

Circular Phase Change Material for social architecture

De FRITUURFABRIEK

BoTu - M4H



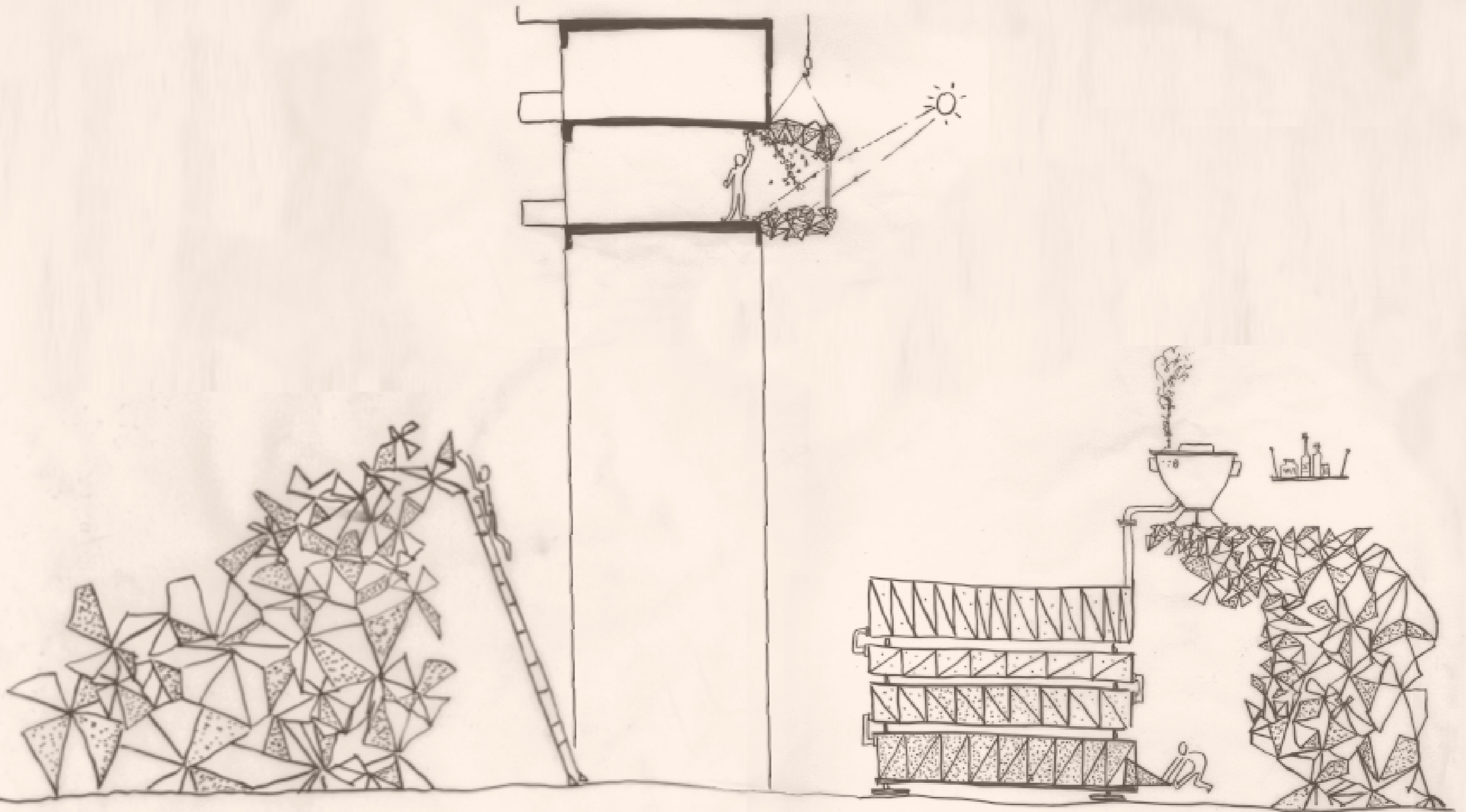




Photo: archive Stadsmakerscongres

#2 Tussendijken zipcode 3026

#5 Bospolder zipcode 3025

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29.7 % poor

#5 Bospolder zipcode 3025
28.6 % poor

#1 Financial situation

a. 72% *Low income*

b. €14950,- *average annual income*

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 - b. 76% *'Practically' educated*
- #3 Professional situation
- a. 17% *Jobless*
 - b. 13 *jobs per 100 inhabitants*



Photo: Ruben Hamelink



“I want my children to grow up in BoTu, just like myself”

- *Bob*



“I want my children to grow up in BoTu, just like myself”

- *Bob*

“I know all the family members of all my friends in this neighbourhood”

- *Abdul*





“I want my children to grow up in BoTu, just like myself”

- *Bob*

“I know all the family members of all my friends in this neighbourhood”

- *Abdul*



“Actually, I don’t see myself living somewhere else than in BoTu”

- *Anass*



An aerial photograph of a city, likely Amsterdam, showing a large green park area in the foreground and a dense urban skyline in the background. The park features several soccer fields and a network of paths. The city buildings are visible in the distance, with a body of water and a bridge in the background.

**SOCIAL RESILIENCE
IN ENERGIEWIJK
BOTU**

+/- 4000 dwellings to be renovated in BoTu

“In 10 years BoTu has to be on the level of the Rotterdam socio-economic average, no matter what.”

- Mayor Aboutaleb

*“In 10 years BoTu has to be on the level of the Rotterdam socio-economic average, **no matter what.**”*

- Mayor Aboutaleb

Emancipation vs gentrification

to educate vs to get rid of

A FACTORY..

A COOPERATIVE FACTORY!



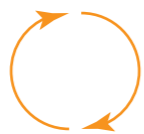
Democracy: employee group decisions



Transparency: factory financial transparency + education of the subject for comprehension



Self chosen salary: consistent (basic) + flexible amount (bonus)
No differentiated privileges among employee (owners): no personal car parking etc.



Rotation of position: change of tasks over period of time: also allows for periodic energy boost



CEO: only in the phase of developing the cooperative ownership





Salary

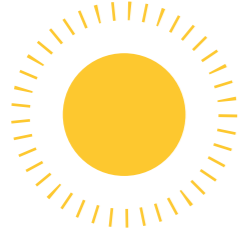


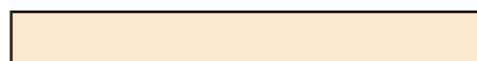
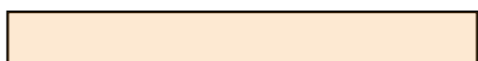
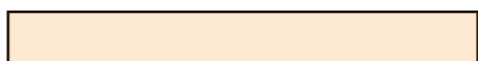
PCM: Phase Change Material

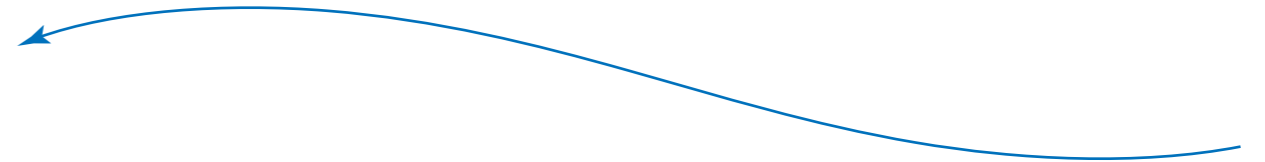
WHAT IS PCM?

Imagine a house as a living organism..

