

Co-Operate

A neighbourhood for
seven generations



Community
Land Trust
H-BUURT

space&matter

And The People



NEW ECONOMY

x Gemeente
x Amsterdam

stimuleringsfonds
creatieve industrie

Preface

What is this provocation about?

The objective of this provocation is to catalyse change in the way we produce our built environment and to open up pathways towards direct community involvement in those processes.

Faced with the twin crises of social inequality and climate breakdown, community ownership is now more than ever a necessary instrument for city planning and development. The building industry faces the task of drastically lowering its carbon and ecological footprint by extending the lifespan of buildings through adaptability and reuse. Community ownership enables residents to jointly prioritise challenges and to be part of the solution.

We believe that finance is key to unlocking this transition. **By focusing on the business model behind the built structure, Co-Operate hopes to work towards the infrastructure required for home-owners and users to inhabit and co-produce their environment.** Co-Operate aims to support the transition to a society based on co-creation, participation, involvement and inclusion.

Who is this provocation for?

Realising a transition to a circular and inclusive built environment will require collaboration at all levels. This provocation is therefore aimed at the broad spectrum of actors who have a role to play -

- A **community group** who would like to develop housing in a circular way
- A **financier** or **investor** with creative ideas and strategies for stimulating early-stage circular innovation in the Netherlands
- An **asset owner** or **fund manager** with the curiosity to develop and test impact-driven frameworks for portfolio management and evaluation
- A **municipal urban planner** looking to draft tendering requirements for a site according to community driven circular principles
- A **land owner** who would like to develop a piece of land in a circular and inclusive way
- A **contractor** who wants to commission circular services for a building development

Who produced this provocation?

Co-Operate was initiated by Space&Matter, And The People and New Economy in support of Community Land Trust H-Buurt in 2020 and published in 2021.

The project is enabled by funding from [Stimuleringsfonds](#), [Gemeente Amsterdam](#) and [Interegg North-West Europe](#) under the European Social Housing for Inclusive and Cohesive Cities ([SHICC](#)) programme, as well as contributions in kind from Space&Matter, And The People and New Economy.

If you would like to get involved please reach out to us at contact@cooperate.eco.

Authors

Space & Matter

Spatial & strategic design

Space&Matter is a studio for spatial and strategic design. With a strong track record for circular projects including De Ceuvel, Schoonschip and SWEETS hotel, the studio uses an integrated design approach to make buildings and neighbourhoods that foster close knit communities and have a positive impact on our planet.

In all its projects Space&Matter works towards a more cooperative form of building development, placing the community and common good at the heart of the process. With its strategic design unit Matter, it is part of an emerging group of architectural practitioners who are turning their energy and efforts towards the 'dark matter' of cities (governance, finance, ownership) in order to solve the wicked problems faced in the built environment today.

And The People

Social innovation

And The People is a social innovation company aimed at democratising opportunities for people to take a proactive role in sustainable development and transformation on a neighbourhood and city scale. ATP works actively with municipalities and other public authorities to connect policy-level ambitions with the practical reality on street-level.

Their expertise lies within designing locally embedded bottom-up solutions that are in line with local or national policies in the fields of energy, food and circular economy. In 2018 ATP started researching how the Community Land Trust model could be applied in the Dutch context, and are part of the European coalition for Sustainable Housing for Inclusive and Cohesive Cities (SHICC).

New Economy

Circular business models

New Economy develops products and services that contribute to climate solutions. The office combines business with nature to arrive at future-proof solutions that strengthen business, society and ecosystems. They help regions to develop a new economic perspective that makes it accessible for everyone to learn, move and consume in a healthy living environment.

New Economy have realised projects for (urban) regions, the waste-management sector, manufacturing companies, the packaging industry, the construction sector and e-commerce. Their interest in ownership models for the built environment deepened last year when we were asked to contribute new business models for the open building philosophy for the World Architecture Festival.

1. A framework for seven generations
2. Place-based prototyping
3. Use cases
4. Next steps

1.

**A framework for
seven generations**

We need to reimagine our relationship with the future

We are facing a crisis of collective imagination. Our inability to address the future is leading us towards extinction. How might we create the conditions for both current and future generations to thrive?

The Great Pyramid of Giza has stood for 4,500 years

When we attach cultural significance to a built structure we find ways to maintain it for eternity. Built as a tomb for the Fourth Dynasty Egyptian pharaoh Khufu, the Great Pyramid of Giza has been through a process of transformation at the hands of successive rulers since the 26th Century BC. Careful renewal, stewardship and care mean that many of the original materials remain, supplemented by additions which have been carefully selected for their aesthetic and structural qualities.

The average lifespan of a building today is 42 years

Whilst the material lifespan of building components is much longer, the average building today lasts only 42 years. Although it is often believed that “durable” structural materials such as steel and concrete will provide the longest service lives for their buildings, research suggests there is no significant relationship between the structural system and the actual useful life of the building. Reasons for demolition are instead related to the business model behind real estate: changing land values, lack of suitability of the building for current needs, and lack of maintenance of various non-structural components.

A Community Land Trust stewards land and buildings for perpetuity

The Community Land Trust is a non-profit, democratic, community-led organisation. By avoiding market speculation, it develops and manages homes which are affordable for perpetuity, as well as other community assets which contribute to thriving neighbourhoods. And most important of all, a CLT acts as a long-term steward of these assets, ensuring they remain permanently accessible for generations to come.

The challenge

How might we redesign the business model behind the built environment to ensure our planet remains livable for current and future generations?

Something is wrong with the way we build our cities. The built environment accounts for approximately 40% of energy consumption and 36% of CO2 emissions in the EU. Yet despite all this building, across Europe we face a severe lack of affordable housing and growing homelessness.

These twin crises are compounded by a crisis of imagination. Form follows finance and the demand for short-term Return on Investment drives short-term decisions. How might we redesign the business model behind the built environment to ensure our planet remains livable for current and future generations?



The opportunity

The Community Land Trust is a model which does just that – a long-term steward of assets, ensuring accessibility for generations to come.

A Community Land Trust is a non-profit, democratic, community-led organisation. By controlling market speculation, it develops and manages homes which are affordable for perpetuity, as well as other community assets which contribute to thriving neighbourhoods. Most importantly, a CLT becomes the long-term steward of these assets, ensuring accessibility for generations to come.

For this project we work directly with [Community Land Trust H-Buurt](#), the first CLT in the Netherlands. The group comprises 110 residents located in the Bijlmer in Amsterdam South-East who want to build housing and supporting facilities which are affordable for perpetuity. To support this effort, we worked with CLT members to prototype new business models for the built environment based on community ownership.



The proposition

How might we do this whilst addressing the groups who will be most impacted by climate change – current and future generations?

Climate change will disproportionately impact already marginalised groups, young people and those not yet born. What if, instead of short-term financial gains, we made decisions to benefit these groups, today and in the future? A Community Land Trust could be the best vehicle we have to make local people stewards of their own shared assets with a legal obligation to take decisions which will benefit future generations.

This project therefore aims to support communities who are too often left out of conversations around climate change. With [Community Land Trust H-Buurt](#) we focus on empowering marginalised groups across generations including students, single parents, large families and the elderly. We do this by considering the impacts of circular business models from the resident perspective, including realistic cost and time input across generations.



The methodology

How might we use time as a medium of design by matching business model to material lifecycle?

Frank Duffy [pointed out](#) that 'a building properly conceived is several layers of longevity.' With Co-Operate we aim to demonstrate that using time as a design tool can unlock new forms of value creation. Our research aims to explore the relationship between an [Open Building](#) approach and [community ownership models](#). By matching business models to material lifecycle we maximise the utility of building components and by investing collectively through a Community Land Trust we guarantee the stewardship required for a circular economy.

Shearing Layers of Change building model 6 layers (Stewart Brand (1994) and David Bergman) + 7 'social' layer (Circle Economy, 2019)

1. Stuff
The furniture, storage, carpeting, plants, etc. that is placed in buildings

2. Space plan
The way the floors are compartmentalized into separate spaces with different purposes, the type of materials used to divide space.

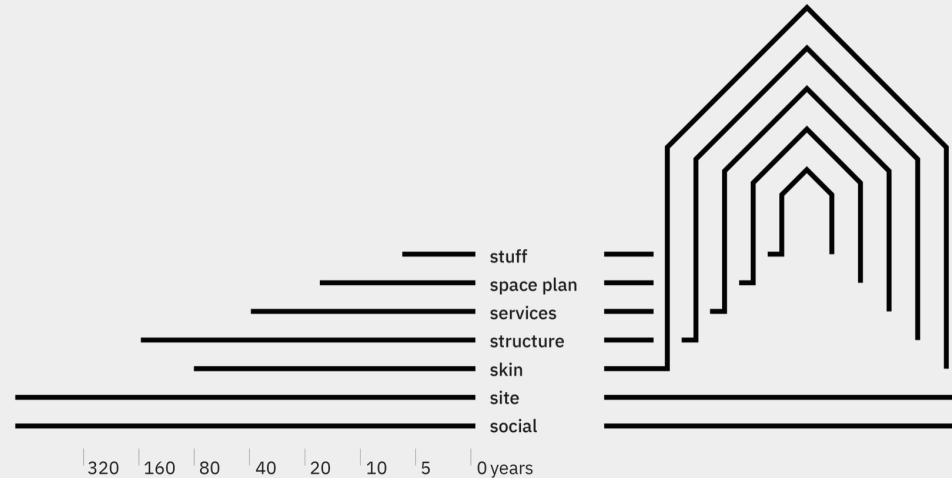
3. Services
Services such as smart energy systems, lightning, air-condition that support operation of the building

4. Structure
The construction of a building, which involves the structural skeleton of the building and determines its basic shape.

5. Skin
Outside layers of the building such as facade, windows, surface material and insulation.

6. Site
The surface area and the environment that the building is situated in.

7. Social
How the occupants live, work and use the buildings; how their behaviour influences the circularity of the building.



Defining a neighbourhood for seven generations

Taking a seven generation perspective forces us to think long-term. Inspired by the Iroquois Confederacy, a neighbourhood for seven generations is one in which decisions are considered from the perspective of future residents, in addition to present concerns. By taking this approach we strive for a neighbourhood in which social, environmental and economic values are in balance.



Inclusive & affordable for perpetuity

A place where residents can access affordable housing for generations to come. Where a community thrives based on the synergy of unique talents and skills of its members. Where residents directly influence their living environment through coordinated action and feel comfortable to voice their needs.



Nature-based

A place where ecological value is created by residents and nature-based solutions are first selection. Energy comes from renewable sources and materials are recovered at the highest value possible. The environment is biodiverse and walkable with human-scale streets, buildings and public spaces too.



In constant transformation

A neighbourhood that can adapt to future uses and technologies by leaving room for experimentation and appropriation by end users. Which supports self-organising capacity with collective facilities. Where new models of ownership lead to continuous reuse of structures in novel ways.

