

CONSTRUCTION SKILLS ENERGY EFFICIENCY

BIM CERT

REGULATING SUPPLY CHAINS

TACKLING CLIMATE CHANGE



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BIMcert Conference

22nd January 2020

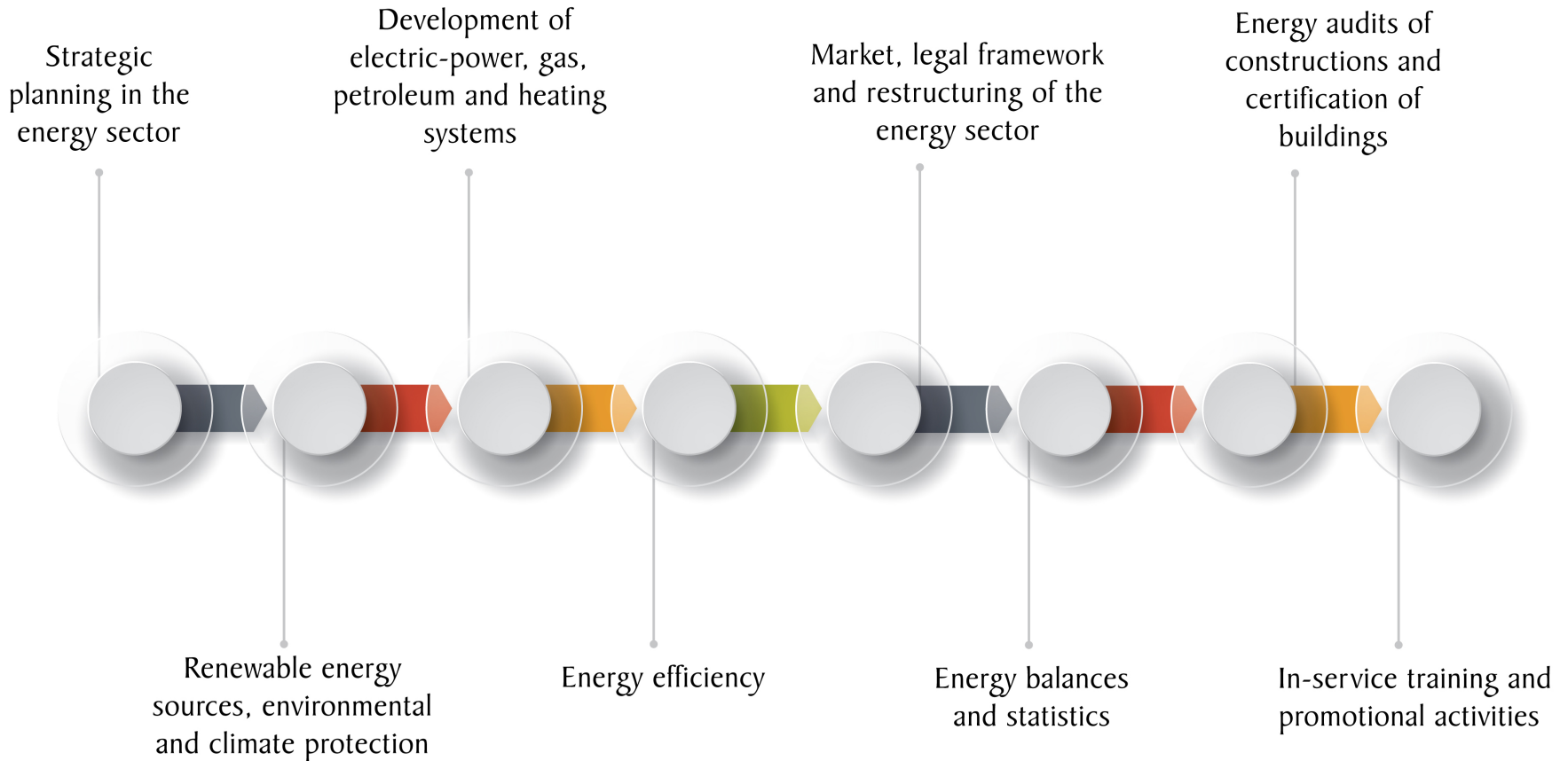
***Reducing the energy footprint
in the built environment***