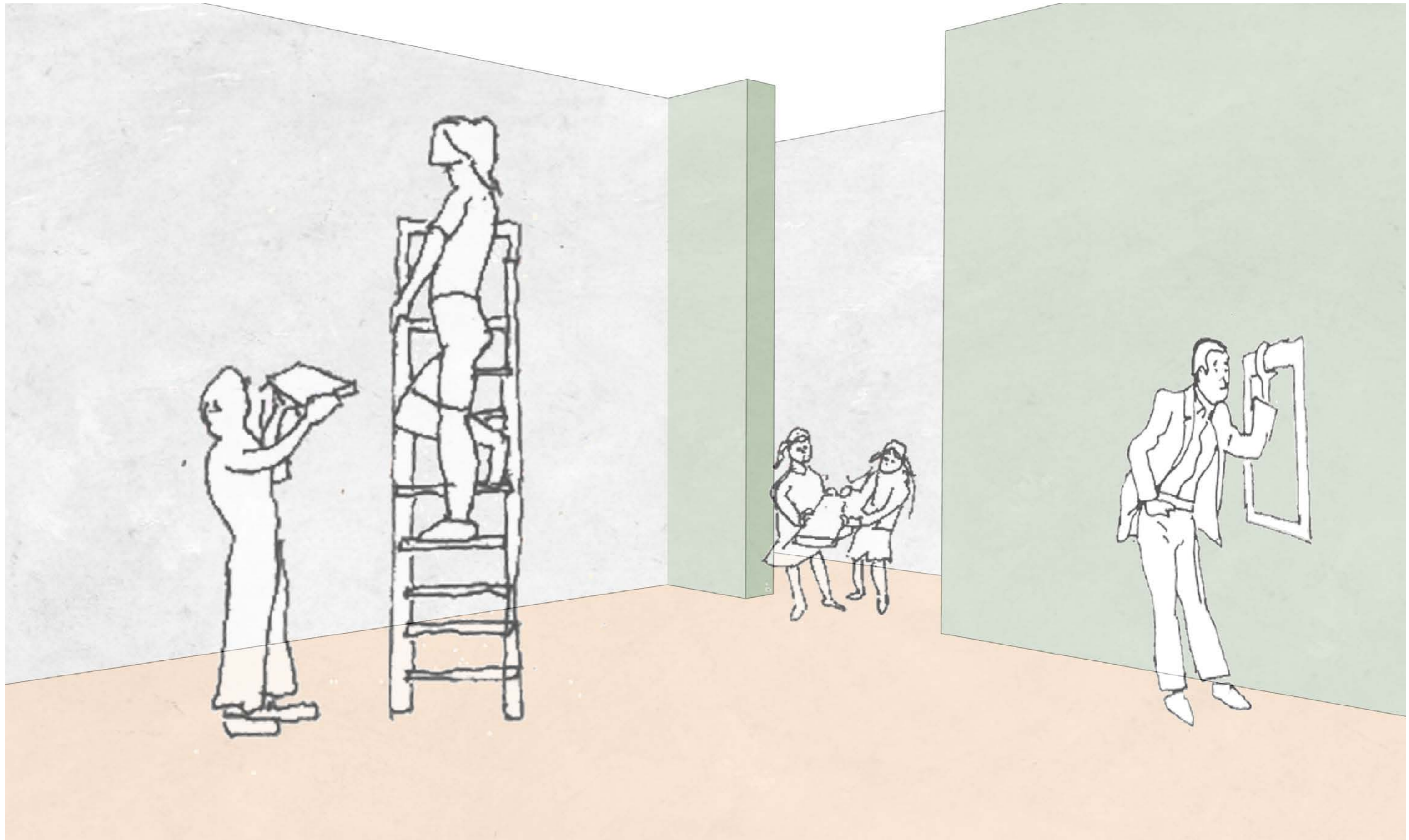








Passive cooling vs airconditioning





THE PCM MODULE



Volume: 11.4 L
Weight: 9.1 kg
Size: 1000 x 300 x 40 mm

THE INGREDIENTS

Mg^{2+}

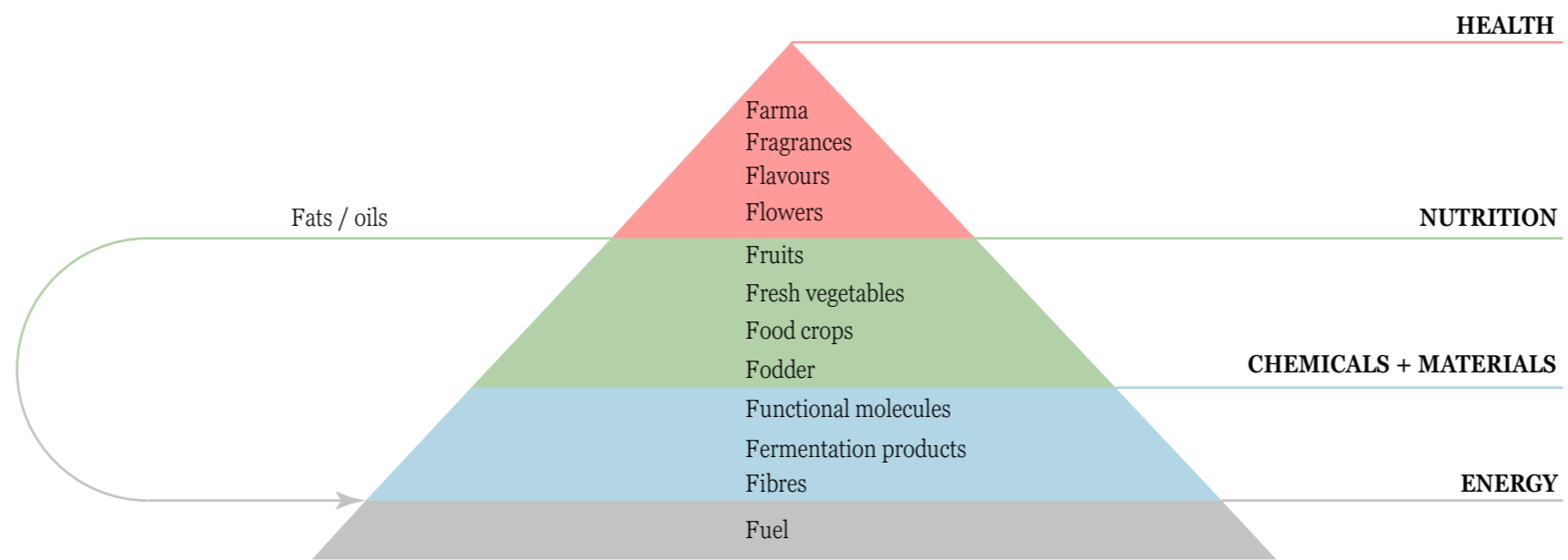
+

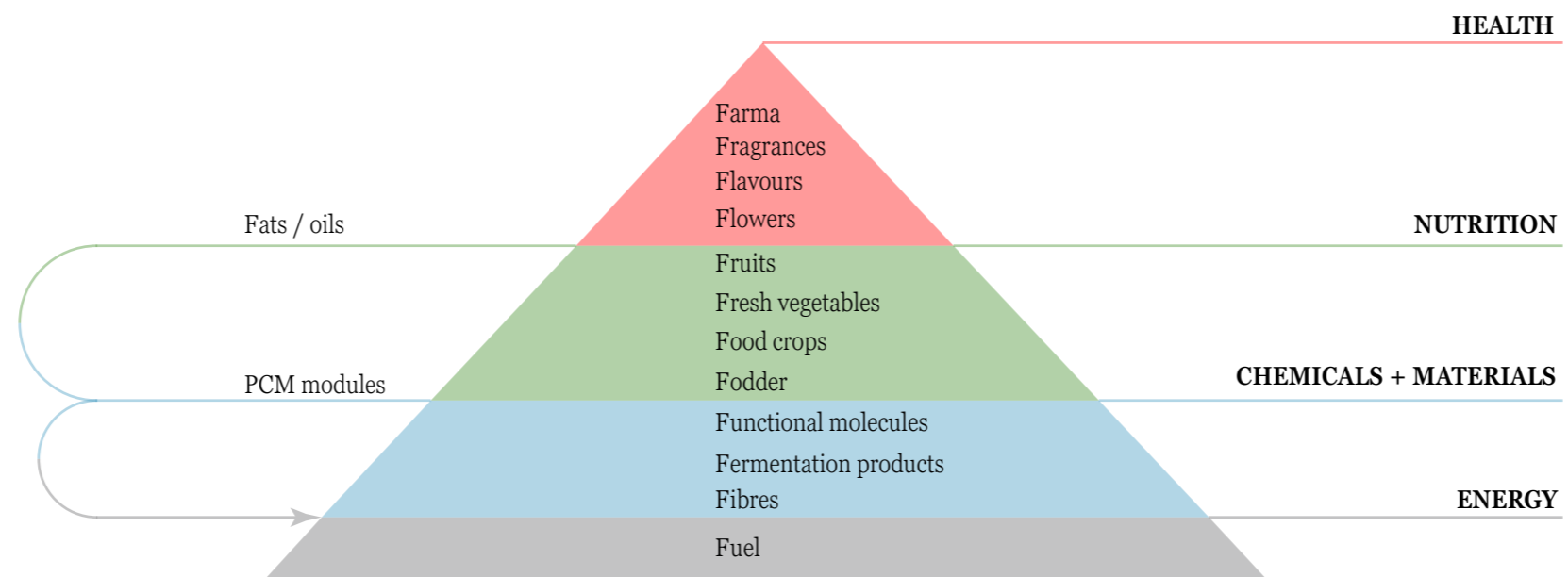


Waste: ²⁺ ion

Frying oil

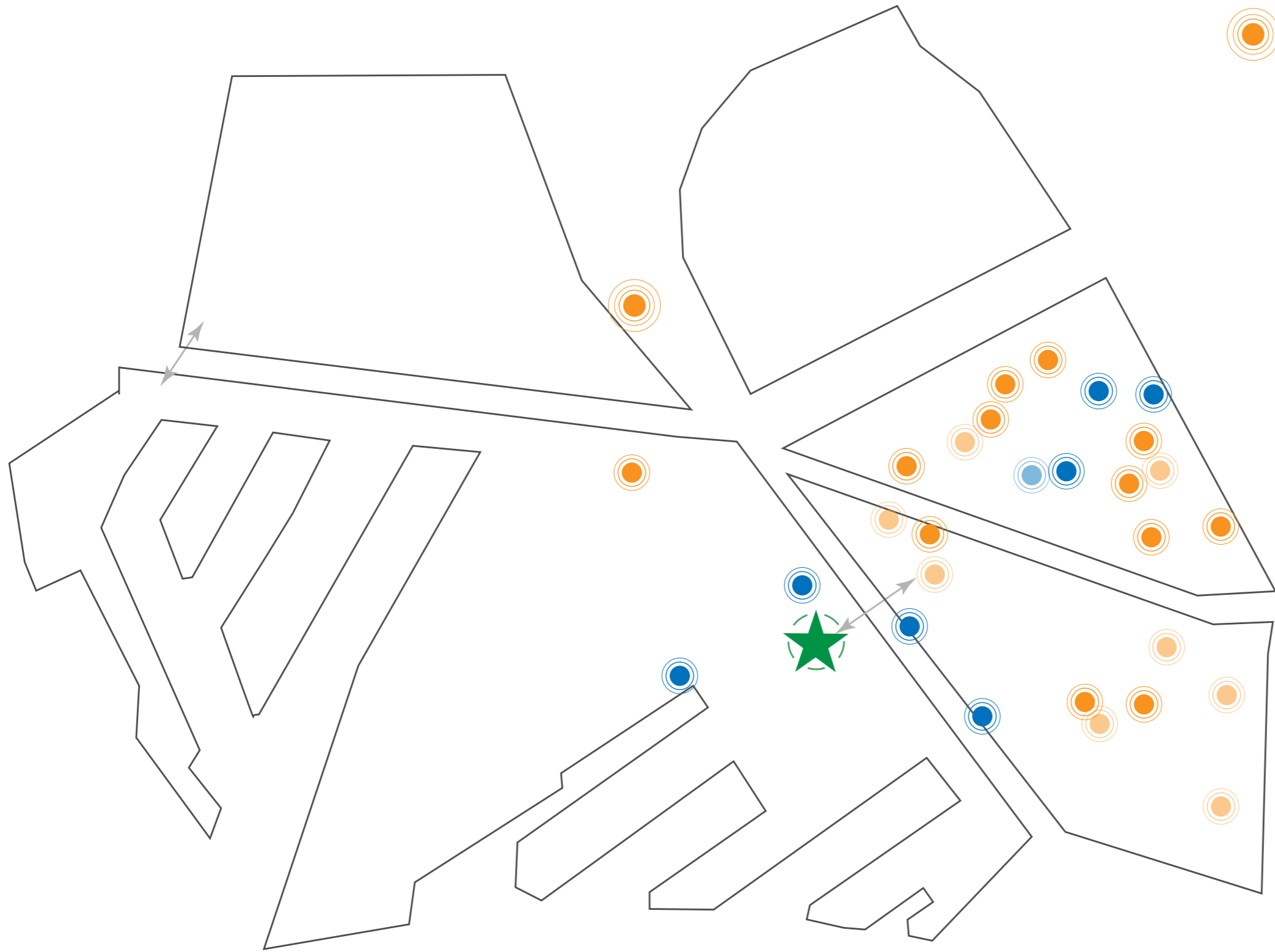
Biobased PCM





From recycling to upcycling!

THE IMPLEMENTATION PROCESS



Pre-factory stage

1 Educational

Squares

