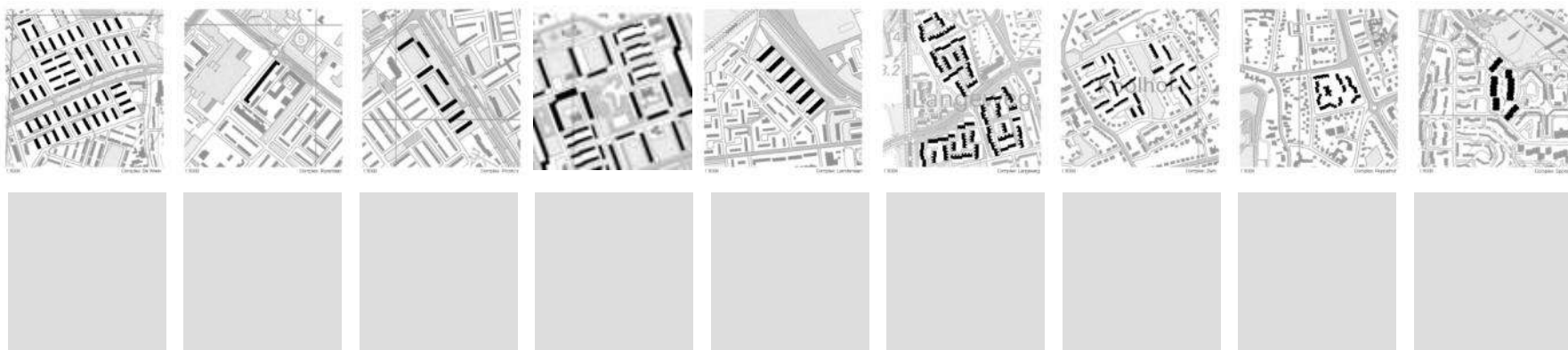


Repetition allows for sustainable solutions

Renovation as a science


Haico van Nunen M.Sc. PhD. | 21 May 2015 | Brdo | Slovenia

BouwhelpGroep



Sustainability in the 21th century





BouwhulpGroep

advies en architectuur

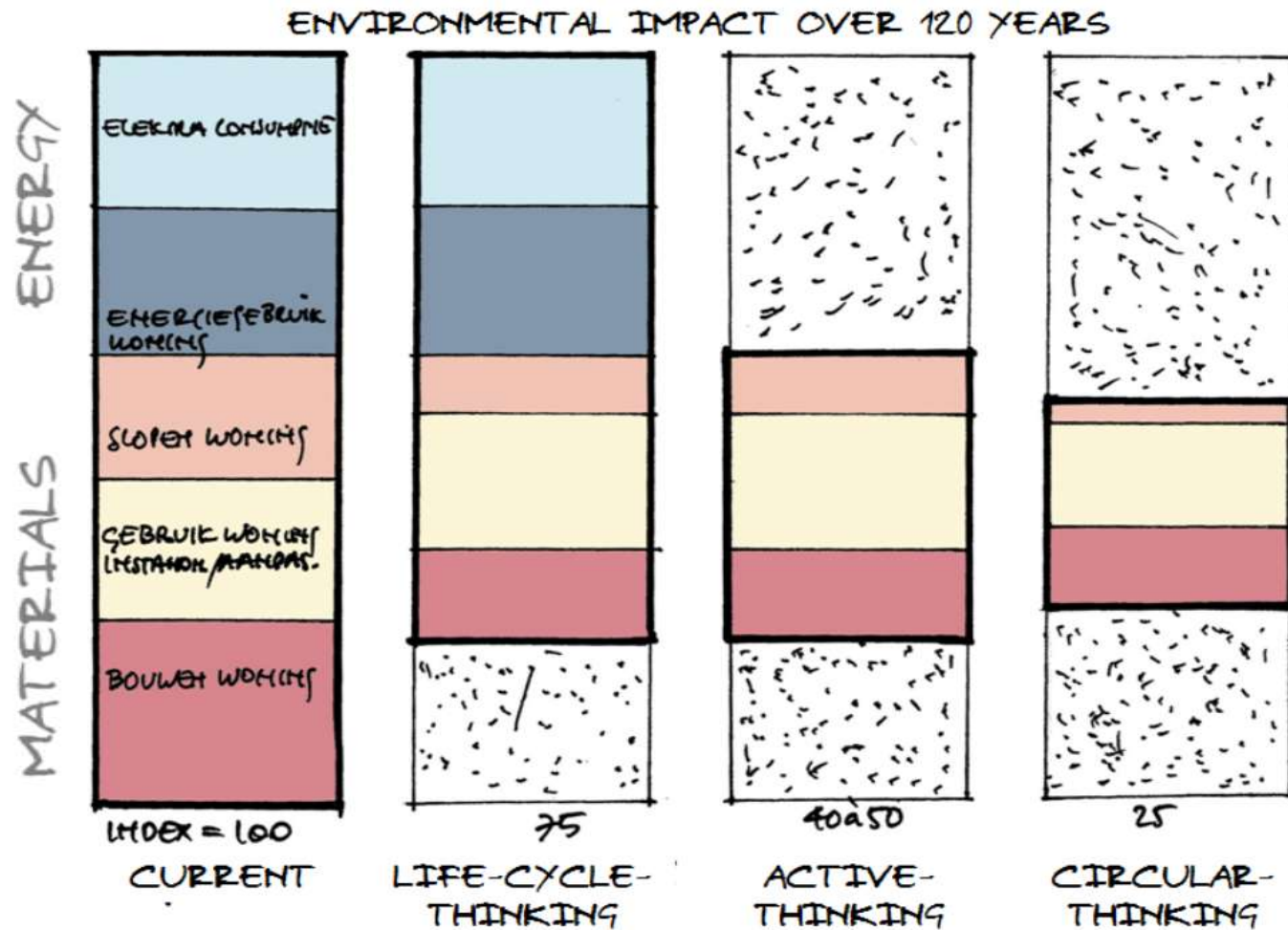
*37 years of experience in architecture,
housing and industrialisation in the
existing city*

