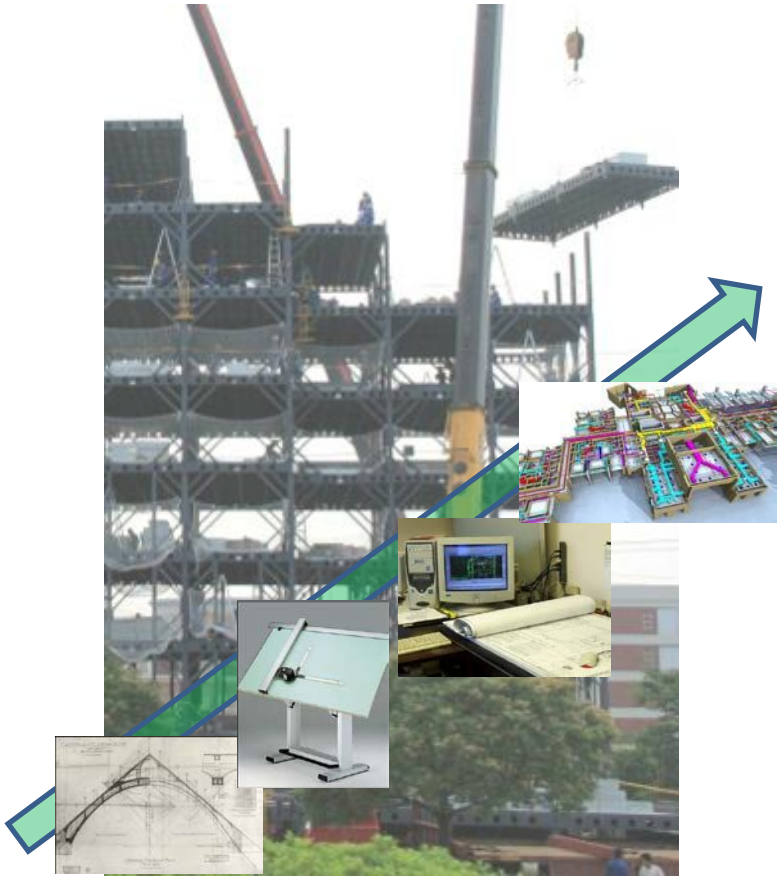
South-Eastern Norway Regional Health Authority
– Sustainable development according to our mission