A framework for impacts across seven generations

In order to describe the core aspects and resulting effects of finance and ownership models designed for seven generations, we have developed a framework. This describes (1) the requirements to enable each business model as well as (2) the impacts across key fields.

This table describes how we use the framework to project the impacts of each model across future generations. Later on we fill the framework with the detail of each use case.

Requirements


User requirements	What is required from the user?
Supplier requirements	What is required from the supplier?
Technical requirements	What is required from legal contracts & regulations?
Spatial requirements	What is required from the building and land?
Governance & maintenance requirements	What governance / maintenance structure is required?

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	How does the model impact residents in the 1st generation?	How does the model impact the lives of residents in the 2nd - 6th generations?	How does the model impact the lives of residents by the 7th generation?
Financial impacts (CLT)	How does the model impact the finances in the 1st generation?	How does the model impact CLT finances in the 2nd - 6th generations?	How does the model impact the finances of the CLT by the 7th generation?
Environmental impacts	How does the model impact the environment in the 1st generation?	How does the model impact the environment in the 2nd - 6th generations?	How does the model impact the environment by the 7th generation?
Regulatory impacts	How does the model impact the municipality in the 1st generation?	How does the model impact the municipality in the 2nd - 6th generations?	How does the model impact the municipality by the 7th generation?
Material lifecycle impacts	How does the model impact building lifecycle in the 1st generation?	How does the model impact the lifecycle of the building in the 2nd - 6th generations?	How does the model impact the lifecycle of the building by the 7th generation?

Enablers for seven generations


Matching investor to lifecycle



Each layer has a separate investor, mediated by CLT as monitoring body

Matching investor to material lifecycle makes each building layer an investable proposition, free from dependencies and with legal flexibility. Responsibilities and risks are separated and ROI depends on maintenance - incentivising repair during operation.

Crowdfunding



Attracting investment from the local community

With a Products and Services Plan, a CLT can generate income from the garden, facade and events. Surrounding residents or businesses could invest by buying shares in products or services in advance. The CLT provides a structure which gives certainty and reduces risk for local investors.


Impact accounting



Financial compensation for positive social & environmental impact

Recognition is growing that we need to find methods to quantify and measure social and environmental impact in order to be able to invest in them. Models like carbon accounting and social impact bonds are examples of innovative mechanisms which incentivise positive social and environmental impact.

Long-term investing



Attracting long-term institutional investment

Long-term value creation is legally enshrined in the CLT model, making it a perfect vehicle to deliver on ESG targets. Circular material flows have great long term investment potential and investing directly into a CLT brings institutions like pension funds closer to their investees, deepening trust and reducing risk.

Steward ownership



Residents own a share in the building and land rather than their own home

A co-ownership model turns residents into stewards, incentivising cooperation and care over self-serving interests. The buildings and land are not speculated on and members can decide on the preferred ownership model per building layer.

Timebanking



Rewarding talent and time through a localised currency

Not all members of a CLT will have equal time and talent to contribute to a collective effort. Creating a local currency enables fair transfer across contributions. This can be governed locally and generate 'savings' for the future to be paid back in time, food, support or care.

In response to social inequality and ecological degradation, innovative financial instruments and models are emerging. These approaches are led by a variety of protagonists — from civic activists to traditional corporations, from local businesses to legislators — and demonstrate ways in which people can participate in our economic system whilst accounting for environmental and social impacts.

This page highlights mechanisms which could enable business models for seven generations at the neighbourhood level. While these enablers open up important new pathways, we need a variety of further shifts in governance (from legislative change to new social norms through awareness raising) in order to scale. More detail can be found [here](#).

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2.

Place-based prototyping

Amsterdam will be a Doughnut city

The Netherlands has set its sights on becoming a fully circular economy by 2050. Since we base our work in Amsterdam, we situate our research within the context of the transition to a circular economy, with a focus on the built environment. The two main strategies which inform our thinking are as follows -

Amsterdam Circular Strategy 2020-2025

Amsterdam wants to ensure a good life for its citizens, within the Earth's natural boundaries. To do so, the city has drafted a strategy to halve the use of raw materials by 2030 and become a fully circular city by 2050.

Amsterdam City Doughnut With this strategy the city uses the Doughnut Economy model from British economist Kate Raworth. The model describes how societies and businesses can contribute to economic development while still respecting the limits of the planet and our society.

Environmental impacts

Social impacts



Place-based prototype: The Bijlmer, Amsterdam

In order to test our research within a real-world context we had the privilege of working directly with [Community Land Trust H-Buurt](#) on a transformation site in the Bijlmer called [H-Midden](#). The Bijlmer provides a vibrant and diverse site with a [history of attempts](#) at transformation. However, in the past its development has been top down. Although ambitions were high, the process failed to listen to and involve the target group. In an effort to counter this, we developed a series of prototypes and verified them directly through an iterative process with resident members of the CLT.

The Bijlmer: a focus area for the future

In the [Omgevingsvisie 2050](#) a spatial vision for the city is outlined, alongside a roadmap of how to build this common future. The postwar area will be transformed into a series of mixed-use neighbourhoods where density, public space and social infrastructure go together and residents have a stake. Delivering on this promise will rely on increasing resident capacities and representation. The [Omgevingsvisie](#) acknowledges this need and aims to support pioneers of new collective ownership and governance models to make the transition work.

Bijlmer-Oost

H-Midden

Community Land Trust H-Buurt

Since there is no precedent for a Community Land Trust in the Netherlands, much pre-work has already been done to contextualise the model within the Dutch legal framework. A grassroots organization has been active in the H-Buurt for more than fifteen years with the support of different expert organisations and the municipality of Amsterdam joined hands.

They organised workspace events and meet-ups to co-create the CLT governance model and inform interested actors in and around the neighbourhood. This [whitepaper](#) describes the legal, financial and viability of the CLT acting as a long-term steward of these assets, ensuring they remain permanently accessible for generations to come.

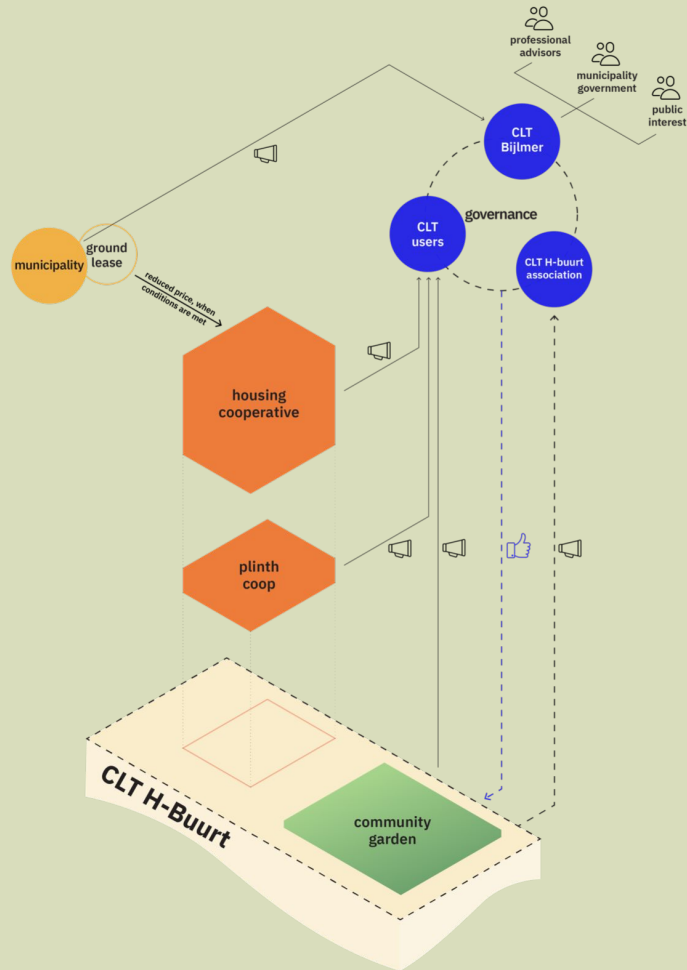


CLT H-Buurt members
2019

Contextualising the CLT model in the Netherlands

The Dutch land ownership context provides a specific set of challenges and opportunities when it comes to establishing a CLT. Much of Dutch land is in public ownership by the local municipality, as compared with the UK and USA where CLTs are more common in reaction to private land ownership. This means that the transfer of ownership from municipality to community is not clear-cut and requires ongoing collaboration rather than purchasing rights.

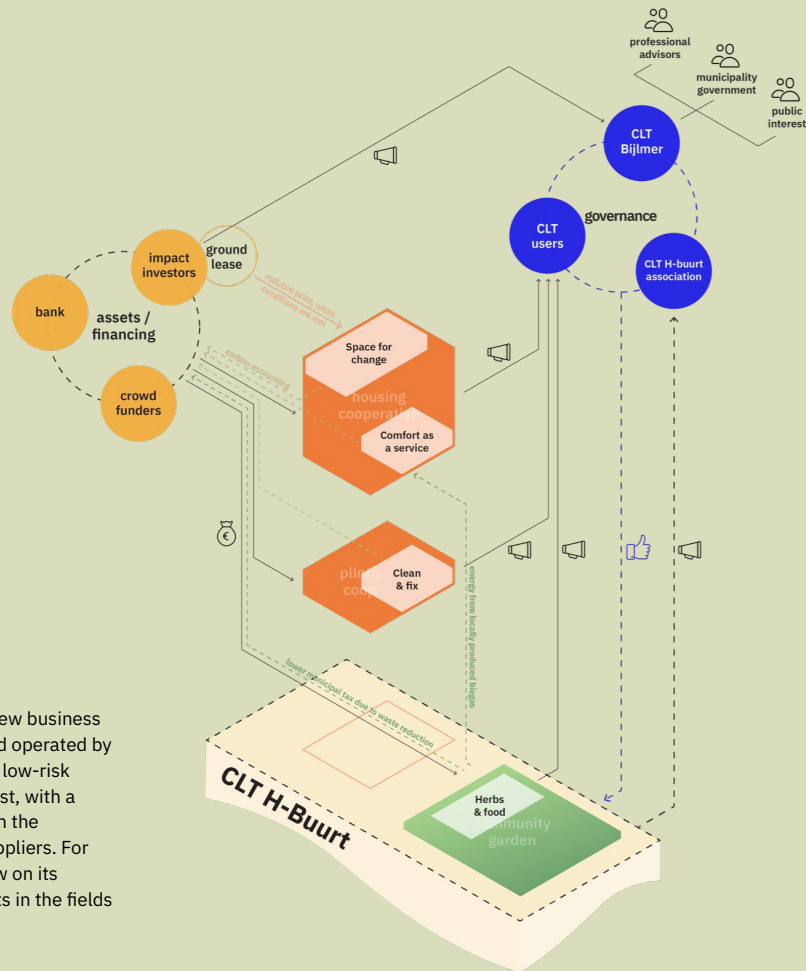
With this in mind, several years of work contextualising the model together with Amsterdam Municipality have resulted in the establishment of the members association CLT H-Buurt and the identification of a specific site within the Bijlmer called H-Midden. It is within this context that we situate our proposal for a set of residential buildings owned and managed for perpetuity by the CLT.



