

HESMOS

ICT Platform for Holistic Energy Efficiency Simulation and Lifecycle Management Of Public Use Facilities



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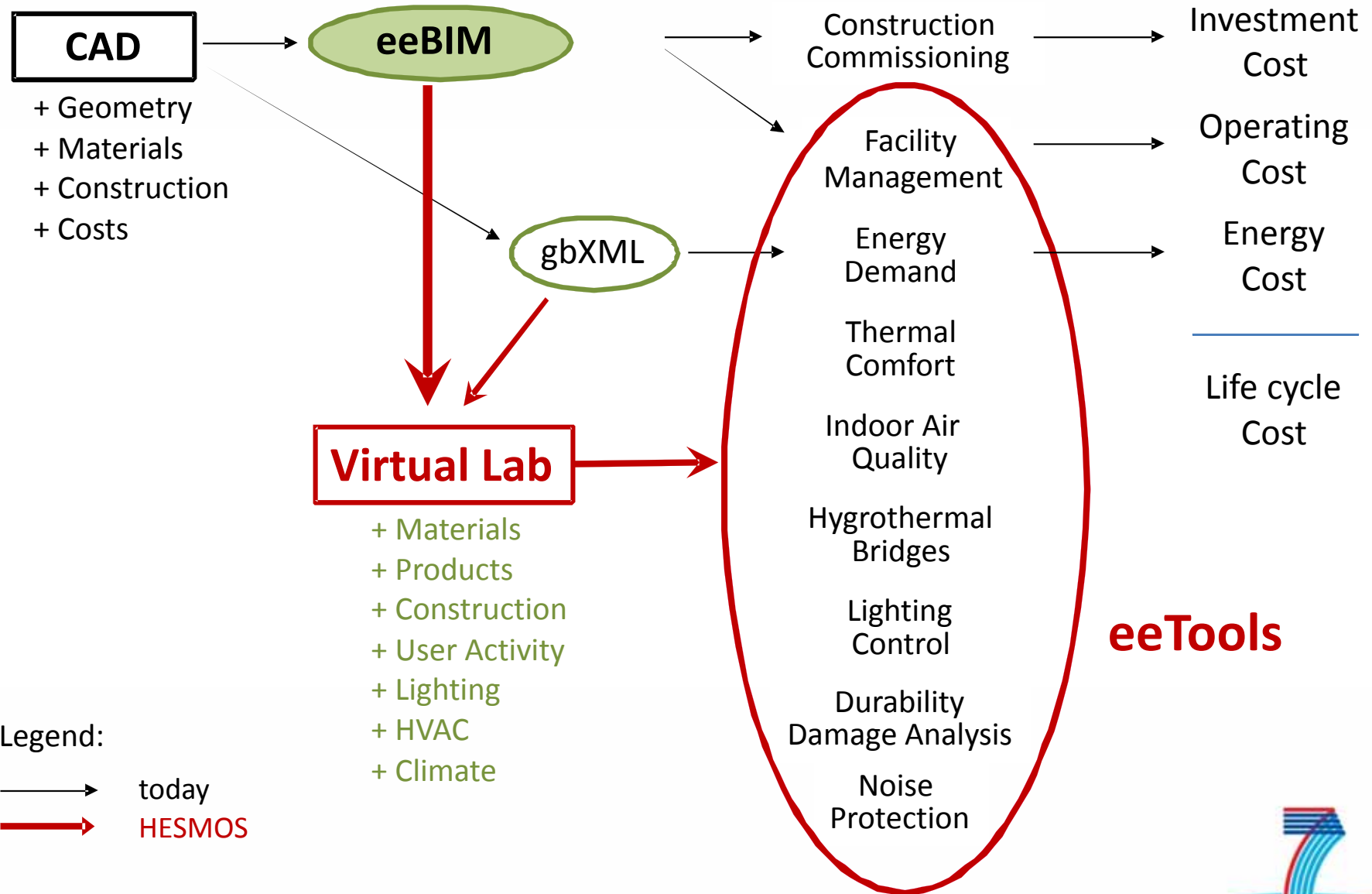


