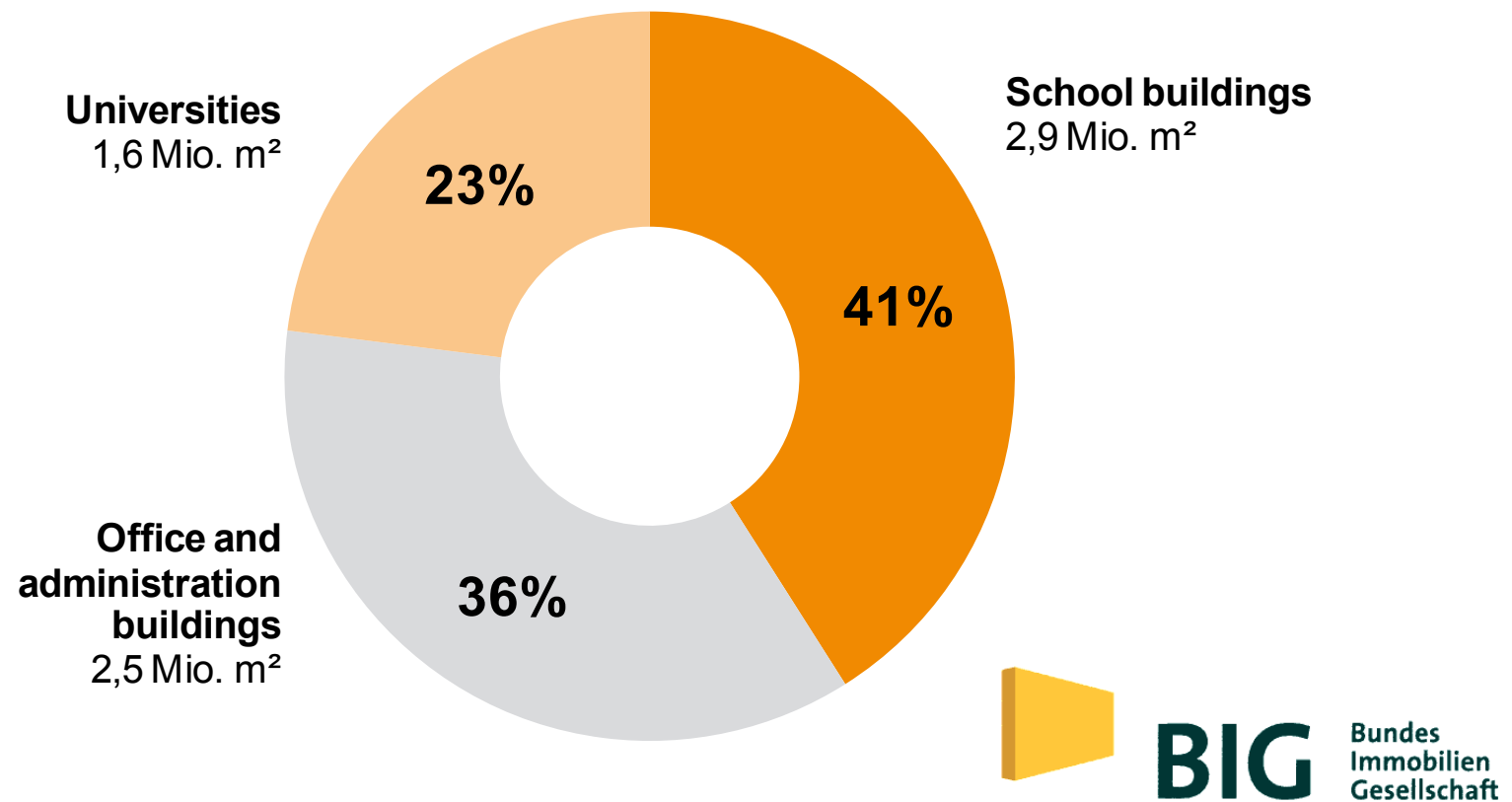


BIGMODERN

Introducing **integrated (energy) design** processes
into Austria's largest public real estate company

Federal Real Estate Company (BIG)

