in this project which was unfamiliar and proved fascinating was entering into the world of Design Anthropology. Using theory and social science as a foundation and trigger for design was a first for me. I really enjoyed diving into this literature and broadening my social perspective and understanding. Creating a vision and concept to move towards a relational energy ecosystem made me more aware of how stuck we are in the linear and transactive systems of today, and has inspired me to investigate this perspective further.

Whilst this final project concludes my chapter as a student, it starts a new one as an explorative designer and learner, bridging interaction and systemic design to tackle complex societal issues and transform our transitions.

Thank you for reading,

Vicky

REFERENCES

A

Adams, S., Brown, D., Cárdenas Álvarez, J. P., Chitchyan, R., Fell, M. J., Hahnel, U. J. J., Hojckova, K., Johnson, C., Klein, L., Montakhabi, M., Say, K., Singh, A., & Watson, N. (2021). Social and Economic Value in Emerging Decentralized Energy Business Models: A Critical Review. Energies, 23, 7864. https://doi.org/10.3390/en14237864

B

Boekelo, M., & Beukers, S. (2022). A just energy trading platform – or just an energy trading platform?

C

Capper, T., Gorbatcheva, A., Mustafa, M. A., Bahloul, M., Schwidtal, J. M., Chitchyan, R., Andoni, M., Robu, V., Montakhabi, M., Scott, I. J., Francis, C., Mbavarira, T., Espana, J. M., & Kiesling, L. (2022). Peer-to-peer, community self-consumption, and transactive energy: A systematic literature review of local energy market models. Renewable and Sustainable Energy Reviews, 112403. https://doi.org/10.1016/j.rser.2022.112403

Carrier, J. G. (2021). Economic Anthropology (The Economy Key Ideas). Agenda Publishing.

Clayton, A. (2010). Do Local Currency Systems Have a Role in Economic Regeneration. Social and Economic Studies.

D

Davis, J. (1992). Exchange. U of Minnesota Press.

E

Elsden, C., Feltwell, T., Lawson, S., & Vines, J. (2019). Recipes for Programmable Money. Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3290605.3300481

F

Ferreira, J., Perry, M., & Subramanian, S. (2015). Spending Time with Money. Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing. https://doi.org/10.1145/2675133.2675230

G

Giotitsas, C., Pazaitis, A., & Kostakis, V. (2015). A peer-to-peer approach to energy production. Technology in Society, 28–38. https://doi.org/10.1016/j.techsoc.2015.02.002

Graeber, D. (2014). Debt - The First 5,000 Years. Melville House.

Gunn, W., Otto, T., & Smith, R. C. (2013). Design Anthropology: Theory and Practice. Routledge.

H

Hayashi, M. (2012). Japan's Fureai Kippu Time-banking in Elderly Care: Origins, Development, Challenges and Impact. INTERNATIONAL JOURNAL OF COMMUNITY CURRENCY RESEARCH. https://doi.org/10.15133/J.IJCCR.2012.003

Heijne, K., & van der Meer, H. (2019). Road Map For Creative Problem Solving Techniques.

Hekkert, P., & van Dijk, M. (2016). VIP Vision in Design: A Guidebook for Innovators. BIS Publishers.

Humphrey, C., & Hugh-Jones, S. (1992). Barter, Exchange and Value. Cambridge University Press.

Hutty, T. D., Pena-Bello, A., Dong, S., Parra, D., Rothman, R., & Brown, S. (2021). Peer-to-peer electricity trading as an enabler of increased PV and EV ownership. Energy Conversion and Management, 114634. https://doi.org/10.1016/j.enconman.2021.114634

J

Jain, P., Ibtasam, S., Balkrishan, D. K., Ahmed, N., Jones, M., Shahid, S., Razaq, L., Perry, M., & Joshi, A. (2020). Designing Digital Payments for Next Billion Users. Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3334480.3381064

James. (2022). A Handbook of Economic Anthropology. Edward Elgar Publishing.

Jones, P., & van Ael, K. (2022). Design Journeys through Complex Systems: Practice Tools for Systemic Design. BIS Publishers.