*25 years of research for (semi) govern-
mental institutes and 30 percent of the
Dutch housing associations*

*Have reviewed over half a million houses
of the Dutch housing stock in the role as
architects and consultants*

1. Task

Sustainability in the 21th century

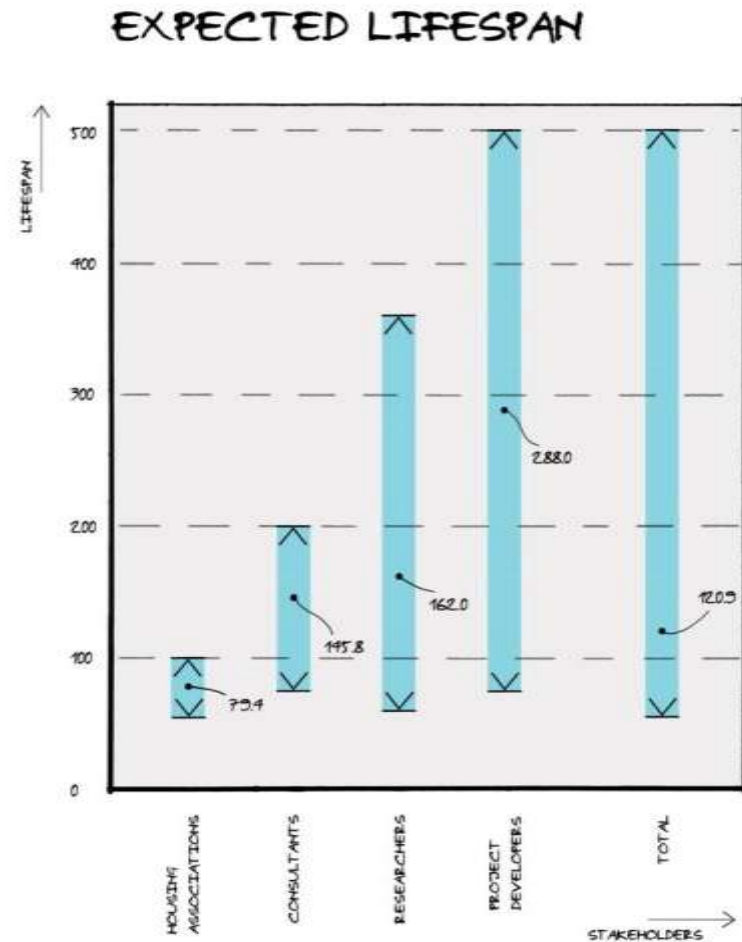


1. Task

Facts and figures

- Decline of newly built houses (<1%)
- Lifespan of a building is 120 years
- Maintaining the existing stock is the most durable

From a sustainability point of view renovation offers the best potential



1. Task

From present to future

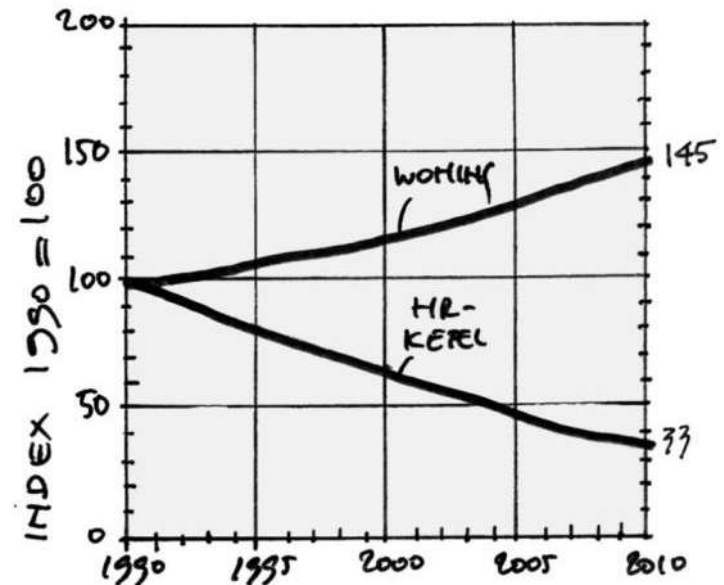
Aspects of the past:

- Less expensive
- Better (engineering, quality)
- Bigger production capacity

Prospects of the present:

- Customization/ freedom of choice (price - quality)
- Choice of the initial moment (for the customer)
- Replaceable building parts (components)

Developments in house prices and central heating systems



INDEX 1990 = 100, PLOJBEIL 2010
OPREDELJENJE: - WORKING 350M³
- ODRZKOVO HR-KEREL
SEKALVELO IN 2020MR.

