Danish Building and Property Agency

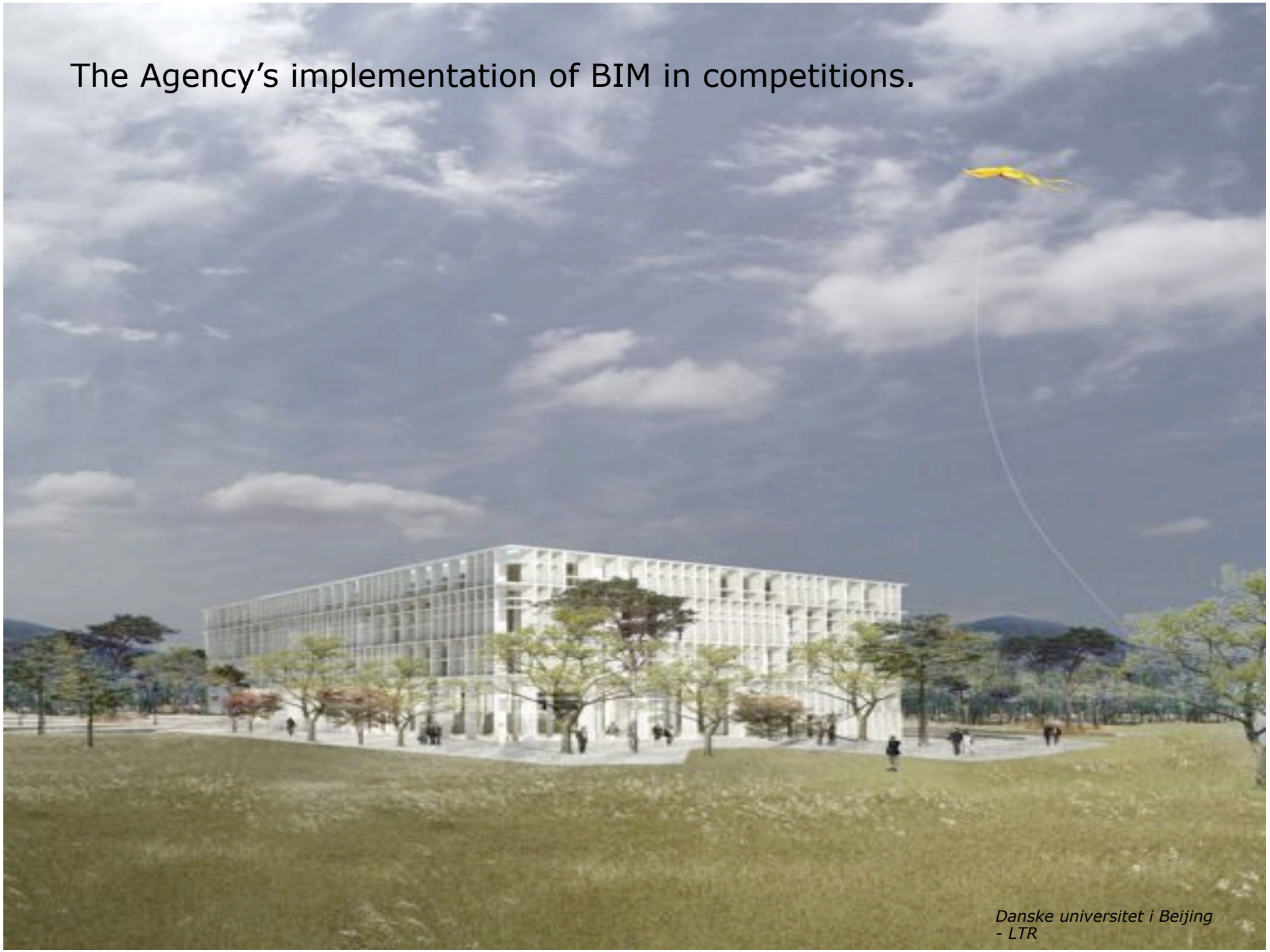
Danish Ministry of Climate, Energy and Building

Bygningsstyrelsen - BYGST
Marianne Thorbøll – project manager

31 january 2013

Mærsk Building

The Agency’s implementation of BIM in competitions.

