

Nordic built challenge

Sattrup, Peter Andreas; Schipull Krauschen, Jan

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NORDIC BUILT CHALLENGE

TEAM JJW / WITRAZ / RAMBØLL

Jan Schipull Kauschen

phd-studerende CINARK/JJW arkitekter
arkitekt MAA

“Bæredygtige Systemleverancer
ved renovering og nybyggeri” (2010-14)



Metode

7 koncepter

Konkurrence fase 1 - NBC som case

Nordic Built Charter - to eksempler

Peter Andreas Sattrup

Lektor, DTU.Byg
arkitekt MAA, PhD

Bæredygtighed, Klima, Energi,
Dagslys & Designmetoder

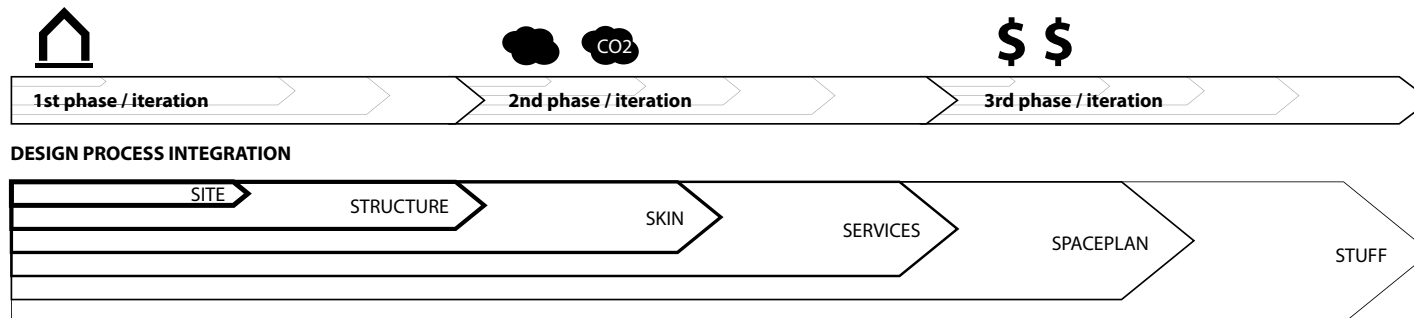
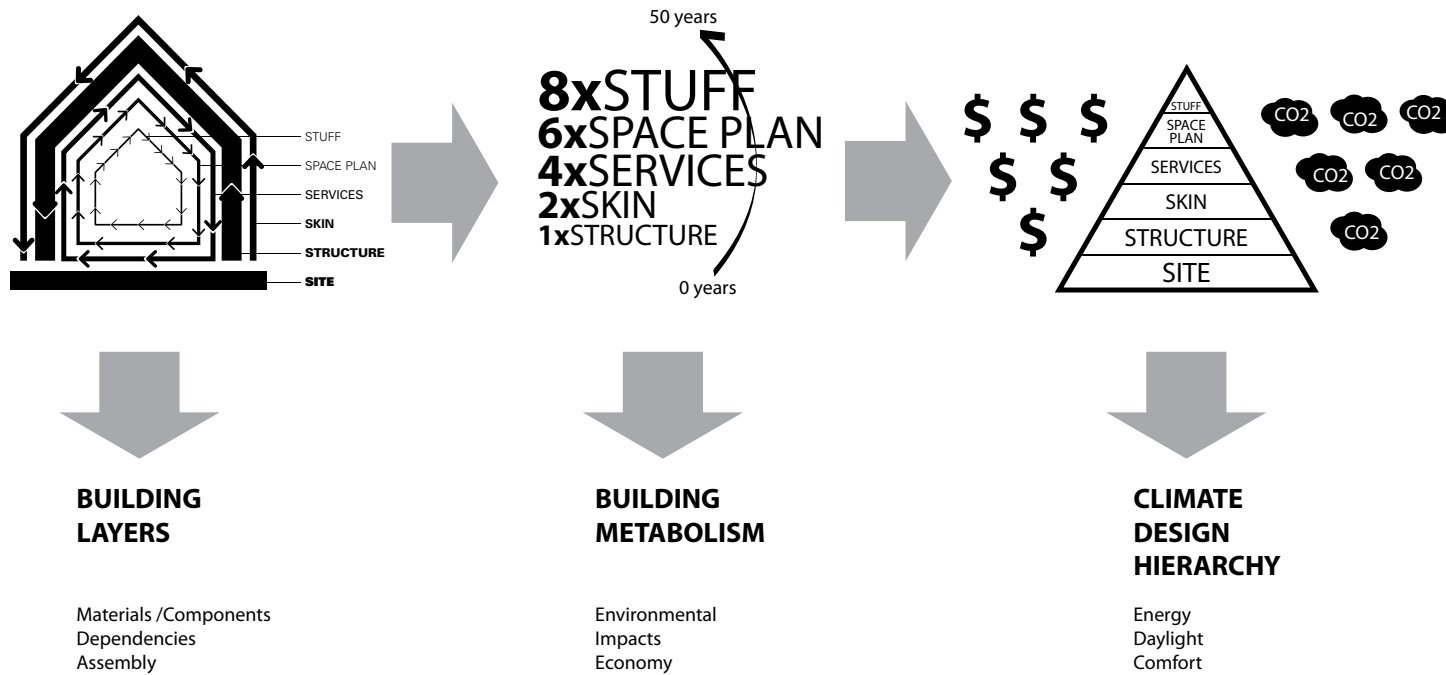