1. Task

The scope



Divide types of houses in periods of construction

| BOUWJAAR WOONTYPE → | < 1 1945 | 2 1946-1964 | 3 1965-1974 | 4 1975-1991 | 5 1992-2011 | TOTAAL |
|------------------------|-----------|-------------|-------------|-------------|-------------|-----------|
| 1 VRIJSTAANDE WONING | 216.000 | 225.000 | 119.000 | 221.000 | 256.000 | 1.037.000 |
| 2 'TWEË-ONDER-EGH' KAP | 140.000 | 145.000 | 142.000 | 224.000 | 249.000 | 900.000 |
| 3 RIJTESWONING | 523.000 | 478.000 | 606.000 | 879.000 | 509.000 | 2.995.000 |
| 4 KASCHAKETWONING | 113.000 | 113.000 | 22.000 | 94.000 | 57.000 | 399.000 |
| 5 GALERWONING | ~ 5000 | 64.000 | 174.000 | 109.000 | 162.000 | 514.000 |
| 6 PORTIEKETWONING | 256.000 | 269.000 | 112.000 | 142.000 | 101.000 | 878.000 |
| 7 OVERIGE RIJTESWONING | 49.000 | 50.000 | 125.000 | 125.000 | 196.000 | 545.000 |
| TOTAAL | 1.302.000 | 1.342.000 | 1.700.000 | 1.794.000 | 1.528.000 | 7.266.000 |

BRON: - AFGESCHAFTE
- BOUWHULP GROEP
© 2013

7.2 MILLION HOUSES, 35 REFERENCE TYPES

2. Project Montfoort

Introduction

- Advertisement: “Concept is looking for project”
- What ambition to realise?
- Active House vision

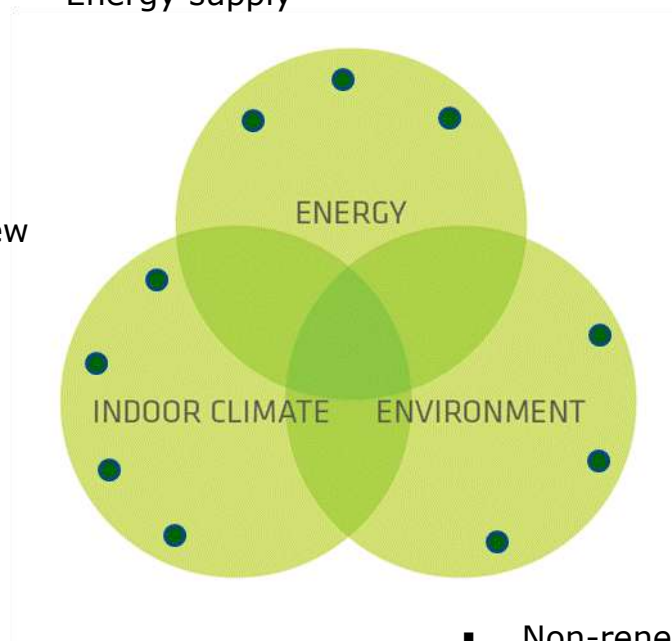


2. Project Montfoort

Active House specifications

- Energy performance
- Energy consumption
- Energy supply

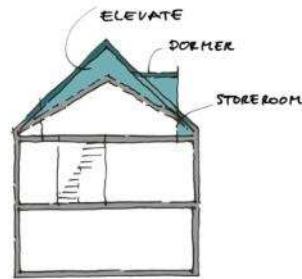
- Daylight and optimised view
- Thermal comfort
- Air quality
- Sound and acoustics



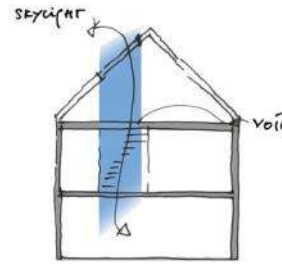
- Non-renewable energy sources
- Emissions to air, soil and water
- Water consumptions and waste water