Objectives

Integrated Virtual Energy Laboratory (IVEL)

- Life-cycle energy simulation and management
- Extension of BIM (ISO 16739) to eeBIM
- BIM / BAS interoperability
- eeBIM-based CAD design
- FM & Energy Simulation Tools Integration
- Engineering Language for information filtering & navigation
- 2 PPP projects for validation

How to integrate a Virtual Lab



Legend:

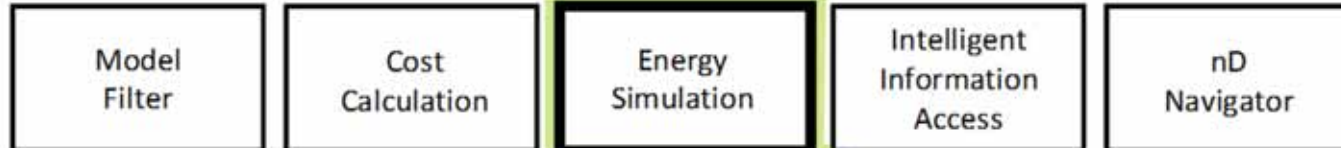
- today
- HESMOS



Principal HESMOS Architecture

Auxiliary Functionality Layer

- Intelligent Tools/Services



Kernel Functionality Layer

- Modeler
- Information Logistic
- Model Management



Kernel Data Layer

- Common Basic Model
- Information Base
- BIM management

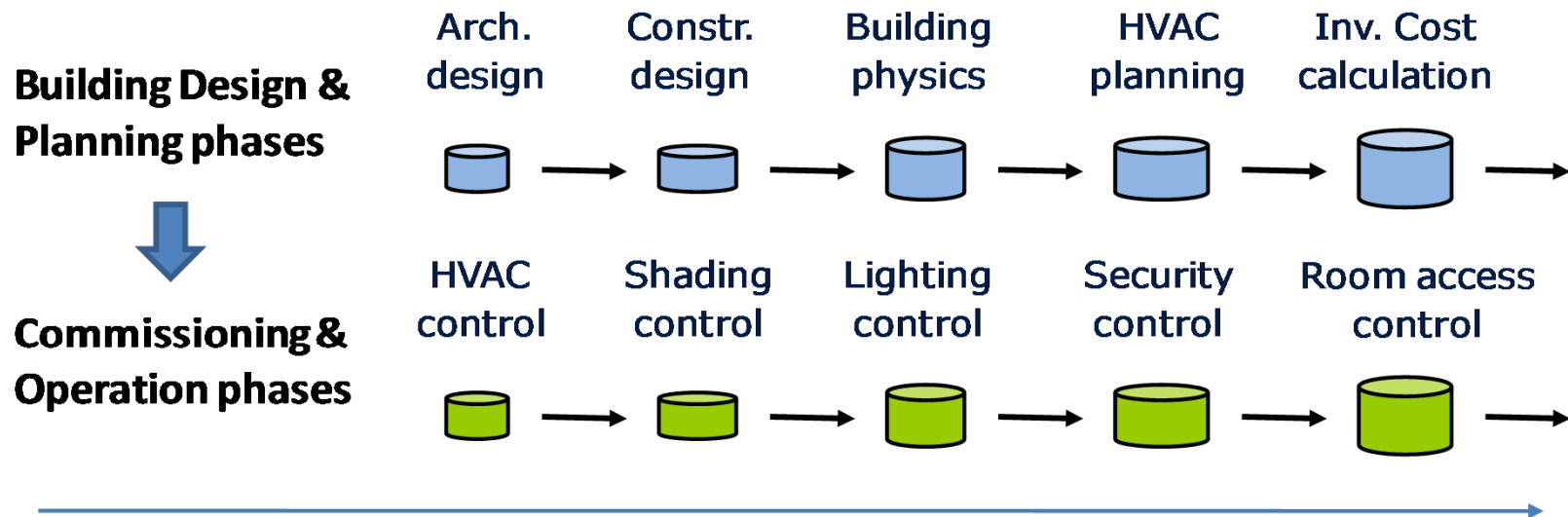


Auxiliary Data layer

- Data Banks
- Libraries
- Other Systems



Interoperability in AEC/FM



Building Information Modeling (BIM)