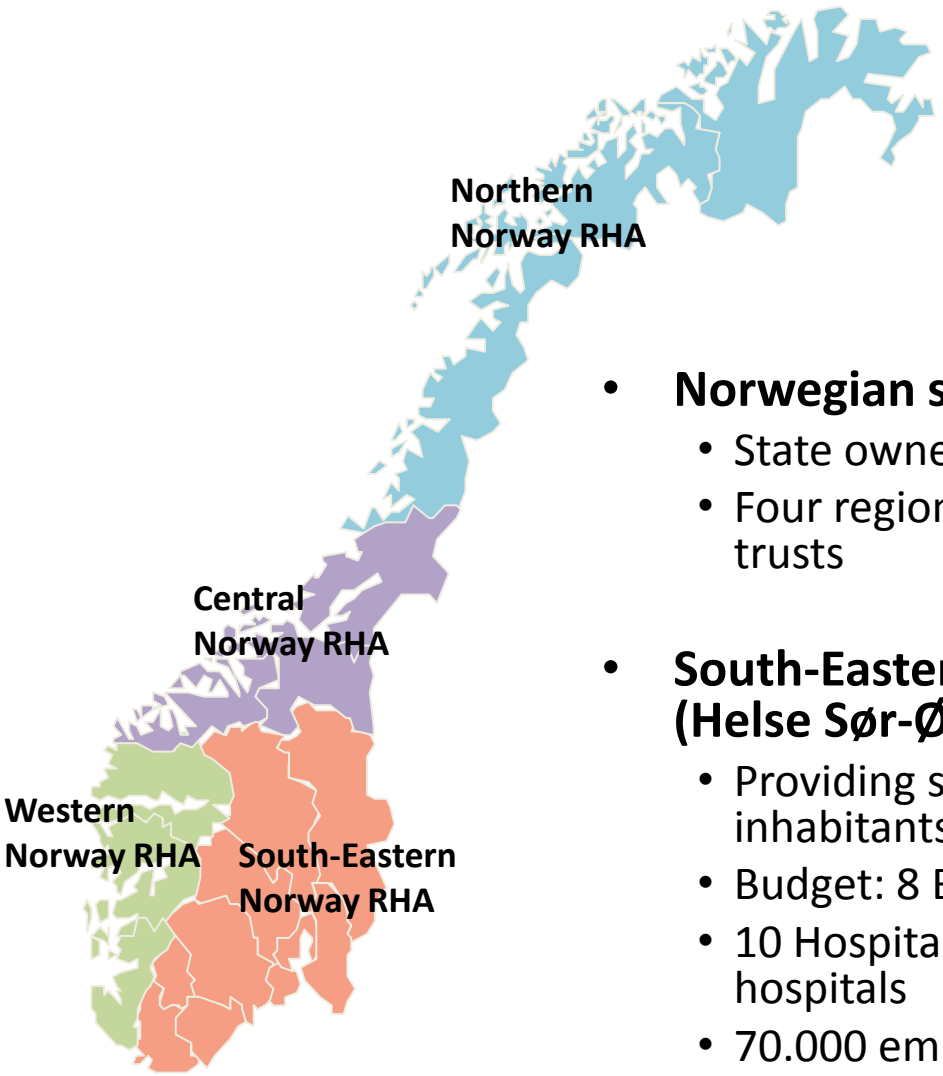
From politics to openBIM requirements

Seminar 31. January 2013 Copenhagen

Kjell Ivar Bakkmoen
Senior advisor BIM support

HELSE SØR-ØST

South-Eastern Norway Regional Health Authority



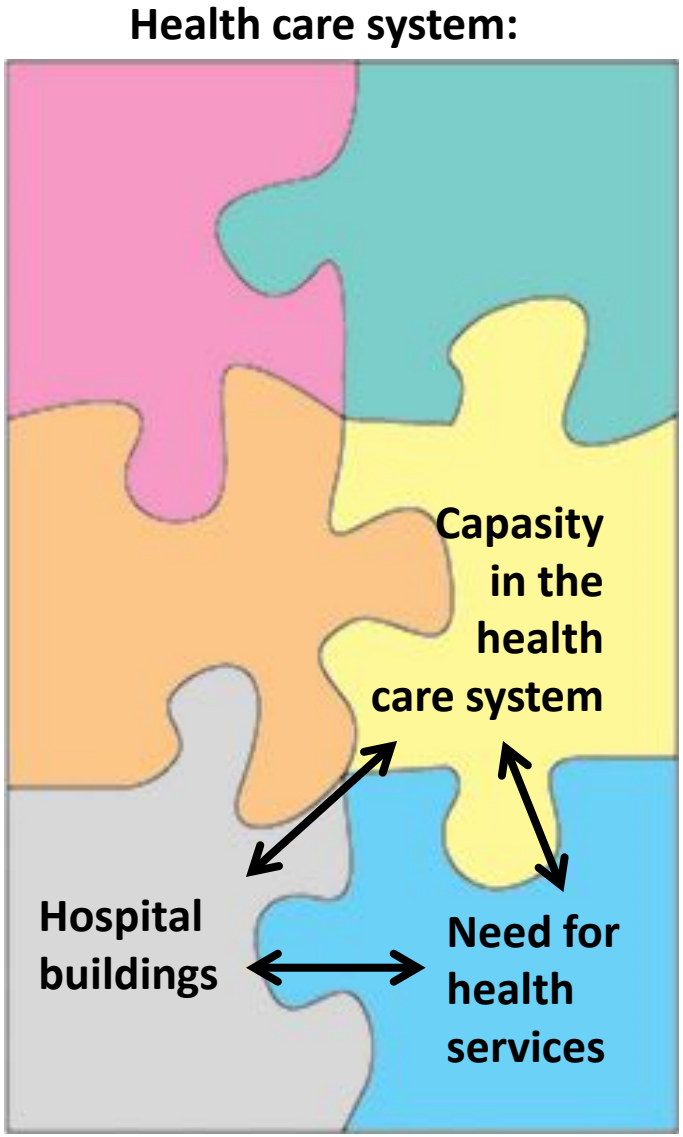
Our mission:

Provide high quality specialist healthcare services to all who need it, when they need it; irrespective of age, origin, ethnicity, gender or financial standing.

- **Norwegian secondary health services**
  - State owned public funded health trusts
  - Four regional health authorities controls 26 hospital trusts
- **South-Eastern Norway Regional Health Authority (Helse Sør-Øst HSØ):**
  - Providing specialist health services for 2.8 Mill. inhabitants (56% of the Norwegian population)
  - Budget: 8 Billion EUR
  - 10 Hospital trusts, plus 5 private non commercial hospitals
  - 70.000 employees
  - 2,6 Mill. m2 floor area (excl. Private hospitals)

Hospital buildings – a strategic perspective

- Hospital buildings is one of several pieces in a health care system, where the overall objective is to get better health for the population.
- Hospital buildings is a strategic tool for the production of health services.
- The core business gives the premises for the construction and property management.

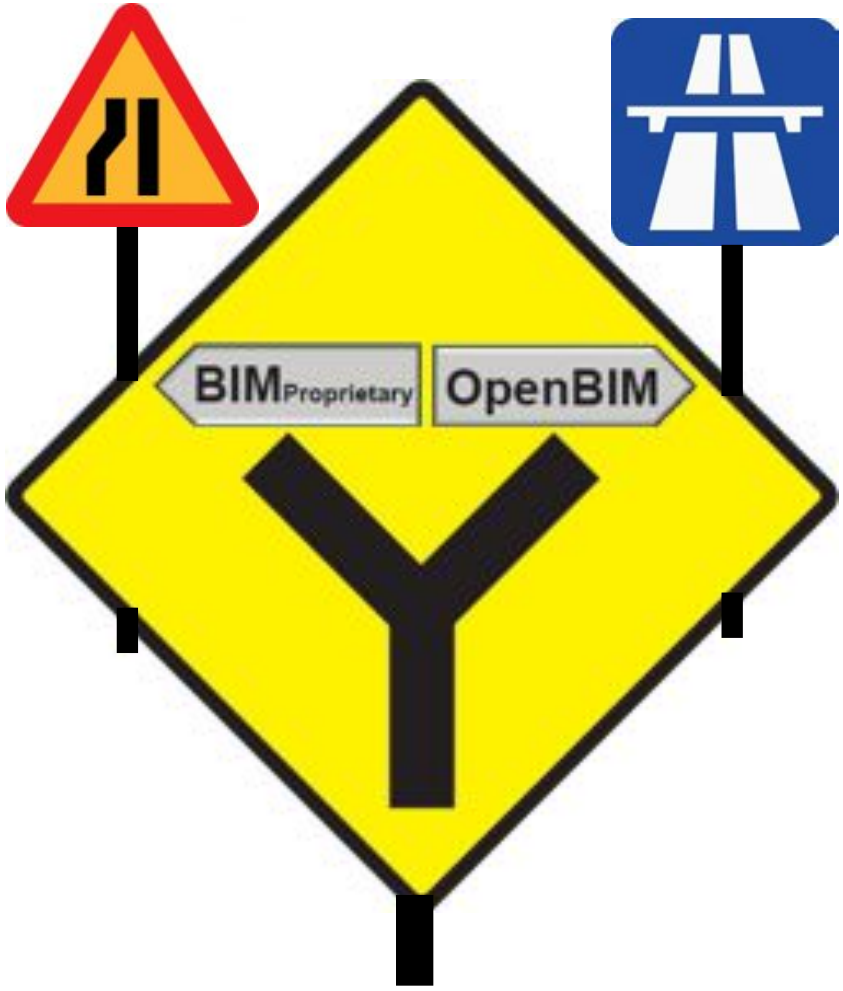


Our BIM vision

- Through BIM, achieving reduced cost and time spent on building projects, and at the same time getting better functional areas – with less faults.
- BIM is the concept and tool to reduce facility management and operations costs during the buildings lifespan.

HSØ overall openBIM strategy

- Adopted November 2011
- Give clear direction to the organization.
- Ensure proper focus from top-level management - throughout the organization.
- Focus on “business objectives” rather than technicalities.
- Give clear signals to the building industry, in relation to where South-Eastern Norway Regional Health Authority is moving.



HSØ overall openBIM strategy

- **openBIM in all new projects**
  - BIM is a strategic element in order to reach the prescribed quality, time and cost.
  - Contribute to a 10 % increase in efficiency within the property area (2010-2015).