Towards ownership models for a circular CLT

The key features of the CLT model in Amsterdam are that land remains in the technical ownership of the municipality but a contractual agreement is established whereby the municipality agree to lease the land for perpetuity to the CLT, based on conditions of continued community ownership and development according to circular economy principles which support Amsterdam's ambitions to become the world's first Doughnut city.

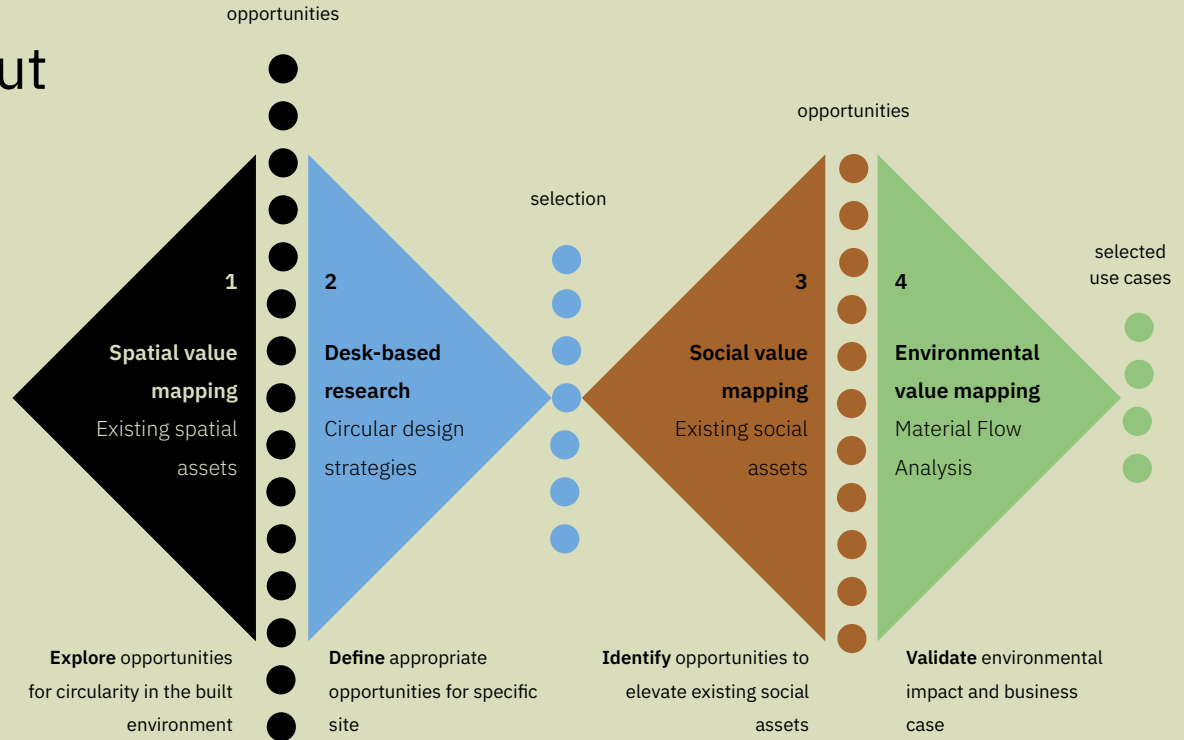
It is within these parameters that new business models for a circular neighbourhood operated by CLT H-Buurt sit. The CLT provides a low-risk vehicle into which third parties invest, with a management board set up to govern the relationships with investors and suppliers. For support, CLT H-Buurt is able to draw on its pre-existing network of local experts in the fields of law, finance and regulation.



Applying the Doughnut to a neighbourhood

When we apply the Doughnut principles at the neighbourhood scale we are confronted with an existing process of area development. In traditional area development processes, economic impacts dominate other forms and the site is maximised for economic return. By applying the Doughnut we try to rebalance this towards social and environmental impacts.

In order to do this we developed a methodology which balances social and environmental with spatial and economic value. By starting with desk-based research we identified opportunities for circularity in the built environment and then filtered those opportunities down based on maximising the positive spatial, social and environmental impact of those opportunities. This results in four validated use cases to take further.

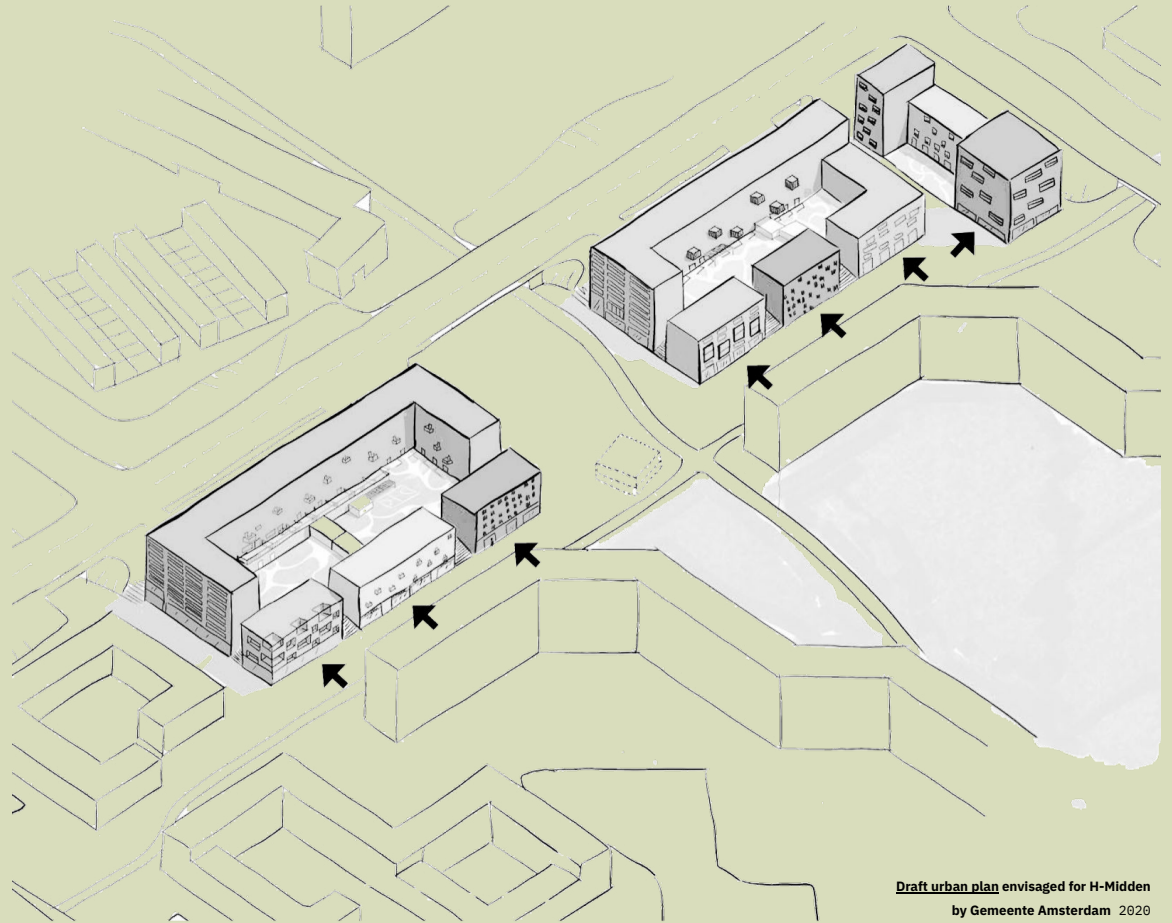


Step 1: Spatial value mapping

H-Midden, Bijlmer

In the H-Buurt of the Bijlmer the transformation of two parking garages at **H-Midden** into a new residential area is expected to start in 2024. The **plan** envisions a mixed use area development with workspace, social infrastructure and green public spaces in addition to 200-500 dwellings of roughly 47.000 m2. Crucially, the planned development invites self building by means of cooperatives (**wooncooperaties** in Dutch).

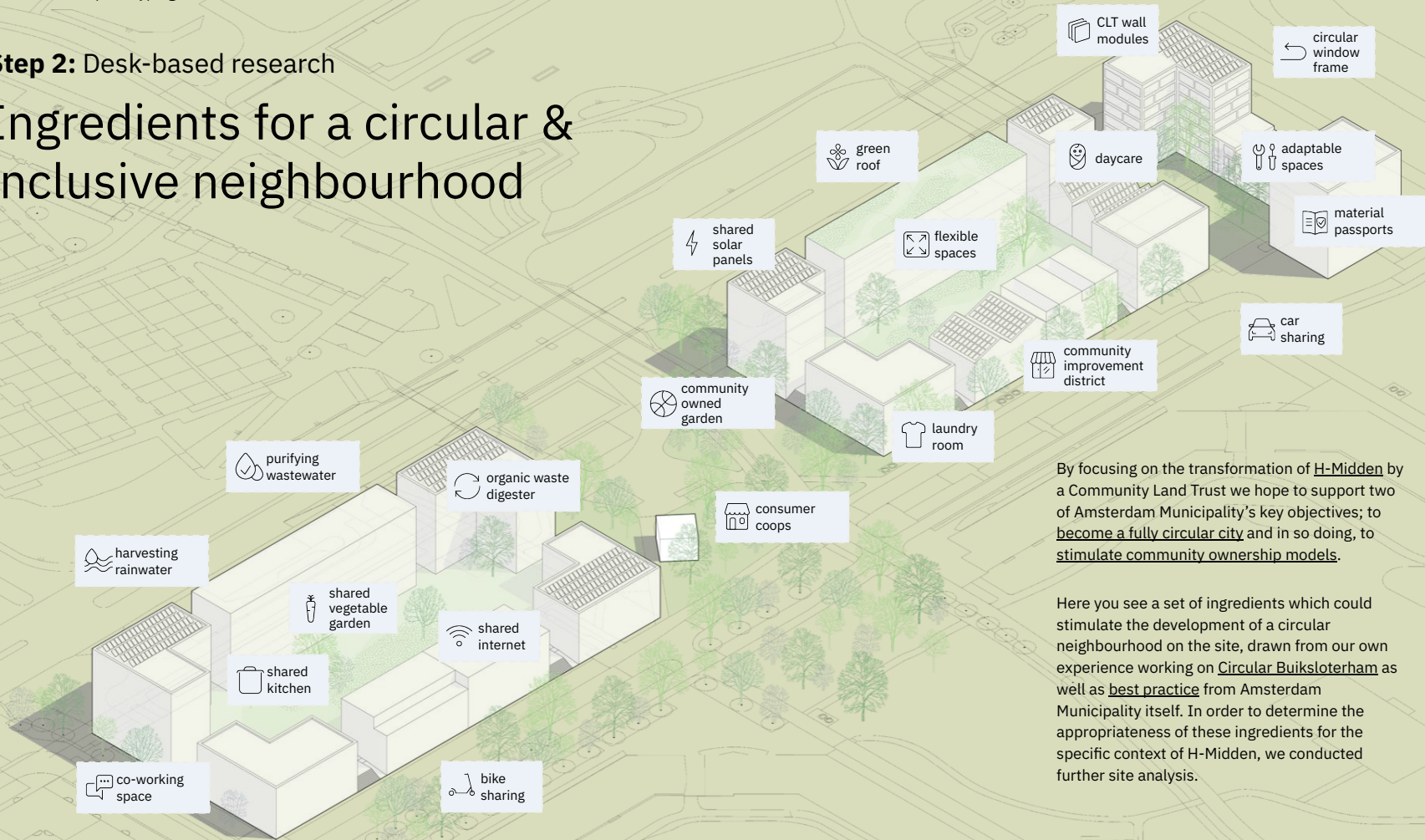
To inform and complement the ongoing urban planning process and to leverage the existing social capital and environmental values in the area, Amsterdam municipality supported the setting up of a CLT over the past years. In addition, temporary use of public space and buildings have been made available up to self-builders wanting to start a project.