Metode

Nordic Innovation

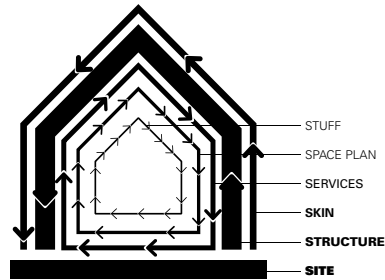
AGENDA

"Shearing Layers of Change"¹ - som design strategy for bæredygtigt byggeri

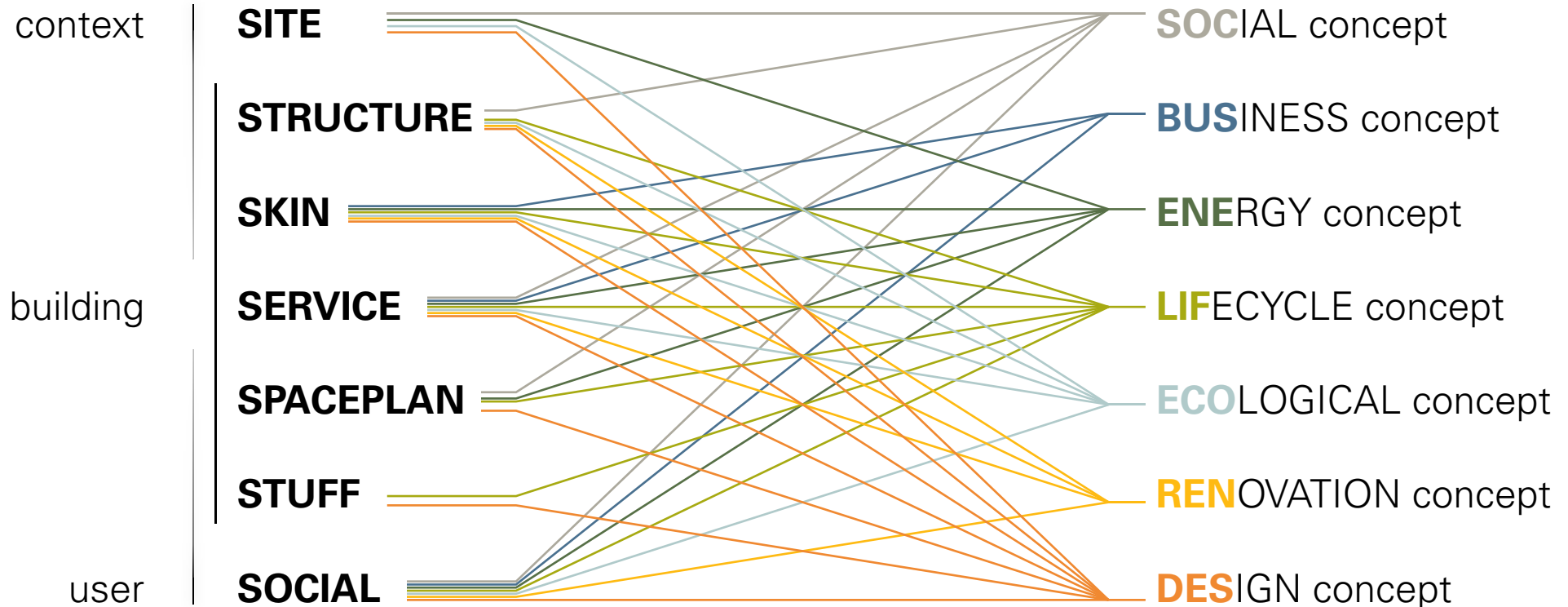


1 Brand, Stewart. How Buildings Learn. 1994

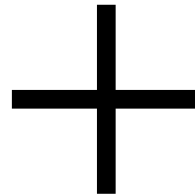
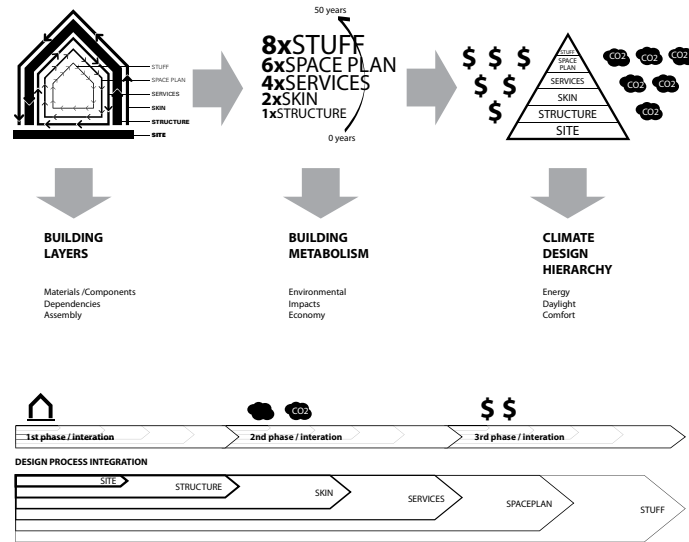
Bæredygtighed i byggeriet - håndtering af kompleksitet



