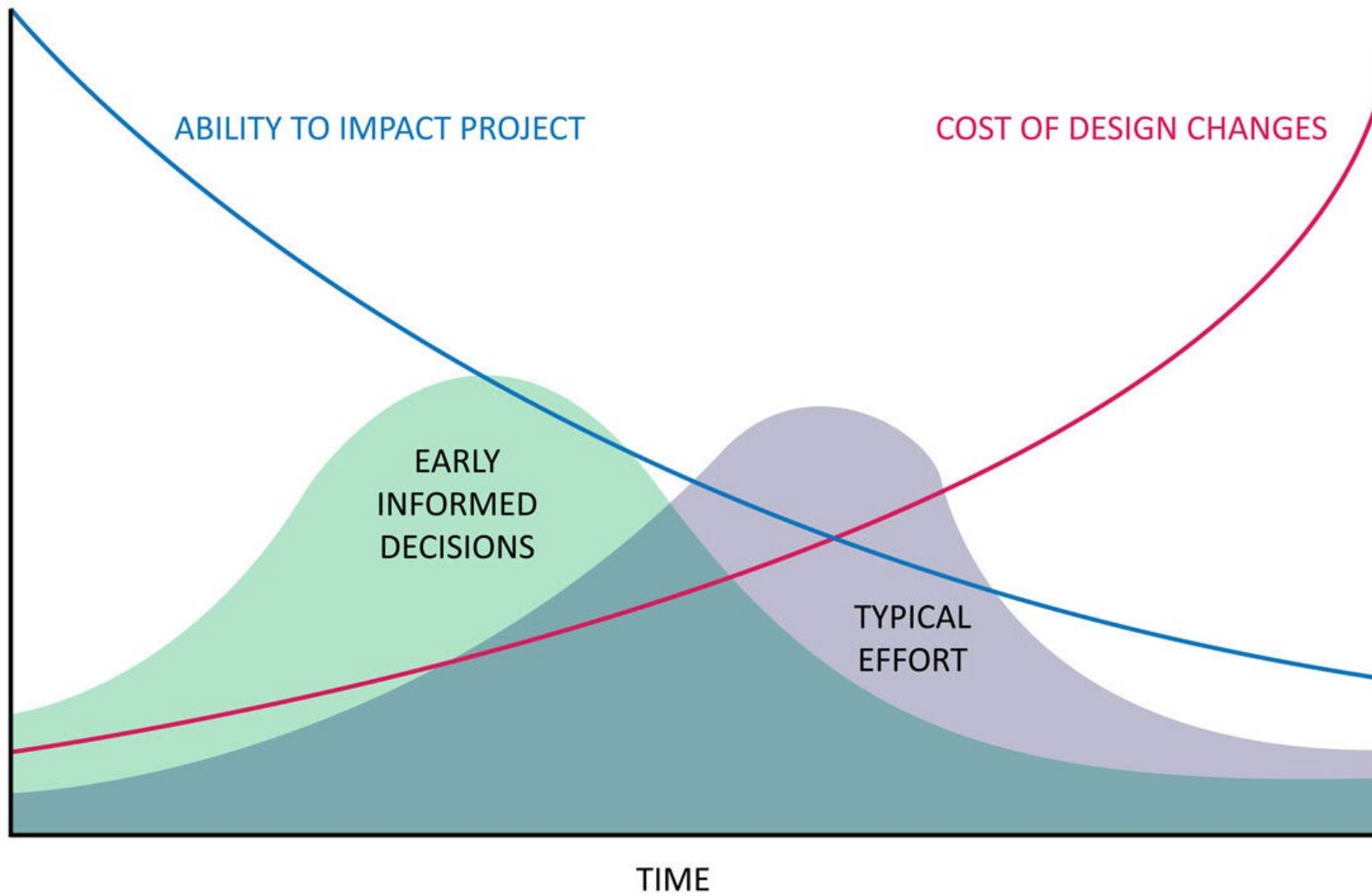


# Indeklimasimulering skal tilpasses designpraksis – ikke omvendt

Pil Brix Purup







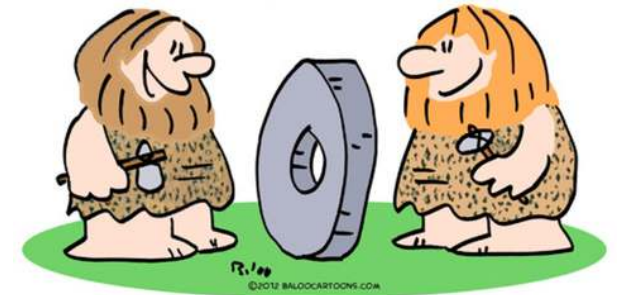
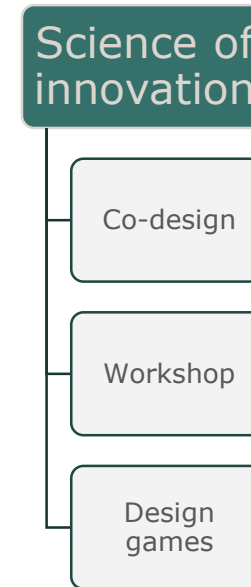
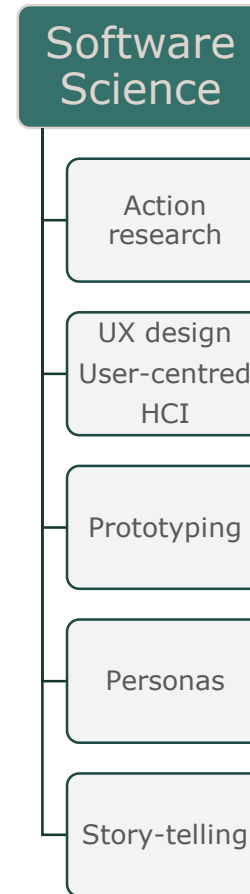
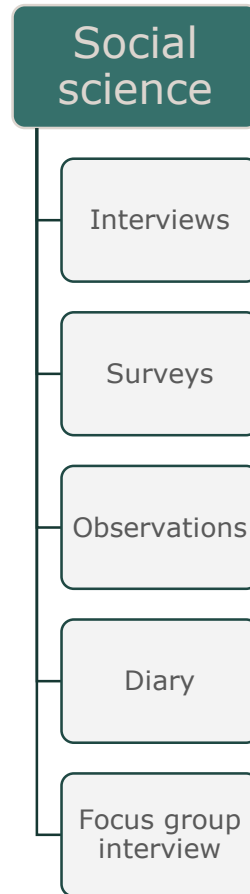
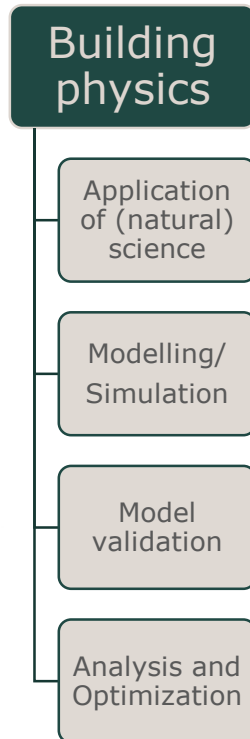
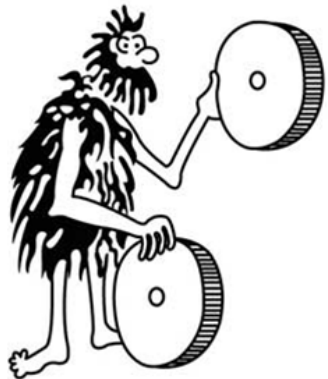