Draft urban plan envisaged for H-Midden
by Gemeente Amsterdam 2020

Step 2: Desk-based research

Ingredients for a circular & inclusive neighbourhood



By focusing on the transformation of H-Midden by a Community Land Trust we hope to support two of Amsterdam Municipality's key objectives; to become a fully circular city and in so doing, to stimulate community ownership models.

Here you see a set of ingredients which could stimulate the development of a circular neighbourhood on the site, drawn from our own experience working on Circular Buiksloterham as well as best practice from Amsterdam Municipality itself. In order to determine the appropriateness of these ingredients for the specific context of H-Midden, we conducted further site analysis.

Step 3: Social value mapping

Interviews with local residents

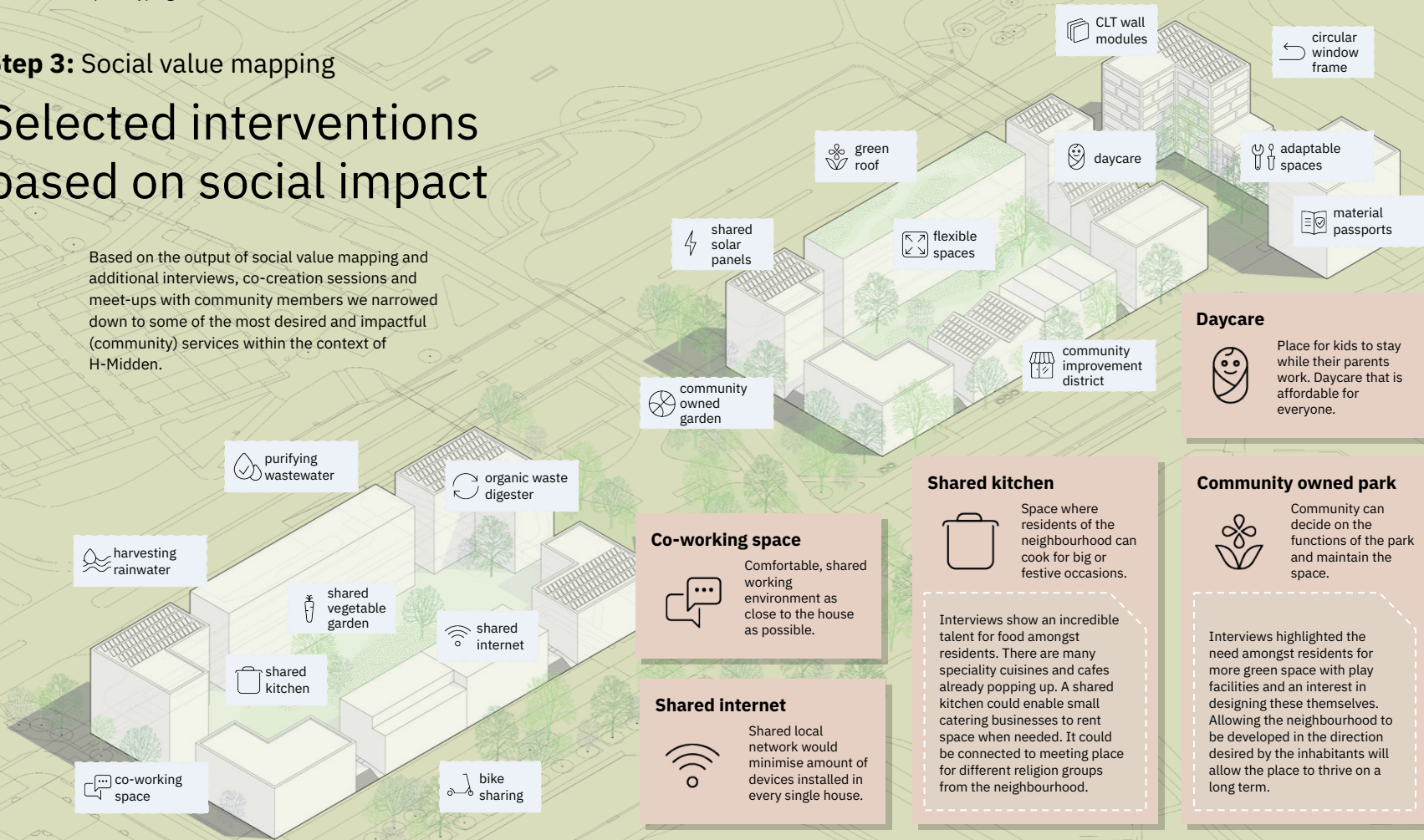
To better understand the existing social value in the area we worked with an anthropologist called Irosha Driessen who used the Asset Based Community Development (ABCD) methodology. This involved interviewing a diverse set of local residents in the H-Buurt neighbourhood to ascertain the existing qualities of the area from their perspective. The results of the interviews were placed onto a live map - click on the link to the right to explore.



Step 3: Social value mapping

Selected interventions based on social impact

Based on the output of social value mapping and additional interviews, co-creation sessions and meet-ups with community members we narrowed down to some of the most desired and impactful (community) services within the context of H-Midden.



Daycare

Place for kids to stay while their parents work. Daycare that is affordable for everyone.

Shared kitchen

Space where residents of the neighbourhood can cook for big or festive occasions.

Interviews show an incredible talent for food amongst residents. There are many speciality cuisines and cafes already popping up. A shared kitchen could enable small catering businesses to rent space when needed. It could be connected to meeting place for different religion groups from the neighbourhood.

Co-working space

Comfortable, shared working environment as close to the house as possible.

Shared internet

Shared local network would minimise amount of devices installed in every single house.

Community owned park

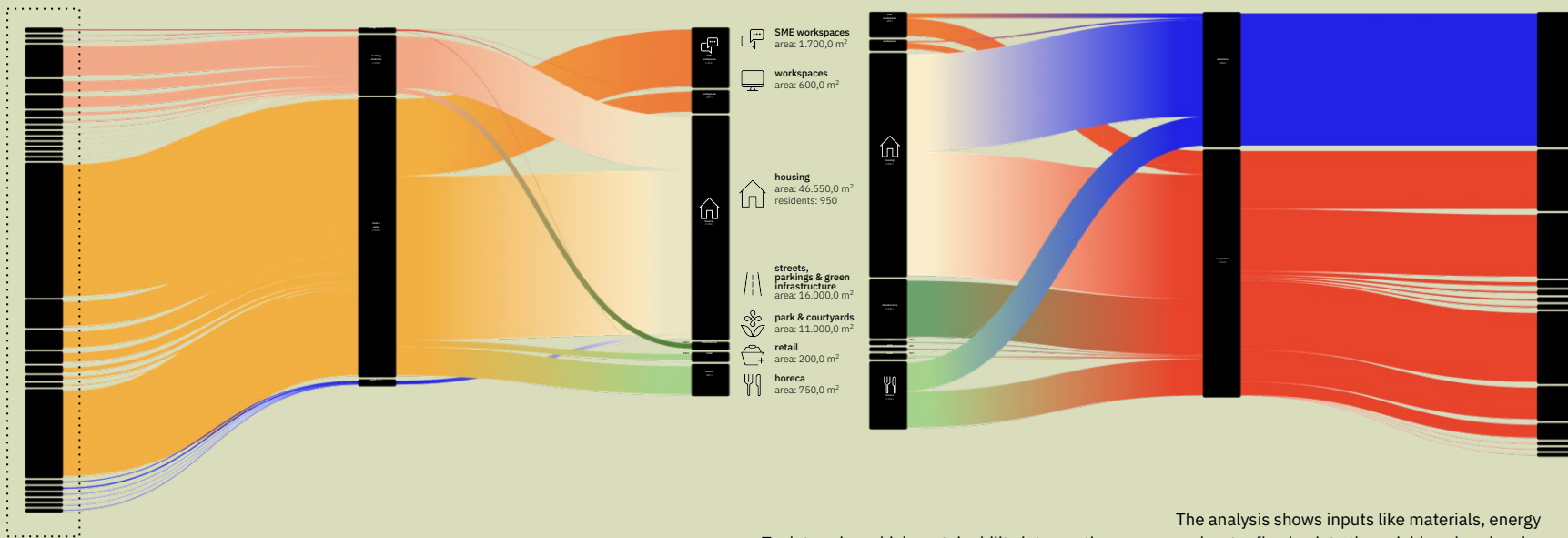
Community can decide on the functions of the park and maintain the space.

Interviews highlighted the need amongst residents for more green space with play facilities and an interest in designing these themselves. Allowing the neighbourhood to be developed in the direction desired by the inhabitants will allow the place to thrive on a long term.

Step 4: Environmental value mapping

Material Flow Analysis

a. Business as usual



>>> Click [here](#) for high res image with detailed information

* water flows are scaled down to 2% of its actual mass
** building materials of non-residential buildings are not included
***data is based on a study conducted by Metabolic for the wider H-Buurt neighbourhood in 2019 entitled 'Circulaire gebiedsontwikkeling in de H-buurt.'