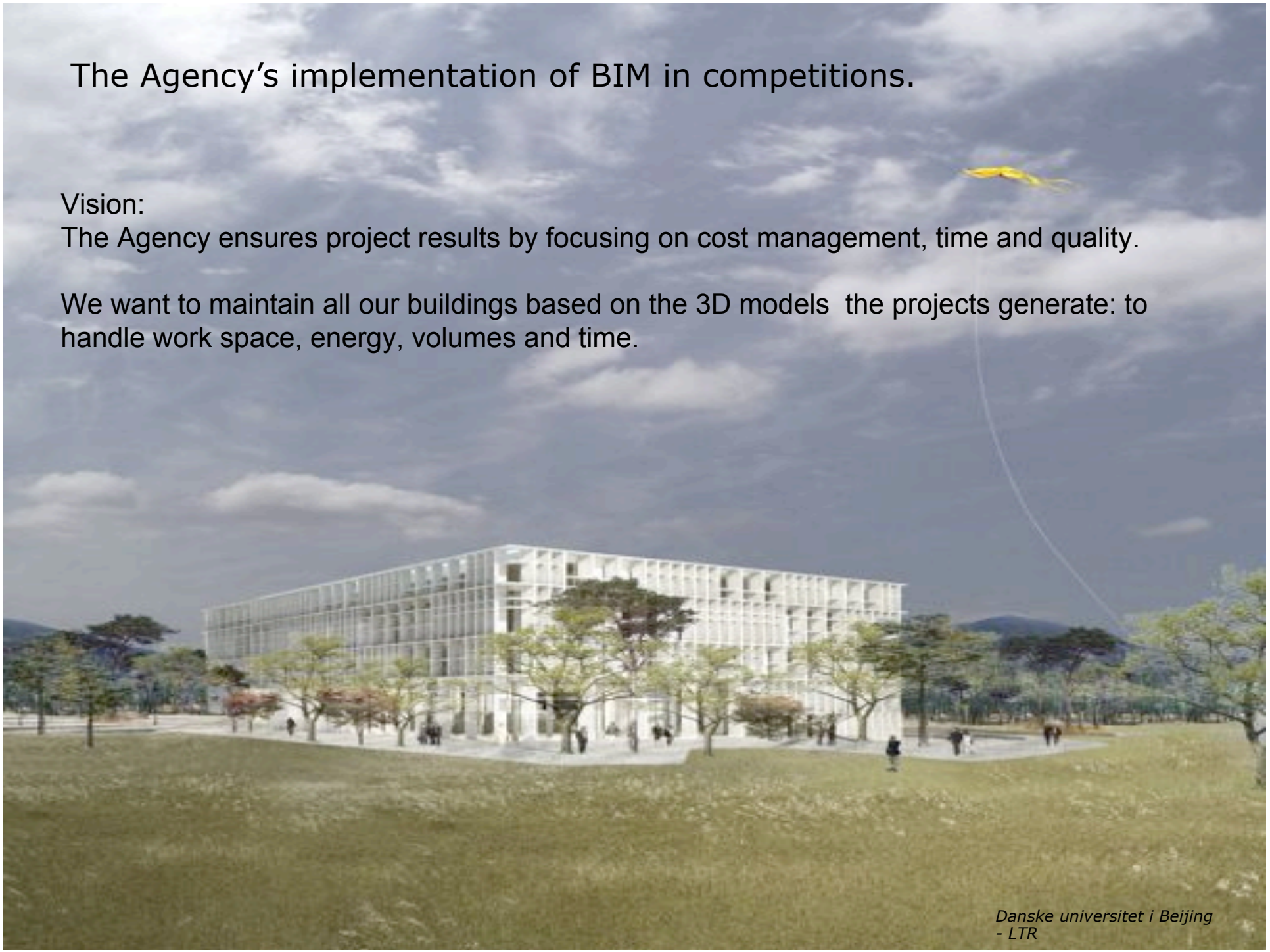


Danske universitet i Beijing - LTR

The Agency’s implementation of BIM in competitions.

Vision:
The Agency ensures project results by focusing on cost management, time and quality.

We want to maintain all our buildings based on the 3D models the projects generate: to handle work space, energy, volumes and time.