Schools

Children farm + public garden

2 Workshop

Market stand

Various (participation) projects

Factory stage

Factory







Can cooler



Laptop cooler

THE PRODUCTION PROCESS

Mg^{2+}

Waste: $^{2+}$ ion

+



Frying oil

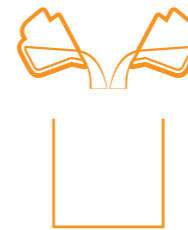
Biobased PCM



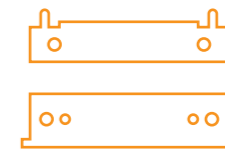
Horeca + Domestic waste collection



Filtering fat



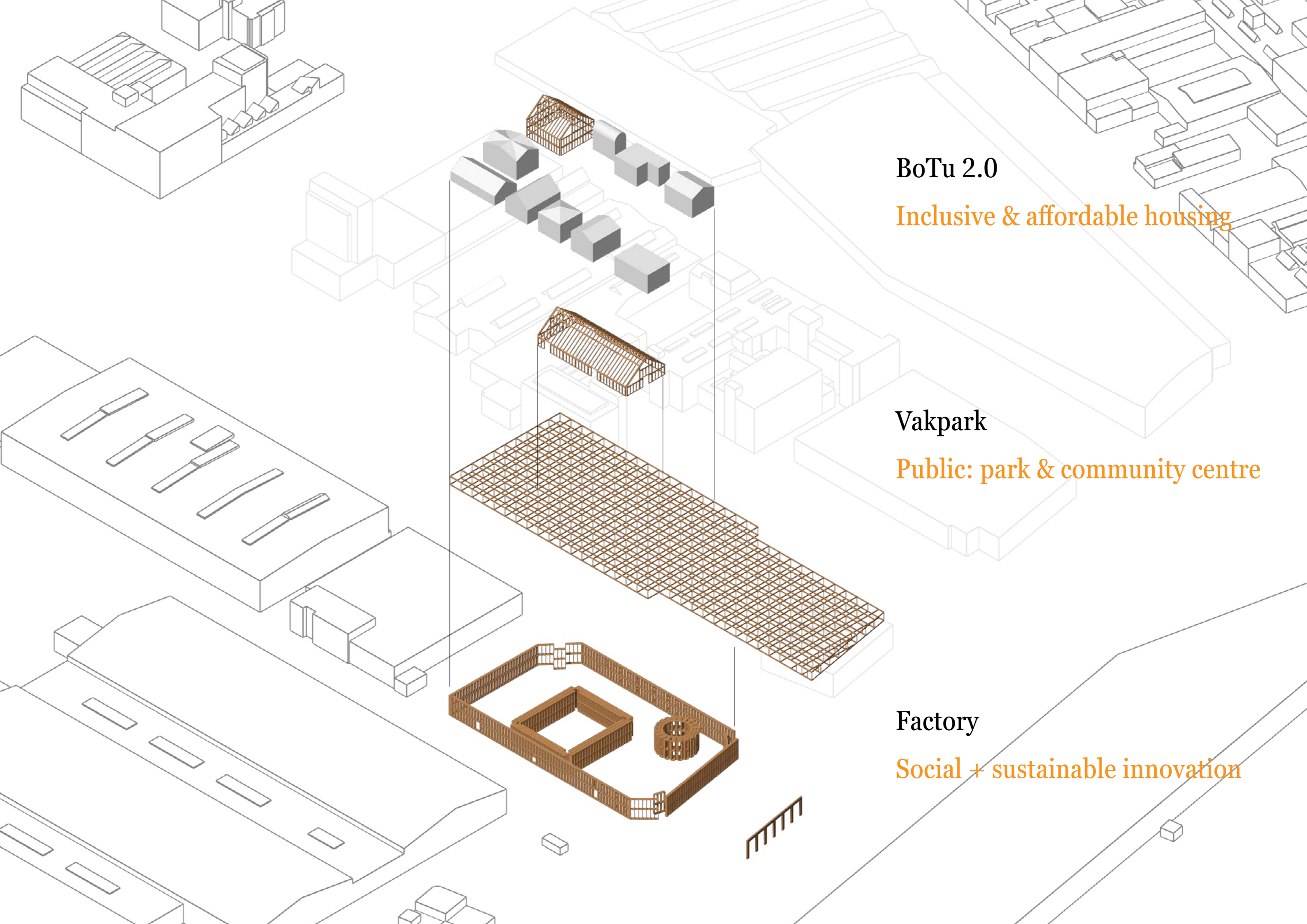
Mixing



Molding container (HDPE)