- **Our commitment to BIM shall be based on openBIM and guidelines from building SMART**

- **Contribute to the implementation of BIM in the building industry**

URL – South-Eastern Norway Regional Health Authority BIM strategy:

http://www.helse-sorost.no/omoss/avdelinger/bygg-og-eiendom/Documents/BoE%20Vedlegg%203%20-%20BIM-strategi%20for%20Helse%20Sor-Ost_Rev1-0-1.pdf

HSØ overall openBIM strategy

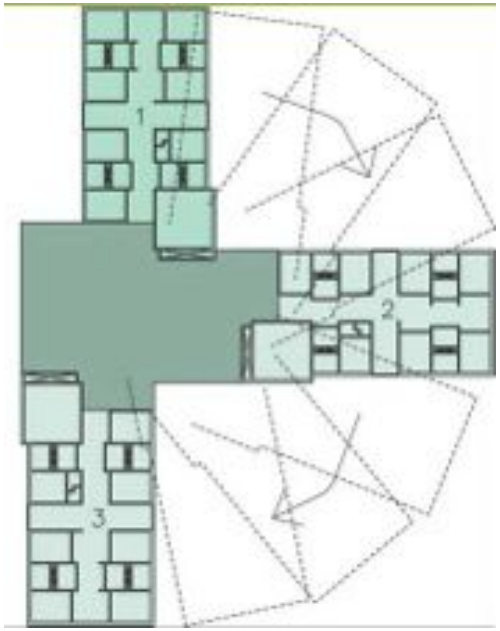
- **South-Eastern Norway Regional Health Authority will optimize the use of openBIM in the organization.**
  - Training and education
  - Focus on the transition between building phases (customer/supplier relationship).
  - Focus on Lifecycle Costs (LCC - included health production cost), rather than investment cost.
  - Exploiting the potential of BIM requires ongoing assessment of the tools and methodologies that will contribute to this.
- **Focus on industrialization in building projects**
- **Securing the property rights**

openBIM strategy: Industrialization

- Standardization of floor lay-out
- Standardization of technical solutions
- Adapting structural design of the building to an industrialized concept
- Cost efficient building process
- Low Lifecycle Cost (LCC)
- Advanced building logistics

We consider BIM as an important element in industrialization of the building process.

Knowledge libraries
Evidence based design
Learning from the last project



Vestfold Hospital Trust, Building stage 7.1

openBIM strategy: Facility Management

Space planning and usage:

- 3D-BIM gives the possibility to plan the usage of the buildings better. Spaces can easily be connected to the functional hospital organization.
- It will be easier to check functional requirements with building attributes, when we are considering a change in the spaces.

Operations:

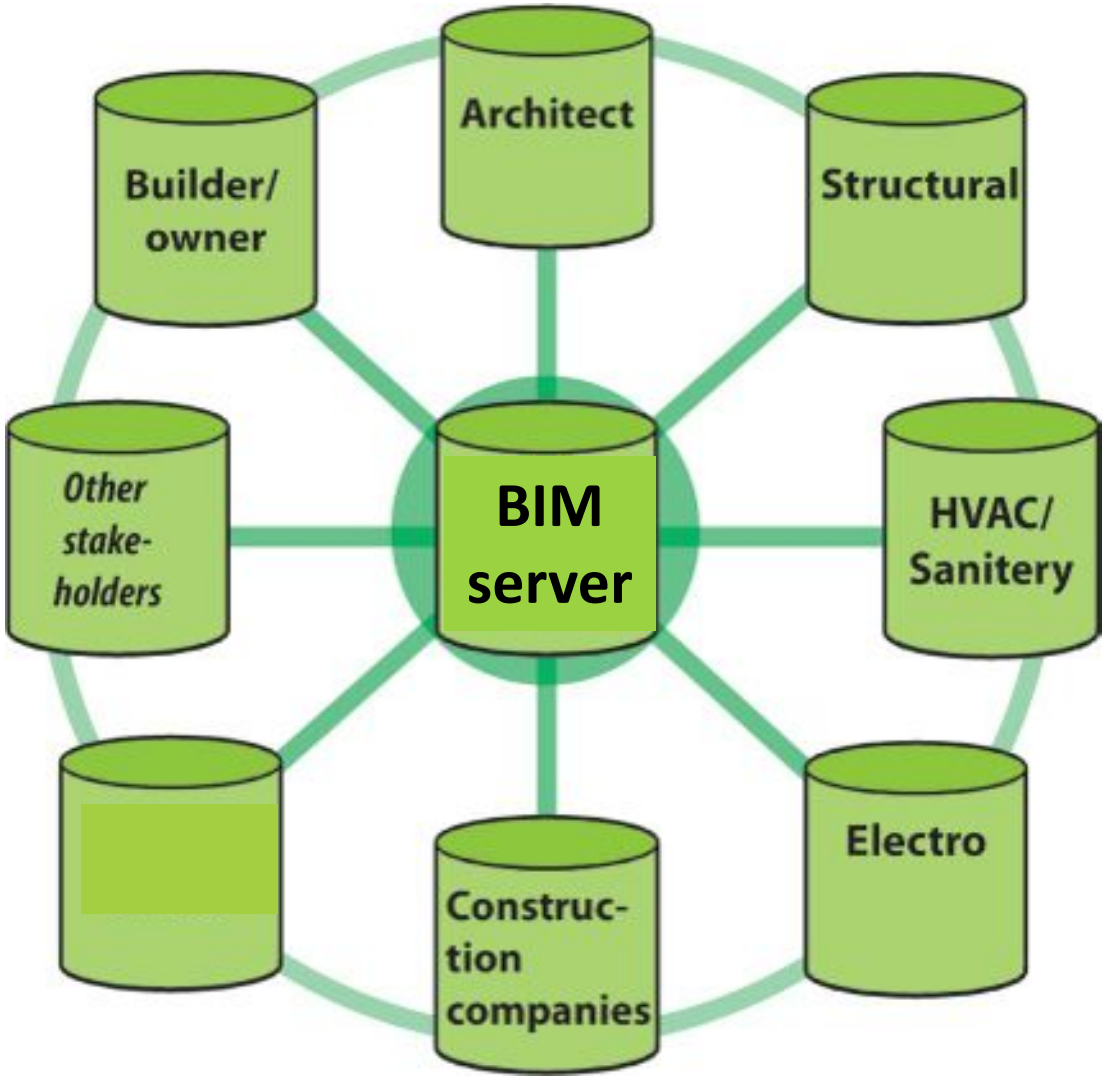
- Establish optimised Facility Management Systems, where the operating personnel (from the engineer to the plumber) have easy access to **all necessary information** in every operating situation.