2. Project Montfoort

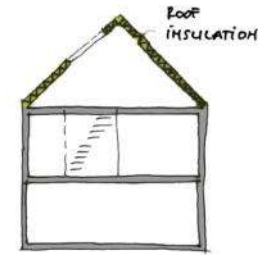
Nine stories about Active House



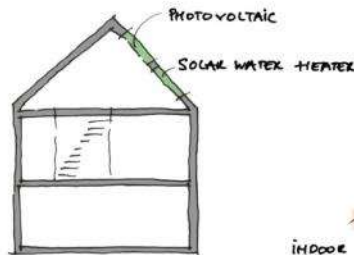
SPACE



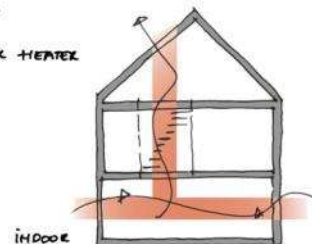
SPATIALITY



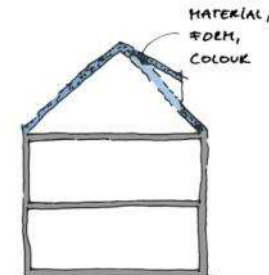
ENERGY SAVING



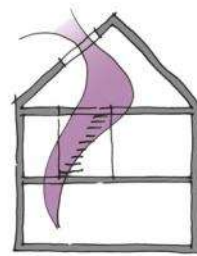
ENERGY
GENERATION



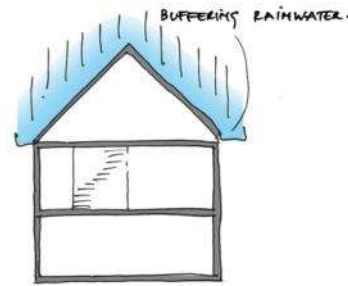
INDOOR
ENVIRONMENT



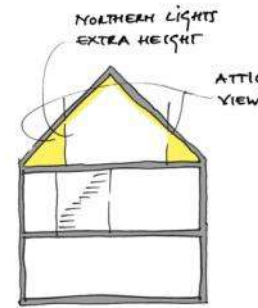
APPEARANCE



DAYLIGHT



WATER REGIME

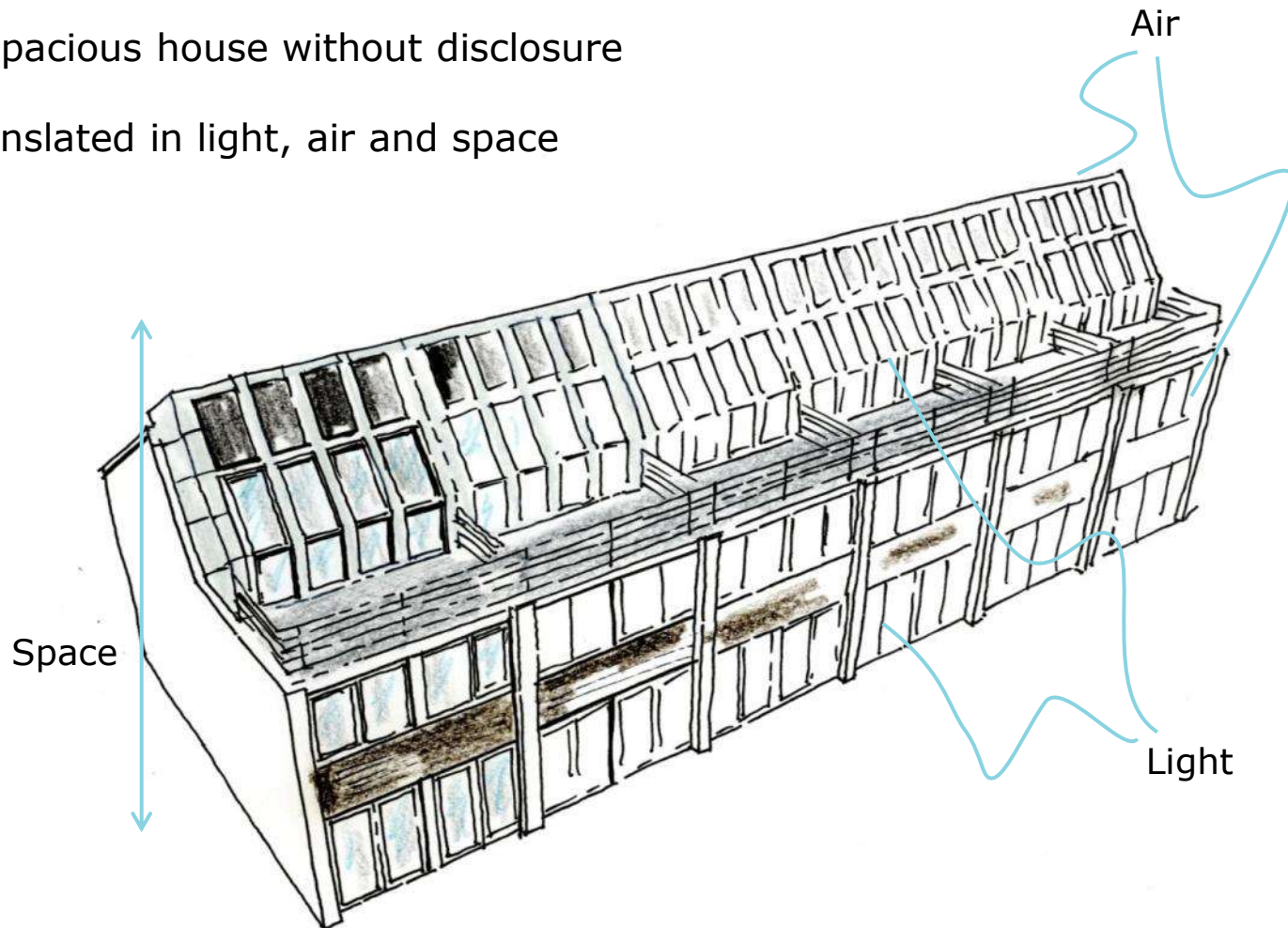


EQUIPMENT

2. Project Montfoort

Design

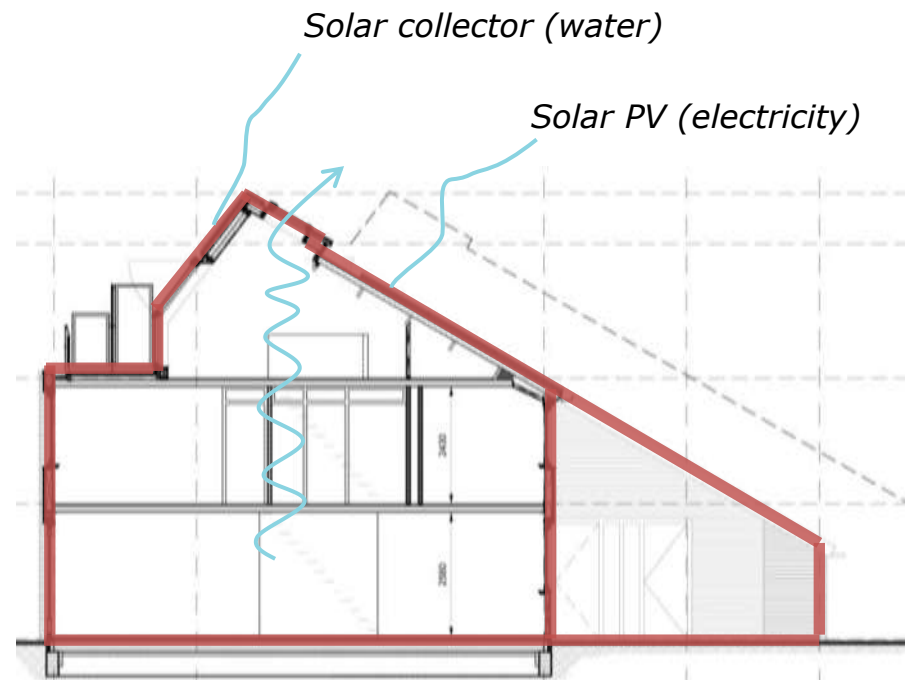
- A spacious house without disclosure
- Translated in light, air and space



2. Project Montfoort

Performance

- High performance thermal insulation
- Demand controlled ventilation system (CO₂)
