Framing energy standards: The role of artefacts

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Analytical framework

This study derives from an interest in ***design practices***

- How building designers work on **complying** with energy requirements during planning of low-energy renovation projects

Practices and everyday work (Nicolini)

- Zooming in on **everyday work activities** and trying to grasp how the social and technical is intermingled
- A sensitivity towards seeing the world routinely made and re-made in practice by using **tools, discourse and human bodies**
- Organisational knowledge as ***relational*** and ***mediated*** by artefacts

Framing and overflow (Callon)

- 'Framing' is an operation used to define agents (persons, objects, goods, etc.) who/which are **clearly distinct** and **dissociated** from one another
- Framing imply that a market exist (e.g. an energy performance market), where distinct agents and distinct goods can be brought into play
- There exist an impossibility to total framing – **any frame is subject to overflowing**

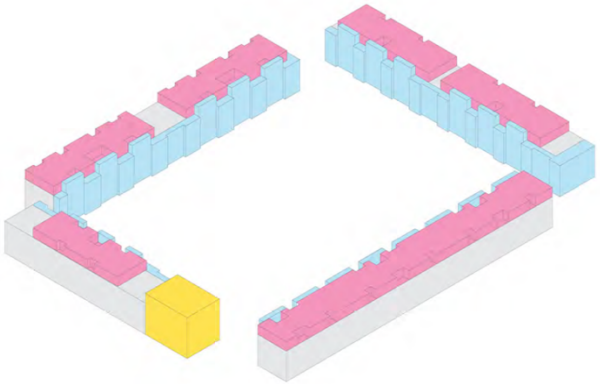
Translation and enrolment (Latour)

- An actor can circulate an 'interestment device' with an attempt to impose and stabilize the identity of other actors through problematization

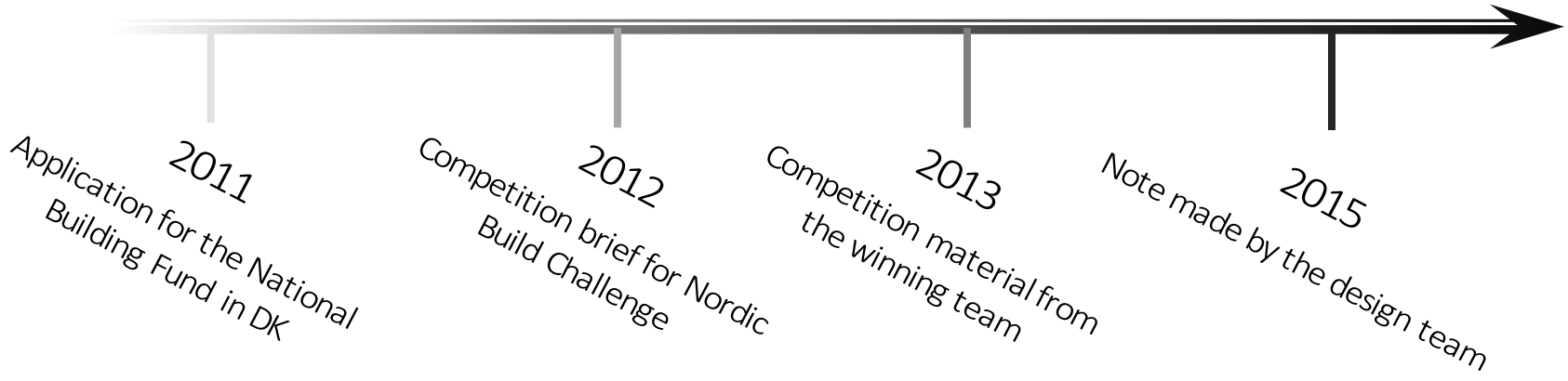
Methodological approach

An on-going study of renovation of **four building blocks** in a suburb to Copenhagen

The findings build on **observations** during design meetings and a few **interviews**



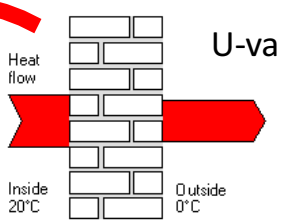
Tracing the energy requirements



Passive house 15 kWh / m2 / year (not profitable)	Renovation Building code 2010	Low-energy class 2015 Renovation & new build	U-values Building code 2015 • Renovation • Extension Building code 2020 (to some extent) Passive house (to some extent)
Low-energy class 2015 30 kWh / m2 / year	New build Building code 2015 (or better)		

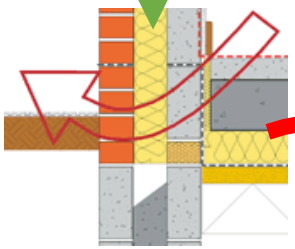
Framing and overflows

"The energy frame"



U-values

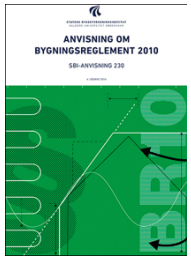
Building owner



Linear transmittance

Early design phases

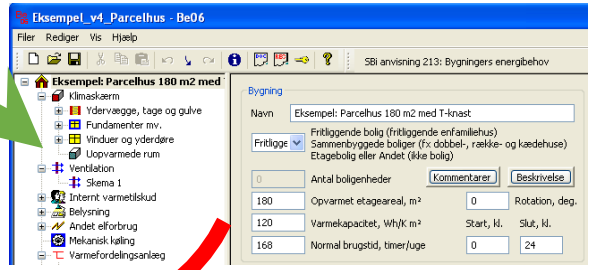
Project material



Building code 2015

Energy specialist

Energy performance calculations (e.g. Be15)