openBIM Strategy:
Securing the property rights

- Securing all legal rights to the work done in all new BIM projects, in order to be able to reuse the functional and technical solutions in the organization and other regional health authorities.

openBIM Strategy: Implementation of BIM-server

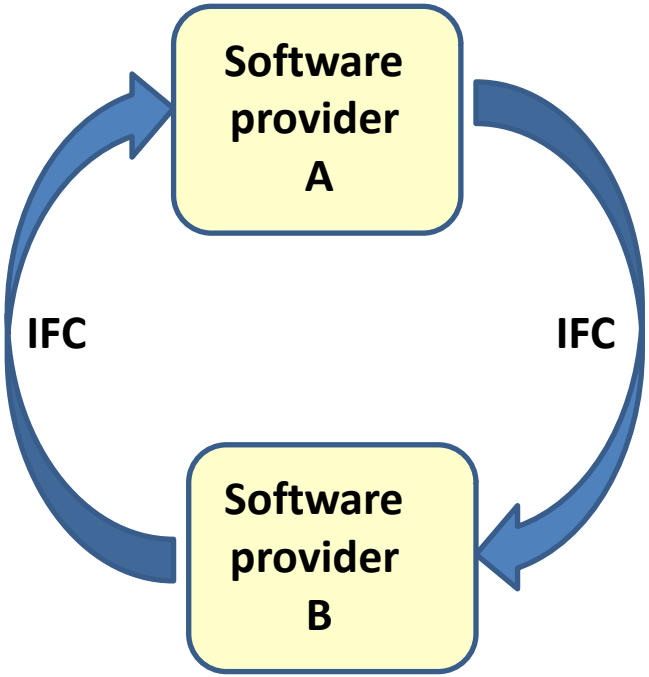
- BIM-server for both building projects and Facility Management



openBIM Strategy: Requirements to the models and storage formats

- All information in projects to be stored on open international formats (IFC – latest available version)

  From 01.01.2014 *the complete information produced by architects, consultants, contractors, etc., in their software applications, shall be exported to openBIM (IFC). All information shall be stored on the latest publicly available version of the openBIM IFC format. Similarly, software applications shall be able to import all the data stored in openBIM (IFC).*



Complete Round-trip

openBIM strategy: Implementation

Our BIM Implementation strategy:

- Divided in eight parts with a list of actions in each part.

Treatment building from north west

New Akershus University hospital

Competition 2000, start building March 2004 - October 2008

Ca. 117.000 m^2 new construction, 20.000 m^2 existing, 31.000 m^2 parking – 1 billion Euro

22 Operating theaters, 17 Diagnostic imaging labs, 615 Beds

Architect and HVAC complete 3D BIM model (Autodesk ADT / Architecture)