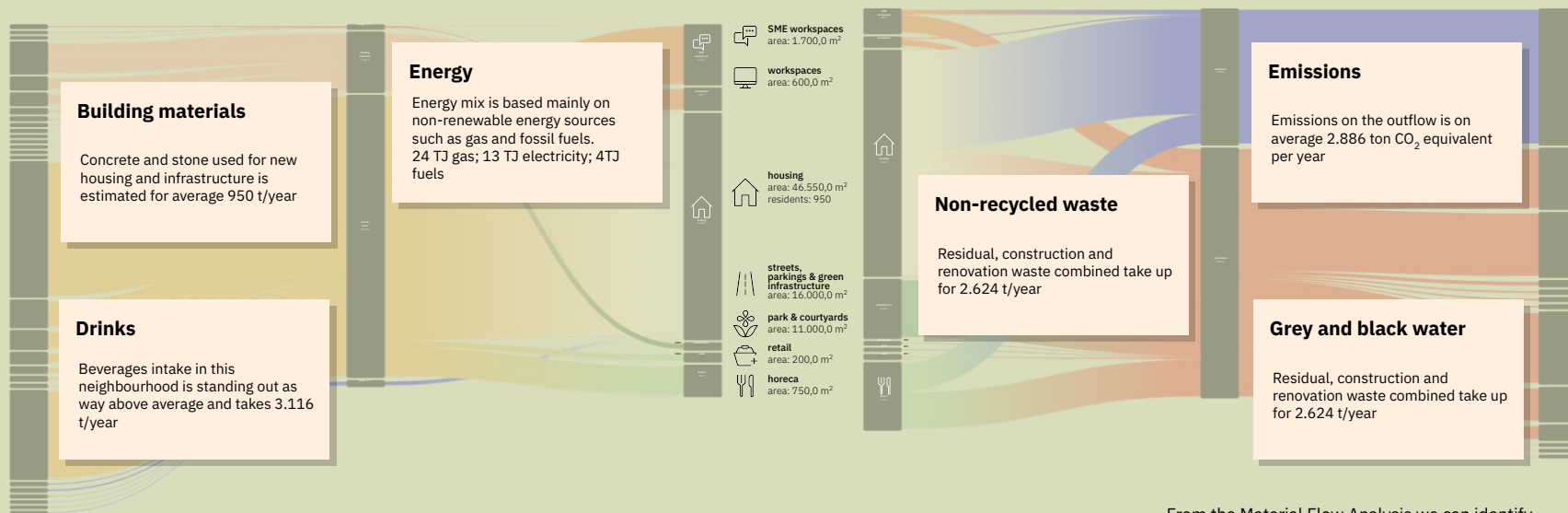
To determine which sustainability interventions would be most impactful in H-Midden, a Material Flow Analysis was conducted. The analysis is illustrated here in the form of a Sankey diagram which represents these material flows in the form of arrows which are proportional to the flow rate.

The analysis shows inputs like materials, energy and water flowing into the neighbourhood and resulting in outputs like emissions, wastewater and residual waste. The scenario shown here is the annual 'business-as-usual' scenario up to 2035 if no new policy is implemented and construction takes place as normal.

Step 4: Environmental value mapping

Material Flow Analysis

b. Challenges and opportunities



>>> Click [here](#) for high res image with detailed information

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Material and water flows are represented in t/year and energy in tj/year. Our analysis takes into consideration both embodied (construction, renovation etc.) and operational energy from daily functioning of the neighbourhood throughout the year.

From the Material Flow Analysis we can identify flows which are problematic from an environmental perspective; the top six are described above. Based on these we were able to identify points of intervention into the 'business-as-usual' scenario which would have a positive environmental impact.

Step 4: Environmental value mapping

Material Flow Analysis

c. Sustainability interventions

Renewable energy

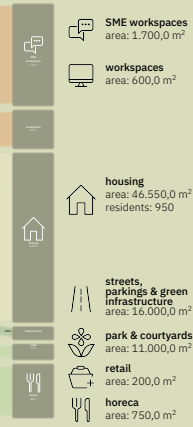
Roofs of the H-midden neighbourhood can produce 1,6 TJ of electric energy for the buildings on site. Reducing loss on energy transportation and maximizing use.

CLT for CLT

Cross Laminated Timber can replace traditional use of concrete as load bearing structure. As bio-based material it has significantly smaller environmental impact and emissions rate.

Building materials

Bio-based materials can be used for interior walls, facade and insulation. When applied properly these would sequester carbon throughout its lifetime.



Greener streets

Reducing amount of parking places and turning them into green public spaces will have positive impact both for the environment and well-being of the residents.

Harvesting rainwater

It is estimated that 24.850 t of rainwater can be harvested locally, that is approximately 1/3 of fresh water consumption in the neighbourhood

Wastewater purification

Introducing local wastewater reuse systems could significantly reduce freshwater consumption and allow for extraction of nutrients.

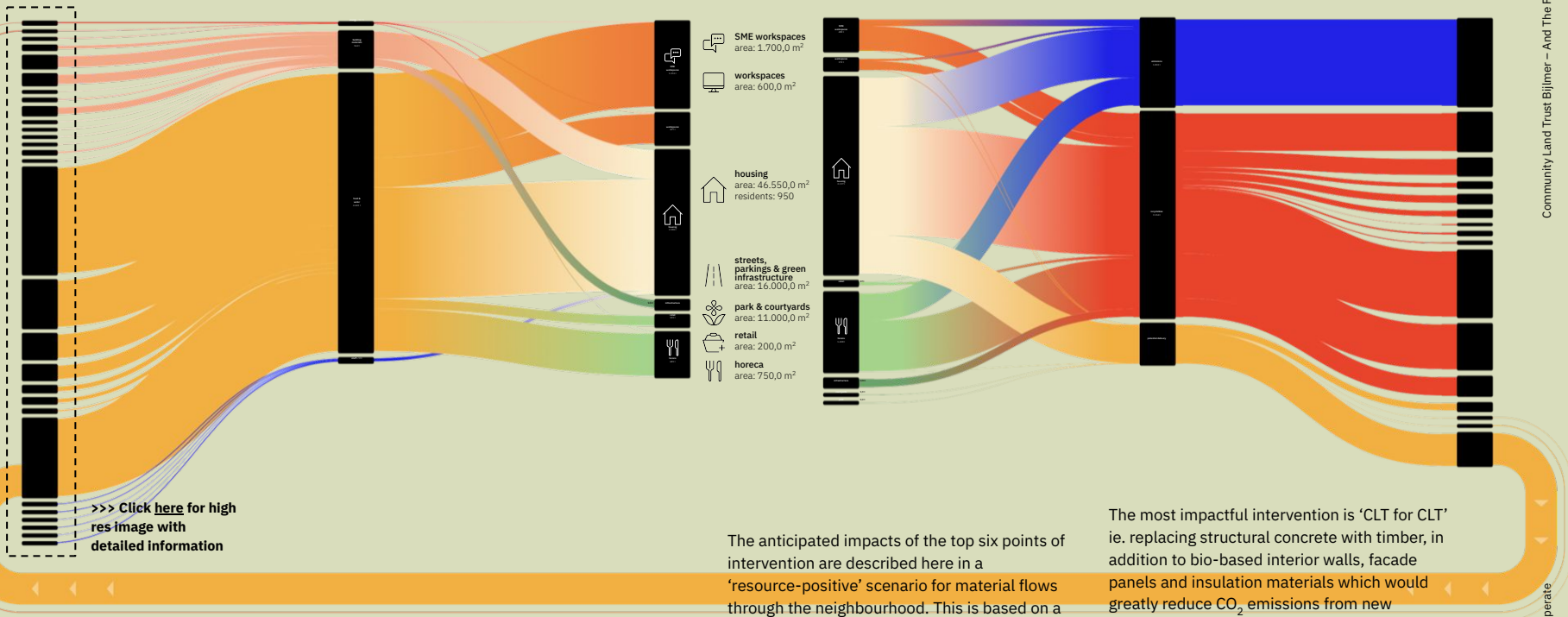
* water flows are scaled down to 2% of its actual mass
** building materials of non-residential buildings are not included

The top six points of intervention which would have a positive environmental impact in the neighbourhood are described here.

Step 4: Environmental value mapping

Material Flow Analysis

d. Towards a resource-positive neighbourhood



* water flows are scaled down to 2% of its actual mass
** building materials of non-residential buildings are not included

Prototyping with residents & experts

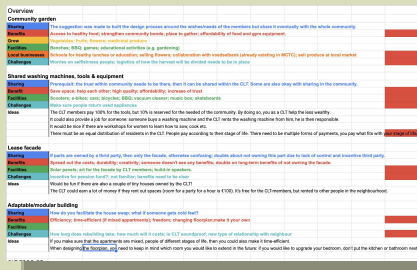
The process of developing a set of contextualised business models for a CLT to develop a circular neighbourhood required prototyping, testing with users and iterating based on feedback. Since Covid-19 disrupted regular channels of communication with CLT H-Buurt members, we shifted into a hybrid online-offline mode.

Right: Online meet-up of CLT H-Buurt members February 2021

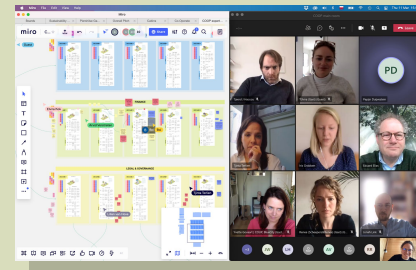


In particular, we conducted interviews with CLT H-Buurt members to share our first ideas for circular business models with them and seek feedback based on how the interventions might impact their lives. Based on this feedback we produced a further iteration which we subsequently shared with experts from the fields of finance, asset management, public governance and real estate development. Based on their insights, we further iterated our models.

Right: Circular business models resident interviews, February 2021 Link to interview notes [here](#)



Right: Circular business models expert workshop, March 2021 Link to Miro board [here](#)



Result

Four transformative use cases

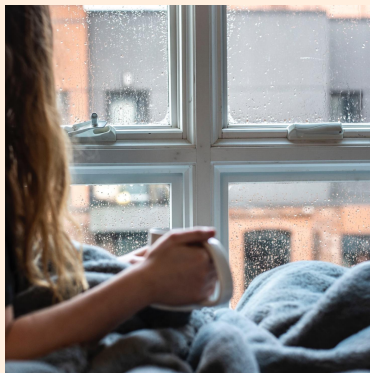
Herbs and food

Community garden where seasonal herbs, fruit and vegetables can be produced locally. Residents of the neighbourhood will collectively take care of the garden, water the crops in order to receive healthy, nutritious products grown just outside their home.



Environmental comfort as a service

A model of performance based solution for the member and service provider that ensures cleanest possible heat and electricity is delivered using only renewable energy sources.



Space for change

Social enterprise established within the housing cooperative that would provide flexible interior wall system for residents. Space can be adjusted periodically to the needs of the residents. Walls would be built from bio-based modules, designed for disassembly.



Clean and fix

Space and service with tools and household appliances, located within the residential building. Service allows residents to save space in apartments using shared appliances. Shared platform helps to exchange tools with neighbours.



This methodology for mapping existing values led us to identify four transformative use cases which would maximise positive impact across spatial, social and environmental domains.

The four use cases are described here in terms of the outcome they look to achieve. In the next chapter we describe business models to facilitate their implementation.

3.