- Heat pumps with low temperature heating
- Comfortable hot water
- External and internal sound insulation
- From energy label E to A++



2. Project Montfoort Floorplans



Ground floor



First floor



Second floor

2. Project Montfoort

Indoor impressions



2. Project Montfoort

Outdoor impressions



2. Project Montfoort

Repetition based on a type



Montfoort Active House



Montfoort existing



Bergen op Zoom



Eindhoven

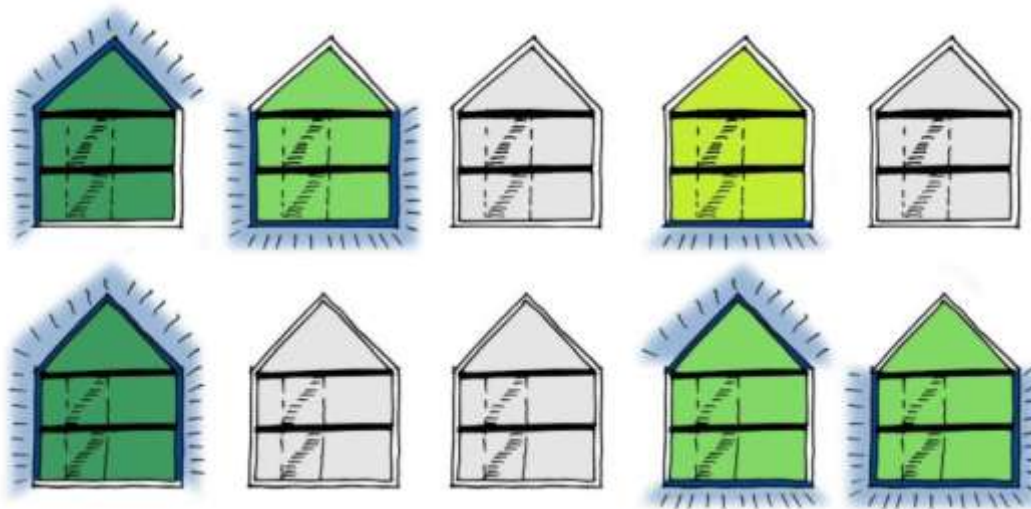


Montfoort regular

3. Alliances

The road to the consumer

- A sustainable and affordable formula to accommodate living, working and caring in the existing housing stock
- Differentiation in price and quality, suited for the needs of housing in the 21th century, on every desirable moment
- In search for a collective carrier, the components