Useful area of BIG-buildings



BIGMODERN

Background and Approach

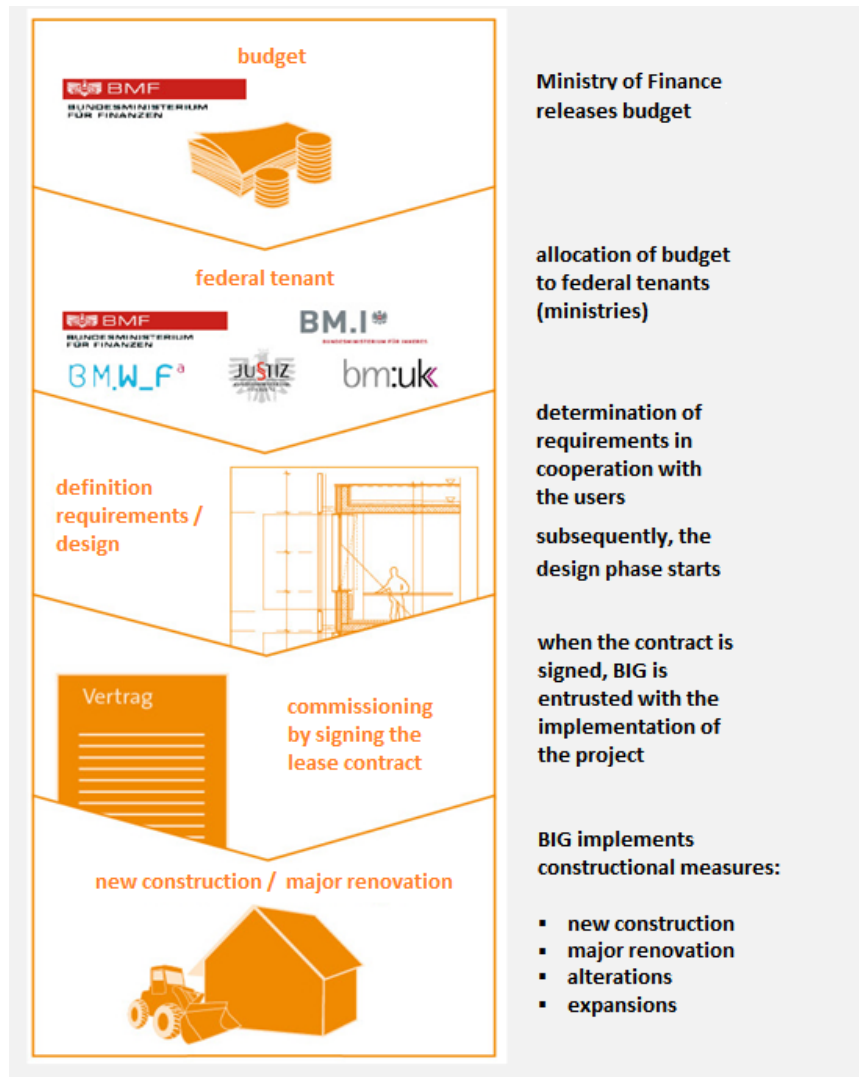
- Large **political** pressure to show engagement regarding energy efficient and sustainable construction

→ → →
- Establishment of **two large demonstration projects** as basis for developing and training major elements of integrated (energy) design “on the job”
- **Transferring** the experiences gathered from the demonstration projects **to key actors**
→ **Introducing ID as standard process**
- Introducing a **standard of energy monitoring** for quality assurance



Federal Real Estate Company (BIG)

Standard procedure for financing



- **Energy efficient and sustainable buildings need to be supported by the users / tenants (ministries, universities etc.)**
- **Integrated Design (ID) is a serious intervention into well-functioning standard procedures**
- **But: ID helps to make the decision process transparent**