7 KONCEPTER



Bæredygtighed i byggeriet - identificering af vigtigste parameter



- SOCIAL CONCEPT
- BUSINESS CONCEPT
- ENERGY CONCEPT
- LIFECYCLE CONCEPT
- ECOLOGICAL CONCEPT
- RENOVATION CONCEPT
- DESIGN CONCEPT

STANDARDER / DE FACTO STANDARDER / PRINCIPPER

f.eks. EN15643

f.eks. DGNB, BREEAM

f.eks. C2C, NBC

NORDIC BUILT Challenge - som case



We, the Nordic building sector, will join forces and capitalise on our common strengths to deliver the sustainable solutions the Nordic region and the world demands. The time is now and the principles of Nordic Built Charter will lead the way.

OUR COMMITMENT

We commit to taking leadership and implement the Nordic Built principles in our work and our business plans. We commit to taking the necessary actions to deliver competitive concepts for a sustainable built environment that benefit users, the building sector, our region and the world.

OUR NORDIC BUILT PRINCIPLES

WE WILL CREATE A BUILT ENVIRONMENT THAT:

- | | | |
|------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------|
| Is made for people and promotes quality of life | 01 | 06 Is robust, durable, flexible and timeless - built to last |
| Pushes the limits of sustainable performance, as a result of our innovative mind-set and high level of knowledge | 02 | 07 Utilises local resources and is adapted to local conditions |
| Merges urban living with the qualities of nature | 03 | 08 Is produced and maintained through partnerships founded on transparent collaboration across borders and disciplines. |
| Achieves zero emissions over its lifecycle | 04 | 09 Employs concepts that are scalable and used globally |
| Is functional, smart and aesthetically appealing, building on the best of the Nordic design tradition | 05 | 10 Profits people, business and the environment |

NORDIC BUILT Challenge - som case

PRINCIPLES



CONCEPTS



CONCEPTS RELATIONS TO THE PRINCIPLES



We, the Nordic building sector, will join forces and capitalise on our common strengths to deliver the sustainable solutions the Nordic region and the world demands. The time is now and the principles of Nordic Built Charter will lead the way.

The ten principles in the Nordic Built Charter have been transformed into seven concepts which summarize the most important aspects of sustainable design. The seven concepts provide a multiple solutions space which breaks down the complexity of sustainable design into tangible elements.

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OUR NORDIC BUILT PRINCIPLES

WE WILL CREATE A BUILT ENVIRONMENT THAT:

- O1 Is made for people and promotes quality of life
- O2 Pushes the limits of sustainable performance, as a result of our innovative mind-set and high level of knowledge
- O3 Merges urban living with the qualities of nature
- O4 Achieves zero emissions over its lifecycle
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SOCIAL CONCEPT

BUSINESS CONCEPT

ENERGY CONCEPT

LIFECYCLE CONCEPT

ECOLOGICAL CONCEPT

RENOVATION CONCEPT

DESIGN CONCEPT

Principles 1-2-3-4-6-9-10

Principles 2-6-8-9-10

Principles 2-4-7-9-10

Principles 2-4-6-9-10

Principles 2-4-7-8-9-10

Principles 2-6-9-10

Principles 1-2-3-4-5-6-7-8-9-10

NORDIC BUILT Challenge - som case

PRINCIPLES



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CONCEPTS



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SOCIAL CONCEPT

BUSINESS CONCEPT

ENERGY CONCEPT

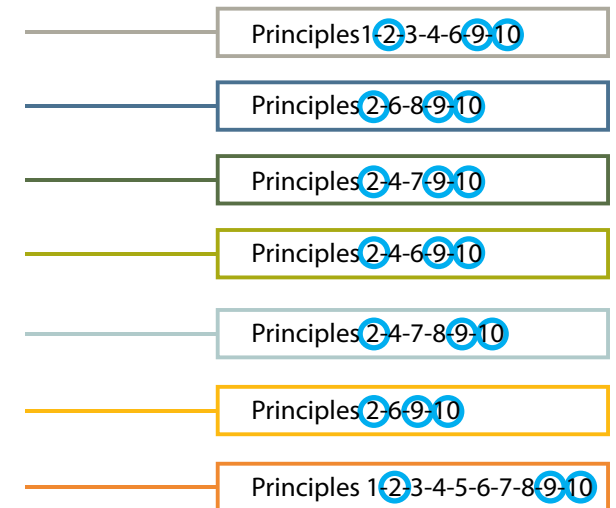
LIFECYCLE CONCEPT

ECOLOGICAL CONCEPT

RENOVATION CONCEPT

DESIGN CONCEPT

CONCEPTS RELATIONS TO THE PRINCIPLES



NBChallenge

udrag fra fase 1

NORDIC BUILT CHALLENGE Denmark 2013

14/10/2013 - 14/10/2018

14/10/2013 - 14/10/2018

LIFECYCLE CONCEPT

KEYWORDS

- Building lifecycle
- Material lifecycle
- The cycle
- Material development

The lifecycle concept addresses the change over time a building is undergoing and users will undergo. The concept has different levels that will influence on the NBChallenge and NBChallenge projects, and will also be included in the "Terms of a Building".