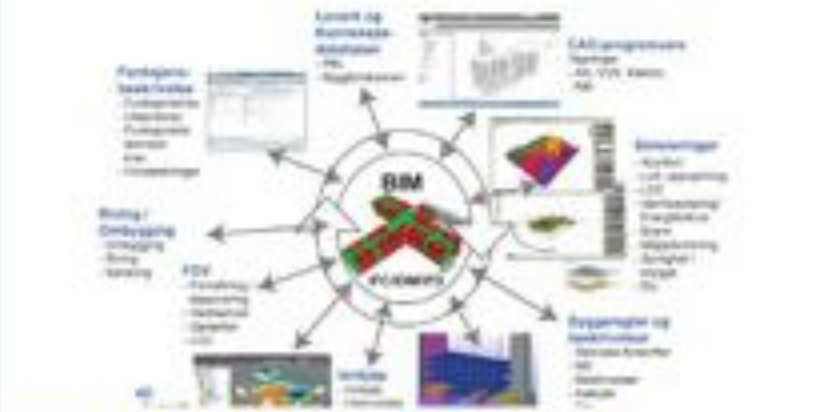
New Østfold Hospital - Kalnes

Projects at the hospital of Vestfold

Nytt P-hus med helikopterplass

Nybygg Skjerve - enhet 3

Nybygg og ombygging NVDPS - Linde



BIM og industrialisering

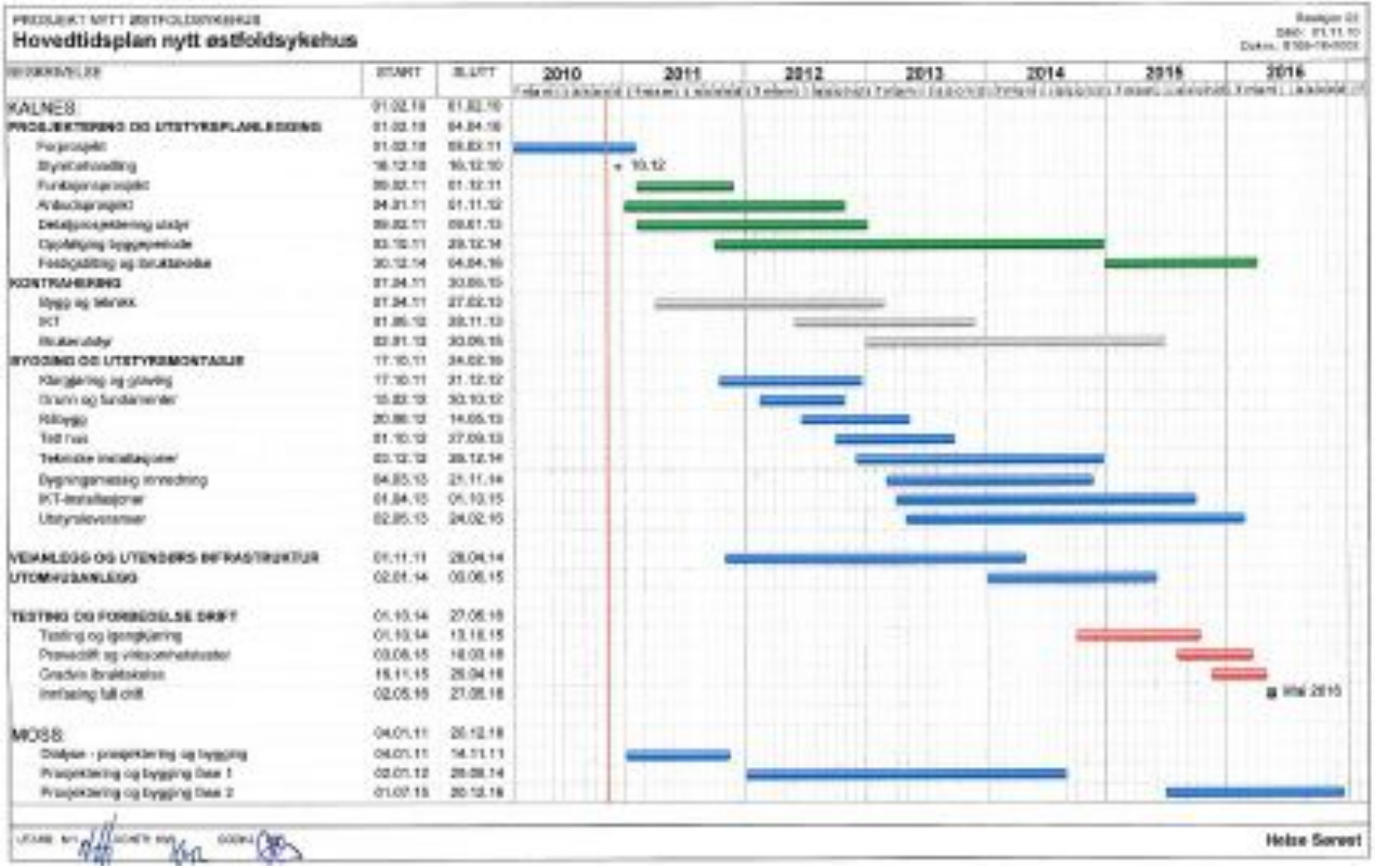
Facts – New Østfold Hospital

Facts – New Østfold Hospital

- **Kalnes**
  - 82 500 m^2 gross area
  - 3 256 user rooms
  - 551 technical rooms

- **Costs** (P50-February 2010)
  - Total project cost 5 090 MNOK incl. equipment and VAT
  - Contractor costs 2 450 MNOK exl. VAT.

Facts – New Østfold Hospital



Open BIM – New Østfold Hospital

Sentralt styringsdokument for Prosjekt nytt østfoldsykehus

- Modellbasert prosjektering innebærer at BygningsInformasjonsModeller (BIM) brukes aktivt i prosjekteringsarbeidet for å oppnå bedre oppgaveforståelse, prosjektering, koordinering, kommunikasjon og kvalitetssikring i prosjektet og ikke bare til tegningsproduksjon.

- Det er lagt til grunn at modellbaserte verktøy tas i bruk og benyttes aktivt i alle faser av prosjektet, både når det gjelder ansattmedvirkning, prosjektering og dokum[illegible] tegningsproduksjon.

Main strategy document

Open BIM – New Østfold Hospital

Sentralt styringsdokument for Prosjekt nytt østfoldsykehus

- Målsettingen er at en gjennom bruk av BIM effektiviserer arbeidsprosessene, både i prosjekterings-, gjennomførings- og driftsfasen. Videre at en også etablerer en bedre basis for overlevering av FDVU-data til driftsorganisasjonen. BIM skal benyttes som basis for gjennomgang og avklaring av ulike løsningsalternativ, slik at bygningsmessige og kostnadsmessige konsekvenser raskt kan analyseres. BIM skal også benyttes som basis fo grensesnittsplanlegging og kontroll.

Main strategy document

Open BIM – New Østfold Hospital

Sentralt styringsdokument for Prosjekt nytt østfoldsykehus

- Det er lagt til grunn at de tre grunnelementene for åpen BIM (lagringsformat, terminologi og prosess) skal benyttes som grunnlag for effektiv digital informasjonsutveksling mellom byggherre, prosjekterende, entreprenør, driftsorganisasjon og andre aktører. All programvare som benyttes av prosjekteringsgruppen skal som prinsipp kunne kommunisere med åpen BIM-formatet IFC, og avvik fra dette skal aktivt begrunnes.
- Helse Sør-Øst har som målsetting at innføring av modellbasert prosjektering i prosjektet skal bidra til å øke kompetansen om BIM generelt, og gjøres på en slik måte at dette har overføringsverdi til andre prosjekter i det regionale helseforetaket.

Main strategy document

Open BIM – New Østfold Hospital

Use of BIM shall contribute to achieve the project targets:

- Secure good information and basis for decisions
- Show positive and documented effects of the use of BIM and open BIM on costs, time, quality and Safety/health
- Facilitate for cost efficient facility management through the lifecycle of the building
- Carry though and document a showcase for other hospital projects
- Establish systematic procedures for the use of BIM and open BIM which will be of value / a learning case for other projects

BIM strategy document

Open BIM – New Østfold Hospital

Concretized:

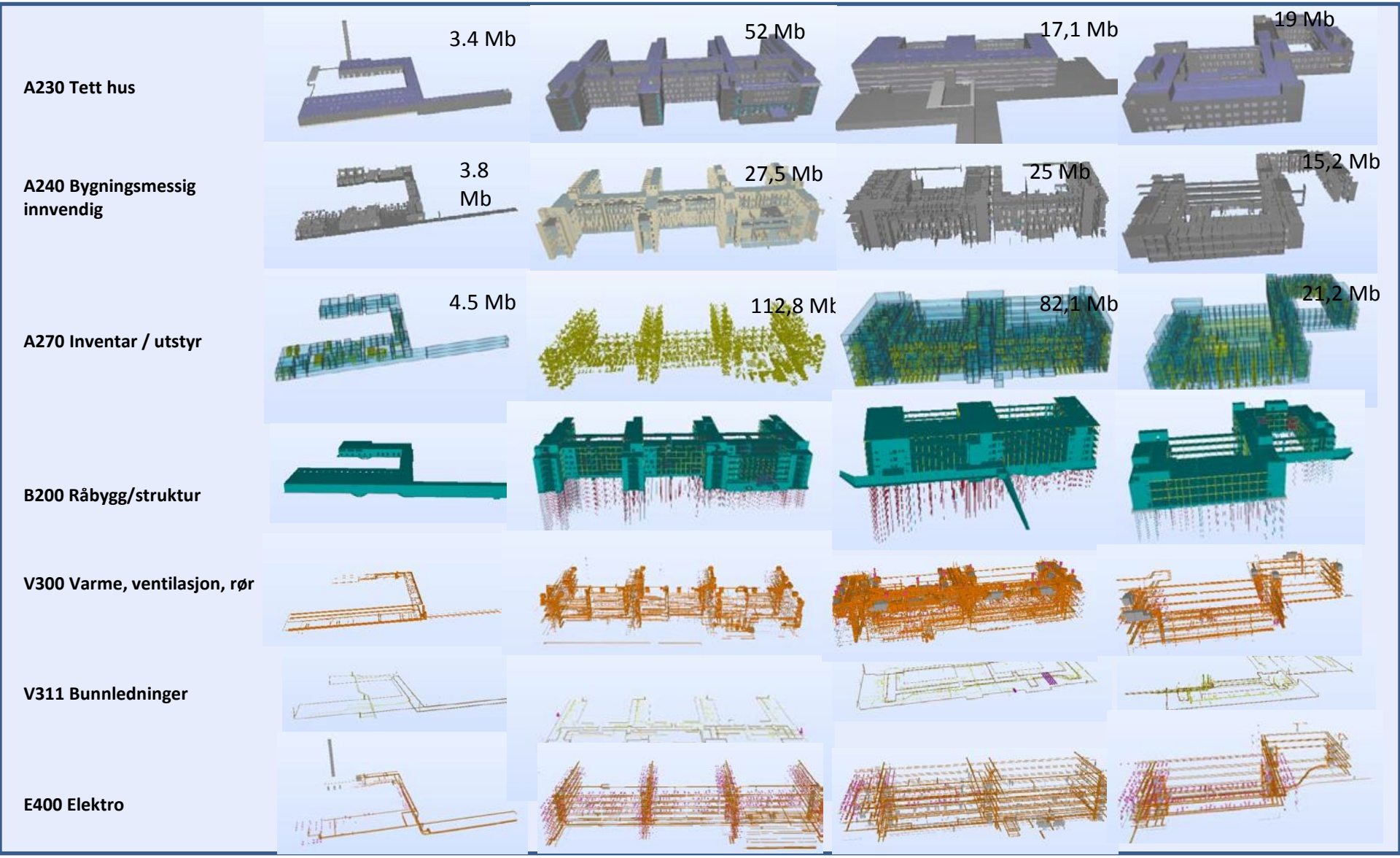
- Better user process with 3D visualization
- Better quality design basis and documentation
- Energy efficient and sustainable solutions
- Better control with life cycle costs
- Industrialization of the construction
- Fewer errors in the construction process
- More efficient operation of the building

BIM strategy document

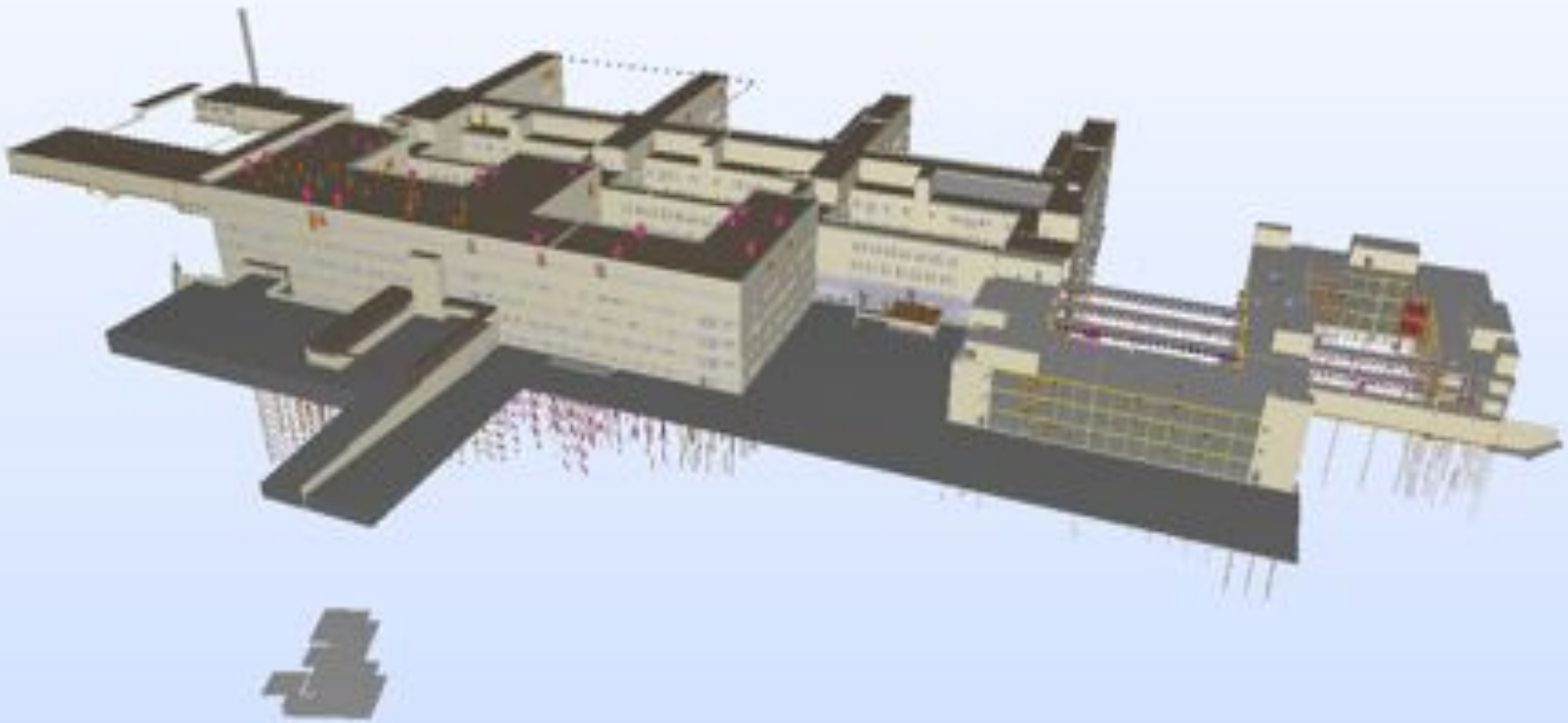
Adoption through challenging and facilitating