THE BUILDING



BoTu 2.0

Inclusive & affordable housing

Vakpark

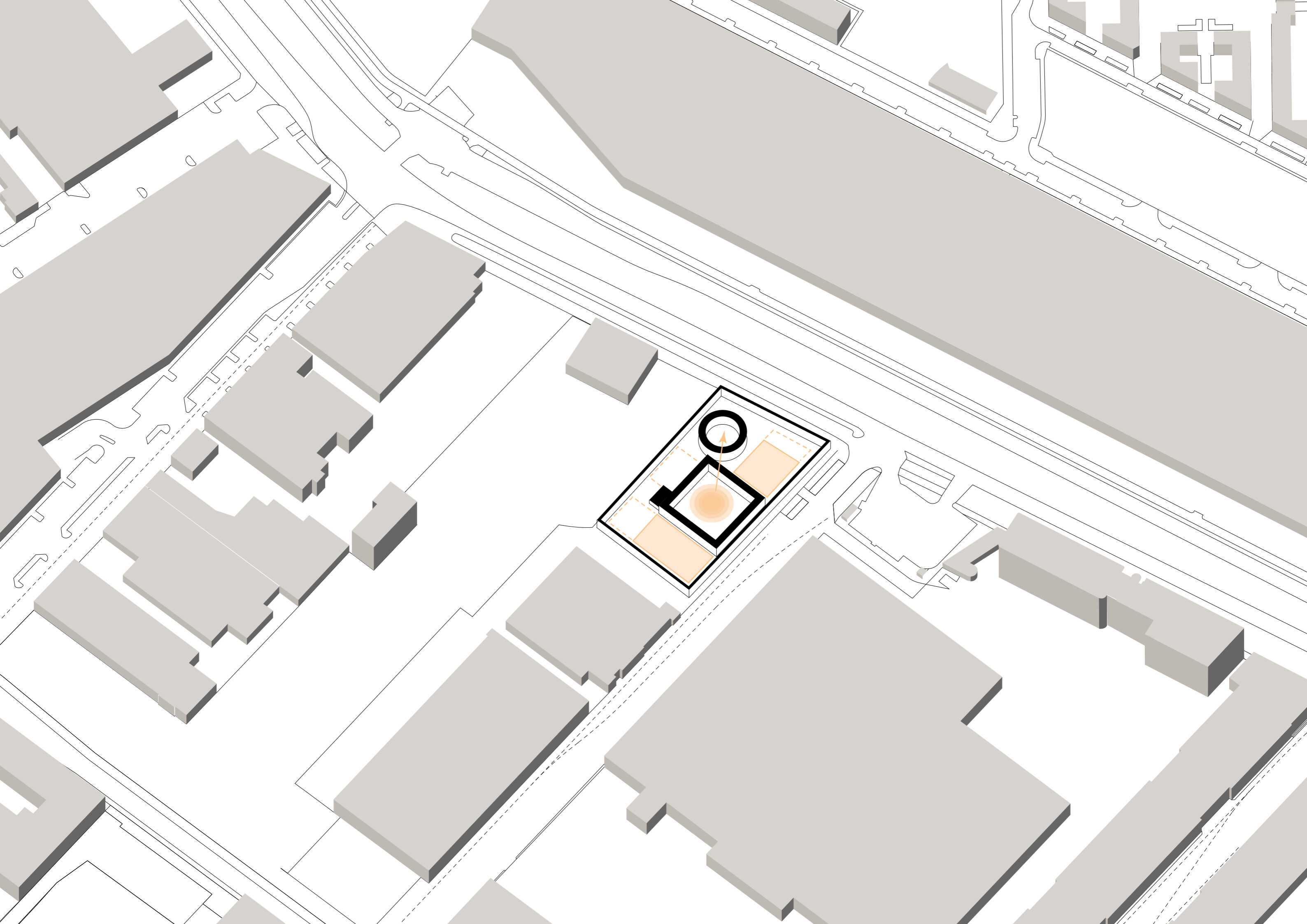
Public: park & community centre

Factory

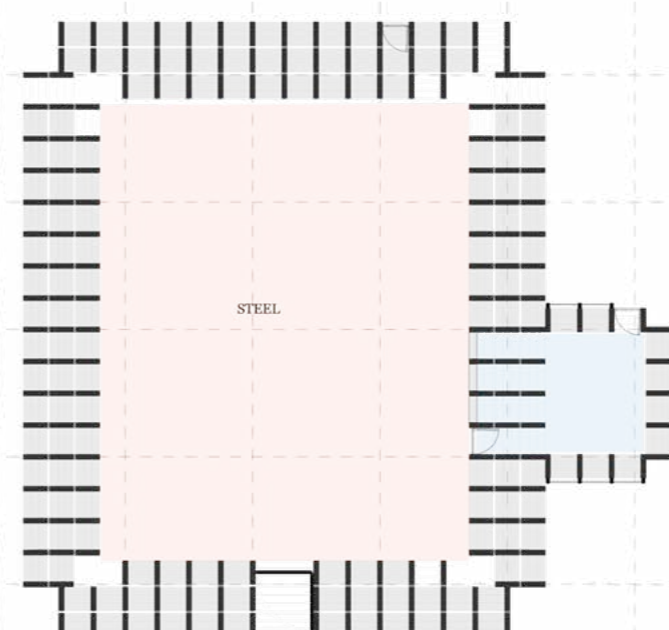
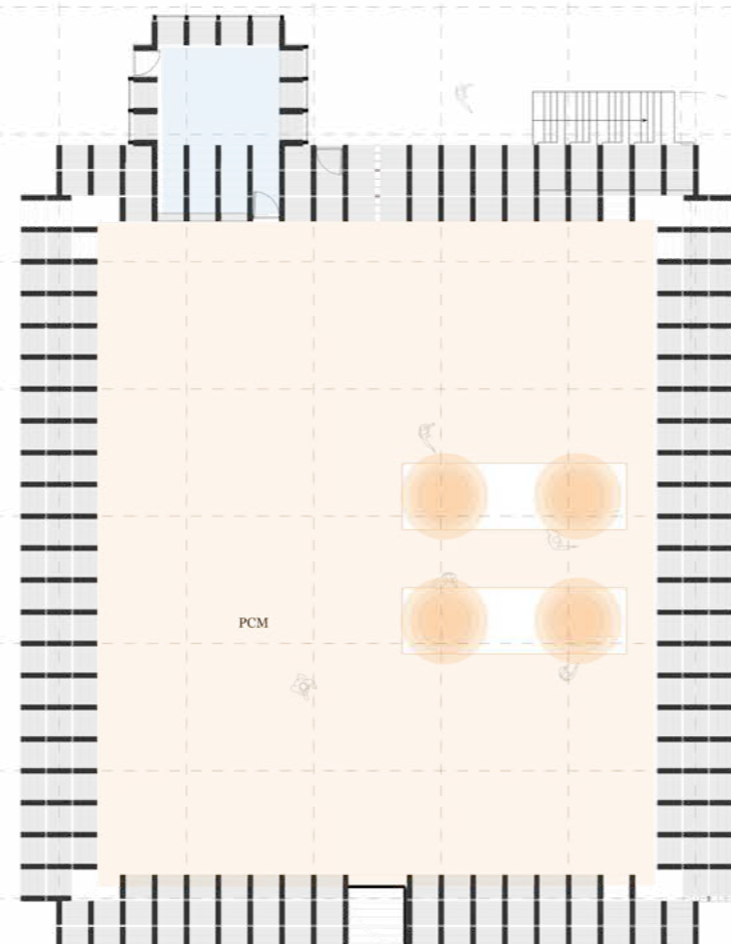
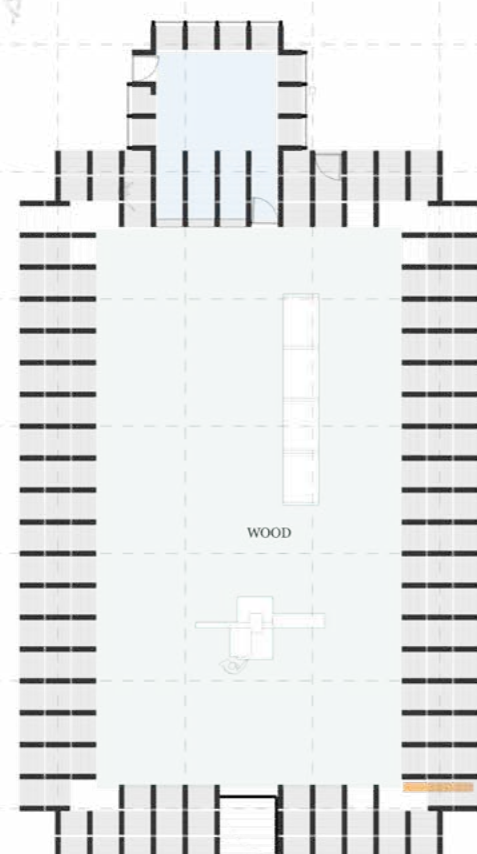
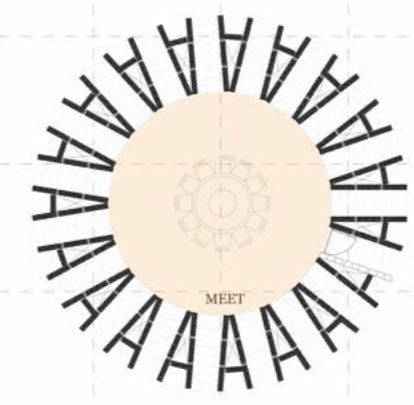
Social + sustainable innovation