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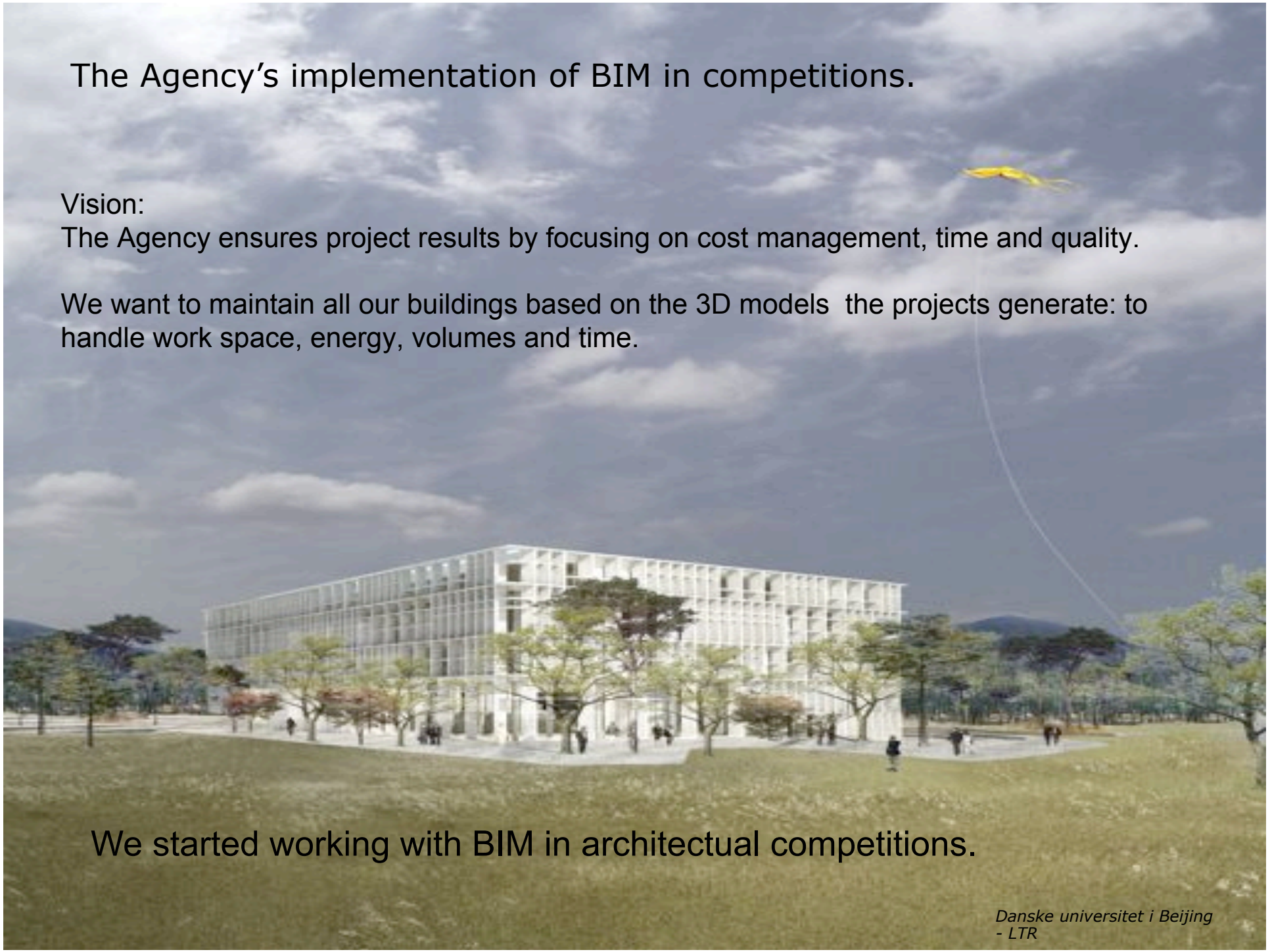

We started working with BIM in architectual competitions.

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Contents:

-**Overview of the Danish Building and Property Agency**
-**IDM for competitions - IFC**
-**History of our progress in competitions**
-**Next steps**

Property Business:

Employees:	220
Office space:	1 mil. m²
University space:	2 mil. m²
Office space, leased	1.3 mil. m²

Ongoing projects have a construction value of:

University: 9 bil.kr.

Office: 1.5 bil.kr

SDU - Alsion

Financial Law from 2010 - Laboratory grants of 6 billion dkr.

The government mandated the grants to be used between 2012 – 2016.

Half of the money will be used for renewal of laboratories and half of it for new constructions.