THE ID APPROACH

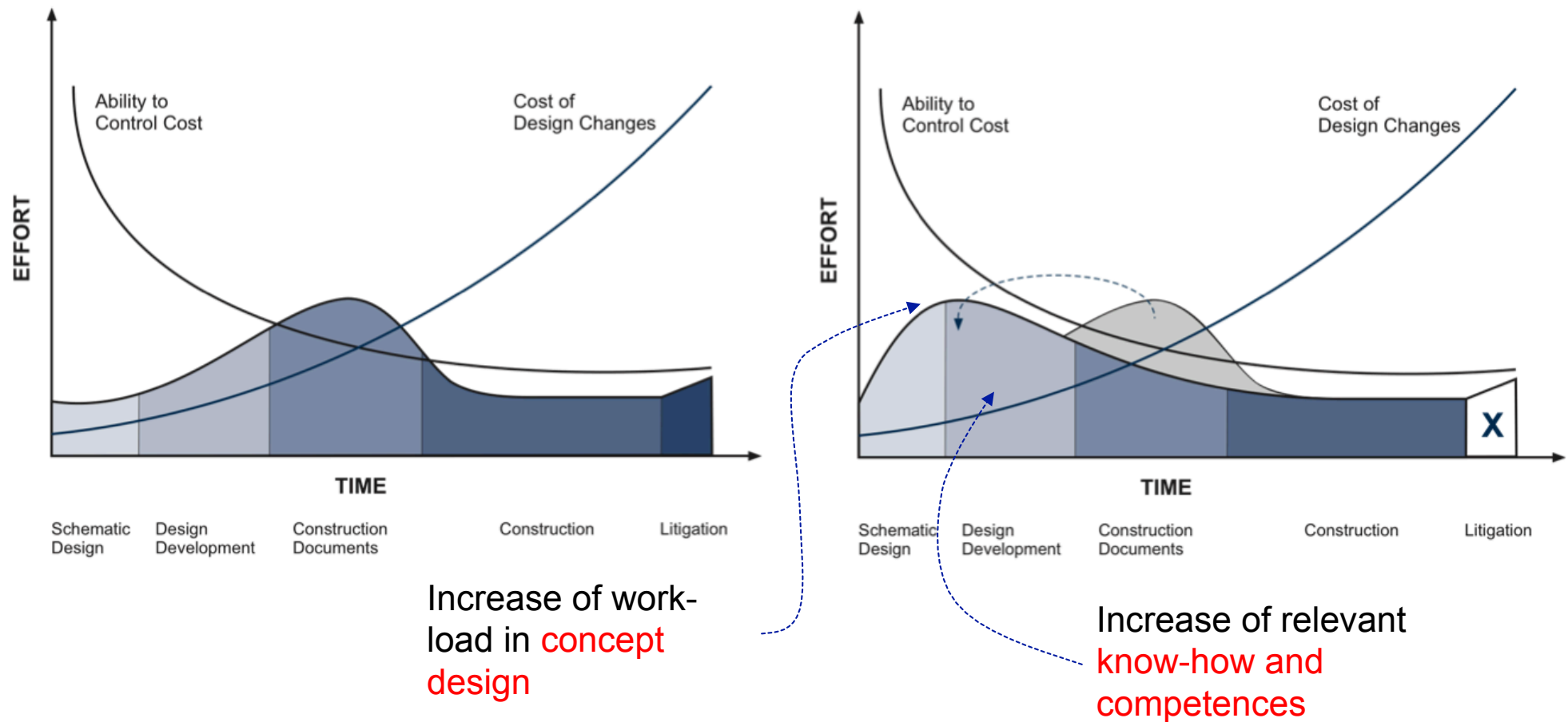
Let 's try a definition

ID is defined as a combination of:

- 1. Collaboration between stakeholders (client, architect and other consultants, and eventually users) from early on in the design process.**
- 2. In achieving high energy/ environmental ambitions, the implementation of integrated architectural solutions or passive qualities are prioritized before active systems.**