THE CHALLENGE - THE BUILDING LIFECYCLE

In buildings, approximately 100 materials, components and elements are applied, functions to be used in different ways to serve the building. A great range of materials, systems, space plans, etc. are used during the early design stages. The building lifecycle is a process that starts from the design of a building concept, over the construction phase, and continues through the use and maintenance phases. A building lifecycle is a process that starts from the design of a building concept, over the construction phase, and continues through the use and maintenance phases. A building lifecycle is a process that starts from the design of a building concept, over the construction phase, and continues through the use and maintenance phases.

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NORDIC BUILT CHALLENGE Denmark 2013

14/10/2013 - 14/10/2018

RENOVATION CONCEPT

KEYWORDS

- Renovation
- Material
- Construction site
- Design for assembly
- Construction site

In short-term buildings will have to be renovated, facade and building systems need upgrades, but an extensive renovation is possible within 10-15 days per apartment. The renovation process, including all necessary steps, will be a high degree of prefabrication, quality and safety. The renovation process, including all necessary steps, will be a high degree of prefabrication, quality and safety.

THE CHALLENGE

Approximately 40% of multi-story residential buildings in the Danish social housing sector are in need of renovation. The renovation process, including all necessary steps, will be a high degree of prefabrication, quality and safety.

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NORDIC BUILT CHALLENGE Denmark 2013

BUSINESS CONCEPT

KEYWORDS

- Business
- Investment opportunities
- Product Service System

The business concept is to present a possible solution through a business model. The business model is a plan of all activities in a business, resulting in a financial forecast. The business model is a plan of all activities in a business, resulting in a financial forecast.

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NORDIC BUILT CHALLENGE Denmark 2013

ECOLOGICAL CONCEPT

KEYWORDS

- Ecology
- Resource
- Urban form

The ecological concept addresses the right, use and disposal of materials that are used within a building. The ecological concept addresses the right, use and disposal of materials that are used within a building.

THE CHALLENGE

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NORDIC BUILT CHALLENGE Denmark 2013

DESIGN CONCEPT / LANDSCAPE AND ARCHITECTURE

KEYWORDS

- Design
- Architecture
- Material
- Construction site

The design concept is to present a possible solution through a design model. The design model is a plan of all activities in a design, resulting in a visual representation. The design model is a plan of all activities in a design, resulting in a visual representation.

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NORDIC BUILT CHALLENGE Denmark 2013

ENERGY CONCEPT

KEYWORDS

- Energy
- Renewable energy
- Heat recovery
- Insulation

The energy concept is to present a possible solution through an energy model. The energy model is a plan of all activities in an energy system, resulting in a visual representation. The energy model is a plan of all activities in an energy system, resulting in a visual representation.

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NORDIC BUILT CHALLENGE Denmark 2013

SOCIAL CONCEPT

KEYWORDS

- Social
- Community
- Local
- Participation

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NORDIC BUILT CHALLENGE Denmark 2013

LOCAL AND PUBLIC ENERGY SUPPLY

KEYWORDS

- Local
- Public
- Energy
- Supply

The local and public energy supply concept is to present a possible solution through a local and public energy supply model. The local and public energy supply model is a plan of all activities in a local and public energy supply system, resulting in a visual representation. The local and public energy supply model is a plan of all activities in a local and public energy supply system, resulting in a visual representation.

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NORDIC BUILT Challenge - Team JJW / WITRAZ / RAMBØLL

Fase 1



Ellebo / Danmark
JJW



ReBootkyrka / Sverige
WITRAZ

med
Habitats (Lise Kloster Bro) - landskab
Novitas Innovation (Tanja Bisgaard) - sparring til økonomisk koncept

NORDIC BUILT Challenge - to eksempler

Is made for people and promotes quality of life **O1**

Pushes the limits of sustainable performance, as a result of our innovative mind-set and high level of knowledge **O2**

Merges urban living with the qualities of nature **O3**

Achieves zero emissions over its lifecycle **O4**

Is functional, smart and aesthetically appealing, building on the best of the Nordic design tradition **O5**

O6 Is robust, durable, flexible and timeless - built to last

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O10 Profits people, business and the environment