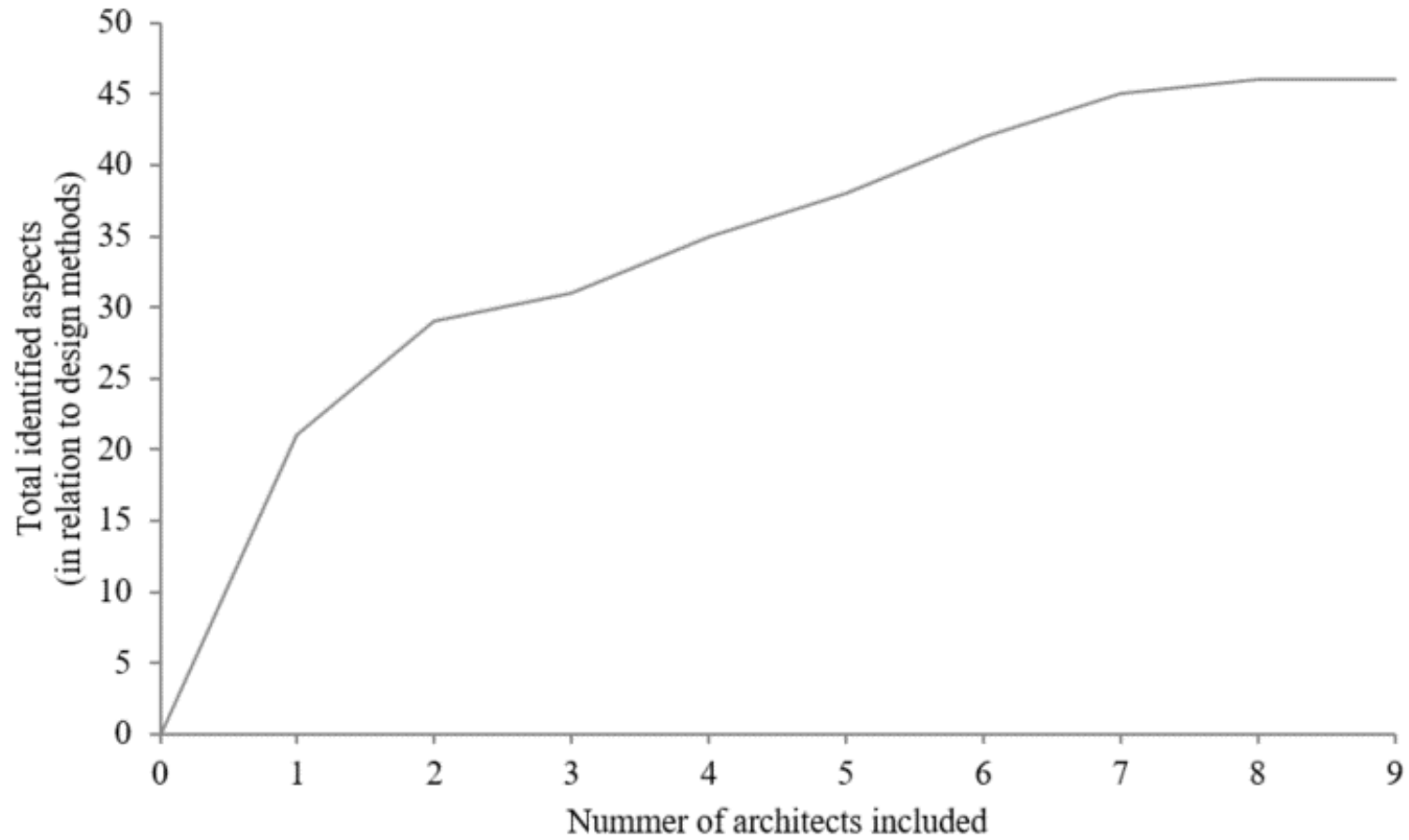
Existing Tools

Design Practice

# Forskningsmetode

## Mix-methods



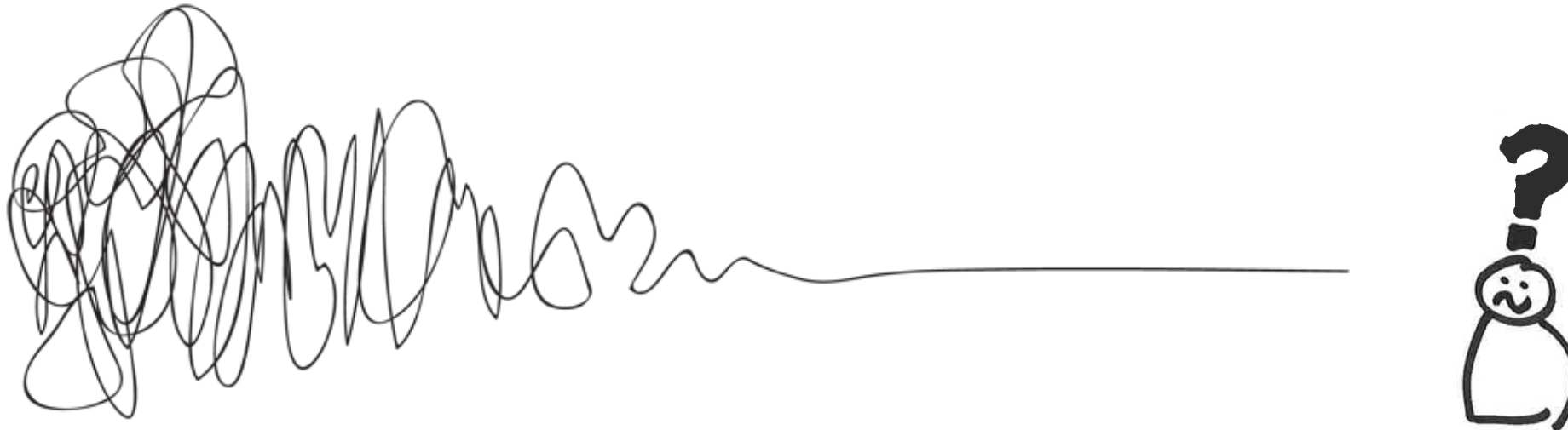


*Figure 2 – Discovery of alternative design practice aspects stagnated after 7 interviews*

# Designpraksis

**Arkitekt 04:** *”jeg vil sige, at det hele tiden handler om det der med at afsøge muligheder og så ligesom prioritere dem”*

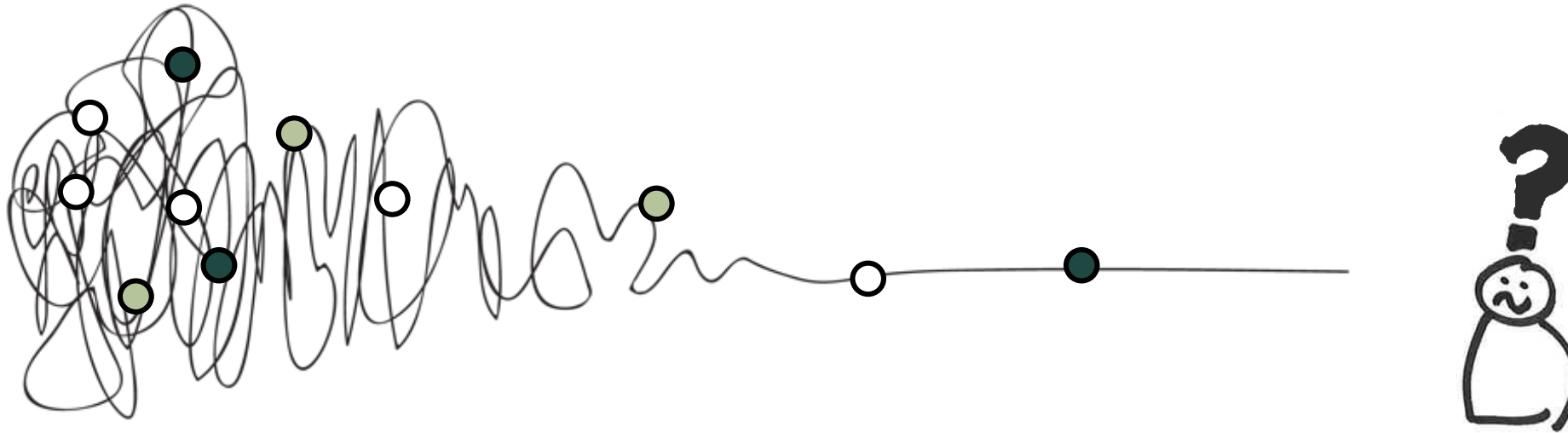
**Arkitekt 03:** *”der er måske også tidspres, så vi tager et tidligt valg og det er den vi kører med. Ellers har vi måske en to tre sideløbende som man tager et niveau videre. Og så skiller. Og så derefter bare finde den ene.”*



Source: Damien Newman <https://revisionlab.wordpress.com/that-squiggle-of-the-design-process/>

# Designpraksis

**Arkitekt 03:** *”Og så kan man bare sidde og producere modeller og søge inspiration. Pinterest. Og ellers bare søge på google efter hvad man tror på, når man lige får en eller anden ide. Søge på andre nybyggede lignende projekter. Hvordan har de løst det.”*