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How BIM can aid the
energy efficiency
process for the
European construction
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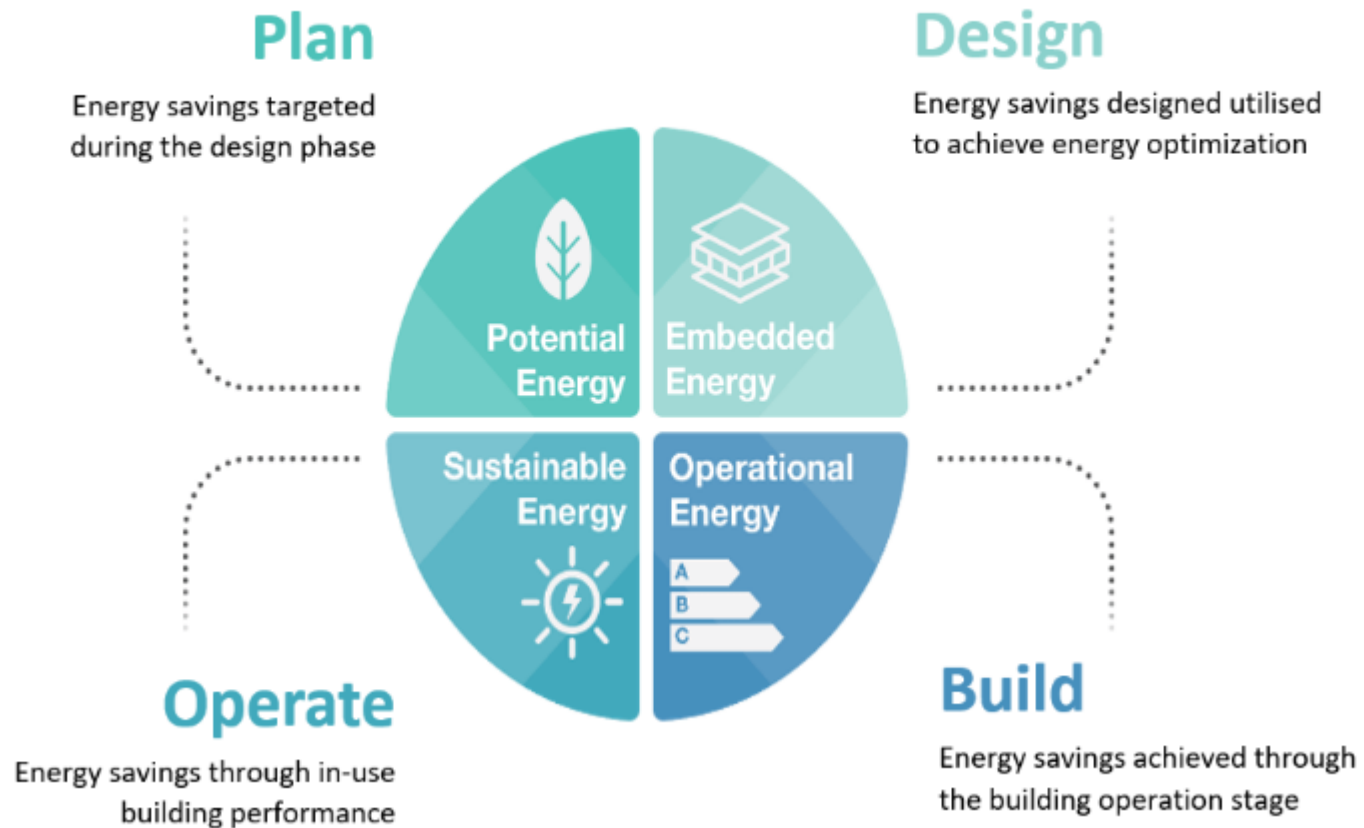
Energy Institute Hrvoje Požar



How BIM can aid the energy efficiency process for the European construction supply chain

- **BIM as enabling technology has global impact**
- **Sustainable construction – difficult without BIM**
- **BIM increases economics of entire construction process**
- **BIM digital model is universal**
- **BIM increases energy efficiency and transparency**
- **Benefits of technology**

How BIM can aid the energy efficiency process for the European construction supply chain



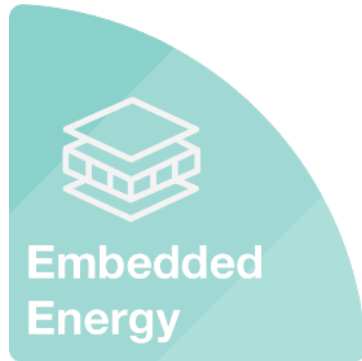
How BIM can aid the energy efficiency process for the European construction supply chain



Energy savings are planned and targeted during the design phase. It is about utilising BIM tools to possibly reduce the gap between predicted and actual building performance proactively

- **BIM as an enabler of effective collaboration between design disciplines**
- **BIM tools for fast and accurate processing and comparison of a large number of design alternatives.**
- **Visualisation of energy loads and performance**
- **Multi-criteria optimization in terms of energy, environment and economy**
- **Selection of cost and energy for the most effective design alternative**
- **Tracing the route for the future decades of a building's optimal service and operational life**

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Recognized as a tool to support the visualisation of a building's energy performance, sequence and schedule of construction aimed towards the application of sustainable construction materials and techniques, with minimum waste of energy and materials

- **BIM 4D tools (time scheduling simulation)**
- **5D (quantification)**
- **3D BIM model integrated with VR and AR technologies**

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Operational Energy



Energy savings achieved through the building operation stage –are monitored and managed continually

- **interlinking of data environments (BIM supported Energy Management System of Buildings)**
- **Smart buildings**
- **engagement of wider public stakeholders (occupants and users)**

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easier way of achieving energy savings through the lifetime of the building

- **Smart decisions made in the early design stage**
- **Energy for demolition or recycle / reuse**
- **Smart buildings**
- **BIM can be used to analyse and find effective and feasible ways to re-use existing building stock without the need of new builds**

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IDM/MVD methodology

LCA and LCC analysis within a BIM-based environment

BIM-LCA/LCC framework

STREAMLINED LCA/LCC analysis

COMPLETE LCA/LCC analysis

Environmental Information:

- Global Warming Potential for Total Fossil Fuels (GWP)
- Acid Equivalent Potential for materials (APEQ)
- Global Warming Potential (GWP)
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- Photochemical Ozone Creation Potential (POCP)
- Primary energy consumption using non-renewable sources (PE-Non)
- Primary energy consumption using renewable sources (PE-Ren)

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Legend:

- Information to be used - can be integrated within BIM objects
- Information to be provided - should be provided by designers
- Information to be used - can be automatically generated by a BIM model
- Required information for a Streamlined LCA/LCC
- Required information for a Complete LCA/LCC



BIM models as *data repositories* for the information management throughout a building's lifecycle



Integration of LCA/LCC data within BIM objects

Software	BIM object	API	API	API	API	API	API	API
STREAMLINED LCA analysis	BIM object	API	API	API	API	API	API	API
COMPLETE LCA analysis	BIM object	API	API	API	API	API	API	API
COMPLETE LCC analysis	BIM object	API	API	API	API	API	API	API