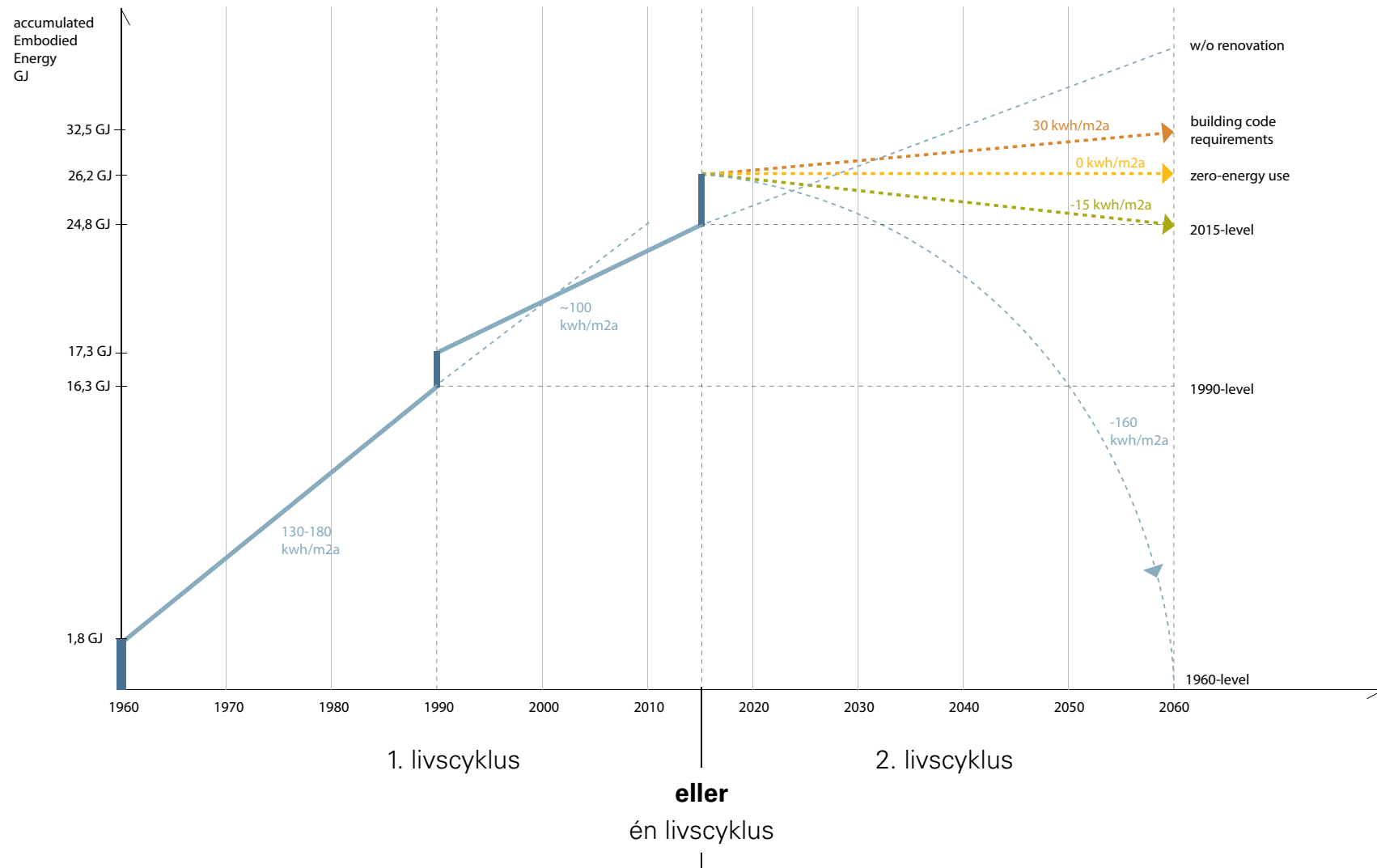
NORDIC BUILT Challenge - to eksempler

Achieves zero emissions
over its lifecycle **O4**



NORDIC BUILT Challenge - to eksempler

Embodied Energy + driftsenergi / systemgrænser?