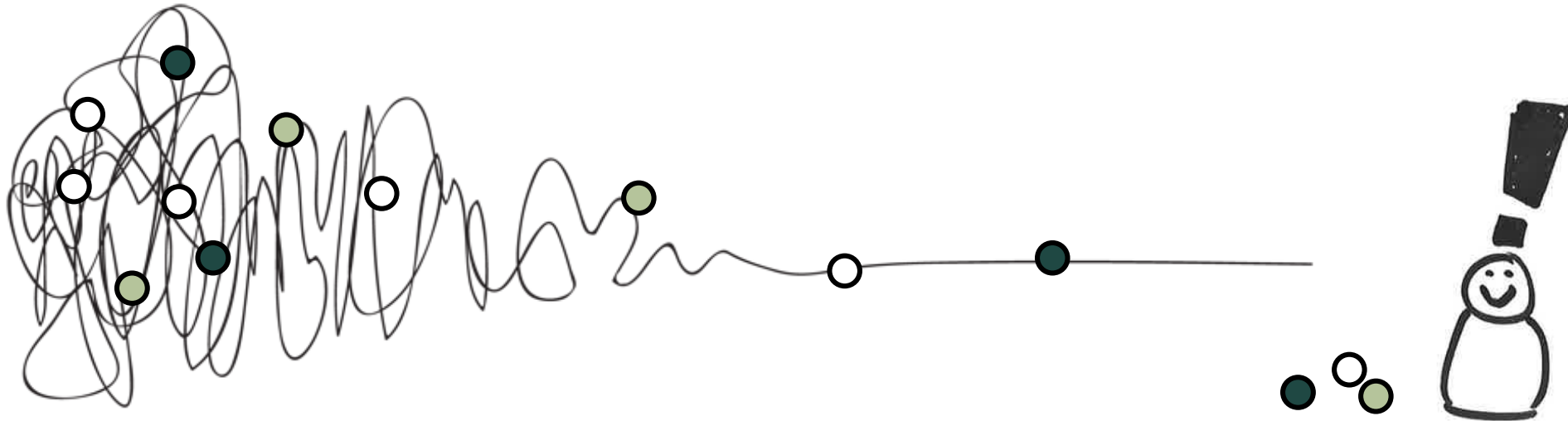


Source: Damien Newman <https://revisionlab.wordpress.com/that-squiggle-of-the-design-process/>



# Designpraksis

**Arkitekt 03:** *”Og så kan man bare sidde og producere modeller og søge inspiration. Pinterest. Og ellers bare søge på google efter hvad man tror på, når man lige får en eller anden ide. Søge på andre nybyggede lignende projekter. Hvordan har de løst det.”*

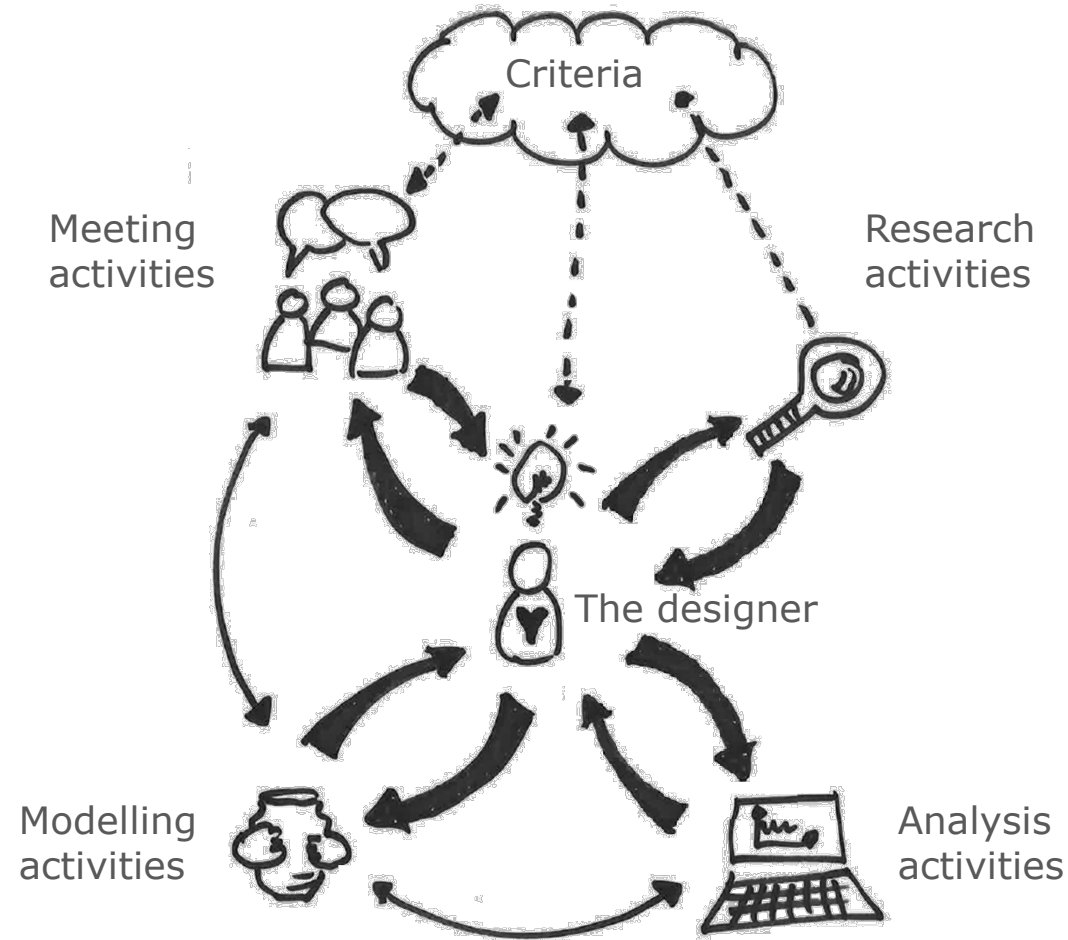


Source: Damien Newman <https://revisionlab.wordpress.com/that-squiggle-of-the-design-process/>