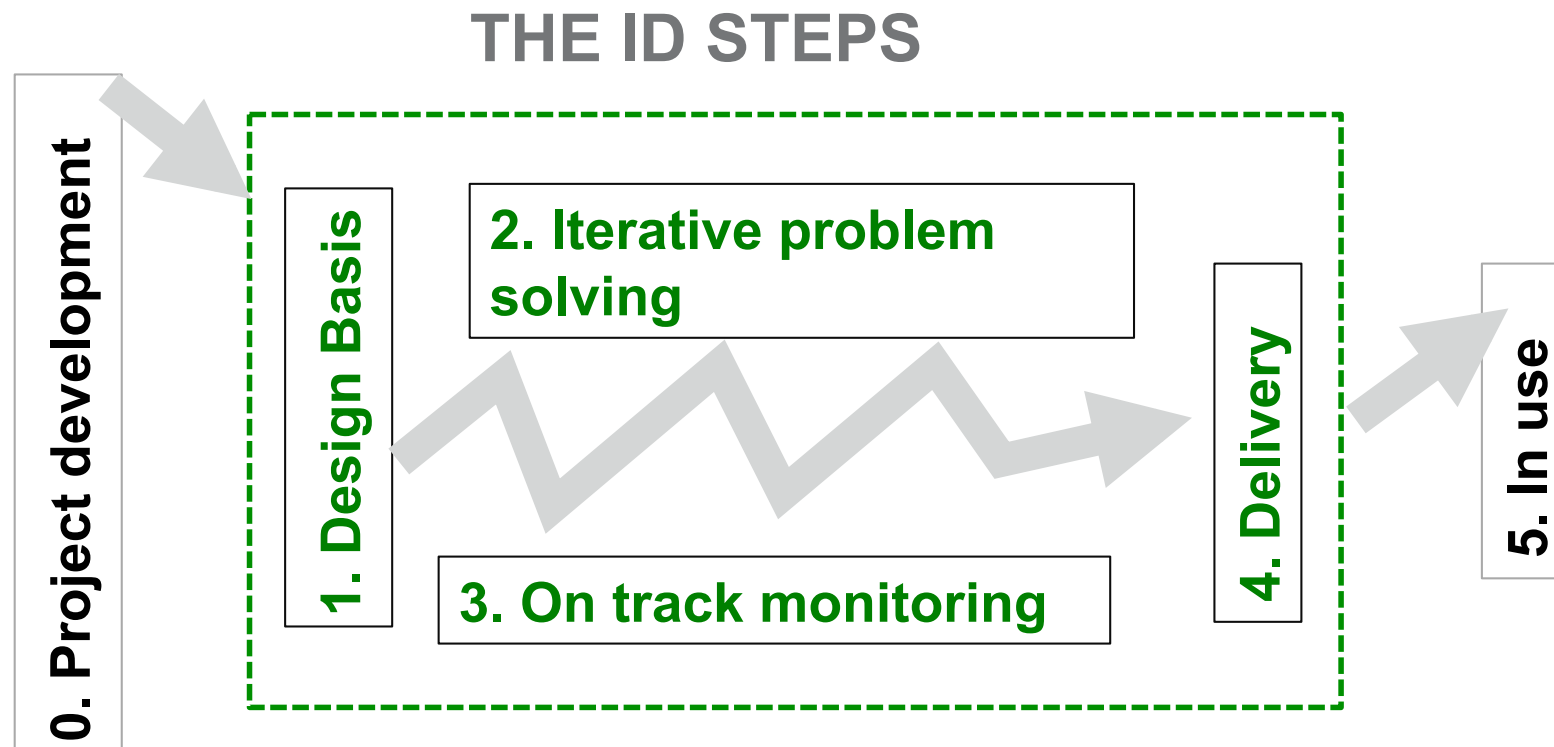
THE ID APPROACH

Focus on early design phases



THE ID APPROACH

The ID steps - overview



THE ID APPROACH

Costs and Benefits of ID

Tasks	Costs	Comments
Concept and pre design	5 -10 % more	Based on experience
Detailed engineering	< 5 % more the first projects 5-10% less in the next projects	Based on experience – smoother process caused by more detailed concept design
Building costs	5 – 10 % more	3-6 % for Passive houses
Operational costs	70 – 90 % less	Based on experience
Building faults	10 – 30 % less	Because of better planning and better follow up during construction

THE ID APPROACH

Changed roles and responsibilities

Design team

- Higher input in concept phase
- Definition of a set of variants
- thorough analysis of (innovative) variants

Client

- Clear definition of project goals
- More intensive engagement in the concept phase
- event. contracting an ID facilitator

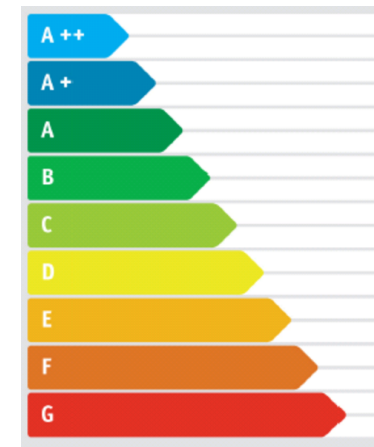
ID facilitator

- Support in programming, detailed definition of objectives
- on-track monitoring of compliance with agreed objectives
- Event. support in facilitating the process