- Interoperability of different tools
- Common open data model
- Growing databases

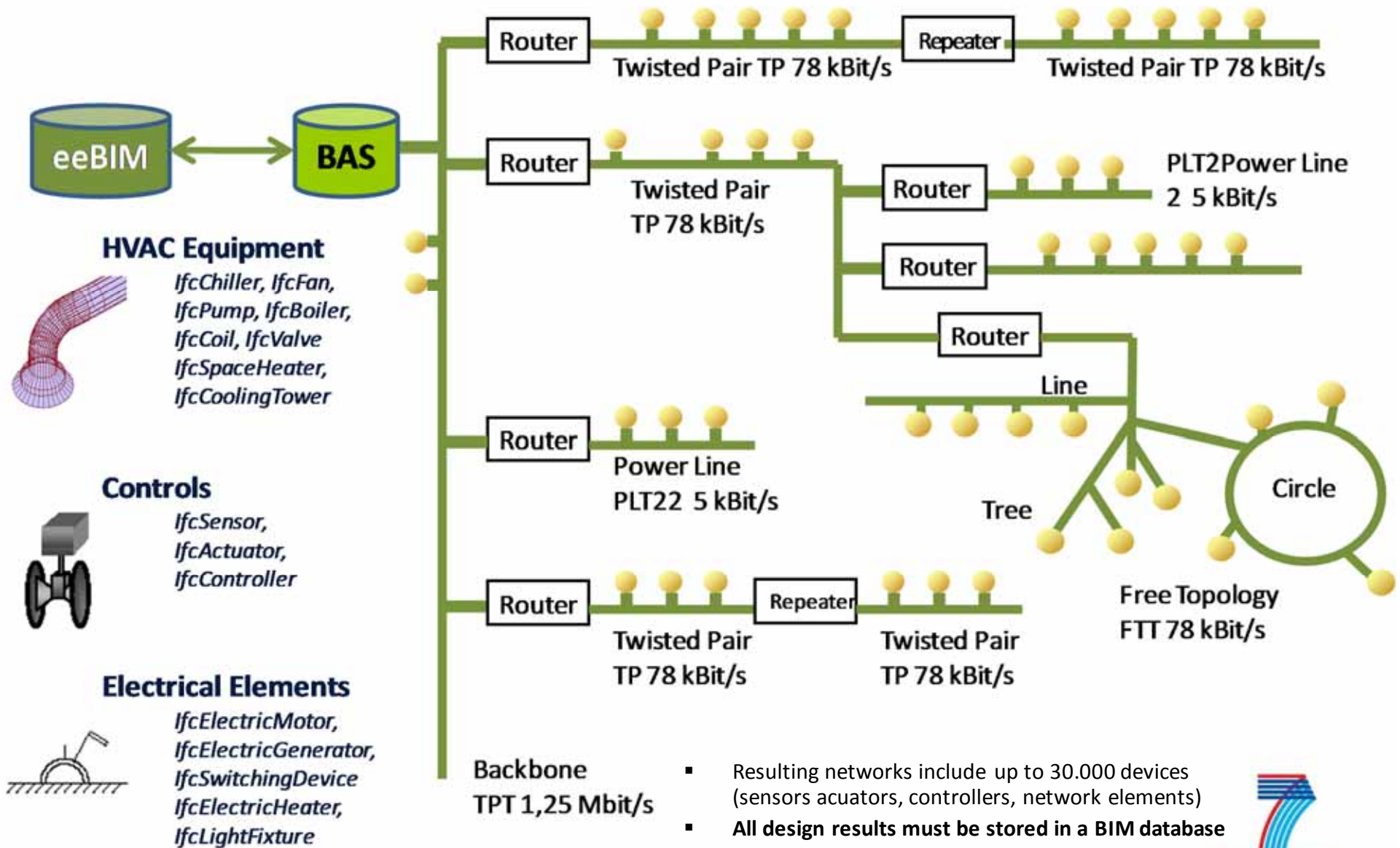
Greatest energy saving potential at the beginning and end of the value chain

BIM is not enough!