Panum laboratorier

Government requirements for using Information Communication Technology - ICT from 2011.

Types of Building Projects :

- Building projects after 1.3.2011
- New construction, rebuilding and renovations for the State Property Agency
- Construction financed >50% by the State
- All construction > 5 mil. kr.
- Architectual Competitions

CPSC. LTarkitekter

Building Agency´s objectives.

What do these requirements mean to the Building Agency?

- By digitizing our building projects, we want to be more effective, reduce mistakes and thereby achieve more economical projects.
- We want to ensure that we can create and reuse valid data throughout the buildings' life cycles.

Nørre Campus
- COBE

Building Agency´s objectives.

Nørre Campus
- COBE

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How does this effect our daily life?

- Over the last couple of years we have required competitive bids to be submitted in 3D models in competitions.

The Building Agency IKT Requirements for Competitions:

Requirements for use of digital building models in 3D

The client shall ensure that the competitive bids are submitted in 3D models.

1. The 3D models must illustrate and document the architectural and technical solutions, visualisation, simulations and analysis of the proposal.

2. The 3D model must be delivered in IFC

3. Client shall ensure that the received IFC proposals for architectural and technical solutions are used for judging the competetion.

CPSC. LTarkitekter

3D model in Contests – IDM for Proposals

Niels Bohr Science Park - 2010 - 45.000m²

Panum - 2010 – 35.000m²

Copenhagen Plant Science Center - 2011 – 6000m²

Ballerup Universitetscampus 2011 – 15.000m²

Ballerup Universitetscampus - 2011

Universitetscampus Ballerup
- Rubow

Part of the competition text :

”A 3D digital building model must be submitted. The model should be submitted in its original format and in IFC format”

“The building model must be a BIM model containing the main objects at a low level of detailing – walls, doors, windows, roofs, foundations and slabs”

“The model will be used for area, energy and cost calculations and 3D visualisations of the building related to its surroundings”

“The property data of each room should be indicated by means of a room category in accordance with Danish Building and Property Agency standard”

“Quantity extractions for energy calculations must be defined as property in climate screen objects”

“Quantity drawn from the model must match the indicated quantity in the project.”

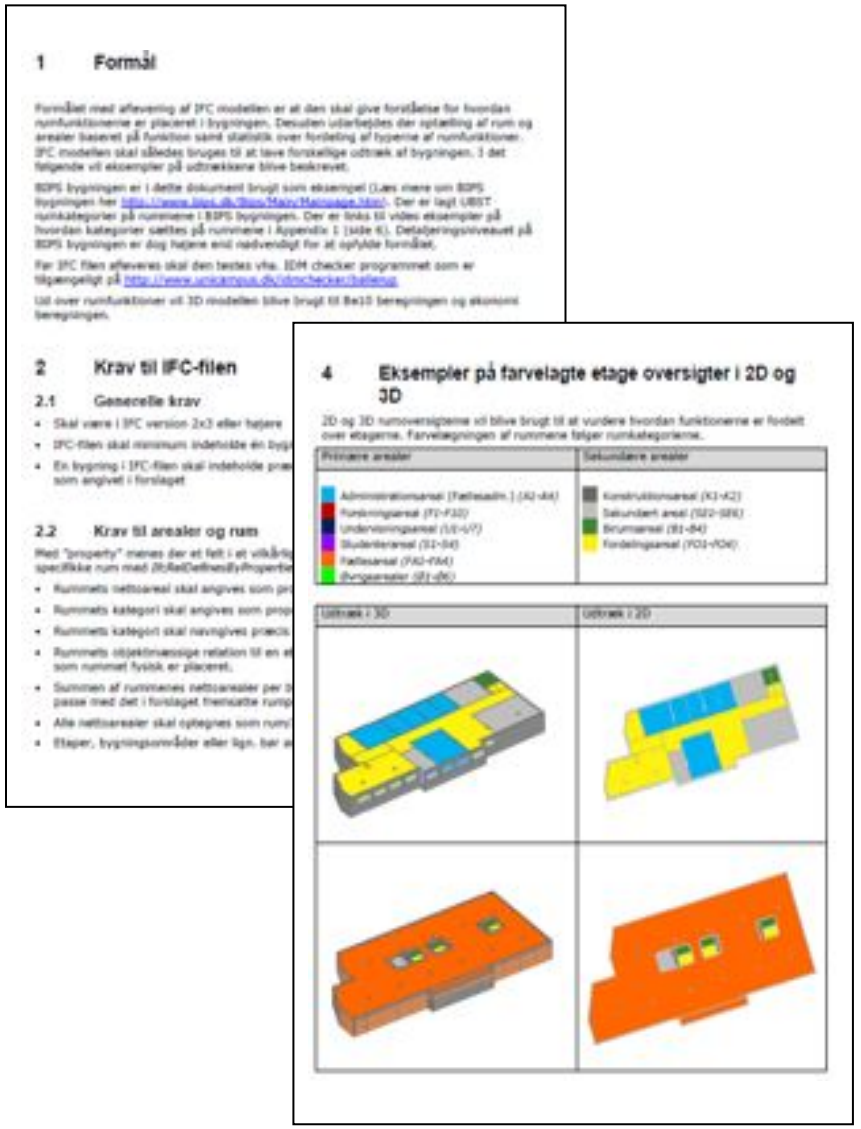
IDM for 3D models in Competitions.