NORDIC BUILT Challenge - to eksempler

LCA og konsekvenser

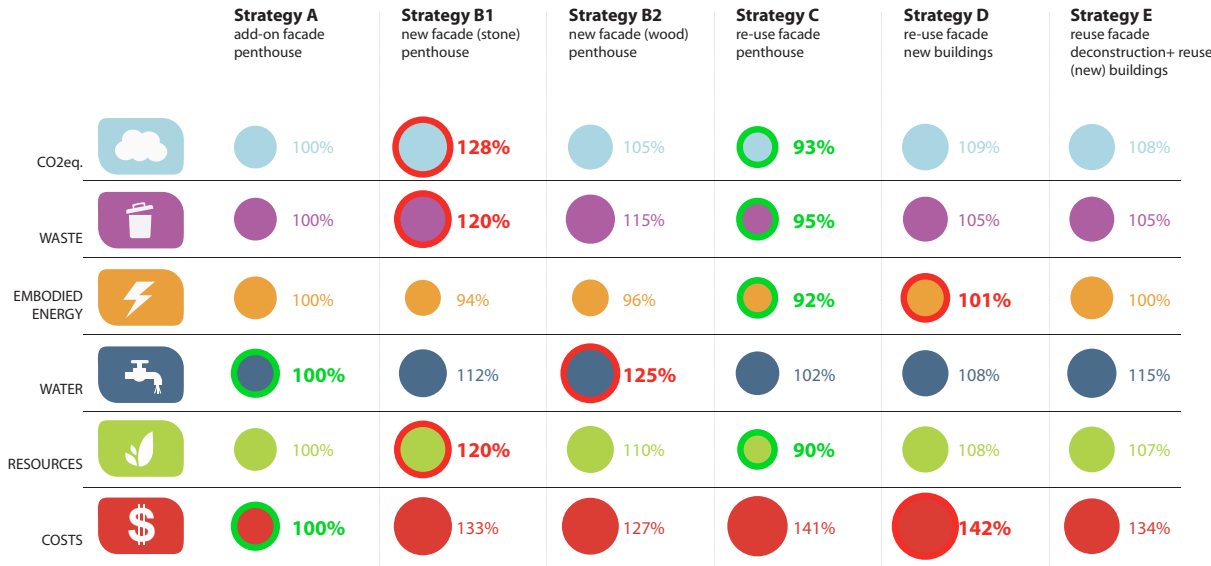


Table 1: Relation of the different renovation strategies with respect to environmental footprints and costs
(Percentages are based on a cost estimate and a Lifecycle Assessment, (LCA). 100% relates to the "base case" (Strategy A))



	Strategy A add-on facade penthouse	Strategy B1 new facade (stone) penthouse	Strategy B2 new facade (wood) penthouse	Strategy C re-use facade penthouse	Strategy D re-use facade new buildings	Strategy E reuse facade deconstruction+ reuse (new) buildings
SITE	no changes	no changes	no changes	no changes	no changes	no changes
STRUCTURE	REUSE of existing structure Lightweight construction of penthouses	REUSE of existing structure Lightweight construction of penthouses	REUSE of exist. structure Lightweight construction of penthouses	REUSE of exist. structure Lightweight construction of penthouses	REUSE of existing structure +new building construction	REUSE of existing structure, partial removal +new building construction
SKIN	add-on facade 240-310 mm standard insulation slate cladding	new facade 420 mm wood-fibre insulation slate cladding	new facade 420 mm wood-fibre insulation wood cladding	new facade 420 mm wf-insulation reused-concrete elements as cladding	new facade 420 mm wf-insulation reused-concrete elements as cladding	new facade 420 mm wf-insulation slate cladding
SYSTEMS	Upgrading of existing systems (district heating)	Upgrading of existing systems (district heating)	Upgrading of existing systems (district heating)	Upgrading of existing systems (district heating)	Upgrading of existing systems (district heating)	Upgrading of existing systems (district heating)
SPACE PLAN	combinations of flats in block 2+4, new kitchen / bathroom	combinations of flats in block 2+4, new kitchen / bathroom	combinations of flats in block 2+4, new kitchen / bathroom	combinations of flats in block 2+4, new kitchen / bathroom	combinations of flats in block 2+4, new kitchen / bathroom	combinations of flats in block 2+4, new kitchen / bathroom
STUFF	no changes	no changes	no changes	no changes	no changes	no changes

Table 2: comparison of the 5 different design strategies.

NORDIC BUILT Challenge - to eksempler

BYSCO-konceptet:

Ellebo bliver til en Produkt-Service-System (PSS)

-> incitament til at spare ressourcer

-> skaber jobs (lokalt)

-> skaber langvarige forretningsperspektiver

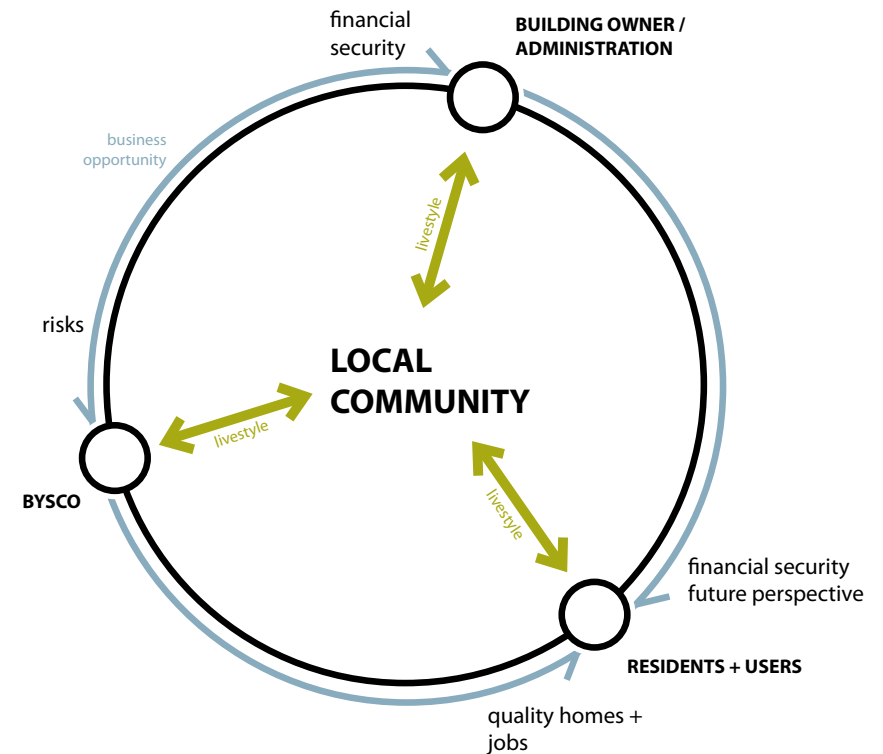
-> begrænser (økonomiske) risici for beboerne