Adoption through challenging and facilitating

Consolidated model ~~12~~ 13 parts from ARK, ~~16~~ 30 from RIx



Consolidated model ~~12~~ 13 parts from ARK, ~~16~~ 30 from RIx

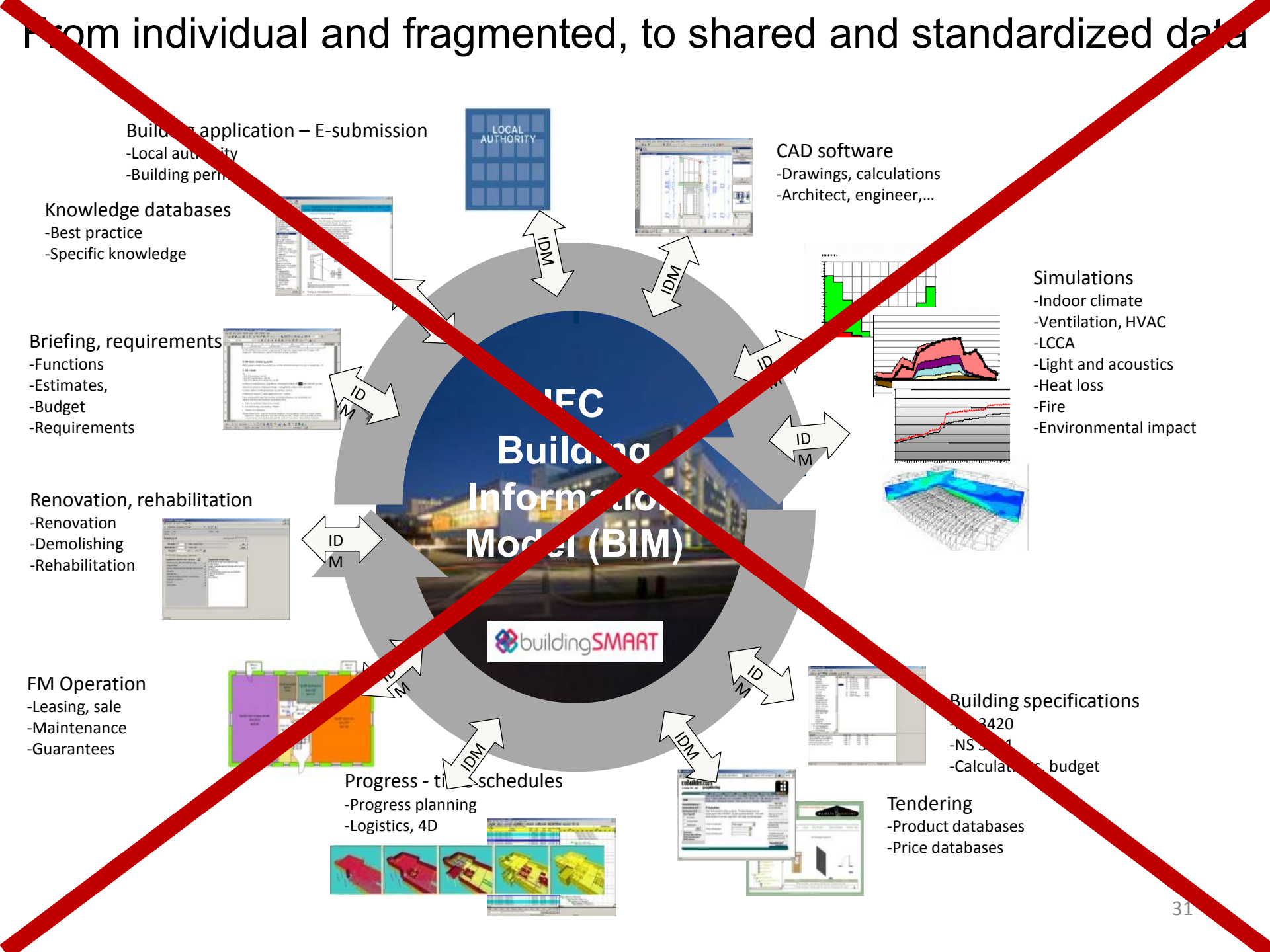


IFC modell all disciplines: ca ~~1.400 mb~~ 2.800 mb

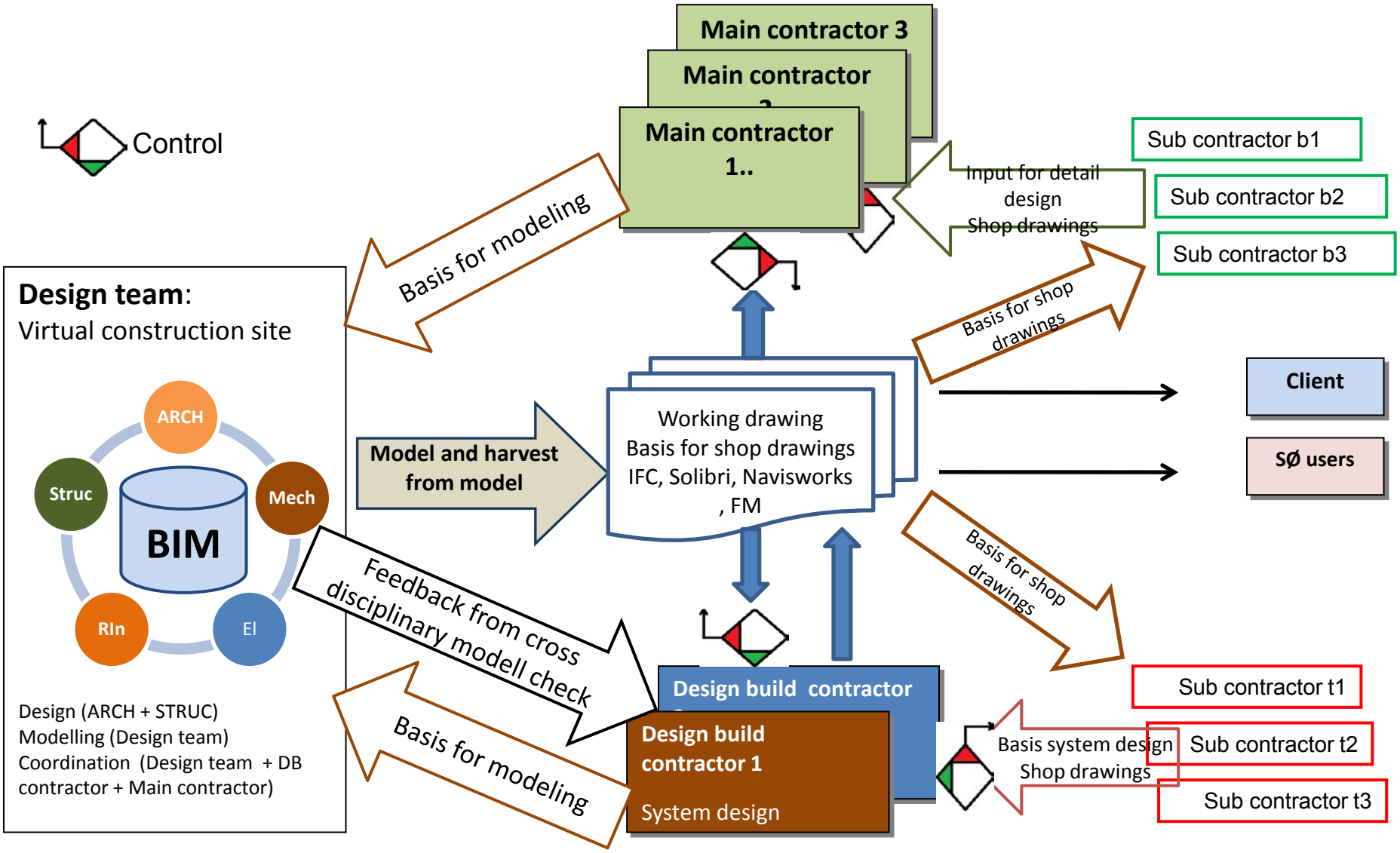
Solibri model all disciplines: ca. ~~80 mb~~ 300 mb

