



EU Research Project HESMOS



Energy Laboratory for life cycle optimisation of public private partnership projects

BAM Deutschland AG

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- 1. BIM Initiatives Royal BAM Group nv
- 2. HESMOS Research Project
- 3. Integrated Virtual Energy Laboratory (IVEL)
 - a. nD Navigator
 - b. WebROOMEX
 - c. Granlund Manager
- 4. Implementation on Pilot Project
- 5. Benefits of IVEL
 - a. Process
 - b. Building
- 6. Conclusion









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Lake Constance 5D-Conference 2013



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BIM Initiatives Royal BAM Group







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HESMOS Research Project: Objectives

- HESMOS = Holistic Energy Efficiency Simulation and Life Cycle Management Of Public Use FacilitieS
- Development of an Integrated Virtual Energy Laboratory (IVEL) for energy optimisation and life cycle management of Public Private Partnership Projects.

Climate Data
Munich, Germany
Assign Climate Data









HESMOS Research Project: Objectives



Project duration 2010 - 2013

Project partners

- TU Dresden (CIB, TIS, IBK)
- Obermeyer Planen und Beraten
- BAM Deutschland AG /
- BAM Utiliteitsbouw BV
- Olof Granlund
- Nemetschek
- AEC3

Homepage www.hesmos.eu

Newsletter http://www.hesmos.eu/news/index.php







HESMOS Research Project: Objectives

Improve Process

- \rightarrow Efficiency / Costs
- \rightarrow Quality

- Standards
- Interoperability
- User Interface
- Easy access
- Structure
- Transparency
- Consistent data

Improve Building

- \rightarrow Efficiency / Costs
- \rightarrow Quality

- Simulation
- Building Automation Systems (BAS)
- Before / After comparisons
- Target performance comparisons
- Alternatives







HESMOS Research Project: AS IS vs. TO BE Process



Knowledge Transfer and Experience Exchange







HESMOS Research Project: AS IS vs. TO BE Process

- Is (state of the art)
- 2D drawings
- Re-enter data
- Slow partial round trips
- Rule of thumb
- Manual verification
- Few alternatives
- Off the shelf values
- Many different platform
- dependent tools

> Should be (future)

- > Model based engineering, estimation etc
- > Re-use data
- > Fast iterations incl. performance prognoses
- > Decision support by simulations and historical data
- > Digital verification
- > More alternatives
- > Validated simulation
- > Best of breath toolset









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Integrated Virtual Energy Laboratory



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Integrated Virtual Energy Laboratory: nD Navigator







Integrated Virtual Energy Laboratory: WebROOMEX











Integrated Virtual Energy Laboratory: Granlund Manager









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Client requirements

Implementation on Pilot Project

BIM









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Implementation on Pilot Project: WebROOMEX Use Case

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Implementation on Pilot Project: Granlund Manager Use Case







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Benefits of IVEL

State of the Art





Manual evaluation for energy report





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Meter data acquisition evaluation with BAS interface

HESMOS Development



Measured data 20





Benefits of IVEL

Building quality

- \checkmark Energy and CO₂ reduction.
- ✓ Fullfilment of user requirements.

Building costs

- ✓ Optimised life cycle costs.
 - Investment costs.
 - Operational costs (energy costs).

Process time

- ✓ Fast and intuitive access to BIM data.
- ✓ Remote access to BAS data.
- ✓ Standardisation of processes to increase efficiency.

Process quality

- ✓ Consistent up to date data.
- ✓ Transparent visualisation of data.
- ✓ Standardisation of processes to mitigate risks.







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Conclusions: Decision-making and monitoring with HESMOS IVEL



Implementation of the IVEL on BAM pilot projects verifies **optimisation of building and processes**

- \rightarrow increased quality
- → increased efficiency