BIM - Check for data:

- Area,
- Enegy
- Cost by area

Orientering om brug af IFC model i konkurrence program

Projektkonkurrence om
Universitetscampus Ballerup
Februar 2011



1 Formål

2 Krav til IFC-filen

2.1 Generelle krav

2.2 Krav til arealer og rum

4 Eksempler på farvelagte etage oversigter i 2D og 3D

Primære arealer

Sekundære arealer

Udtræk i 3D

Udtræk i 2D

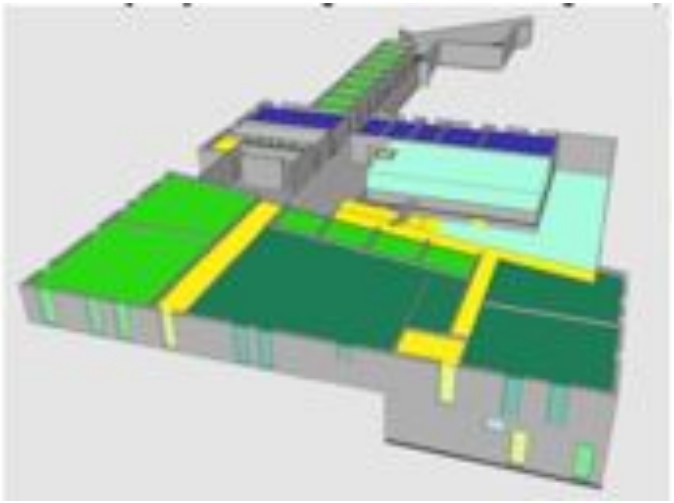
Analyses of digital submission

Output of BIM-check.

- DBK kodningen skal følge nedenstående tabel og sættes på property: 'DBKClassification'

Klimaskærms del	DBK kode
Kælderydervægge, beton	-205.D01
Facade uden glas/alu	-205.01
Tagdæk	-215.AD01
Terrændæk	-A210.01
Yderdøre	-205.03.EC01
Glas/Alufacader	-205.L01
Solafskærmning	-205.12

Property classification for climate screen



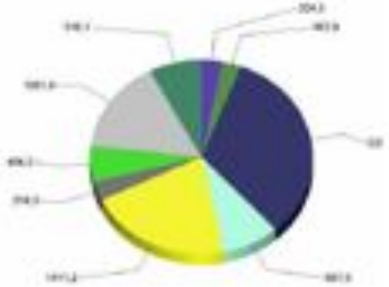
Distributions

Energiresultater

	Transmissionstab (W/m²)	Energibehov for energi ramme 2015 (kWh/m²)
00177	Vest 1: 2,9 Øst: 3,2	Vest 1: 40,8 Øst: 40,9
01010	Vest 1: 2,8 Øst: 3,0	Vest 1: 38,4 Øst: 41,1
21505	Alle tre etaper: 2,9	Alle tre etaper: 33,0
23230	Vest 1: 2,0 Øst: 2,6	Vest 1: 39,8 Øst: 40,8 (50 brugstimer)
52325	Vest 1: 3,4 Øst: 3,1	Vest 1: 45,1 Øst: 44,2 (60 brugstimer)