Use cases

1

Herbs & food

2

**Environmental
Comfort as a
service**

3

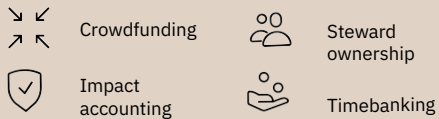
**Space for
change**

4

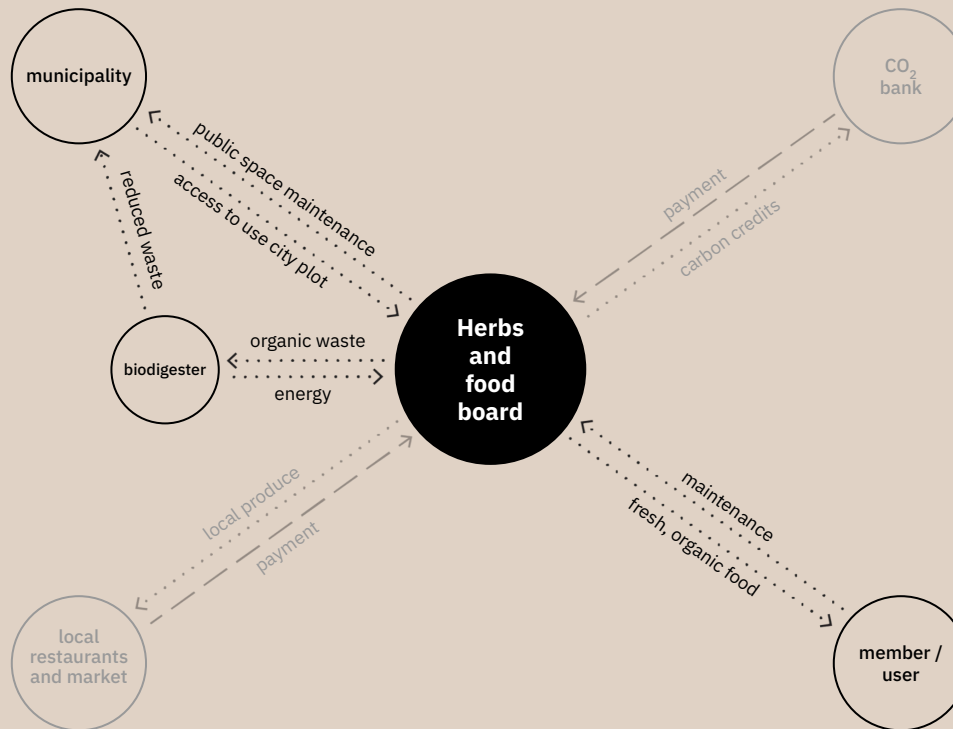
Clean & fix

Use case 1

Herbs and food



A shared urban garden can contribute to a healthier diet, cut spending on food and allow all generations to grow and harvest best quality produce. Building stronger relationships with locally produced food can be beneficial for health and well being of the youngest generations growing up in densely populated cities. Through selling excess food, energy from the biodigester and carbon credits from the soil, the garden can also bring profit to the CLT. Reducing organic waste and using it locally reduces emissions and closes material loops.



Herbs and food

Market benchmarks

Community Gardens

Community gardens, where seasonal herbs, fruit and vegetables can be produced locally. Residents of the neighbourhood are collectively taking care of the vegetable garden, watering the crops in order to receive healthy, nutritious products grown at their doorstep.



Incredible Edible

At Incredible Edible we have one overriding truth – that people have the power to create places they are proud of with futures full of hope, where anyone can be involved. If you eat, you're in!



Urban farming in Detroit

Detroit's urban garden scene continues to grow in impact, bringing neighbors together and supporting the underprivileged with access to healthy produce.



Voedseltuin IJplein

Food garden IJplein is a communal vegetable garden for and by local residents. Everyone who works in the garden gets a share of the proceeds. Organically grown vegetables and herbs are given to Food Banks in Amsterdam.



Use case 1

Herbs and food

Requirements

Impacts

		1st generation	2nd - 6th generation	7th generation
User requirements	Time invested into tending the garden is returned in free fruit and veg			
Supplier requirements	Fruit and veg is provided on service contract to surrounding f&b			
Technical requirements	Permaculture applied to eliminate pesticide/herbicide & biodigester generates energy			
Spatial requirements	Plot size determined by resident demand and contracts			
Governance & maintenance requirements	CLT manages garden including relationship with surrounding f&b			
Social impacts		Residents meet each other regularly and improve diet	Knowledge on diet & health grows, food costs lower	Deep health knowledge & minimal food expenses
Financial impacts (CLT)		Fruit & veg sold to local f&b generates income for CLT	Income grows as investments into production are made	Income used to regenerate building & land over time
Environmental impacts		Reduction of imported food lowers CO2 emissions	Biodiversity flourishes and trees fully grown	CLT is CO2 positive - sequestering more than emit
Regulatory impacts		Municipality could allow the CLT to 'adopt' the garden	Minimised waste streams reduce service demand	Self-supporting neighbourhood with 100% nutrient reuse
Material lifecycle impacts		The lifespan of site & soil is infinite, making this the best investment		

“When [the neighborhood sees that] we are active with growing our own food, cooking with local ingredients, facilitating outdoor sporting and social gatherings - this will positively influence a healthy lifestyle of generations to come.”

CLT H-Buurt member
Full interview notes available [here](#)

Use case 1

Herbs and food

Impacts quantified

Increasing food security

Growing food in community and home gardens can contribute to food security. Recent studies have reported doubling community vegetable intake to a level that met the number of daily servings recommended by Dietary Guidelines.

1

Reducing food costs

Depending on plot sizes, cost savings per household can range between between €15.000,- and €51.000,- per year for the CLT Bijlmer Community (30 households)

2

Increasing CLT income

Studies have shown production of food, methane, organic fertilizer and carbon credits have an internal rate of return of 21.4%, and the short payback period of 7.9 years. Meaning that herbs and food revenue direct profits already within the 1st generation.

3

Reducing food waste

If organic waste from both households and surroundings is sent to anaerobic digesters approximately 36% of general waste is organic waste. This can reduce local waste taxes by 36% - estimated between €100 and €200 per year per household.

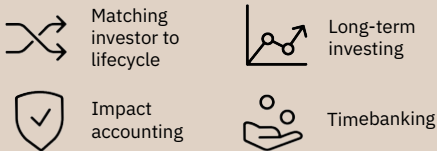
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Impacts

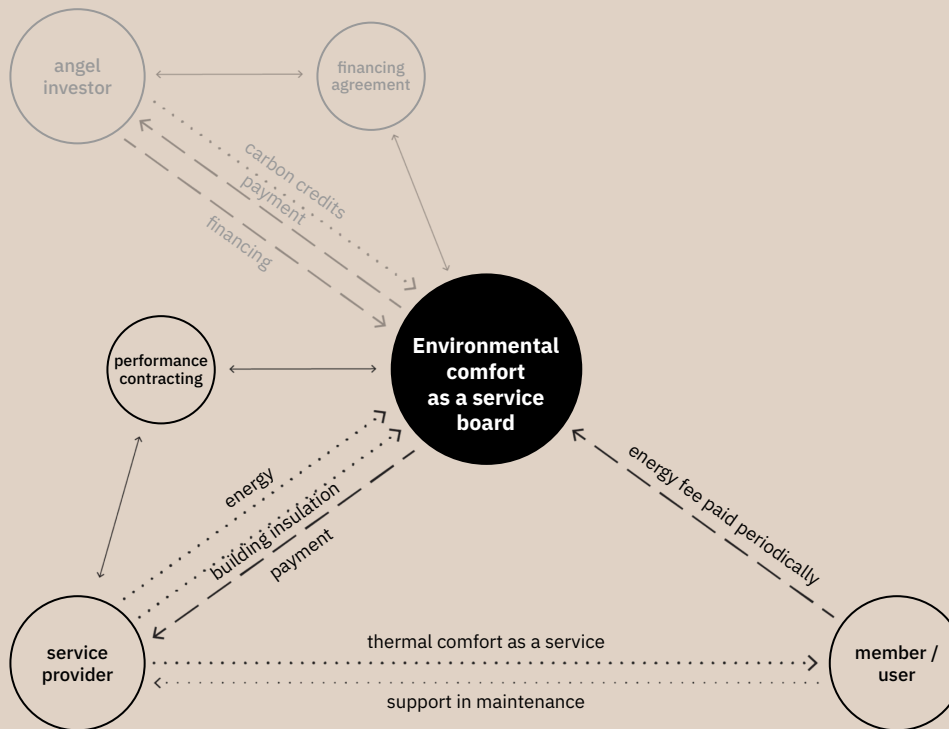
	1st generation	2nd - 6th generation	7th generation
Social impacts	Increasing food security & health, meeting neighbours 1	Knowledge on diet & health grows, food costs lower	Deep health knowledge & minimal food expenses
Financial impacts (CLT)	Household cost savings from food accrue to CLT members 2	Income grows as investments into production are made	Income used to regenerate building & land over time 3
Environmental impacts	Reduction of imported food lowers CO2 emissions	Biodiversity flourishes and trees fully grown	CLT is CO2 positive - sequestering more than emit
Regulatory impacts	Municipality could allow the CLT to 'adopt' the garden	Minimised waste streams reduce service demand 4	Self-supporting neighbourhood with 100% nutrient reuse
Material lifecycle impacts	The lifespan of site & soil is infinite, making this the best investment		

Use case 2

Environmental comfort as a service



The ESCo performance model combines green energy production with bio-based thermal insulation methods to ensure residents receive thermal comfort using the most sustainable solutions available on the market at any given time. The service model means CLT members pay only for the service within a member fee. The CaaS board takes care of servicing solar panels on the roof, replacing installation after it's life time and making sure environmental footprint of these operations is smallest possible, measured throughout the whole life cycle and beyond (EN 15978 stages A-D). Residents can contribute to the process and in doing so reduce their monthly energy price. If you have time and skills, join the energy group within the CLT or the maintenance crew. Maybe you can also contribute to reducing carbon footprint of some operations, by just being available when needed and checking on the installation parameters with support of service team.

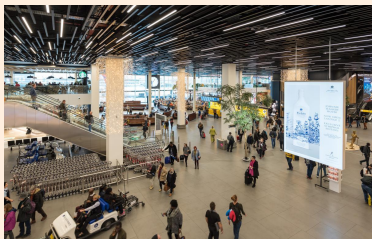


Environmental comfort as a service

Market benchmarks

Philips for Schipol light-as-a-service

For Philips circular lighting solution the principle is simple: instead of buying a luminaire, you buy light. When the contract period has expired, the customer can choose to extend the contract with upgrading the existing lighting or opt for new lighting. Luminaires can be returned to us for reuse or recycling.



ESCO

An energy services company, also known as ESCo, is a party that provides sustainable real estate based on an energy performance guarantee. This can be done by saving energy as well as by supplying energy.



Wolfhagen BEG

Wolfhagen BEG is a consumer cooperative that is co-owner of a municipal energy producer. It provides an outstanding example of what can be called a 'public-common' partnership, where a municipal utility is co-owned and co-governed by a cooperation between the public authority and a citizens consumer cooperative. It is thus an excellent example of what is called a 'just transition', not only contributed to increased energy efficiency and production of renewable energy, but democratizing both access and ownership.