# Design practice defined by design activities

A new theoretical model



# ICEbear intentionen

Performancesimulering til designfasen



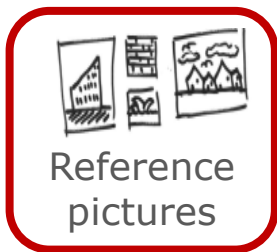
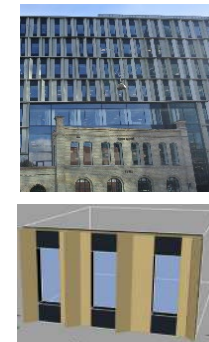
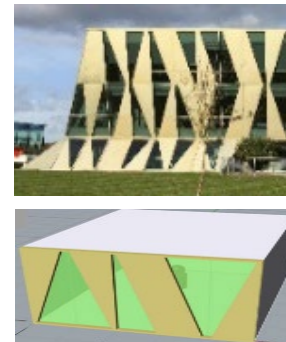
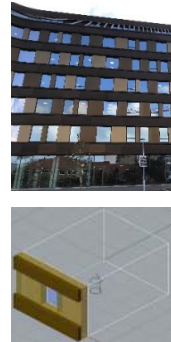
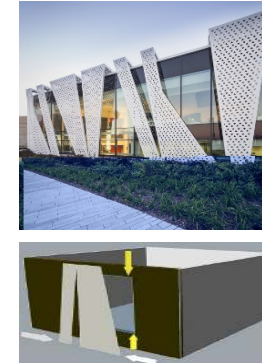
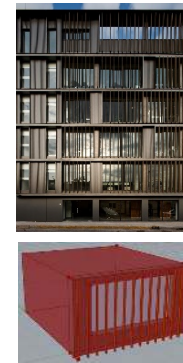
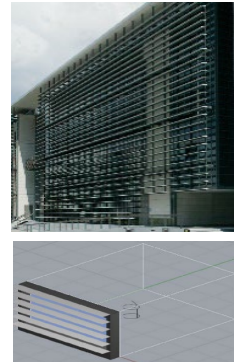
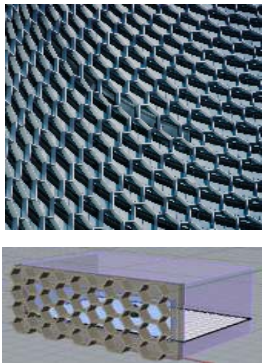
- **Uafhængig af proces** – Tilpasses typiske designaktiviteter
- **Hurtig modellering** – Genbruge arkitektens model og kræve få tekniske input (templates)
- **Uafhængig af CAD-Platform** – Plug-in til flere tegneprogrammer
- **Hurtig og præcis simulering** – Tilpasning af bygningsfysiske algoritmer og validering
- **Geometrisk frihed** – Må ikke simplificeres til blot at regne på "kasser"
- **Intuitiv datafremvisning** – Også forståeligt for ikke-teknikere
- **Støtte samarbejdet mellem faggrupper** – Differentierede informationslag i brugerflade
- **Autogenerer dokumentation** både til teknikere og til lægfolk i fx salgsmappen
- **Koblet til BIM** – Trække data fra rumprogrammer og opstille funktionskrav til projektering