The factory

level #1



FOOD GARDEN / VOEDSELTUIN



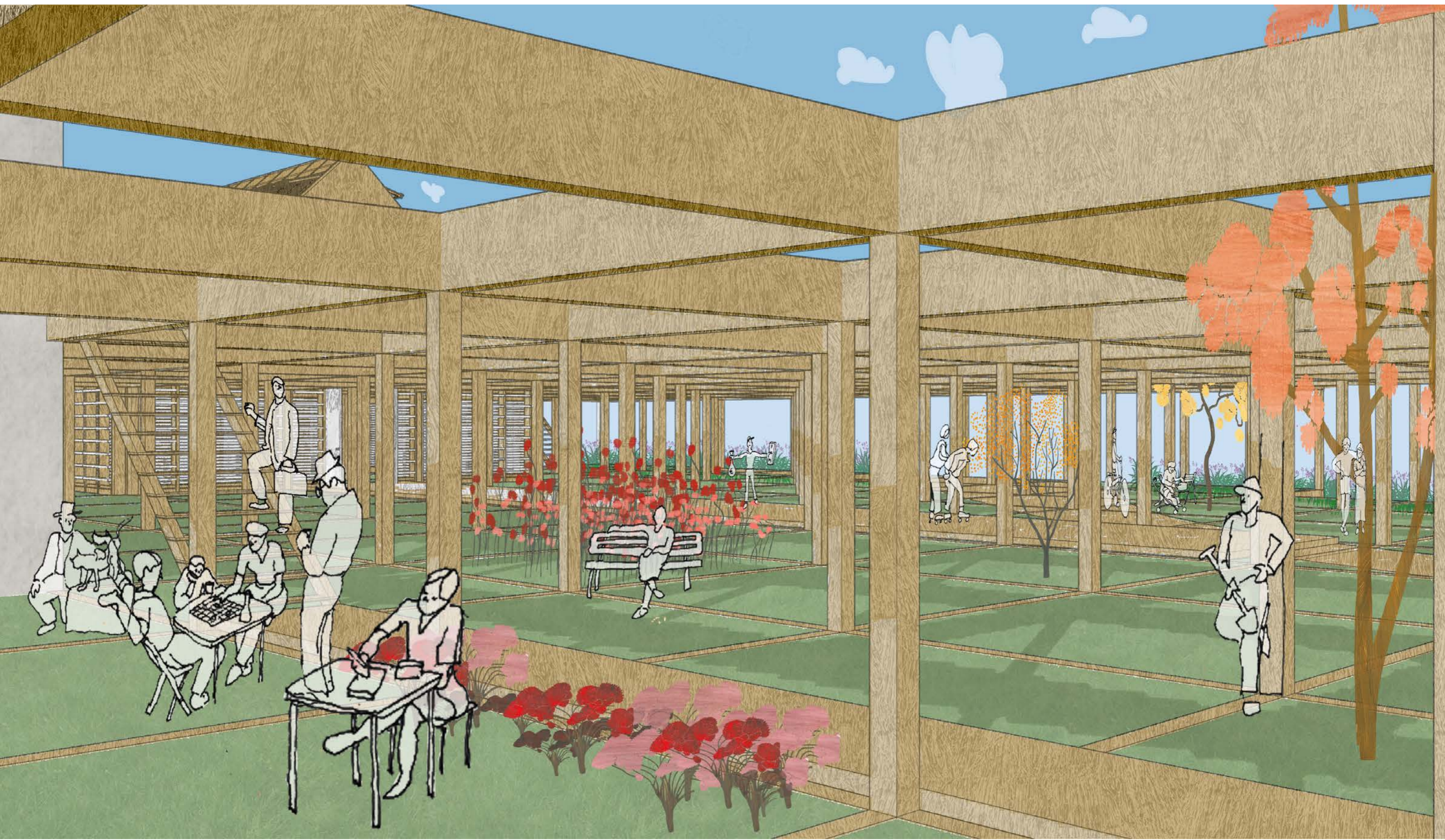


Vakpark

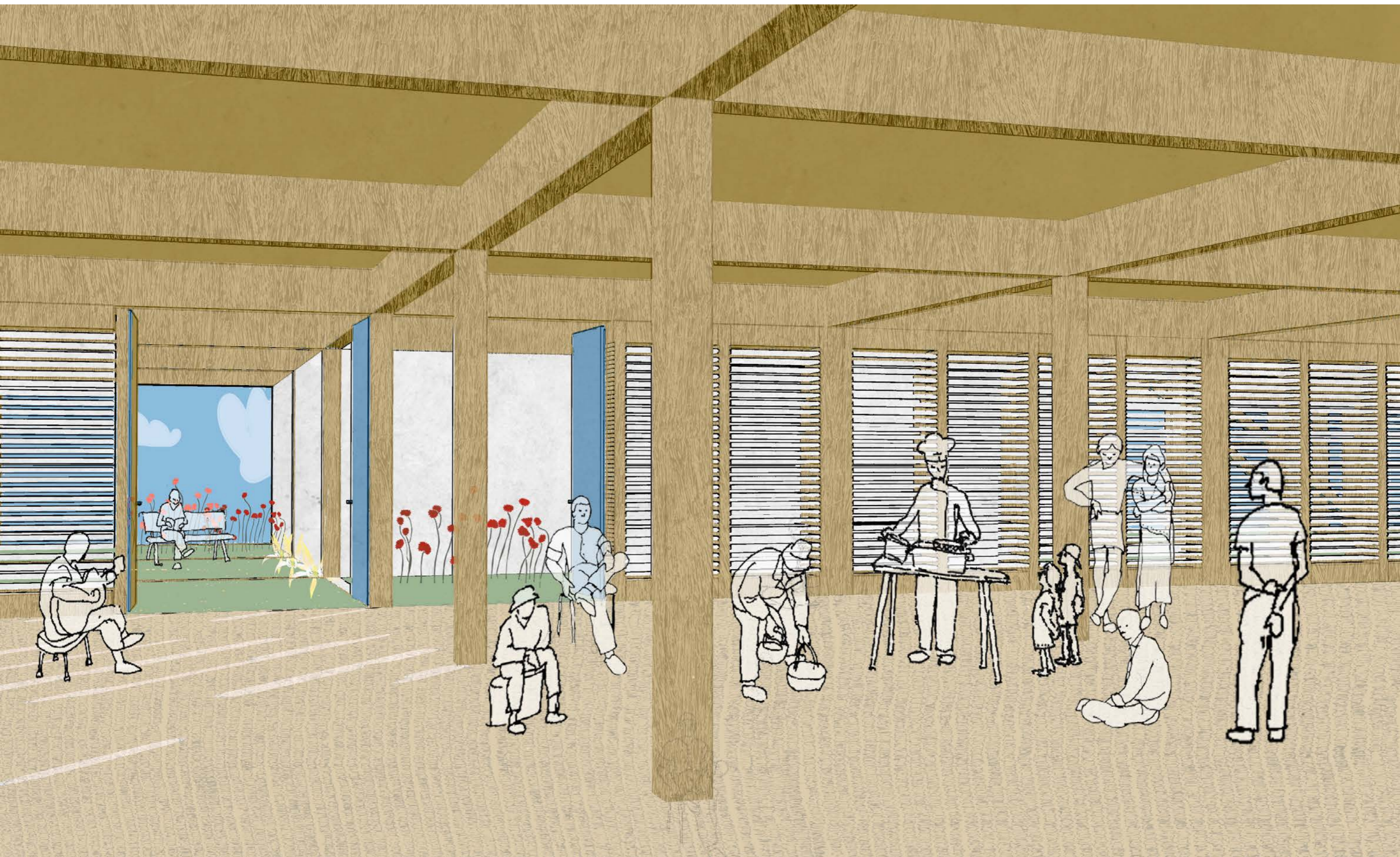
level #2

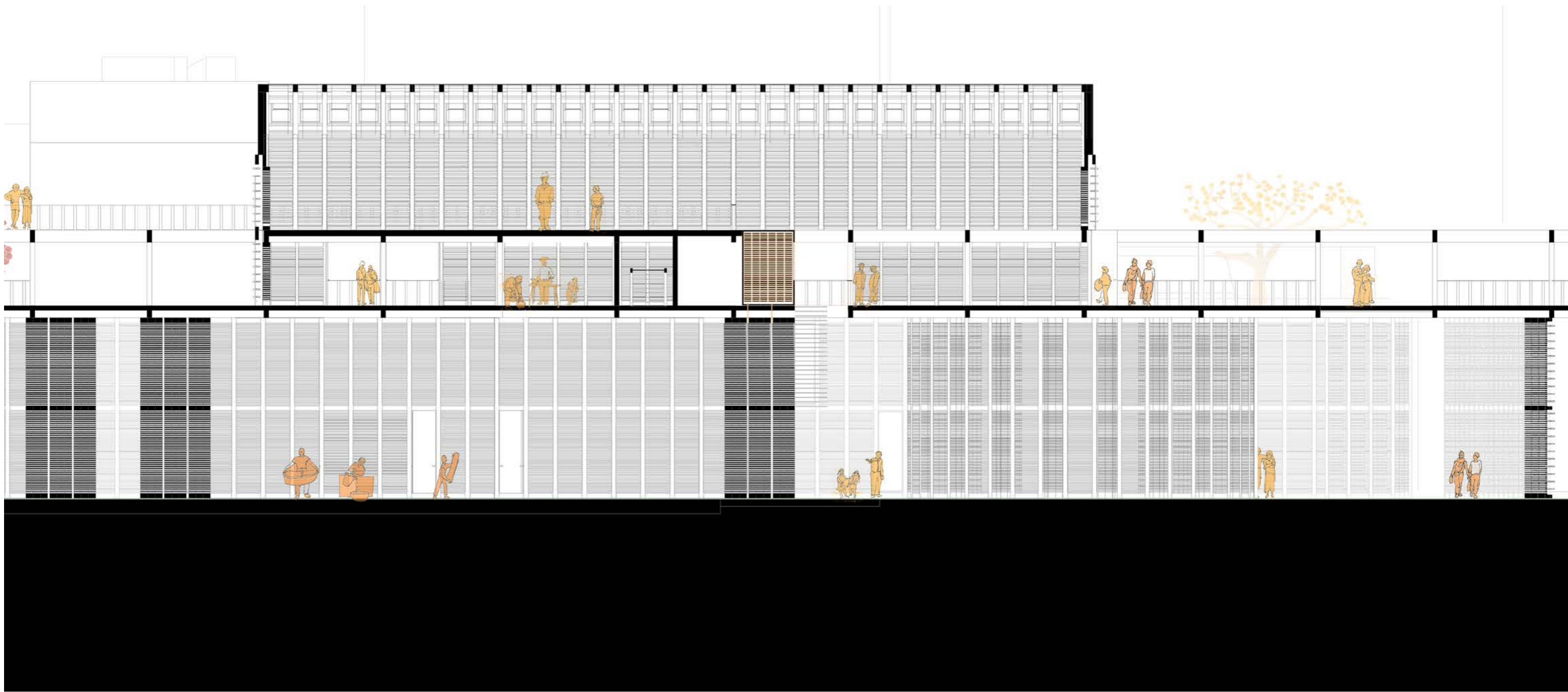


Community
Centre



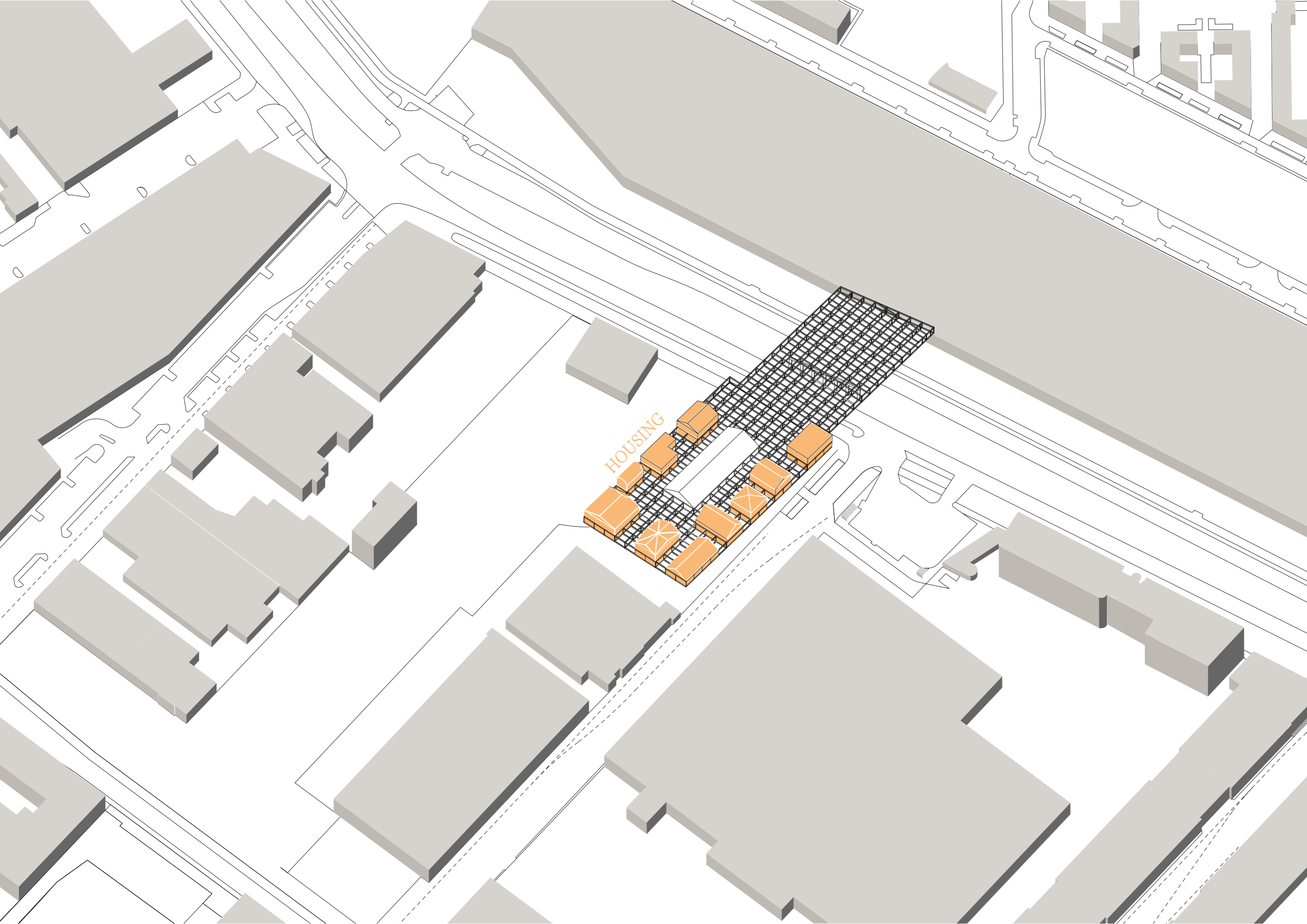
Community centre



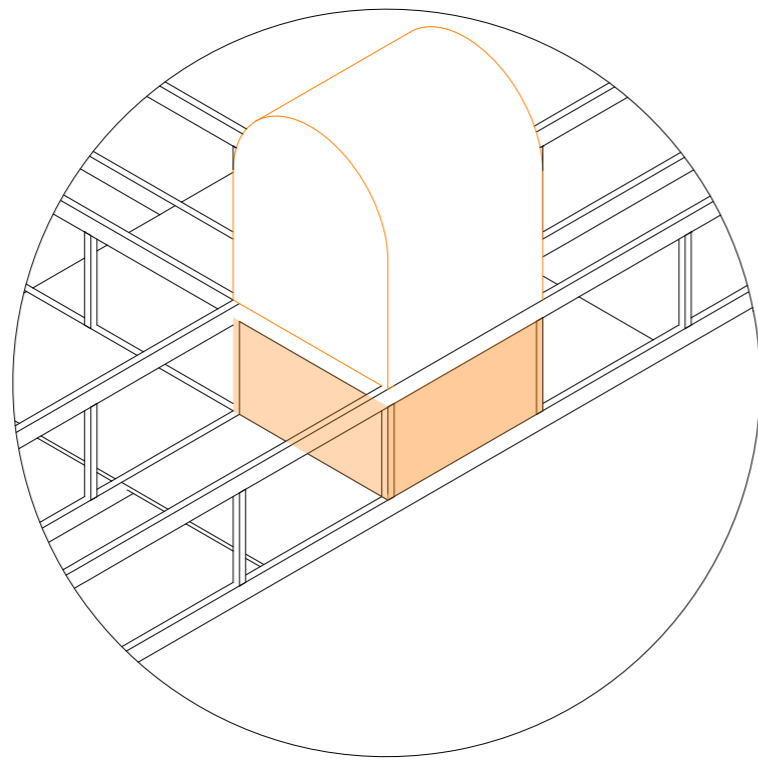


BoTu 2.0

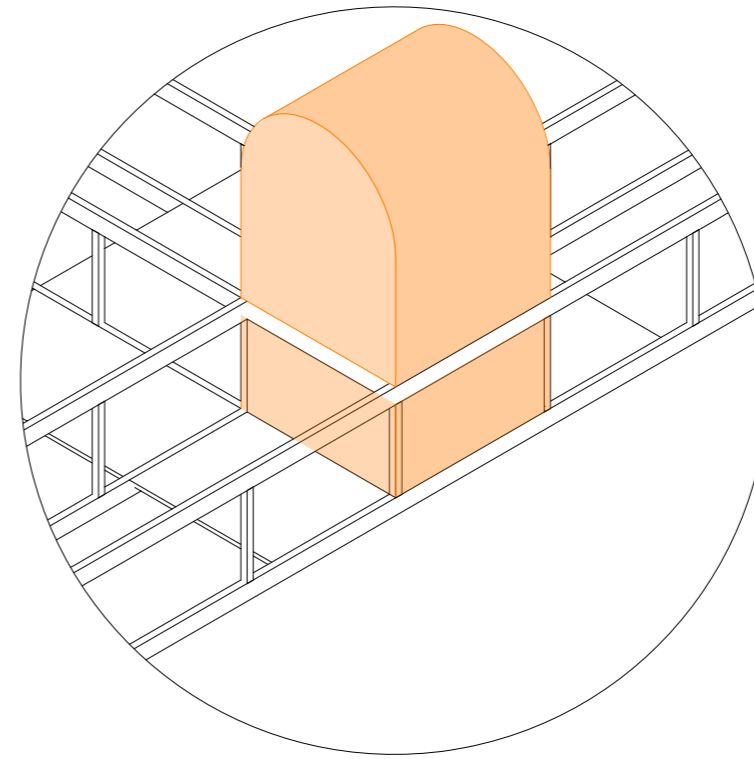
level #3



HOUSING