-> ingen "point-of-sales" (kun et budget, ansvaret forbliver hos BYSCO)

men: hvem kan gøre dette (tillid)? hvem ejer bygningen?

hvad med beboerdemokratiet? store byggeopgaver uden udbud?

fungerer systemet kun ved høje materialepriser?



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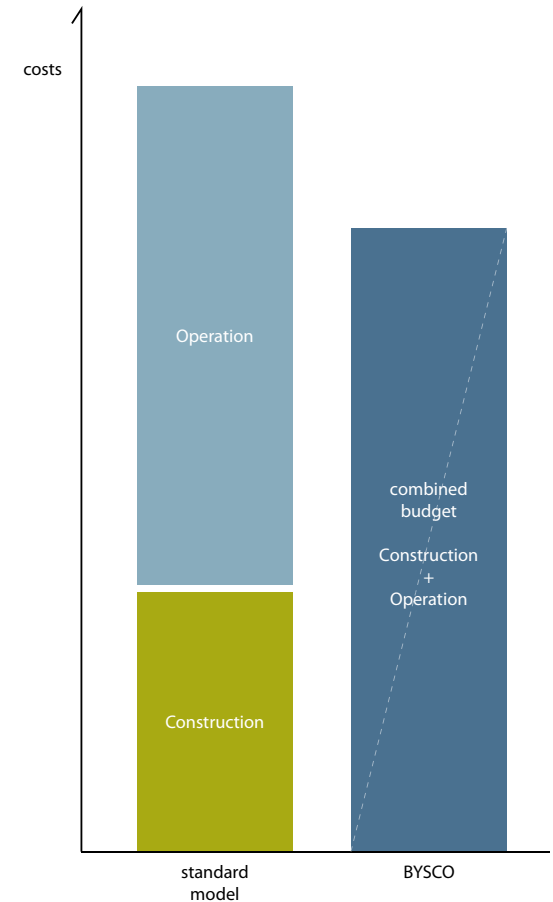
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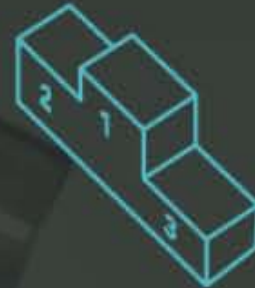
NORDIC INNOVATION

Målsætning



THE CHARTER

Arkitektkonkurrence



THE CHALLENGE

Innovationspulje



THE FUNDING

JJW Arkitekter
Rambøll
KADK / J. Schipull
DTU / P.A. Sattrup

Ellebo, Ballerup
Krögervägen, Stockholm

Metodisk værktøj, -
Begge forslag præmieret

DTU (DK)
KADK (DK)
NTNU (NO)
CTH (SE)

JJW Arkitekter (DK)
Helen & Hard (NO)
White Arkitekter (SE)
Lassila Hirvilammi (SF)
Studio Granda (IS)

NORDIC INNOVATION



Innovationsansøgning på baggrund af erfaringerne fra arkitektkonkurrencen. Det designmetodiske værktøj bør komme flere til gode. Udfordringer:

- Bygninger står for størstedelen 40% af energiforbruget. Arkitektur er (også) ressourcestyring
- Helhedssynet udfordres, kompleksiteten stiger, kræver ny ekspertise
- Implementering og udvikling af ny viden i praksis kræver tid og ressourcer
- Rådgivervirksomheder er ofte små og mellemstore virksomheder, ressourcer er begrænsede, økonomi og tid er presset

NORDIC INNOVATION



Idé: Nyt Nordisk Netværk for Arkitektvirksomheder:

Nordic Built STED – Sustainable Transformation and Environmental Design

- Kritisk masse: Flere virksomheder kan kollektivt skabe mere viden, accelerere udvikling, og skabe byggede demonstrationsprojekter
- Maksimal udnyttelse af nordiske styrkepositioner indenfor både arkitekt og ingeniørforskning: zero-energy, zero-carbon, zero-waste
- Stærk Nordisk arkitektonisk identitet og ekspertise via mix af etablerede og ny virksomheder med stærke faglige profiler (New Nordic, Louisiana)

NORDIC INNOVATION



Idé: Nyt Nordisk Netværk for Arkitektvirksomheder:

Nordic Built STED – Sustainable Transformation and Environmental Design

- Fokus: Bæredygtige designløsninger for renovering og transformation
- Fokus: Forbedret brug af IT: BIM, simuleringsværktøjer og LCA redskaber i designprocessen. Ny tjenesteydelser
- Fokus: Struktureret vidensdeling gennem forsknings- og praksissamarbejde, udvikling af fælles databaser.