Plug-in



# Prototype på database

Med referencebilleder og parametriske modeller



Reference pictures



Transforming 3D shapes



2D Facade



Compare variations



Argumentatory consolidation



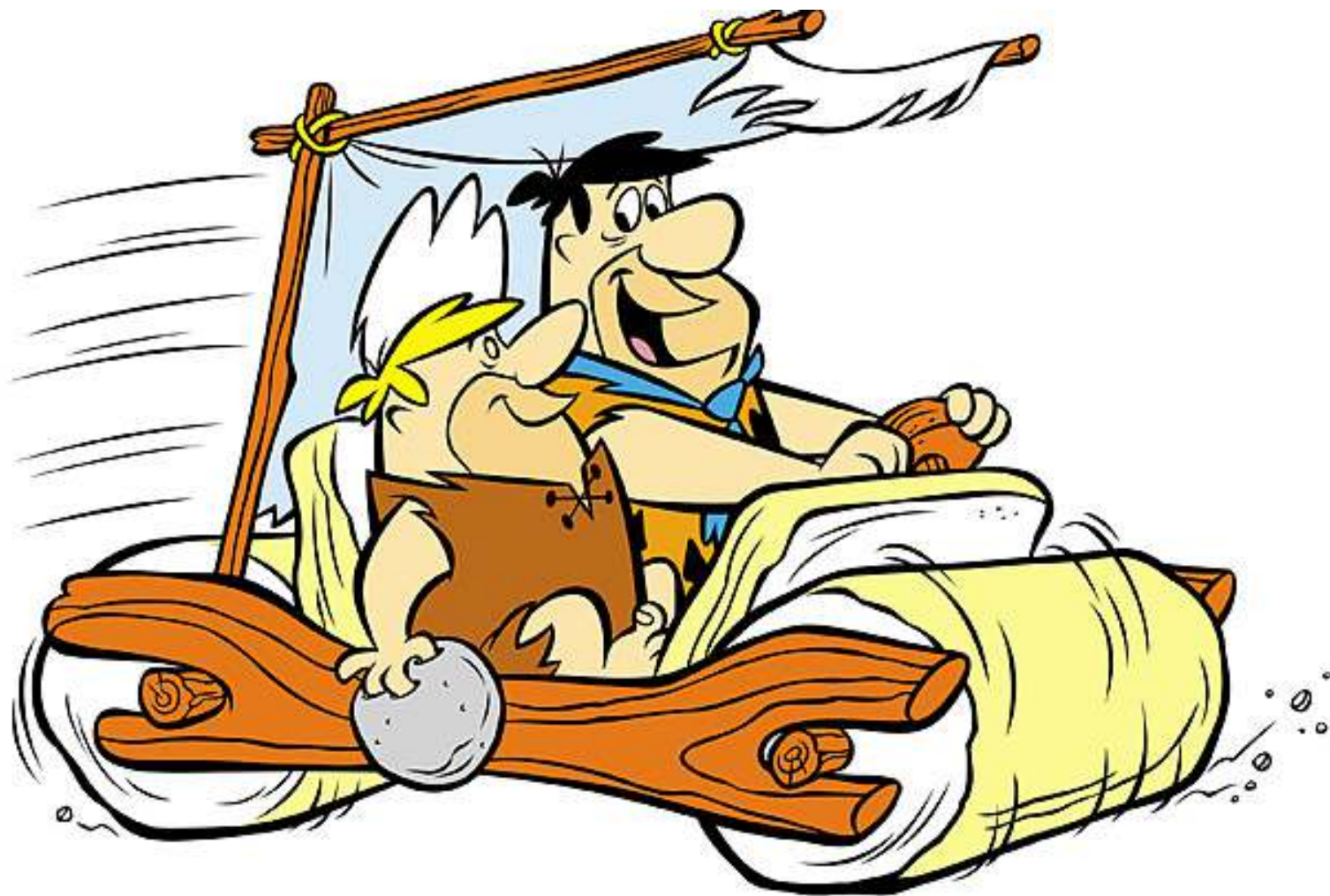
Optimization



Automated shaping



Lego/Duplo



# Udvikling af facadekoncepter

Med afsæt i referencebilleder



"Pakhuset på Langelinje"  
København



Navitas  
Aarhus



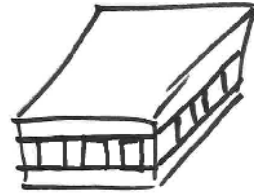
Vodafone head office  
Portugal



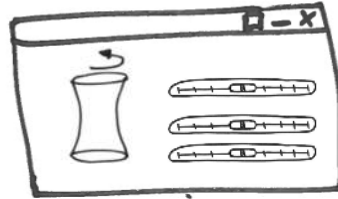
Tietgen kollegiet, København

# Udvikling af facadekoncepter

Med afsæt i referencebilleder



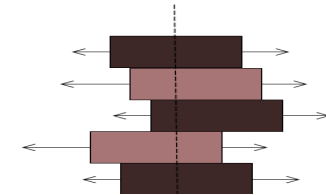
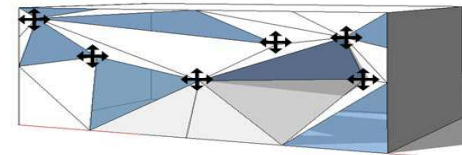
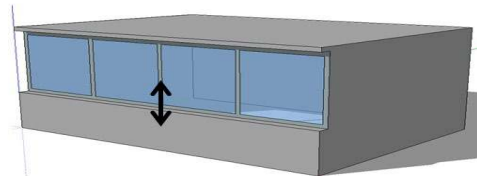
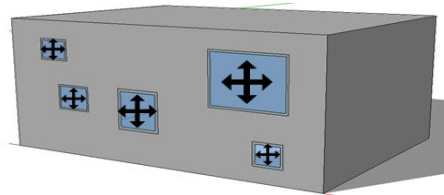
CAD