Flexible space:
studio / shop / workshop



Housing:
modular and adaptive occupance

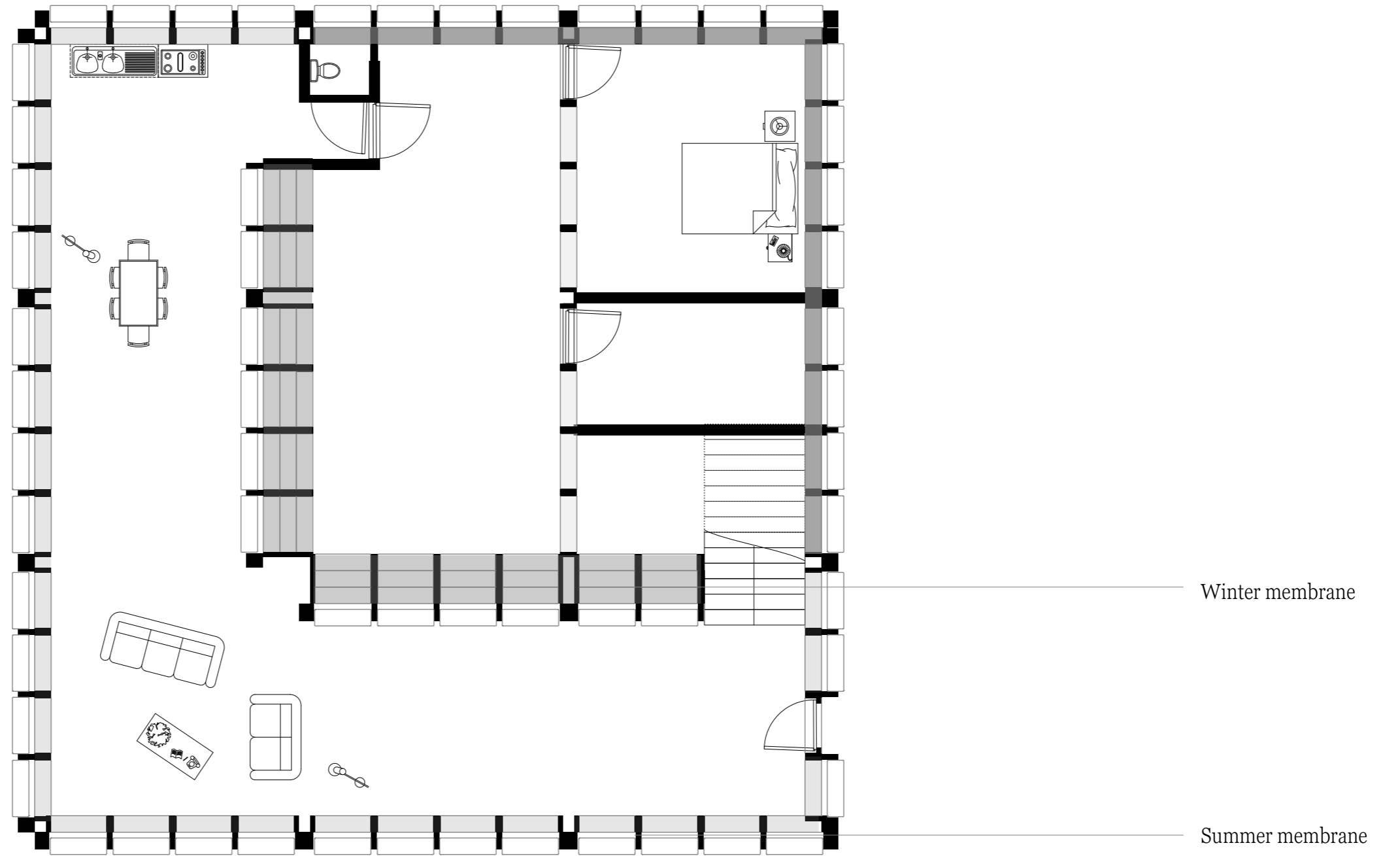


PCM SHOWCASE

PCM Museum dwelling

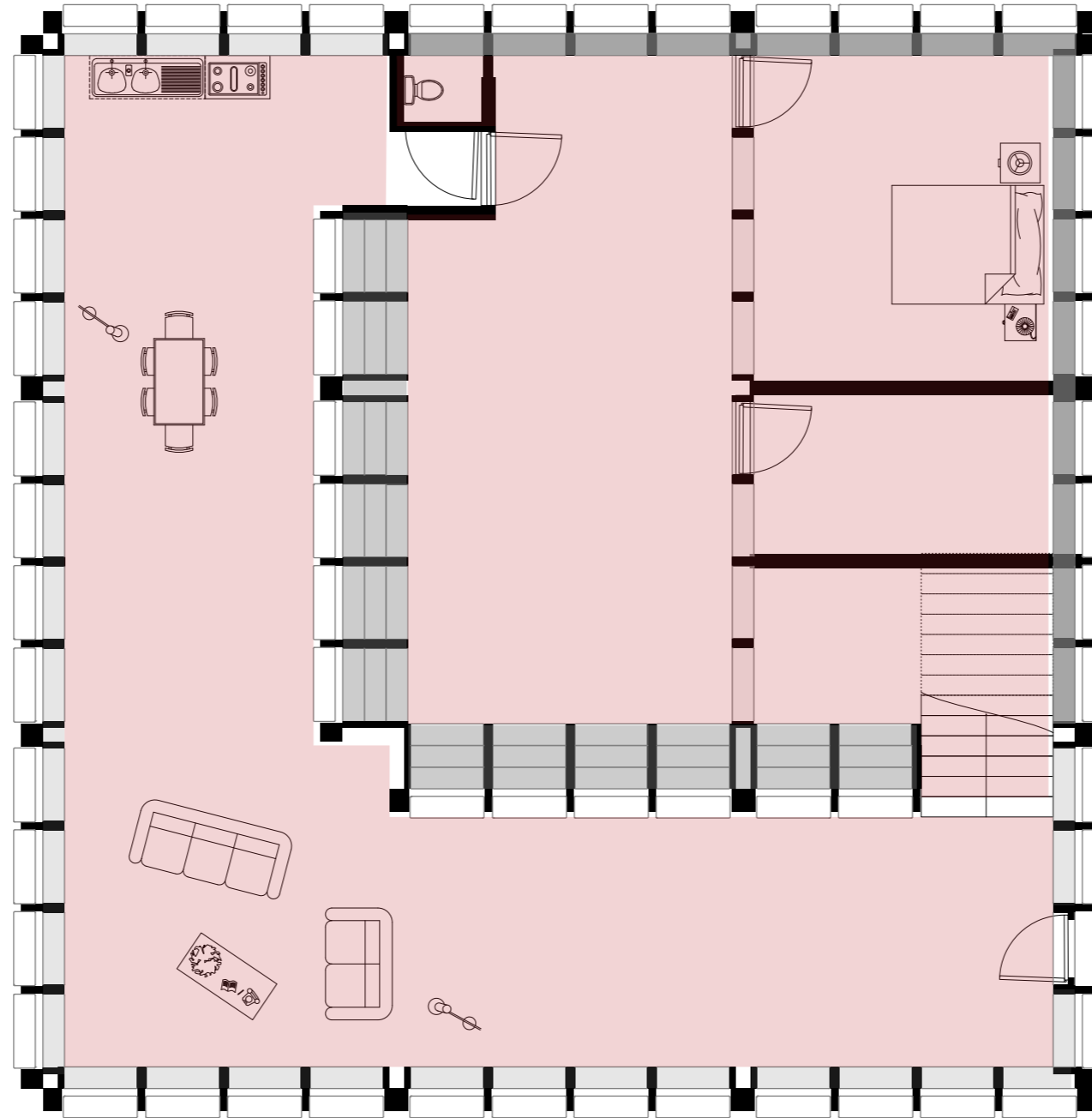
in BoTu 2.0

PCM DWELLING



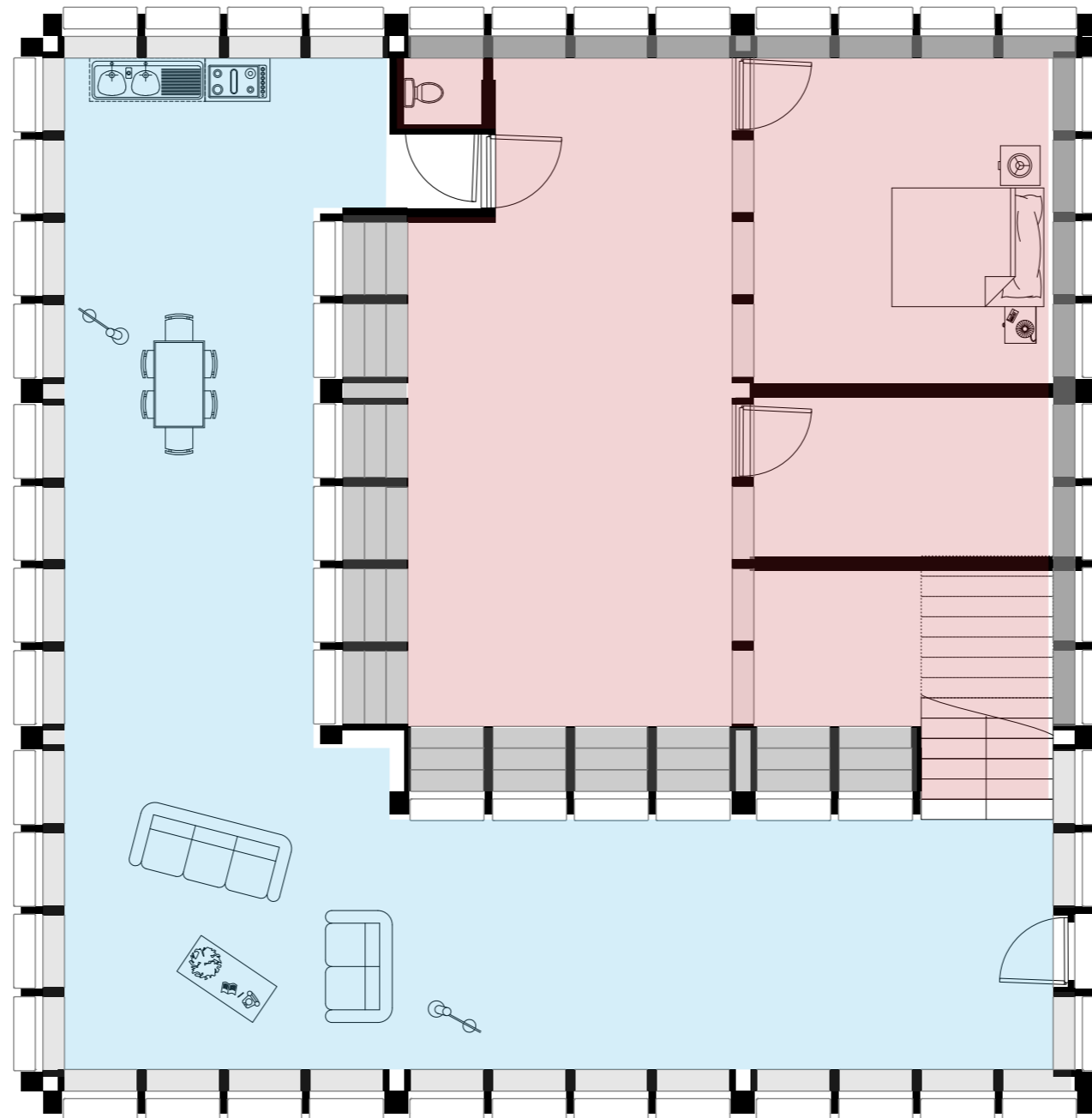
PCM DWELLING

Summer



PCM DWELLING

Winter







CONCLUSION

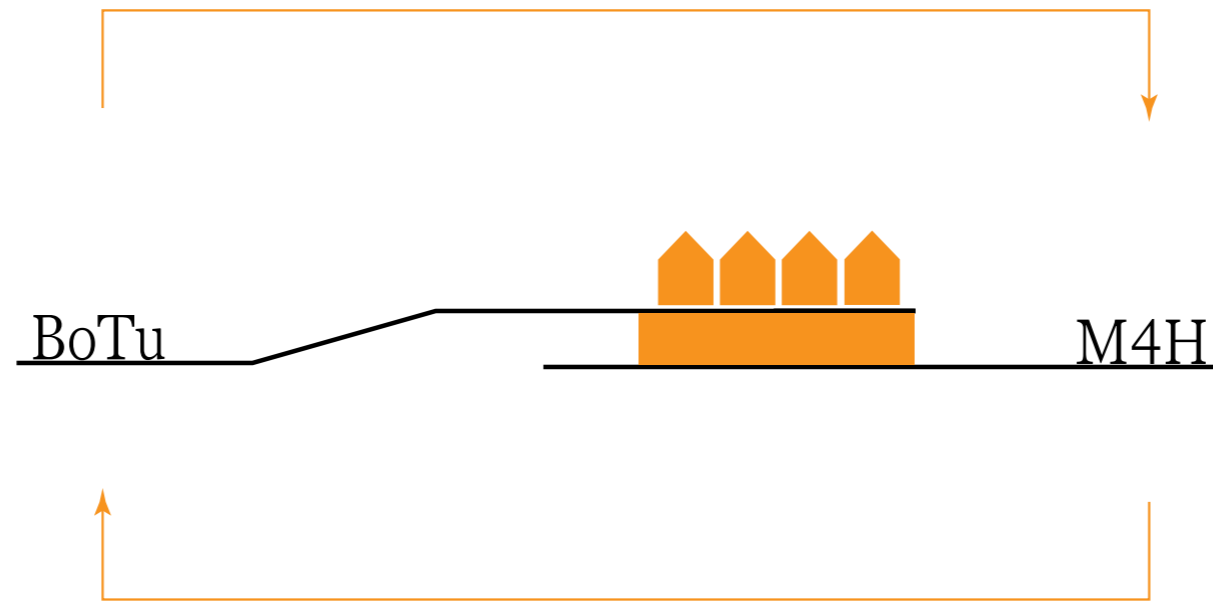
Mutualism BoTu - M4H



Resources: used frying oil



Responsibility: cooperative ownership of factory



Salary



Sustainability: cooling element for energy transition ambitions

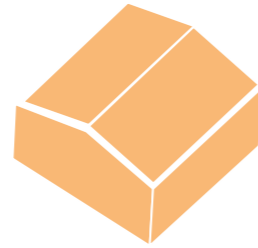


Education + Skills: language, teamwork and new skills

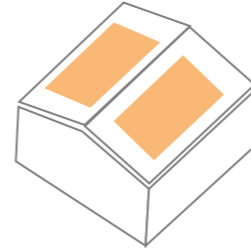


Self-worth: self-esteem/responsibility feeling from professional to private environment