PROGRAMM BIGMODERN

Goals during project development

- **Minimum energy efficiency class A**
 - net heat demand (HWB*) < 25 kWh/m²a
- **Remarkable reduction of primary energy demand**
- **Further sustainability requirements based on klima:aktiv haus and TQB criteria**
 - Requirements in the field of energy, comfort and costs
 - Further sustainability criteria considered, but no requirements
- **wide replicability due to economic viability over the life-cycle**

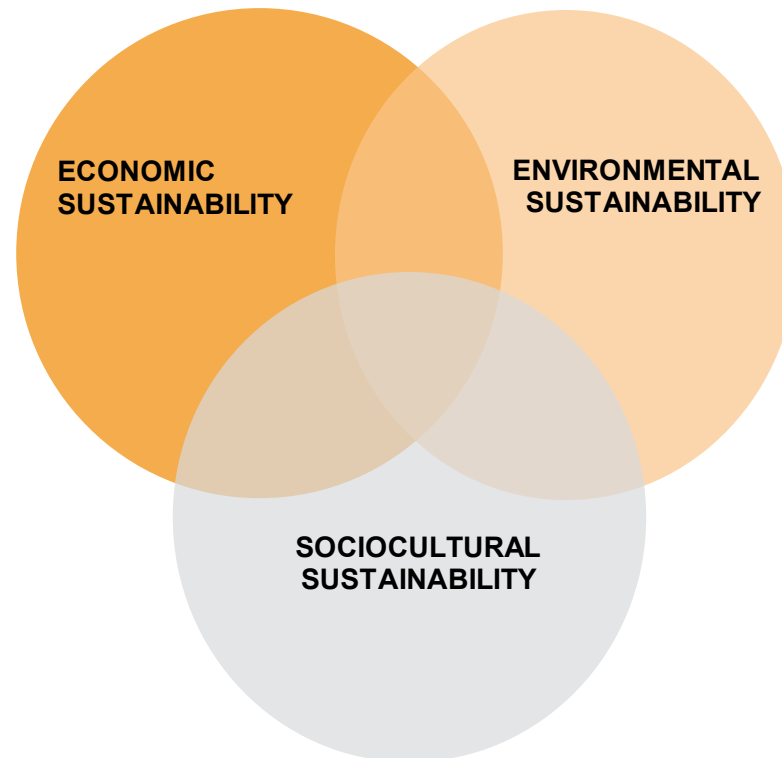


BIGMODERN

Precising minimum requirements

Optimized costs

- Compliance with the framework for investment costs
- Low life cycle costs (LCC)



Low energy demand

- Thermal insulation in summer
- Thermal insulation in winter
- Low primary energy demand
- Renewable energy sources
- Framework for monitoring of building operation

High comfort in use

- Thermal comfort in summer
- Thermal comfort in winter
- Acoustic comfort
- Visual comfort

BIGMODERN

Further sustainability requirements

B Cost effectiveness and technical quality of the building			
B	1.	Cost effectiveness	
B	1.	1.	Calculation of economic profitability
B	1.	2.	Integrated design and analysis of variants
B	1.	3.	Principles for building operation, maintenance and repair
B	3.	Technical quality of the building	
B	3.	1.	Air tightness of the building
B	3.	2.	Thermal bridges of the building
C Energy and supply			
C	1.	Energy demand	
C	1.	1.	Heat demand HWB*
C	1.	2.	Cooling demand KB*
C	1.	3.	Primary energy demand PEB
C	2.	Energy efficiency of electric appliances	
C	2.	1.	Energy efficient lighting
C	2.	2.	Solar power systems

D Health and comfort			
D.	1.	Thermal comfort	
D.	1.	1.	Thermal comfort in winter
D.	1.	2.	Thermal comfort in summer
D.	2.	Air quality	
D.	2.	1.	Ventilation
D.	3.	Sound protection/room acoustics	
D.	3.	2.	Room acoustics in relevant sections of the building
D.	4.	Illumination, lighting, sun protection and anti-glare shields	
D.	4.	1.	Quality of the artificial lighting
D.	4.	2.	Supply of daylight/daylight factor/line of sight
D.	4.	3.	Sun protection and anti-glare shields