3. Alliances

Partners

- Dozens of product industries and local executive partners
- Quality that speaks for itself
- Warranty period on a component level for minimal 15 years, secured by the Alliance

ALLIANTIE+



3. Alliances

Components as a carrier

- A component is a cohesive building part that provides in a function and quality



3. Alliances

Neighbourhood: 1.200 houses – 16 building methods

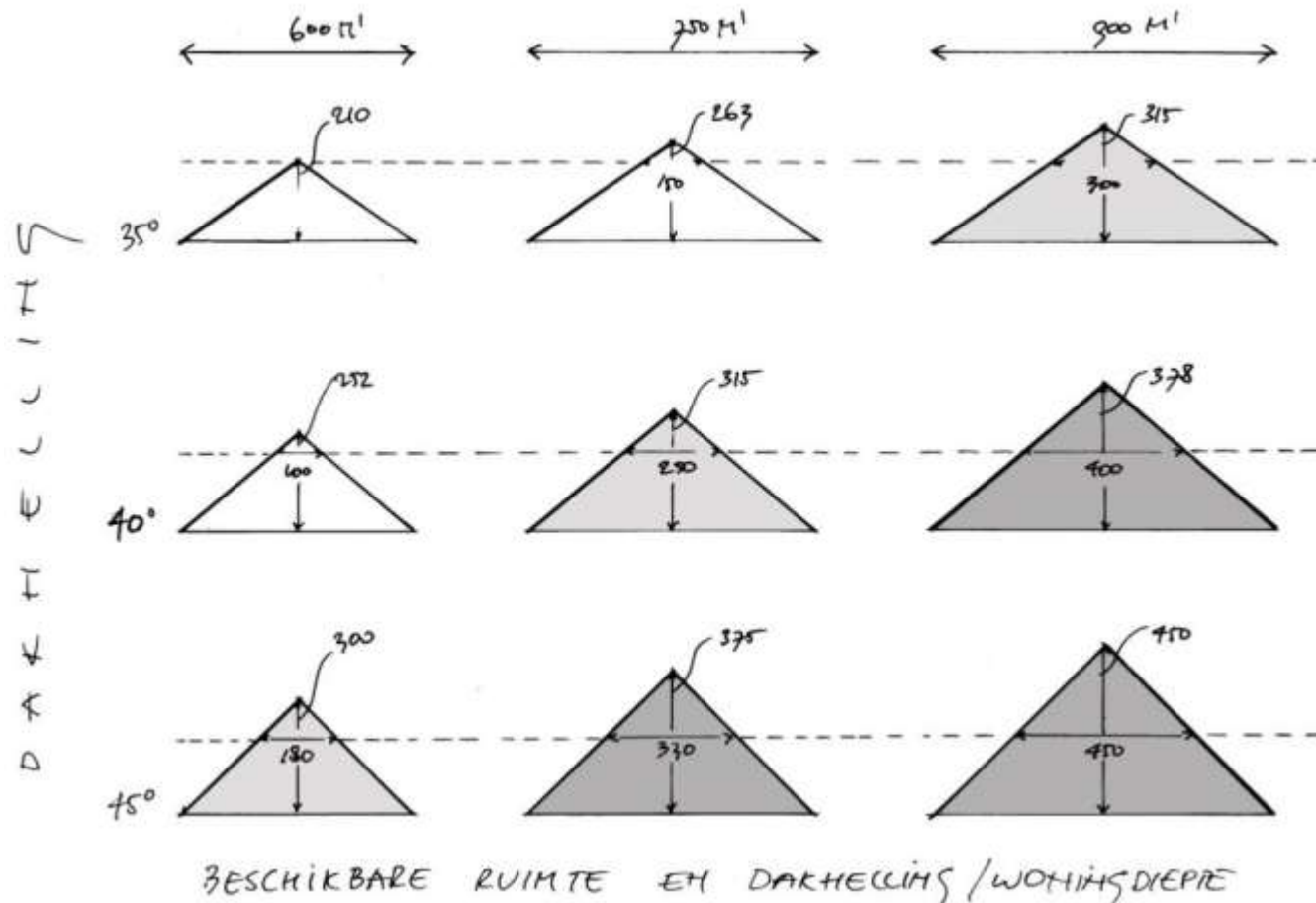


| | |
|--|---|
|  WONINGTYPE 1 36 RIJDESWONINGEN |  WONINGTYPE 9 51 RIJDESWONINGEN |
|  WONINGTYPE 2 33 RIJDESWONINGEN |  WONINGTYPE 10 48 RIJDESWONINGEN |
|  WONINGTYPE 3 80 RIJDESWONINGEN |  WONINGTYPE 11 12 RIJDESWONINGEN |
|  WONINGTYPE 4 69 RIJDESWONINGEN |  WONINGTYPE 12 68 RIJDESWONINGEN |
|  WONINGTYPE 5 101 RIJDESWONINGEN |  WONINGTYPE 13 40 DUPLEXWONINGEN |
|  WONINGTYPE 6 24 RIJDESWONINGEN |  WONINGTYPE 14 340 RIJDESWONINGEN |
|  WONINGTYPE 7 84 RIJDESWONINGEN |  WONINGTYPE 15 136 RIJDESWONINGEN |
|  WONINGTYPE 8 40 RIJDESWONINGEN |  WONINGTYPE 16 34 RIJDESWONINGEN |