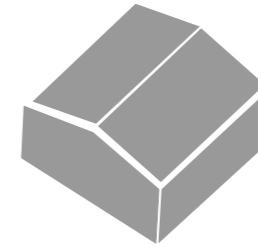
Alternative materials



PCM dwelling



PCM renovation



Concrete dwelling

module

11,6 kg

summer membrane

15.024 kg

winter membrane

13.212 kg

roof

9.462 kg

Total

37.698 kg

170 kg

200.000 kg

Relink historic connection BoTu - M4H



REFLECTION

Architecture with a twist..

Further research:

Engineering of HDPE container

Ratio Mg 2+ with frying oil for specific temperature range

Fire resistancy

SOCIAL IMPACT BY DESIGN

Social Impact by Design

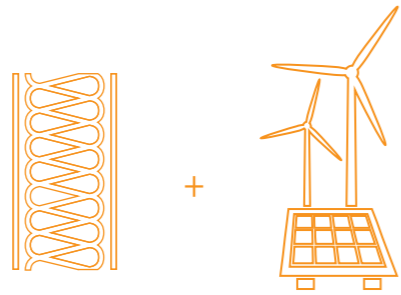
The strategy to facilitate new forms of cooperation that are needed to make BoTu resilient.

The persistence of the challenges in BoTu requires an approach that is based on well-organised cooperation between residents, the Municipality, the housing corporation and private parties from the outset.

[Read more](#)

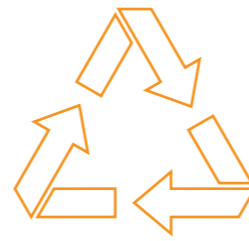
We are looking for parties who are willing to co-invest in the further development of BoTu. Your contribution can be small or large.

[Join us](#)



1

Energy transition



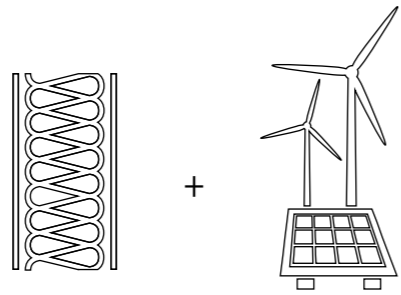
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Circulaire economy



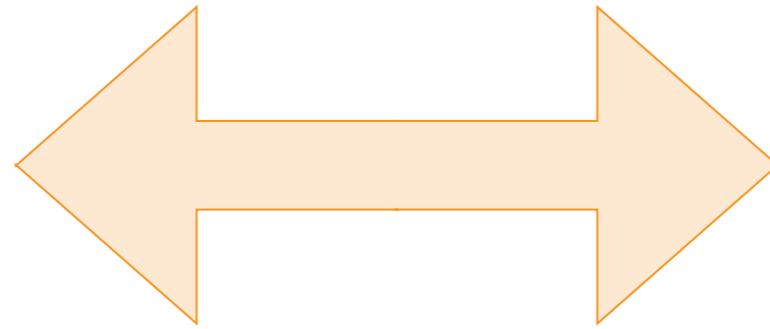
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Socio-economical issues



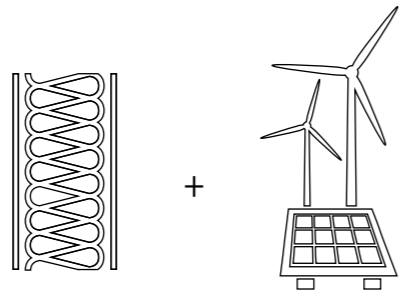
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Energy transition



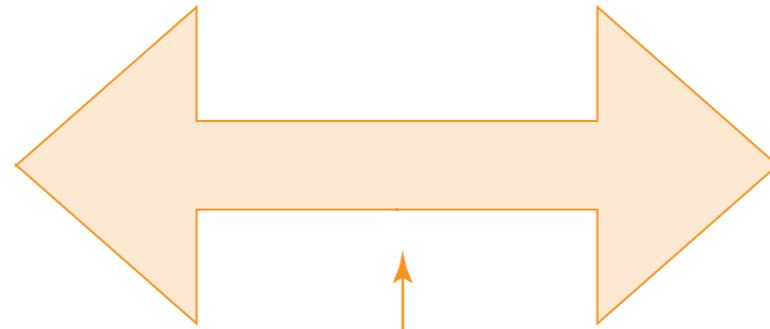
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Socio-economical issues



1

Energy transition

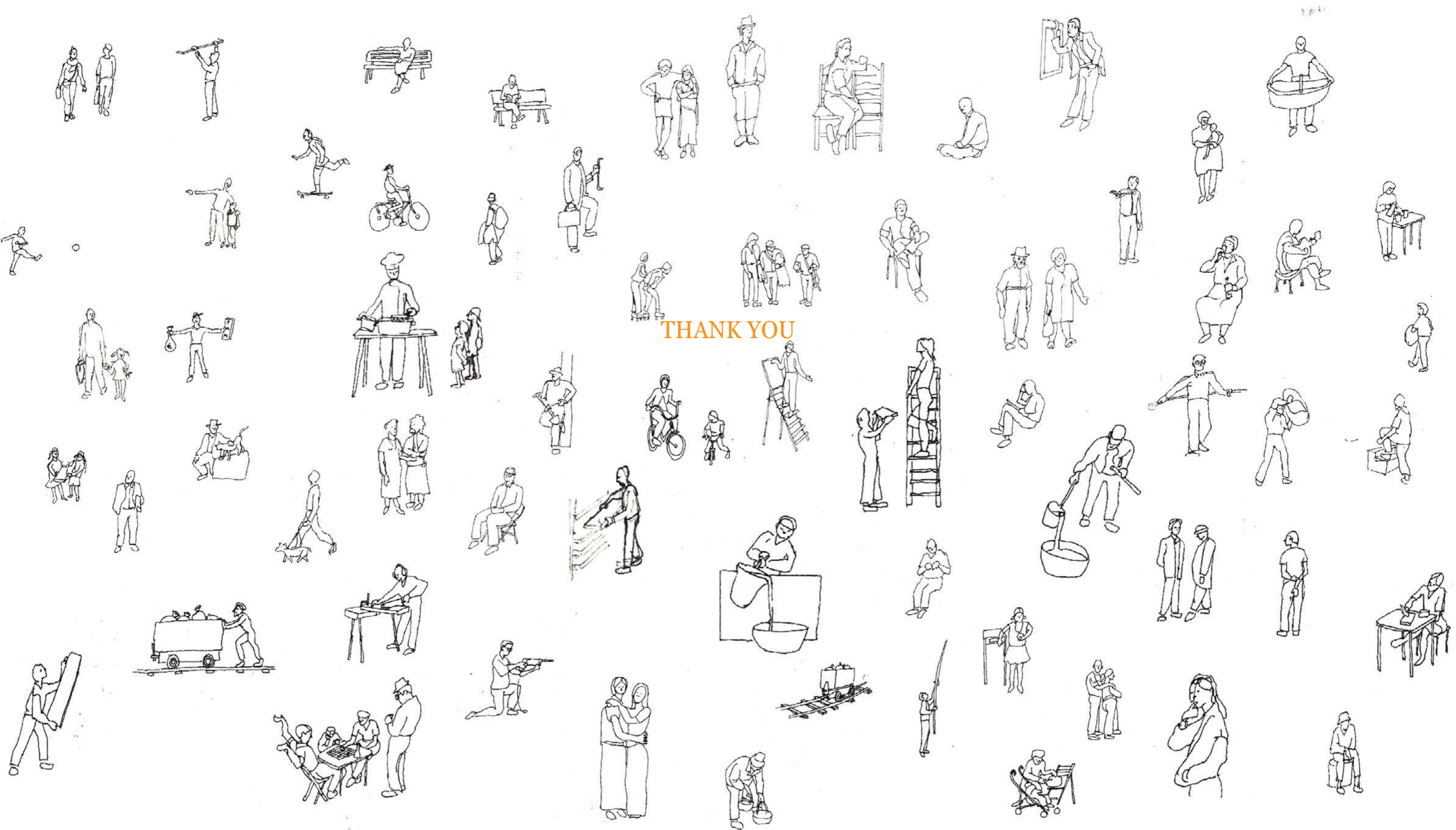


3

Socio-economical issues



Circular economy



THANK YOU