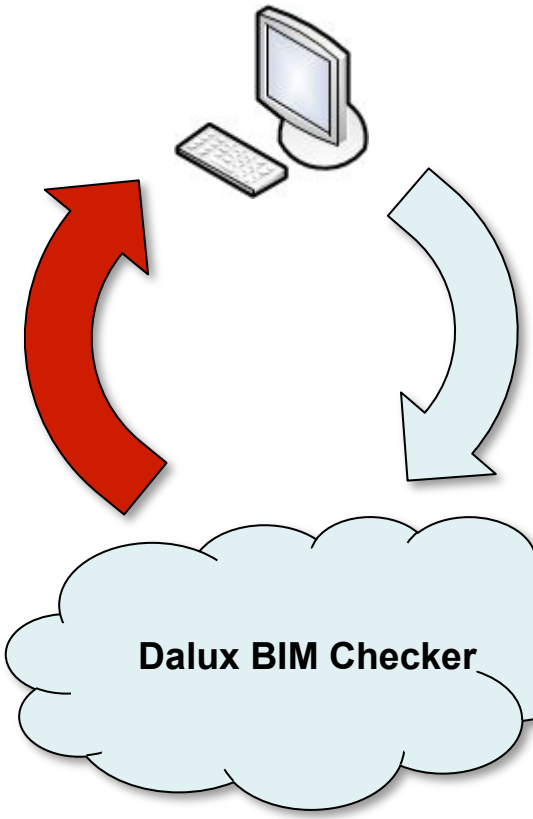
Energy output

Main Categories for the entire building



Room category – requirements / actuality

BIM Checker



Quality control report
with error
for corrections

IFC-model upload
- one click to upload

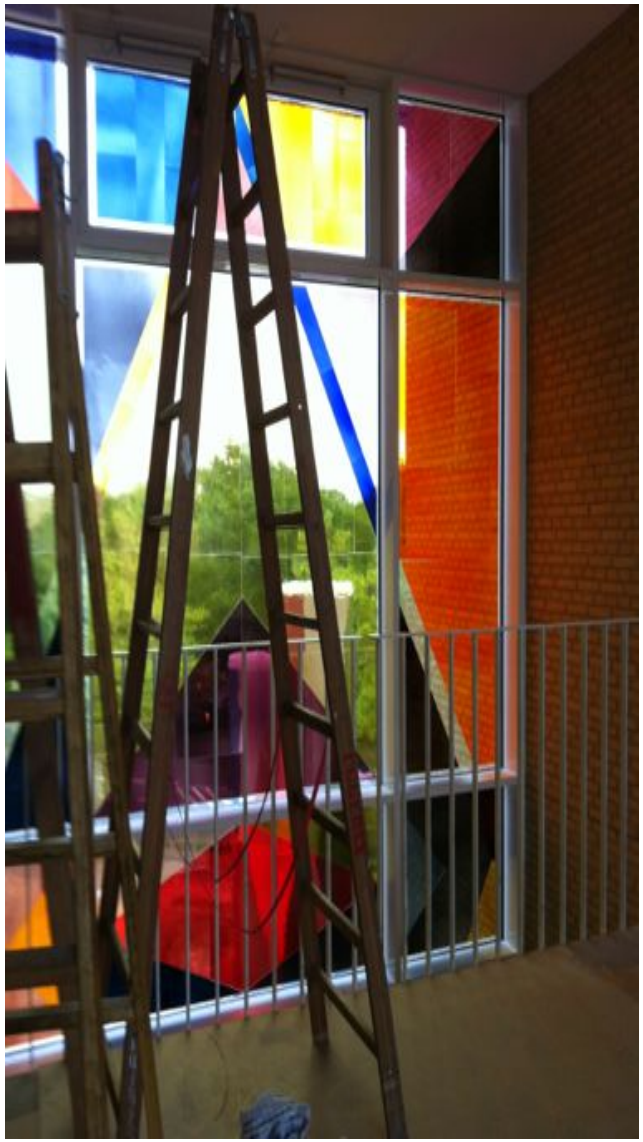
IFC quality
with report as documentation

BIM – What have we learned ?