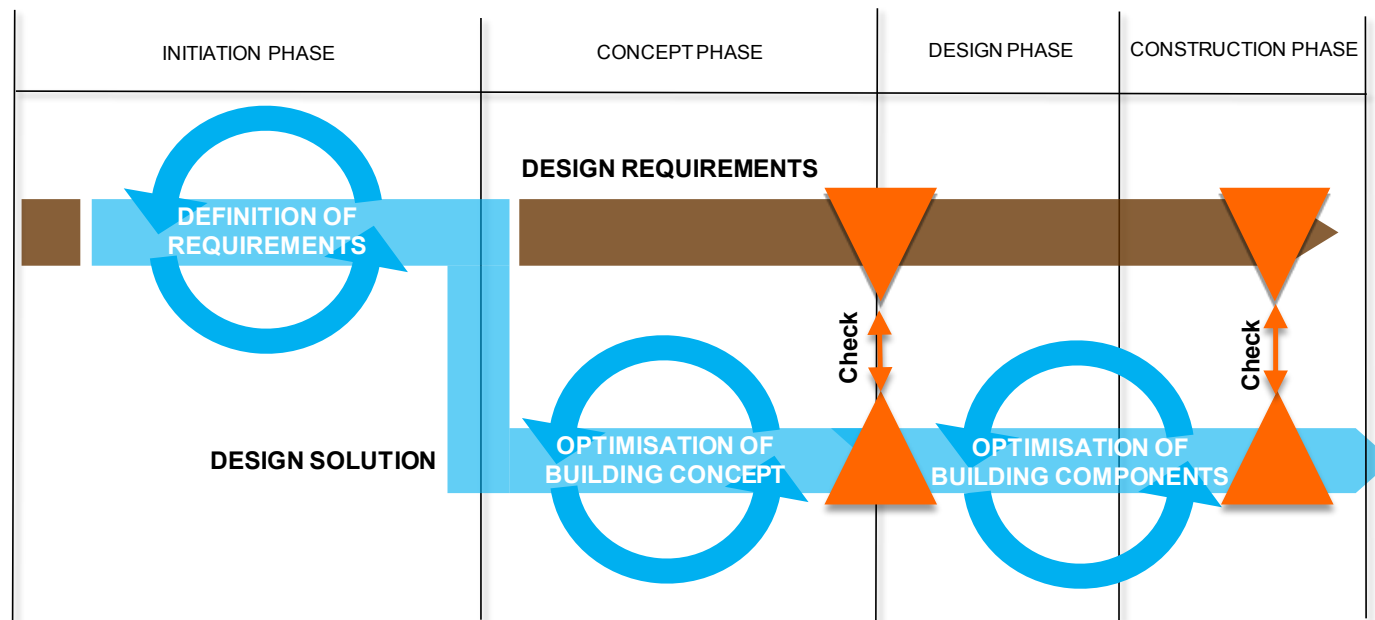
BIGMODERN

Architectural competition

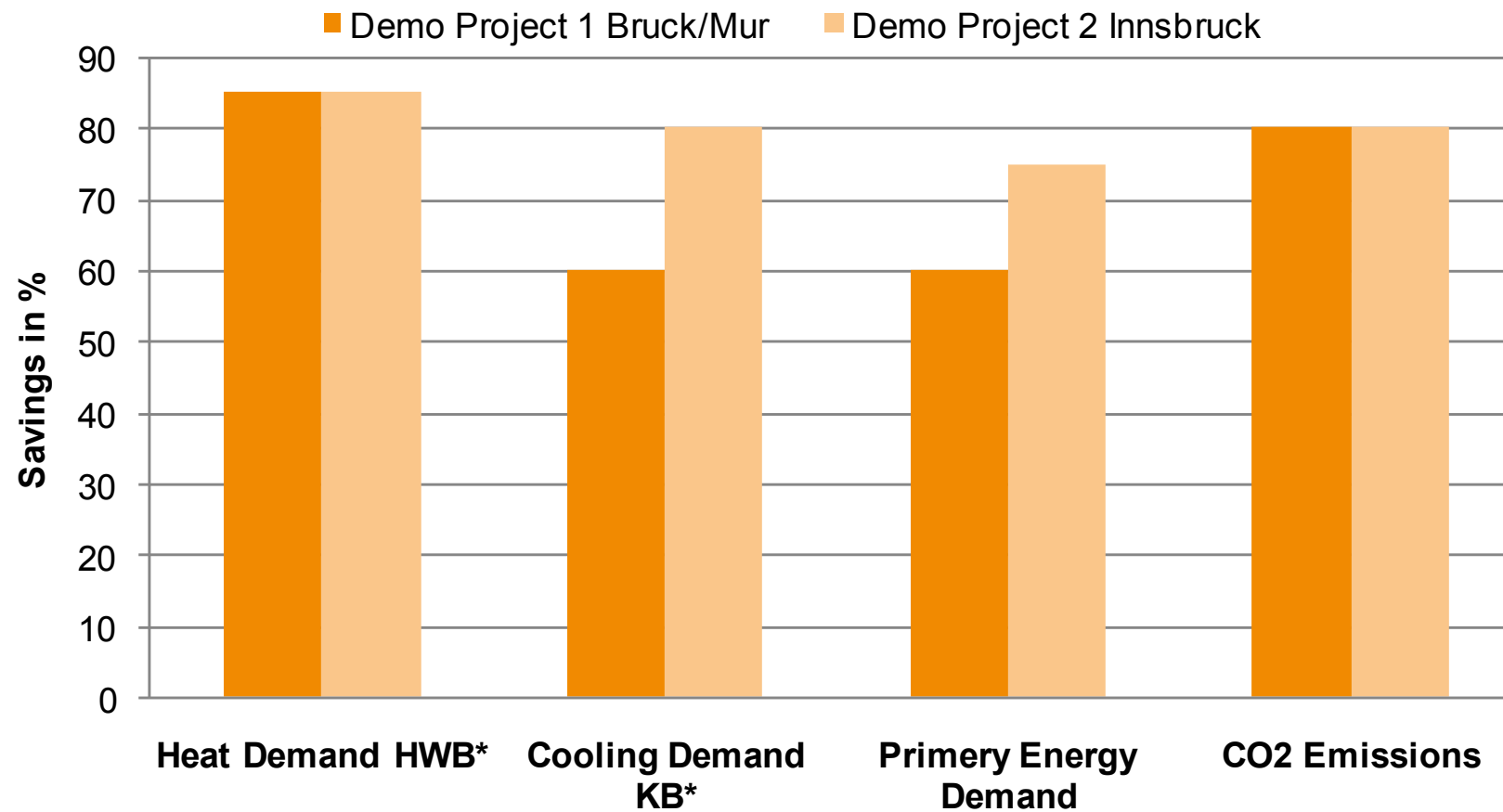
- **BIG has to select designs in architectural competition according to public procurement procedures**
- **Objectives have to be part of the architectural competition**
 - client brief for competition needs to include objectives
 - probability of compliance with (most important) objectives has to be checked in examination of tender proposal
 - winner gets clear obligation for improvement for those parts where the proposed concept endangers compliance with objectives

BIGMODERN On-Track Monitoring

- **Definition of variants** to get analysed during the concept phase
- Major decisions based on **life cycle costs** analysis
- Energy optimization via **dynamic simulation of thermal systems**



BIGMODERN Results



BIGMODERN

Conclusions

- **It's not about technology but about organisational change**
- **Integrated design approach essential for high quality renovation of building**
 - Interdisciplinary team working together
 - Inputs of thermal building simulation to interdisciplinary discussion process useful
- **Life cycle costs analysis important to convince tenants**
 - Early analysis in design phase
 - In long term only energy saving measures that are economically reasonable can be implemented
 - Tenants have to be informed about LCC concept
- **Monitoring energy use in operation phase**
 - Useful for quality assurance

Thank you for your attention!

Klemens Leutgöb

e7 Energie Markt Analyse GmbH

Theresianumgasse 7/1/8

1040 Vienna

Austria

klemens.leutgoeb@e-sieben.at

www.e-sieben.at

For further information on

BIGMODERN: <http://>

**[www.hausderzukunft.at/
results.html/id5837](http://www.hausderzukunft.at/results.html/id5837)**

The MaTrID project

www.integratedesign.eu