NORDIC INNOVATION



Close, - but no cigar! Udfordringer:

- Innovation i tjenesteydelser. EUDP havde et forholdsvis snævert teknologisk sigte mht. innovation, - ikke på IT, - ikke på services/ tjenesteydelser
- Uens kriterier mellem Nordisk og de nationale niveauer (EUDP i Danmark), meget svært at navigere i
- Forskningsdimension måtte nedrosles pga krav om meget 'markedsklare' innovationer

NORDIC INNOVATION



Anbefalinger:

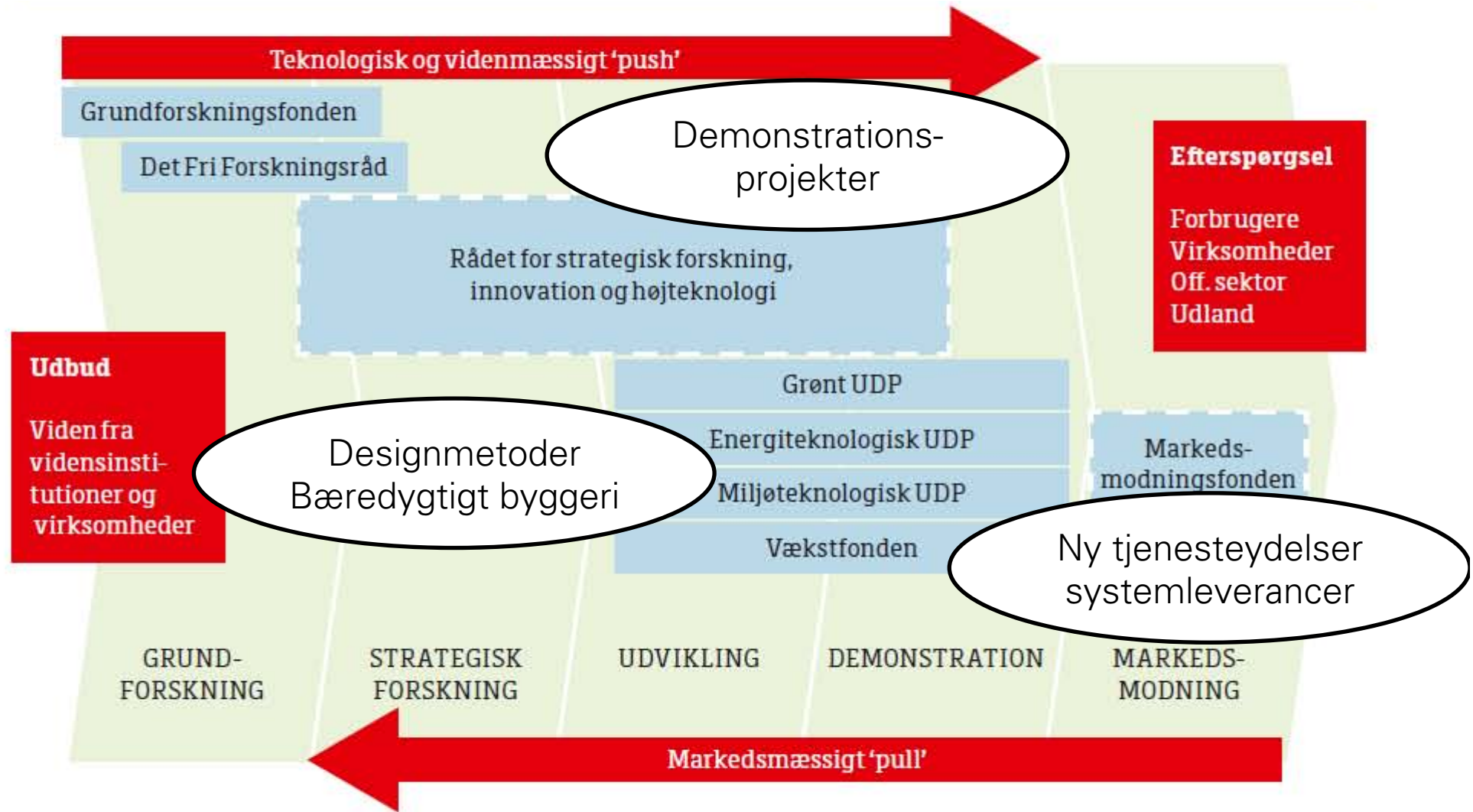
- Større og tydeligere fokus på designforskning, designinnovation og designløsninger:

Godt design skaber mere værdi i flere dimensioner, sparer mere energi, og har bedre miljøprofil end suboptimerede teknologiske tiltag

- Bredere teknologisk sigte:

Teknologi i designproces, Informationsteknologi til støtte for designkvalitet, teknologisk knowhow

NORDISK Forskning og Innovation



Peter Andreas Sattrup pans@byg.dtu.dk

Jan Schipull Kauschen jan.schipull@kadm.dk