K

Kaye, J., Vertesi, J., Ferreira, J., Brown, B., & Perry, M. (2014). #CHImoney: financial interactions, digital cash, capital exchange and mobile money. CHI '14 Extended Abstracts on Human Factors in Computing Systems. https://doi.org/10.1145/2559206.2559221

Kloppenburg, S., & Boekelo, M. (2019). Digital platforms and the future of energy provisioning: Promises and perils for the next phase of the energy transition. Energy Research & Social Science, 68–73. https://doi.org/10.1016/j.erss.2018.10.016

L

Lewis, M., & Perry, M. (2019). Follow the Money. Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3290605.3300620

M

Mauss, M. (2014). The Gift: The Form and Reason for Exchange in Archaic Societies (Routledge Classics). Routledge.

N

Nichols, G., & Ralston, R. (2011). Lessons from the Volunteering Legacy of the 2002 Commonwealth Games. Urban Studies, 1, 169–184. https://doi.org/10.1177/0042098010397400

Nissen, B., Pschetz, L., Murray-Rust, D., Mehrpouya, H., Oosthuizen, S., & Speed, C. (2018). GeoCoin. Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3173574.3173737

P

Pacione, M. (1997). Local Exchange Trading Systems as a Response to the Globalisation of Capitalism. Urban Studies, 8, 1179–1199. https://doi.org/10.1080/0042098975583

Perry, M., & Ferreira, J. (2017). Moneywork. ACM Transactions on Computer-Human Interaction, 6, 1–32. https://doi.org/10.1145/3162082

Pothong, K. (2022). Caricrop: Can a digital payment system support fairer agricultural trade? Proceedings of DRS. https://doi.org/10.21606/drs.2022.311

R

Rankin, J., Elsden, C., Sibbald, I., Stevenson, A., Vines, J., & Speed, C. (2020). PizzaBlock: Designing Artefacts and Roleplay to Understand Decentralised Identity Management Systems. Proceedings of the 2020 ACM Designing Interactive Systems Conference. https://doi.org/10.1145/3357236.3395568

Rawal, N. (1970). Social Inclusion and Exclusion: A Review. Dhaulagiri Journal of Sociology and Anthropology, 161–180. https://doi.org/10.3126/dsaj.v2i0.1362

S

Sanders, E., & Stappers, P. J. (n.d.). Convivial Toolbox: Generative Research for the Front End of Design. Laurence King Publishing.

Singh, A. (2019). Conceptualizing inter-household energy exchanges: An anthropology-through-design approach. TU Delft.

Singh, A., Strating, A. T., Romero Herrera, N. A., Mahato, D., Keyson, D. V., & van Dijk, H. W. (2018). Exploring peer-to-peer returns in off-grid renewable energy systems in rural India: An anthropological perspective on local energy sharing and trading. Energy Research & Social Science, 194–213. https://doi.org/10.1016/j.erss.2018.07.021

Singh, A., Strating, A. T., Romero Herrera, N. A., van Dijk, H. W., & Keyson, D. V. (2017). Towards an ethnography of electrification in rural India: Social relations and values in household energy exchanges. Energy Research & Social Science, 103–115. https://doi.org/10.1016/j.erss.2017.06.031

Stappers, P. J., & Sleeswijk-Visser, F. (2007). Bringing participatory design techniques to industrial design engineers. Engineering and Production Design Eductation.

T

The Urban Lab of Europe (2022). Integrated development in action! Viladecans - Vilawatt. https://www.uia-initiative.eu/en/operational-challenges/viladecans-vilawatt

V

van Boeijen, A. (2020). Delft Design Guide (revised edition): Perspectives - Models - Approaches - Methods. Laurence King Publishing.

van der Schoor, T., & Scholtens, B. (2015). Power to the people: Local community initiatives and the transition to sustainable energy. Renewable and Sustainable Energy Reviews, 666–675. https://doi.org/10.1016/j.rser.2014.10.089

van der Werf, I. (2021). Achieving Inclusion within Smart Energy Cities.

van Gent, A. (2022). Interventions for an inclusive energy transition in Amsterdam Zuidoost.

Visser, W. (2010). Schön: Design as a reflective practice. HAL Open Science.

W

Williams, C. C. (1996). The New Barter Economy: An Appraisal of Local Exchange and Trading Systems (LETS). Journal of Public Policy, 1, 85–101. https://doi.org/10.1017/s0143814x0000787x

Z

Zimmerman, J., & Forlizzi, J. (2014). Research Through Design in HCI. In Ways of Knowing in HCI (pp. 167–189). Springer New York. http://dx.doi.org/10.1007/978-1-4939-0378-8_8

APPENDICES OVERVIEW

(APPENDICES CAN BE FOUND IN A SEPARATE ATTACHED DOCUMENT)