BIM in competitions
BIM in design process
BIM in construction process

-Clearer and more precise requirements
-Quality check
-Earlier project estimate
-Transperency

We made a useful IDM for competitions

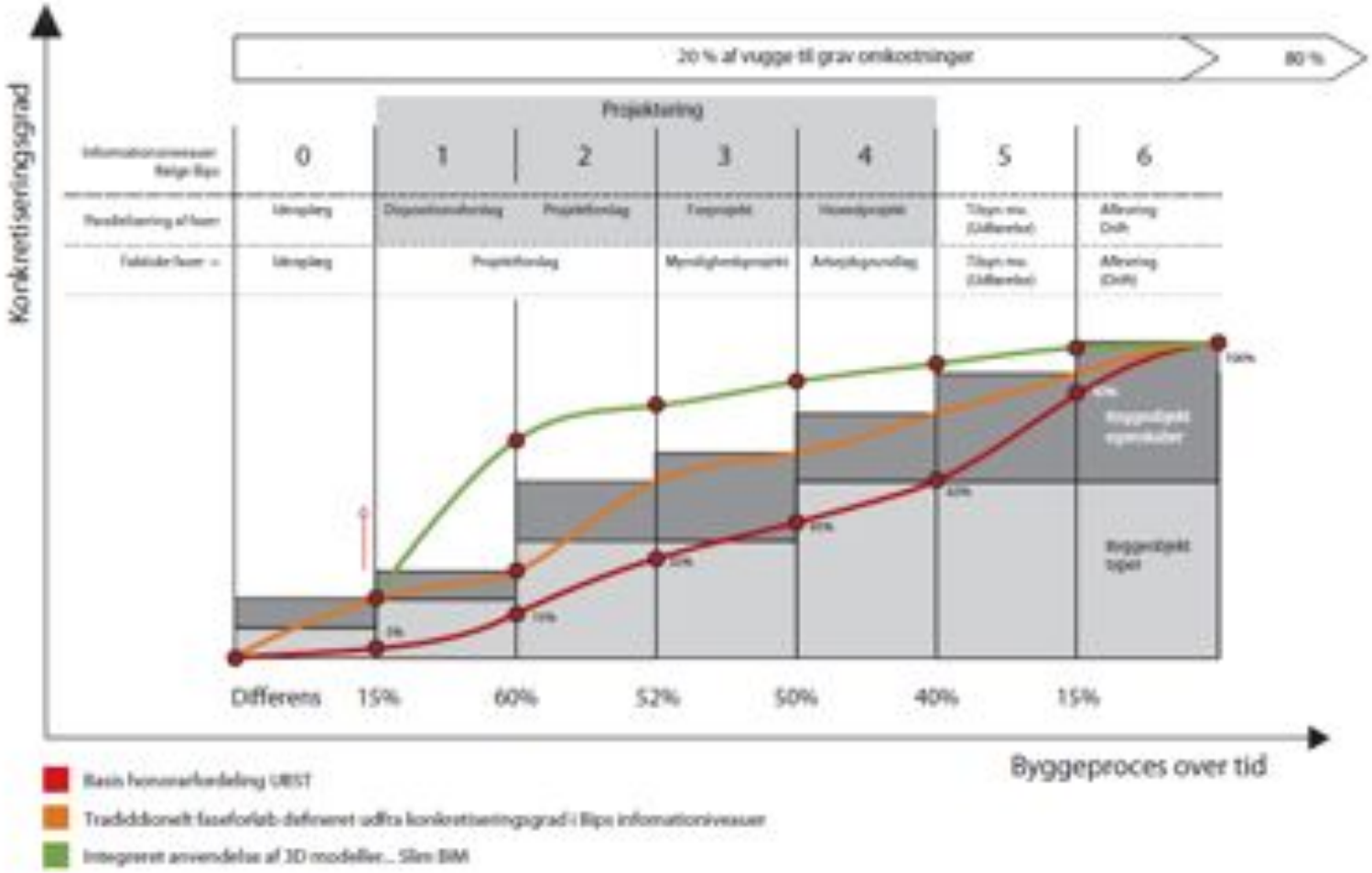


Next steps - BIM

BIM in design process
BIM in construction process

- IDM in design process
- IDM in construction process

Thank you for your time


20 % af vugge til grav omkostninger
80 %
Projektering
0
1
2
3
4
5
6
Differens
15%
60%
52%
50%
40%
15%
Konkretiseringsgrad
Byggeproces over tid
Basis honorarfordeling UBST
Traddidionelt faseforløb defineret udfra konkretiseringsgrad i Bips informationsniveauer
Integreret anvendelse af 3D modeller... Slim BIM