Design team

Late design phases

Translations of energy concerns

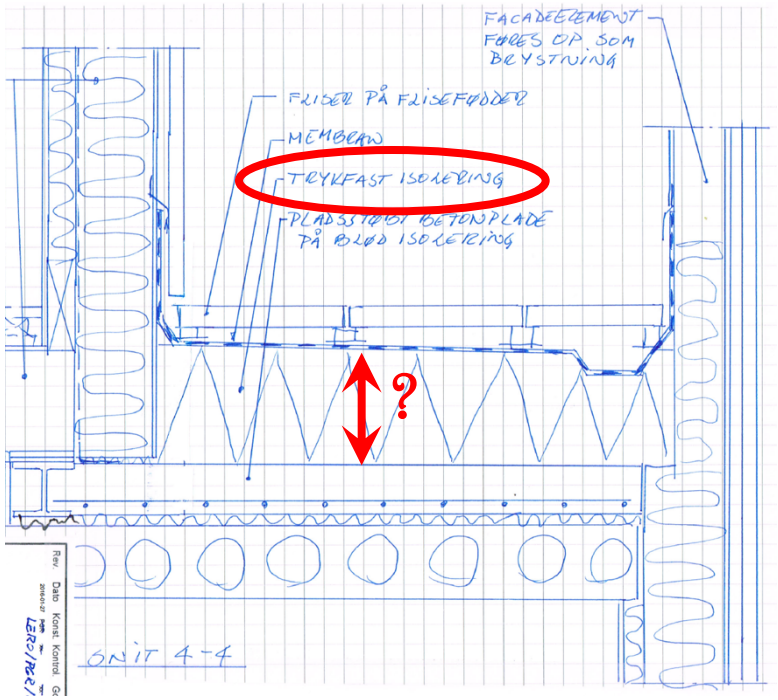
An engineer deemed compliance with building code 2020 to involve **photovoltaic panels**

- Instead, the design team investigated **U-values** and **linear transmittance**

Energy concerns is part of an **engineering domain**

- Energy concerns were handled late in the design phase

The height of the thermal insulation is **the energy specialist's responsibility**



Enrolment of design team members

2. Valgt niveau

For at sikre ensartede løsninger og dermed minimere risikoen for fejl på byggepladsen arbejder vi med samme betingelser for hele byggeriet, så der så vidt muligt er samme isoleringstykkelser i alle facader hhv. i alle tage, samme vinduer, samme ventilation osv.

Ambitionsniveauet skal ligge i tråd med de mål, der mere eller mindre konkret er blevet sat i løbet af projektets udvikling, og det skal kunne realiseres inden for budgettet.

Vi mener at der er muligt at overholde overholder alle relevante krav på bygningsdelsniveau i både BR2015 (renovering), BR2015 (tilbygning) og BR2020 og EnerPHit (Passivhaus Instituts kriterier for renovering). Det ser ud som følger:

Bygnings-del	Vores krav	Note
Ydervægge	U ≤ 0,15	Krav i EnerPHit og BR2015 kap. 7.3 (tilbygninger). Overopfylder BR2015 kap. 7.4 (renovering) samt klasse 2020's krav til transmissionstab.
Tag	U ≤ 0,12	Krav i BR2015 kap. 7.3 og 7.4. m Overopfylder EnerPHit-kravet samt klasse 2020's krav til transmissionstab.
Vinduer	U ≤ 0,85 inkl. indbygning-skuldebroer U ≤ 0,80 ekskl. indbygning-skuldebroer Energitilskud mindst 0 kWh/m²/a	Krav i EnerPHit hhv. klasse 2020. Overopfylder langt alle øvrige krav om mindste varmeisolering, energitilskud osv. og forhindrer naturligvis træk i lejlighederne, hvilket er vigtigt for indeklimaet.
Varmegen-vinding	75% (PHI)	EnerPHit (konservativ beregning)
	85%	Klasse 2020's krav for ventilationsanlæg, der forsyner én bolig
	1000 J/m³	Krav i 2015 for ventilationsanlæg, der forsyner én bolig Ventilationsanlæggene etableres med mulighed for at måle elforbruget.
Overtem-peraturer	Højst 10% over 25 °C	Krav i EnerPHit. 10% af brugstiden er 876 timer
	Højst 100 timer over 27 °C Højst 25 timer over 28 °C	BR2015-krav. Eftervises for udvalgte, kritiske rum.
Lufttæthed	Infiltration højst 1,0/h ved 50 Pa. 0,6/h som mål.	Krav i EnerPHit. Overopfylder BR2015-krav til nye bygninger.

The energy specialist produced a document, which he used as **an 'interestment device'**

He also use **bodily expressions and statements** to signify the importance of energy related concerns

He suggests **other design solutions** that are 'better' in regards to energy performance

Concluding remarks

Energy issues are not addressed as early as recommended

It seems that there exist some epistemic issues in dealing with energy concerns during design of buildings

The division of labour on building projects locks professional domains to certain concerns

Energy concerns compete with other concerns on the projects and attempts of 'interestment' are needed if energy concerns have to maintain on the projects