Life cycle eeBIM/BAS Interoperability



- Resulting networks include up to 30.000 devices (sensors acuator, controllers, network elements)
- All design results must be stored in a BIM database





Virtual Energy Lab

The screenshot shows the gravis software interface. On the left is a tree view of the building model. The main area displays a 3D floor plan of a building with a legend for DIN 277 E 1. The legend includes: VF Verkehrserschliessung und -sicherung (yellow), HNF 2 Büroarbeit (green), FF Betriebstechnische Anlagen (blue), and HNF 5 Bildung, Unterricht und Kultur (orange). On the right is a 'Drawing related info' panel with a table of data for the selected room.

FDM-Basis > gravis > Raum	
Raum	
Grunddaten	
Nummer	{-} 39
Name	{-} Büro
Architekten-Nr.	
Geometrie	
Höhe [m]	2,900
Bodenhöhe [m]	0,000
Deckenhöhe [m]	0,000
Höhe Raumniveau [m]	
Abzugsfläche [m ²]	0,00
Umfang [m]	17,760
Nutzung	
DIN 277 E 1	HNF 2 Büroarbeit
DIN 277 E 2	Bürräume
DIN 277 E 3	Bürräume allgemein
Mietfläche [m ²]	17,64
Berechnete Werte	
Nebrauminhalt (NRI) [m ²]	51,16
Deckenfläche [m ²]	17,64
Nettogrundfläche (NGF) [m ²]	17,64
Bodenfläche [m ²]	17,64
Wandabzugsfläche [m ²]	9,54
Wandfläche [m ²]	51,50
Wandfläche (Netto) [m ²]	41,96
Fläche nach II. BV. [m ²]	17,64
DVX-Stempel-Fläche [m ²]	0,00
Zweidimensionen	

- Integration of facility management tasks
- Performing energy simulations
- Visualization of the results of simulations
- BIM/BAS integration

- Collaboration platform
- Information server functionality
- Customizable front end





Virtual Energy Lab Navigator

The screenshot shows a software interface for a 'Multi Model Project'. On the left, there is a 'Room Sensor Data' section with a search criteria field containing 'T > 40 AND H > 45'. Below this is a table of sensor data for rooms 100, 103, and 106. At the bottom left, there is an 'IFC Spaces' section with a list of Global IDs. On the right, a 3D BIM model of a building is shown with a black cube highlighting a specific room. Red arrows connect the search criteria, the sensor data table, and the IFC spaces list to the highlighted room in the BIM model. A central text label 'BIM - Sensor Model - Link' is positioned between the table and the BIM model. A green callout box at the top left points to the search criteria field, and another green callout box at the bottom right lists data sources.

Engineering script language to access the data

Criteria : T > 40 AND H > 45

Room	T (°C)	H (%)
100	43,0	48,5
103	43,2	52,3
106	40,1	46,9

BIM - Sensor Model - Link

Integration of multiple data sources:

- BIM
- Climatic data
- Data from Building Automation Systems
- etc.



Consortium

6 Partners (1 academic, 5 industry)

- TU Dresden (CIB, TIS, IBK), Germany - academic, BIM, BAS, eeB
- Nemetschek, Slovakia - software, CAD
- Olof Granlund, Finland - software + eng., FM
- Royal BAM Group, The Netherlands - construction, PPP
 - BAM Utiliteitsbouw NL
 - BAM Deutschland AG DE
 - BAM Construct UK
- Obermeyer Planen+Beraten, Germany - construction, design
- AEC3 Ltd. - SME consultant, data modelling, BIM

Resources

- 420 PM (~ 12 Persons x 3 years)
- 2,7 Mio. € funding



EUROPEAN / European / 7th Framework
COMMISSION / Research Area / Programme

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Thank You