WOAB Woningabonnement

Do you not want to invest in your home, but do you want to use more comfort and less energy? Then the home subscription is the solution. We arrange everything and your living costs remain the same. With a 15-year performance guarantee and support from the province and municipality.



Use case 2

Environmental comfort as a service

“For me as a future CLT resident it is more important to have access and control than to (individual) financial ownership of building components/systems that provide (sustainable) energy or heating.”

CLT H-Buurt member
Full interview notes available [here](#)

Requirements

User requirements	Resident pays fee to supplier in return for the provision of thermal comfort
Supplier requirements	Supplier invests in both energy production and building insulation
Technical requirements	Supplier invests in new solutions over time as technology advances
Spatial requirements	Digital twin supports solution integration with building over time
Governance & maintenance requirements	CLT energy group manages supplier relationship and votes on solutions

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Residents gain energy security and meet each other to take decisions	Energy security and green job creation with installation of solutions	Self-sufficiency brings energy independence at community level
Financial impacts (CLT)	Reduced energy costs and greater flexibility in investments	Building is energy self-sufficient through smart investments	Income from energy generated for surrounding neighbourhood
Environmental impacts	Reduced energy requirements, less emissions	Energy 100% renewable, insulation 100% bio-base	Positive impact on emissions of surrounding neighbourhood
Regulatory impacts	Provides showcase for merging energy and insulation	TCaaS model spreads & city CO2 reduction targets are met	Energy providers now all converted to TCaaS
Material lifecycle impacts	Services lifespan is 25 years, after which solutions are renewed by service provider		

Use case 2

Environmental comfort as a service

Impacts quantified

Reducing energy costs

Cost savings per household range between €2000,- (students & single households) and €3000,- (large families) per year. Up to €90.000,- cost savings for CLT-Bijlmer community per year.

1

Reducing emissions

Properly insulated housing by average requires 22,95% of the heating vs. non insulated housing projects, thereby saving approximately 18 ton Co2-eq each year for 30 households.

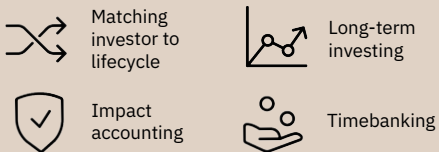
2

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Residents gain energy security and meet each other to take decisions	Energy security and green job creation with installation of solutions	Self-sufficiency brings energy independence at community level
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Material lifecycle impacts	Services lifespan is 25 years, after which solutions are renewed by service provider		

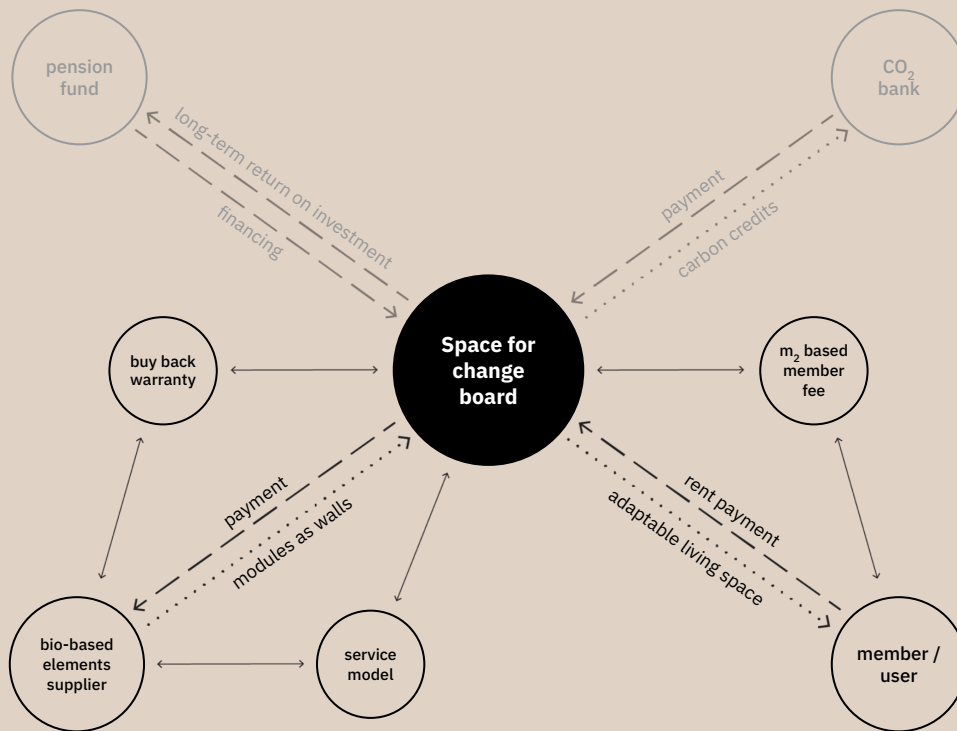
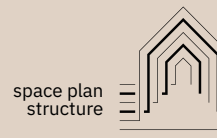
Use case 3

Space for change



Building structure designed according to an Open Building model, allowing users to reconfigure space plan over generations. As a single resident you can live comfortably in a 60sqm apartment for 5 years and when your family grows, reconfigure the walls and have 1 or 2 rooms more. The CLT organisational model facilitates collective decision-making regarding interior functions and layout and adaptability for future generations is guaranteed.

If you are handy, you can also join the construction team within the CLT and cut your monthly costs by contributing some of your time and helping neighbours in renovation works. Elements are designed for disassembly from bio-based materials like Cross Laminated Timber which sequester carbon and retain their residual value after reconfiguration. Each wall element is returned to the supplier via a leasing model. The supplier takes them back, cleans and leases again, keeping the product in the market as long as possible.



Space for change

Market benchmarks

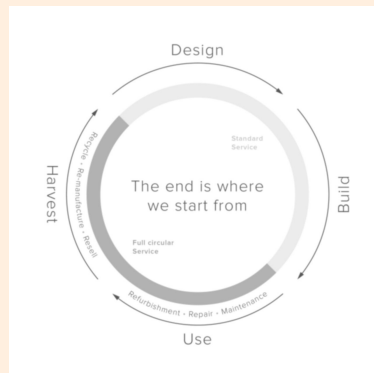
ALKANDOR as-a-service

The pilot of the integral facade as a service provides a building with heating, cooling, ventilation, sunlight regulation and energy generation. Various options are built into the pilot that are interchangeable with each other.



Jansen by ODS

Steel elements from Jansen by ODS are an example of an innovative, circular business model for construction elements.



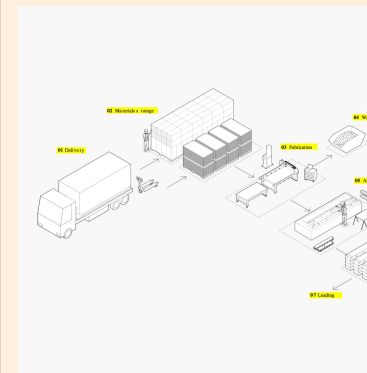
JuuNoo interior walls

Dismountable interior walls for offices; available with bio-based panels on steel construction. Circular business model with buy back warranty and online value calculator.



Wiki house

Systems for CNC optimised production of Cross Laminated Timber modules for homes. Conscious use of bio-based material and controlled supply chains.



Use case 3

Space for change

Requirements

User requirements	Residents vote collectively on space plan configuration
Supplier requirements	Service model guarantees that supplier buys back components
Technical requirements	CLT timber modules must be sustainably sourced with a material passport
Spatial requirements	Building structure must follow <u>Open Building</u> principles for adaptability
Governance & maintenance requirements	CLT manages contract with supplier to perform maintenance

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Increased agency and negotiation with neighbour	Residents stay longer in the community, strengthening it	Building and community have grown together
Financial impacts (CLT)	Reduced costs for renovation due to modular system	Reduced costs for adaptation to new uses and family type	Building lasts much longer, reducing costs for rebuilding
Environmental impacts	Timber components sequester carbon	Fewer new materials consumed due to lease service	Carbon positive building is achieved, no new materials
Regulatory impacts	Incentives established for open building systems	Zoning moves from fixed programme to performance	(Digital) collaboration space with municipality
Material lifecycle impacts	Space Plan lifecycle is 15 years Structure lifespan is 100 years		

“During my lifetime, if my needs for space changes, I am willing to give up sqm to others who need it more.”

CLT H-Buurt member

Full interview notes available [here](#)

Use case 3

Space for change

Impacts quantified

Household cost savings

Cost savings range from €200 - €230 per household each year, depending on building condition and planned retrofits or large adjustments to buildings. Cost savings grow cumulatively over time as less investment required for demolition, refurbishment and retrofit.

1

Increased staying power

Approximately 18% of the people in Amsterdam move each year so that after 5 years. But [research](#) shows that Community Land Trusts enhance neighborhood stability by preventing displacement of low-income households, and maintaining optimal unit conditions.

2

Carbon sequestration

A typical tree can absorb around 21kg of CO₂ per year. If we use Cross Laminated Timber each kg of concrete in a building can be replaced by 0.34kg of timber. With a concrete core and CLT floors and walls we reduce the concrete mass to just 15% of the Business as Usual, reducing CO₂ emissions significantly.

3

Reducing life cycle costs

Space for Change has high potential for life cycle cost reductions. The biggest cost savings occur during Demolition stage. In addition the residual value of the building remains higher than non adaptable buildings. Case studies on circular and adaptive kitchen have shown 10% life cycle cost savings.