Parametri



Simulering



"Pakhuset på Langelinje"  
København



Navitas  
Aarhus



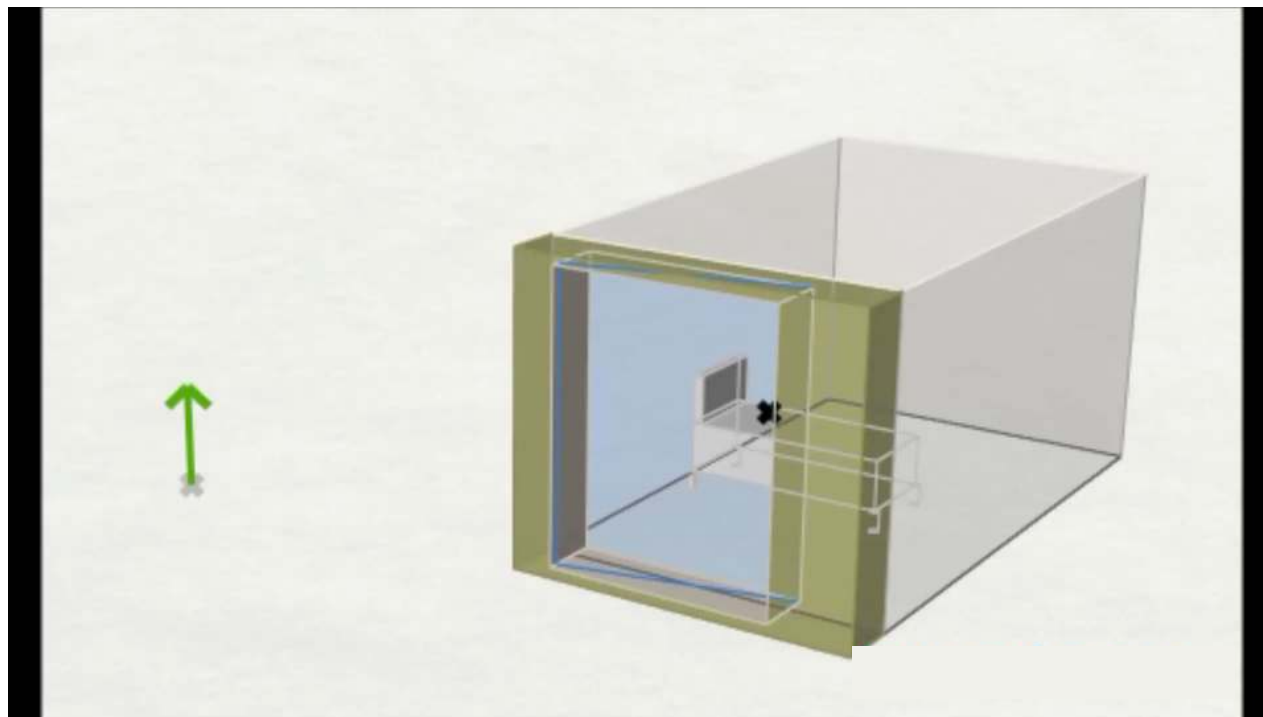
Vodafone head office  
Portugal



Tietgen kollegiet, København

# Parametrisk optimering i konkurrence

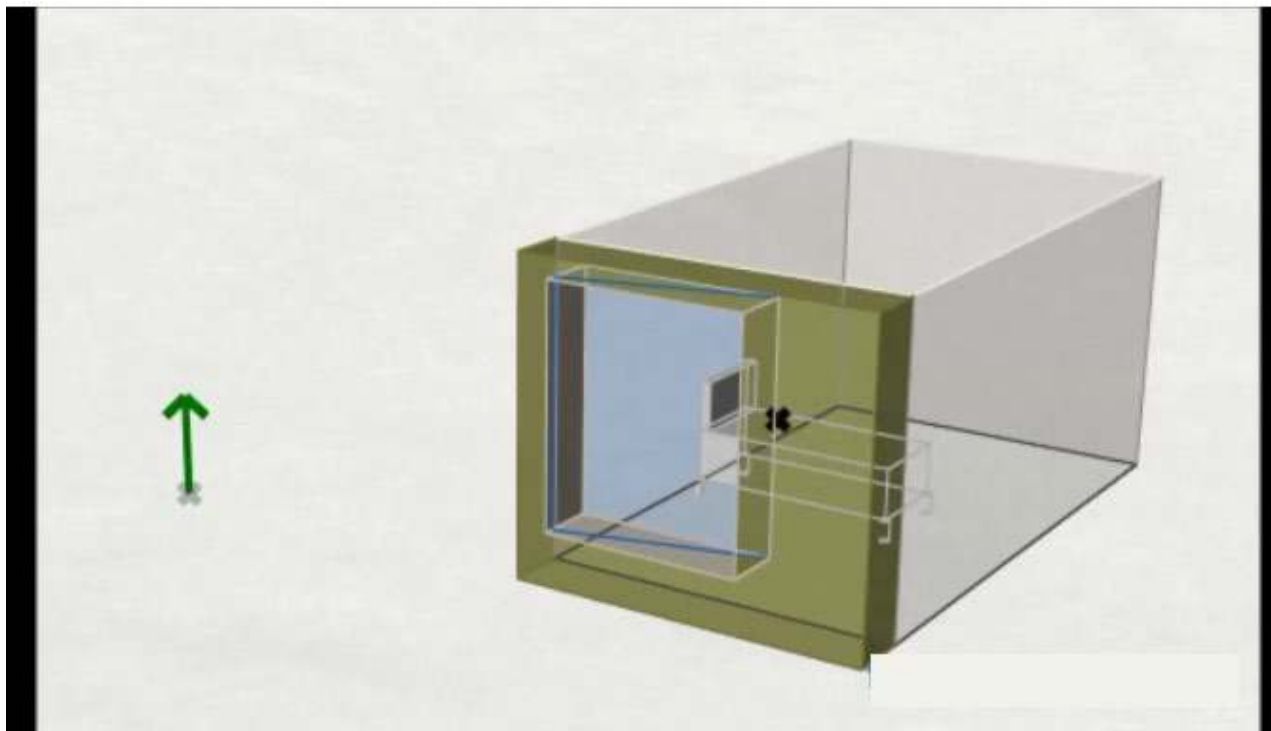
Energioptimering af sengestue





# Parametrisk optimering i konkurrence

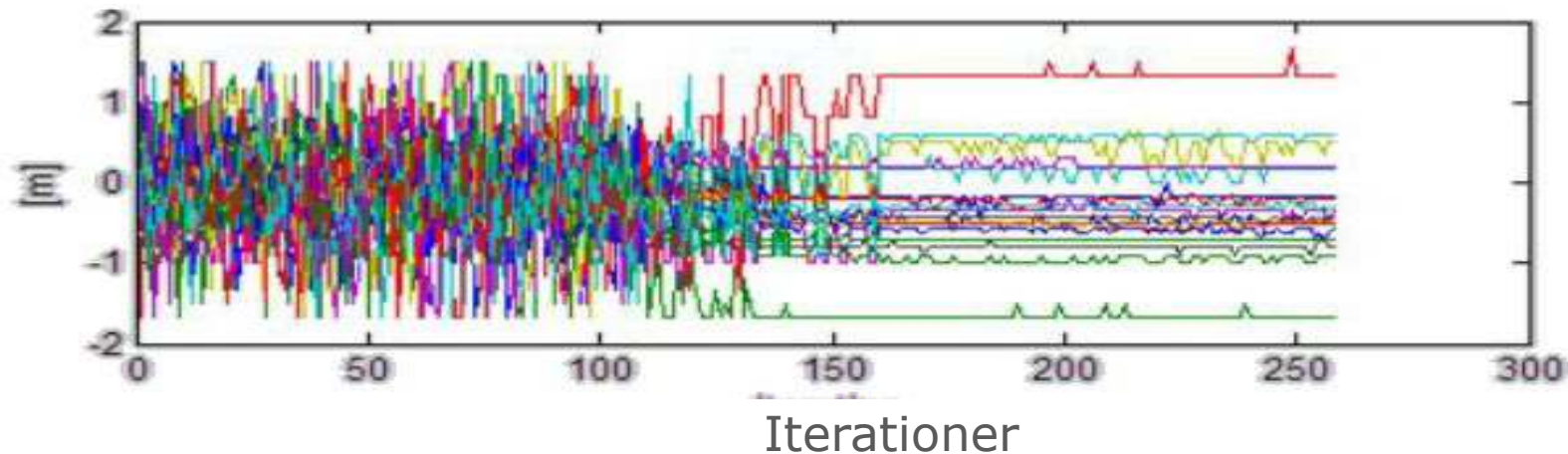
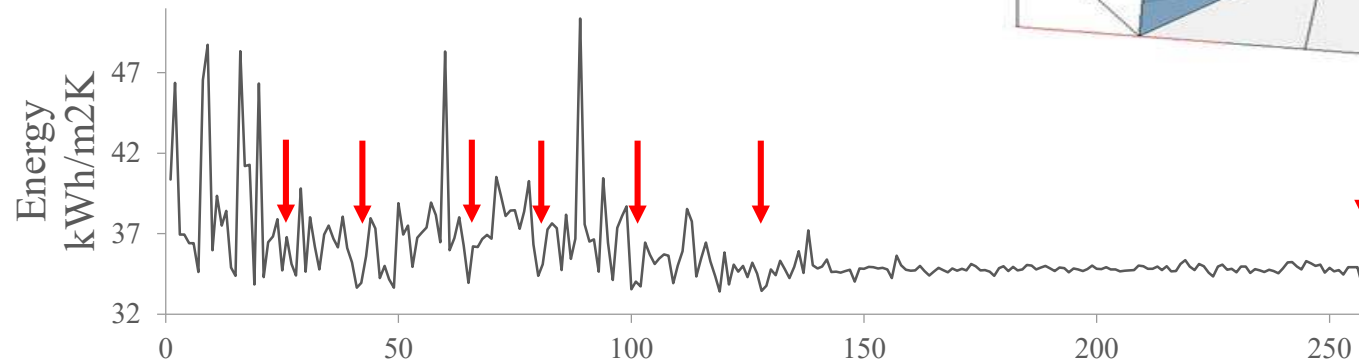
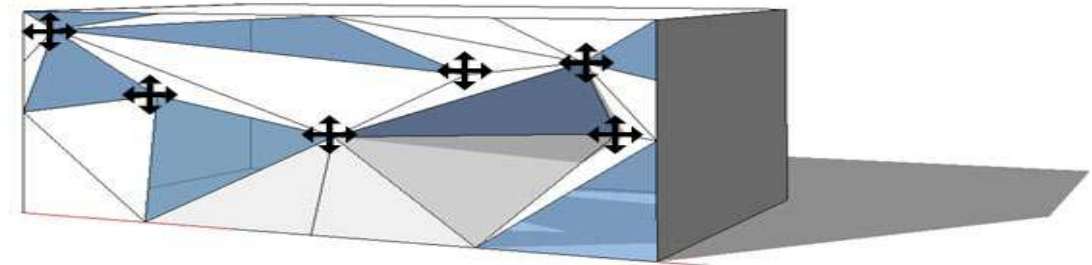
Energioptimering af sengestue



30 % mindre energiforbrug  
5 uger → 1 time

# Facadeoptimering

Til at genererer muligheder



# Facadeoptimering - OUTPUT

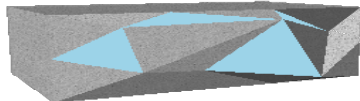
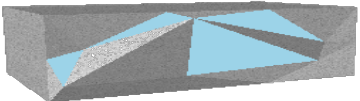