Eindhoven: Eckart, 1964-1967

3. Alliances

Categories: recognizing the families



3. Alliances

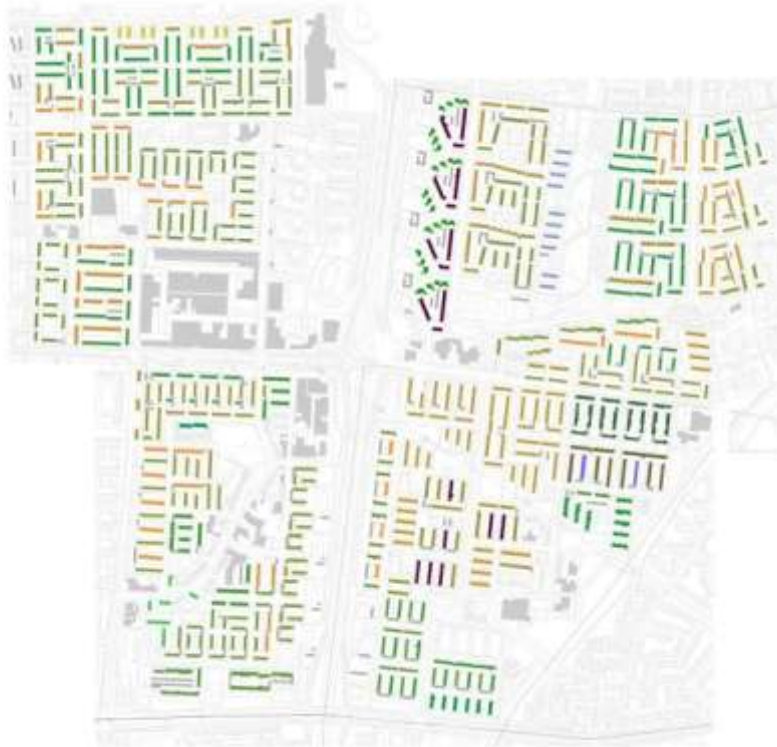
Neighbourhood: 1.200 houses – 5 roof families



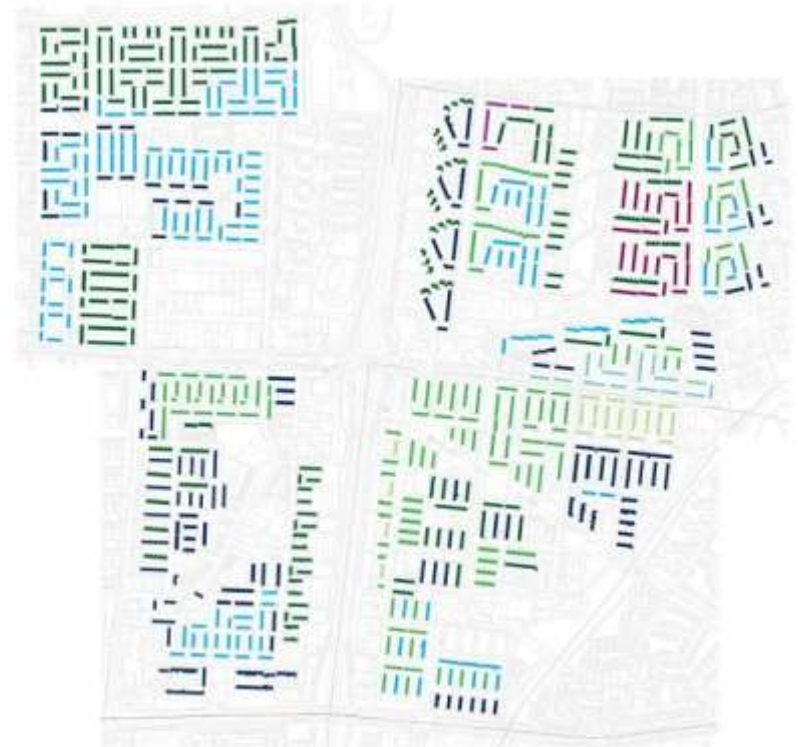
Eindhoven: Eckart, 1964-1967

3. Alliances

From neighbourhood to district



*5.200 row houses - 43 building methods
Eindhoven: Eckart, Vaartbroek,
Tempel ,Vlokhoven 1964-1983*



*5.200 row houses - 8 roof families
Eindhoven: Eckart, Vaartbroek,
Tempel ,Vlokhoven 1964-1983*