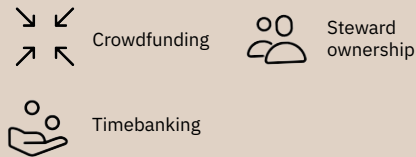
4

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Increased agency in neighbourhood development	Residents stay longer in the community, strengthening it ²	Building and community have grown together
Financial impacts (CLT)	Reduced costs for renovation due to modular system	Reduced costs for adaptation to new uses and family type	Building lasts much longer, reducing costs for rebuilding ¹
Environmental impacts	Timber components sequester carbon ³	Fewer new materials consumed due to lease service ⁴	Carbon positive building is achieved, no new materials
Regulatory impacts	Incentives established for open building systems	Zoning moves from fixed programme to performance	(Digital) collaboration space with municipality
Material lifecycle impacts	Space Plan lifecycle is 15 years Structure lifespan is 100 years		

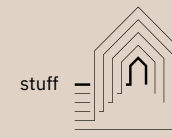
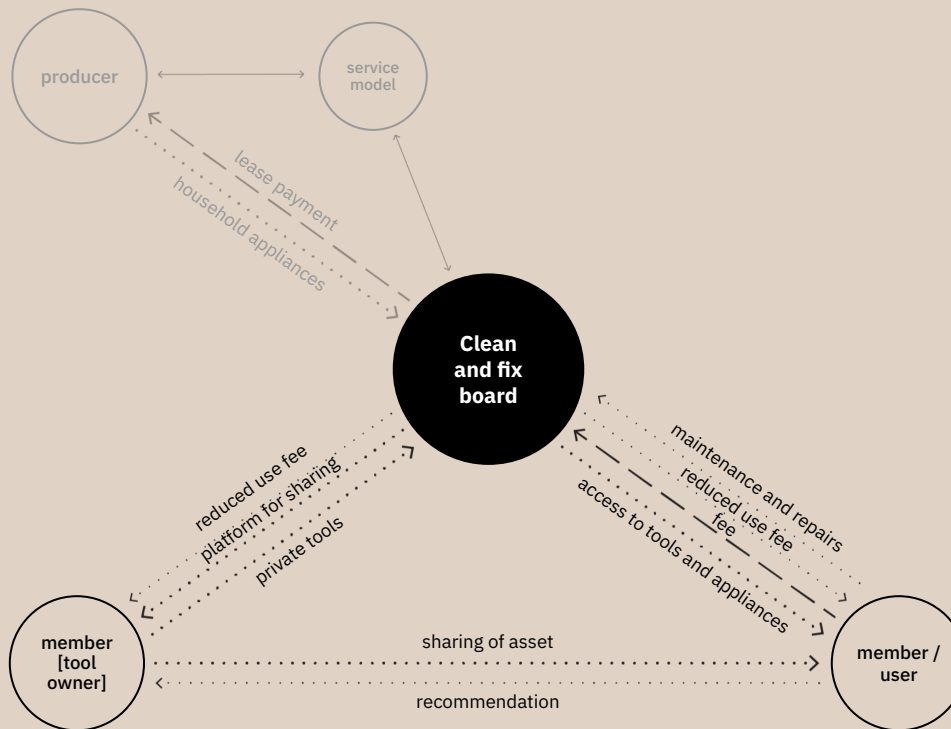
Use case 4

Clean and fix



Although we buy them individually, our tools and household appliances are often underutilised in the home. Maybe we use the vacuum cleaner once a week for 20 minutes, but a drill we own for years and use just once. To combat this underutilisation, Clean and Fix provides a space within the building dedicated to sharing those appliances and tools with neighbours with similar needs.

Here you can share a washing machine and clothes dryer, saving space in your apartment, as well as subscribe to a tool sharing platform. If you are handy you can help other community members to repair their broken appliances and prolong their lifecycle at the same time having personal discount on the Clean and Fix service.



Clean and fix

Market benchmarks

WASBAR

In WASBAR® you can enjoy a tasty meal at any time of the day: breakfast, brunch, lunch to dinner! At WASBAR you can of course also do some laundry while you meet up with friends for something to eat or drink.

<https://www.wasbar.be>



Repair Cafe Oxfordshire

Repair cafes are community events which match people with broken household and personal electrical and electronic items with skilled people who like fixing things. The purpose of the events is to bring about a shift away from consumerism and viewing household items as disposable. The focus is on skill-sharing and building community, as attendees will be invited to learn how to fix their broken item alongside the repairers instead of throwing them in the bin.

<https://repaircafeoxfordshire.org>



Wasbuur

Wasbuur is undoubtedly one of the smallest, but probably also one of the most striking launderettes in Rotterdam. You can come here to freshen up your dirty laundry – for an expense allowance – but also to drink a cup of coffee with the workmen from the wood workshop behind it. The postman also knows where to find Wasbuur to give undeliverable packages a temporary address. And Van Blankensteyn detergent can be found here, which is produced on site from organic residual material (mainly: orange peels).

<https://www.stadindemaak.nl/wasbuur/>



Werkplaats

The Houtwerkplaats is the most intensively used community of Stad in de Maak. As a result, a good range of tools is available: from Stad in de Maak's own full-frame wall sawing machine, to the many tools of the regular users of the workshop. A full commons means that the space can only be shared with others in consultation. Sometimes the Houtwerkplaats is also used in double use with the adjacent distillery, so that special or larger events can be accommodated. On working days, the door is usually open to the curious.

<https://www.stadindemaak.nl/werkplaats/>



Use case 4

Clean and fix

Requirements

User requirements	Residents own a share in the space and subscribe to use appliances
Supplier requirements	Service provider leases appliances and tools to CLT and maintains them
Technical requirements	High quality appliances which can be reused at end-of-life
Spatial requirements	Shared space, minimum 10sqm, accessible to all dwellings
Governance & maintenance requirements	CLT manages service contracts and utilisation of shared space

“It is no problem for me to share appliances such as power tools and laundry machines with other people from the community - so that I have access to more and better quality appliances.”

CLT H-Buurt member
Full interview notes available [here](#)

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Residents meet each other daily and help each other out	Maintenance skills required support local upskilling	Strong social cohesion based on shared responsibility
Financial impacts (CLT)	Residents save costs of buying their own tools and appliances	Savings accrue over time including water and energy	Appliance costs now negligible due to shared service model
Environmental impacts	Sharing leads to overall reduction in purchases	Reduced material, energy & water consumption	On-site energy & water production neutralises environ impact
Regulatory impacts	Municipality incentivises by reducing ground rent on shared space	Municipality mandates all housing to share tools and appliances	Appliance ownership no longer exists, 100% shared in all housing
Material lifecycle impacts	Material lifespan of appliances and tools today is 5 - 20 years but incentivised by a service model and good maintenance, this could be extended		

Use case 4

Clean and fix

Impacts quantified

Resident upskilling

Tool libraries make it easier for home-owners with limited resources to maintain their homes, providing security. Additionally, tool libraries may serve as a gateway to other types of borrowing and sharing opportunities and initiatives such as kitchen tool, skill and toy shares. **1**

Cost savings

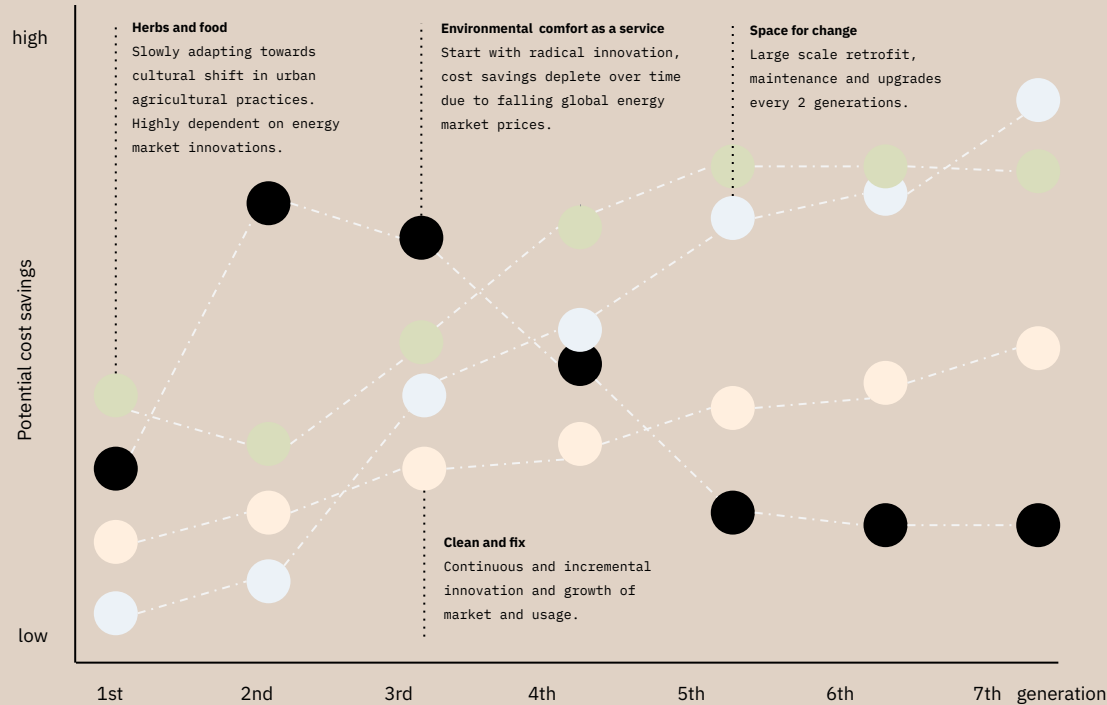
The average cost savings per user per year is approximately €125 - €700 for shared tools. For the CLT H-Buurt community (30 households) this saves over €21,000 each year. **2**

Impacts

	1st generation	2nd - 6th generation	7th generation
Social impacts	Residents meet each other daily and help each other out	Maintenance skills required supporting local upskilling 1	Strong social cohesion based on shared responsibility
Financial impacts (CLT)	Residents save costs of buying their own tools and appliances 2	Savings accrue over time including water and energy	Appliance costs now negligible due to shared service model
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Use cases

Potential cost savings over 7 generations



Often investment into sustainability in the built environment is seen as an extra cost. In workshops with members of Community Land Trust H-Buurt, the question of cost often arose. To test this assumption, we developed scenarios of what the costs might actually be for residents across future generations for each of the four use cases. An estimation of the rate at which these cost savings might accrue incrementally across generations is shown on the left.

We found that although they require upfront investment initially, the use cases actually save residents money already from the first generation. Whilst Herbs and Food, Space for Change and Clean and Fix accrue incremental cost savings, Environmental Comfort as a Service starts with very large cost savings initially which then fall over time due to falling global energy prices.

4.

Next steps

A call to action for cross-sector collaboration

The objective of this provocation is to catalyse change in the way we produce our built environment and to open up pathways towards direct community involvement in those processes.

Faced with the twin crises of social inequality and climate breakdown, community ownership is now more than ever a necessary instrument for city planning, building development and design processes. The building industry faces the task of drastically lowering its carbon and ecological footprint, by extending the lifespan of buildings through adaptability.

Co-Operate aims to support the transition to a society based on co-creation, participation, involvement and inclusion. By focusing on the business model behind the built structure, we hope to work towards the infrastructure required for home-owners and users to inhabit and co-produce their environment.

But we can't do it alone. Therefore we make an open call to action and invite engagement from across sectors. Come and join us if you are:

- A financier or investor with creative ideas and strategies for stimulating early-stage circular innovation in the Netherlands
- An asset owner or fund manager with the curiosity to develop and test impact-driven frameworks for portfolio management and evaluation
- A municipal representative looking for novel ways to crowd in and deploy finance in service of your circularity strategy
- A land owner who would like to develop a piece of land in a circular and inclusive way
- A community group who would like to develop housing in a circular and inclusive way

We invite you to join us in further developing, demonstrating, and scaling an ecosystem approach to circular and inclusive development in the Netherlands. We will be forming a working group with the remit to further define the structure, focal areas and partnerships required to move forward. This working group will run throughout 2021.

If you would like to get involved please reach out to us at **contact@cooperate.eco**.

Colophon

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Community
Land Trust
H-BUURT

space&matter

And The People

 NEW ECONOMY

 Gemeente
Amsterdam

stimuleringsfonds
creatieve industrie