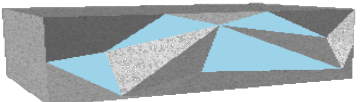
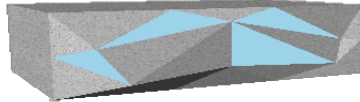
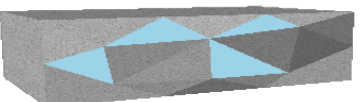
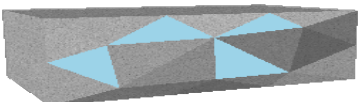
Til at genererer muligheder



Compare variations



Argumentatory consolidation

Iteration number	Energy consumption	Above 26 °C	Poor air quality	Daylight Autonomy	Design
8	25.3 kWh/m <sup>2</sup>	20 hours	1 hours	0.95	
76	24.0 kWh/m <sup>2</sup>	17 hours	1 hours	0.96	
102	24.8 kWh/m <sup>2</sup>	17 hours	1 hours	0.95	
121	24.8 kWh/m <sup>2</sup>	17 hours	1 hours	0.95	
163	26.8 kWh/m <sup>2</sup>	7 hours	6 hours	0.94	
199	26.6 kWh/m <sup>2</sup>	12 hours	5 hours	0.94	
234	26.1 kWh/m <sup>2</sup>	3 hours	8 hours	0.95	