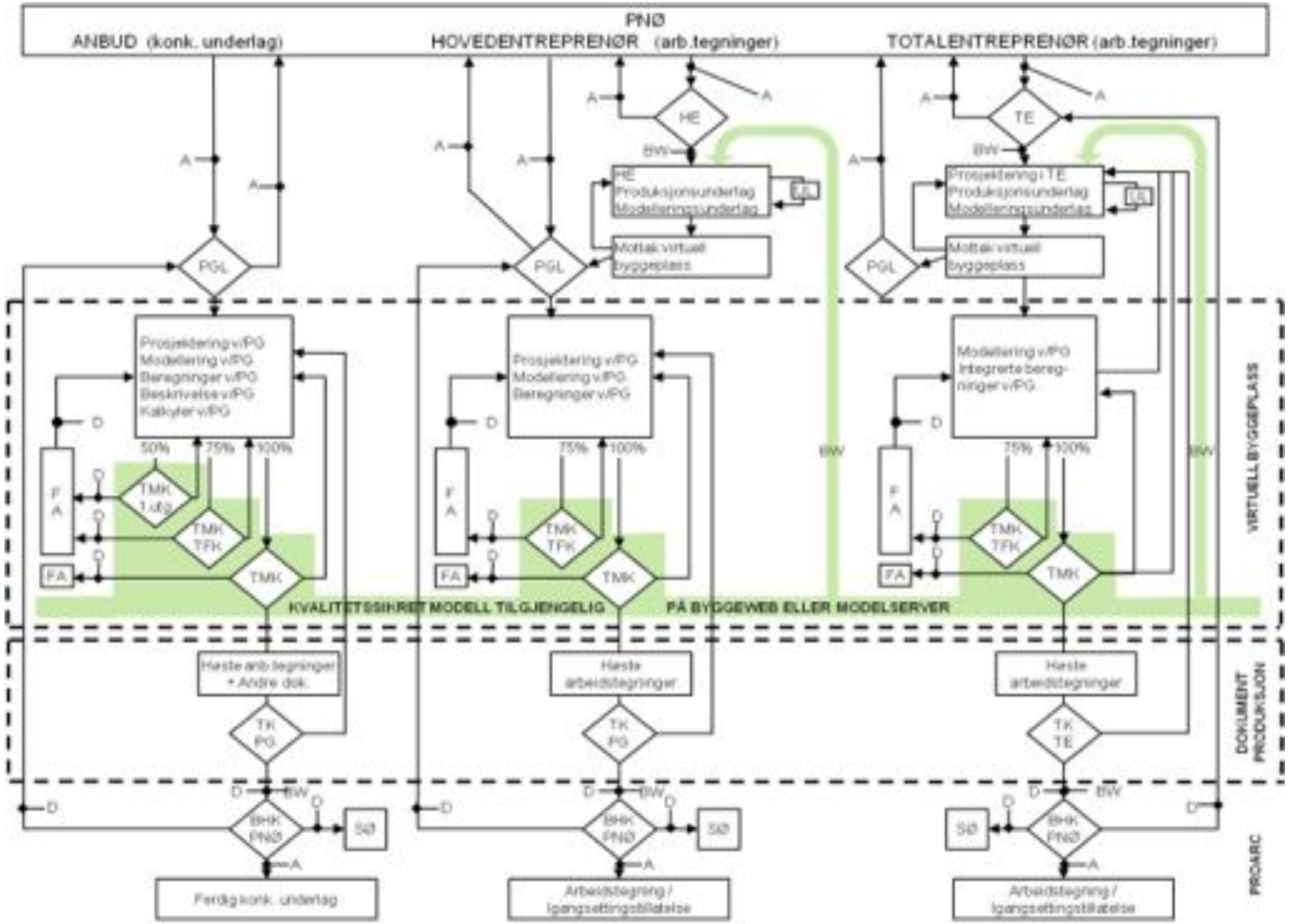
But not yet including the (sub)contractors models

From individual and fragmented, to shared and standardized data



Model maintenance through the construction phase




PNØ
ANBUD (konk. underlag)
HOVEDENTREPRENØR (arb.tegninger)
TOTALENTREPRENØR (arb.tegninger)
HE
TE
BW
A
D
PGL
Prosjektering v/PG
Modellering v/PG
Beregninger v/PG
Beskrivelse v/PG
Kalkyler v/PG
Modellering v/PG
Integrerte beregninger v/PG
50%
75%
100%
TMK 1.utg.
TMK TFK
TMK
FA
Mottak virtuell byggeplass
KVALITETSSIKRET MODELL TILGJENGELIG
PÅ BYGGEWEB ELLER MODELSERVER
VIRTUELL BYGGEPLASS
Første arb.tegninger + Andre dok.
Første arbeidstegninger
TK PG
TK TE
DOKUMENT PRODUKSJON
BHK PNØ
SØ
Ferdig konk. underlag
Arbeidstegning / igangsettingstillatelse
PROARC

Vizualizing of time schedules