3. Alliances

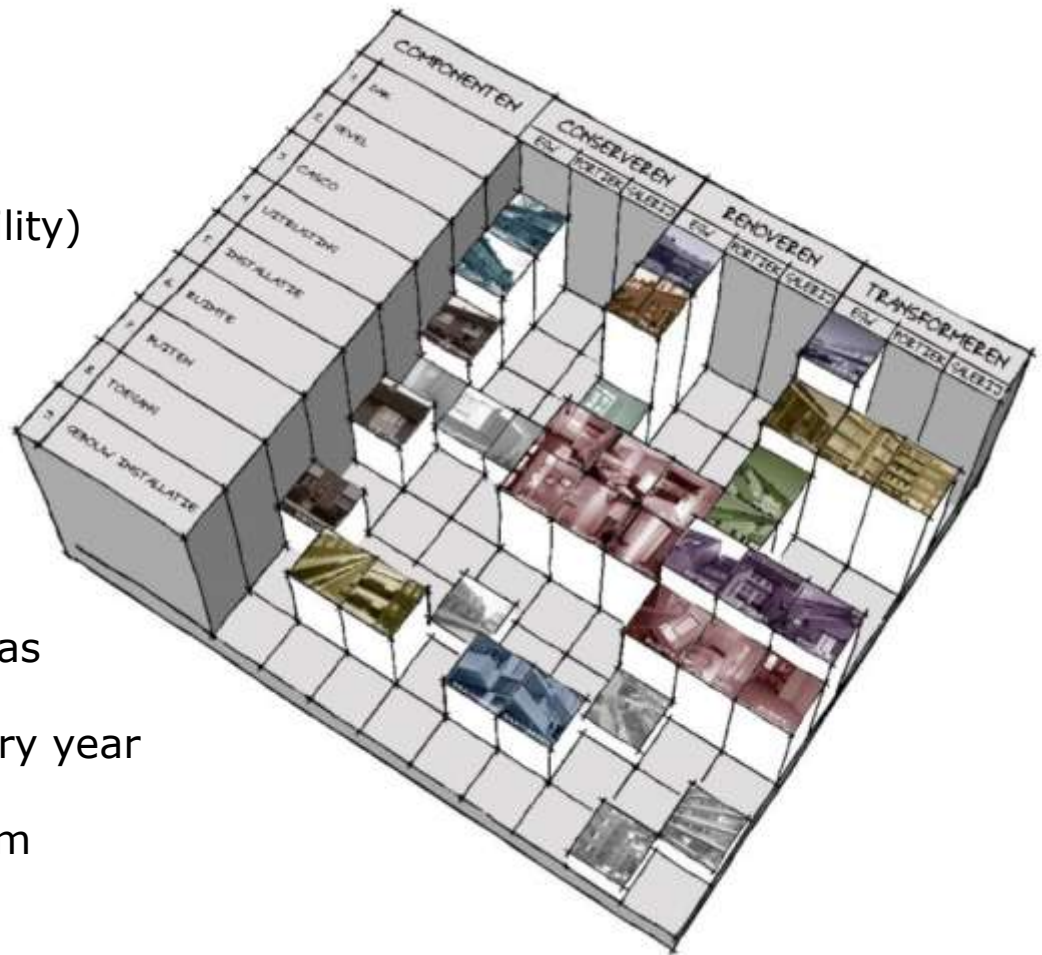
Formulas

An Alliance formula:

- Concentrates on one family
- Specific quality (i.e. sustainability)
- From one project to quantity

Program Alliance:

- Optimizing the existing formulas
- Developing a new formula every year
- Annually an innovation program for the industry



4. Conclusion

Repetition allows for upscaling and sustainable innovation

To give sustainable renovation a chance we need to go beyond the single project and look for the crossover-project solution

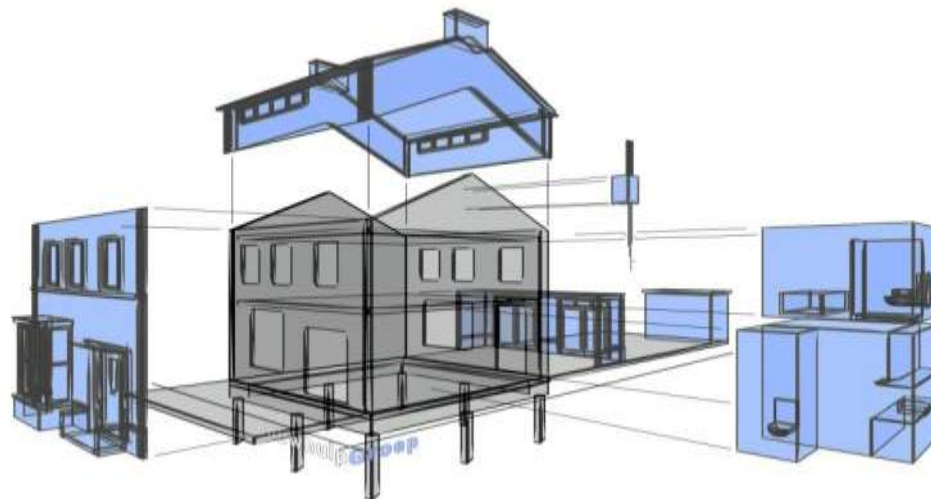
Active House

- In search of a repeatable task on a building scale (type)

Components

- In search of a repeatable task on component scale (building parts)

In search of the largest common denominator, to be able to build with sustainable solutions in the existing housing stock.



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