How
Building Information Modelling (BIM)
and
competences recognition
can ensure the RoI

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Energy Performance Contracting feasibility

Energy Performance Contracting

Issued when

It is possible to recover the invested capital in 10-20 years

Based on

Reliable estimate of investment and savings

The refurbishment design has to consider several aspects

Compliance with the rules of urban planning, safety and security

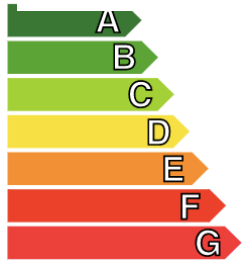
Compliance to functional needs for use of the spaces

Guarantee of thermal and lighting comfort

Feasibility of energy requalification works

The evaluation of the benefits

Energy, environmental and economic savings



Lower consumption

Lower maintenance costs

Lower management costs

How to build a trustful financial-economic plan

Financial economic plan

Achievable saving

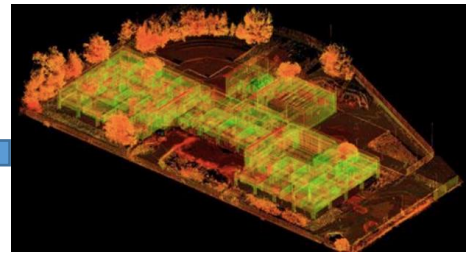
Investment value

BIM Energy Model: BEM

Evaluation of different scenario

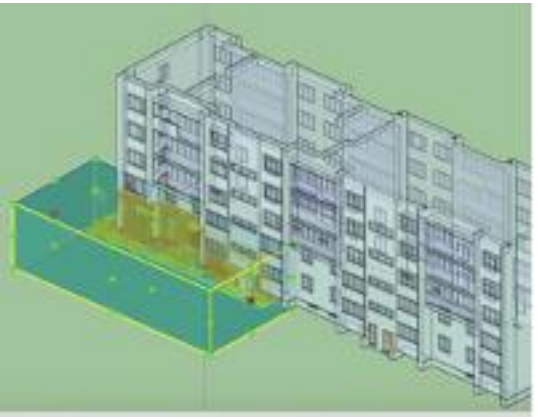
Computation of quantities based on reliable information

Point of cloud



When the BIM model is convenient?

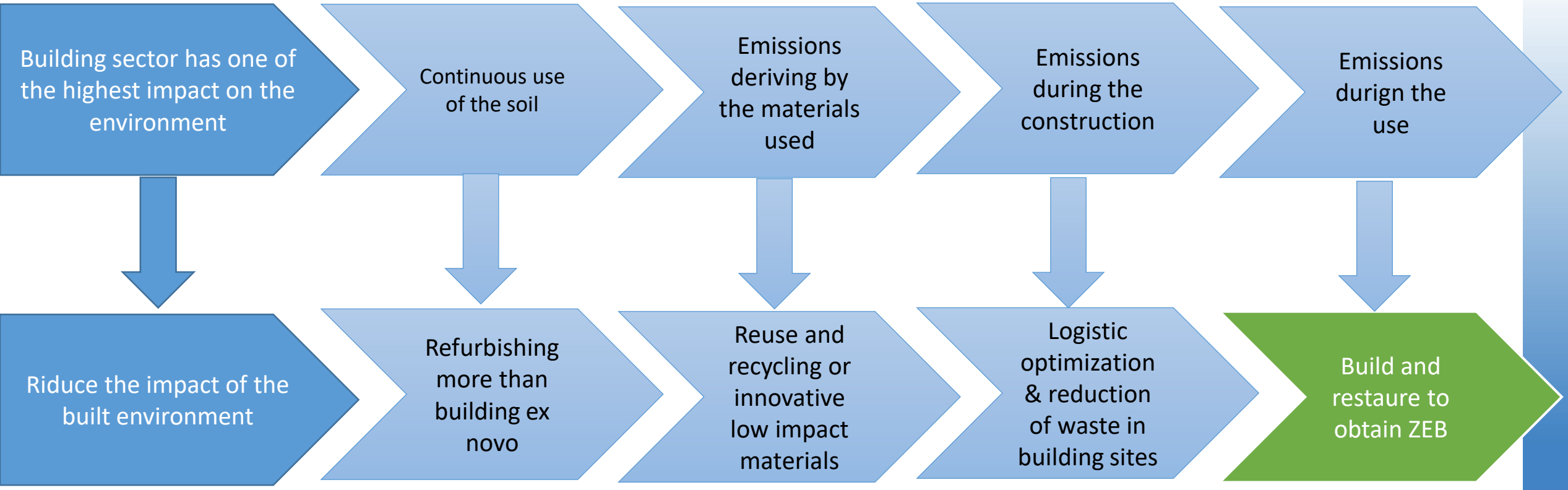
For simple house, **under 100 k euro works**, the BIM modelling it is not economically convenient and the use of CAD and usual metric calculation evaluations are used.



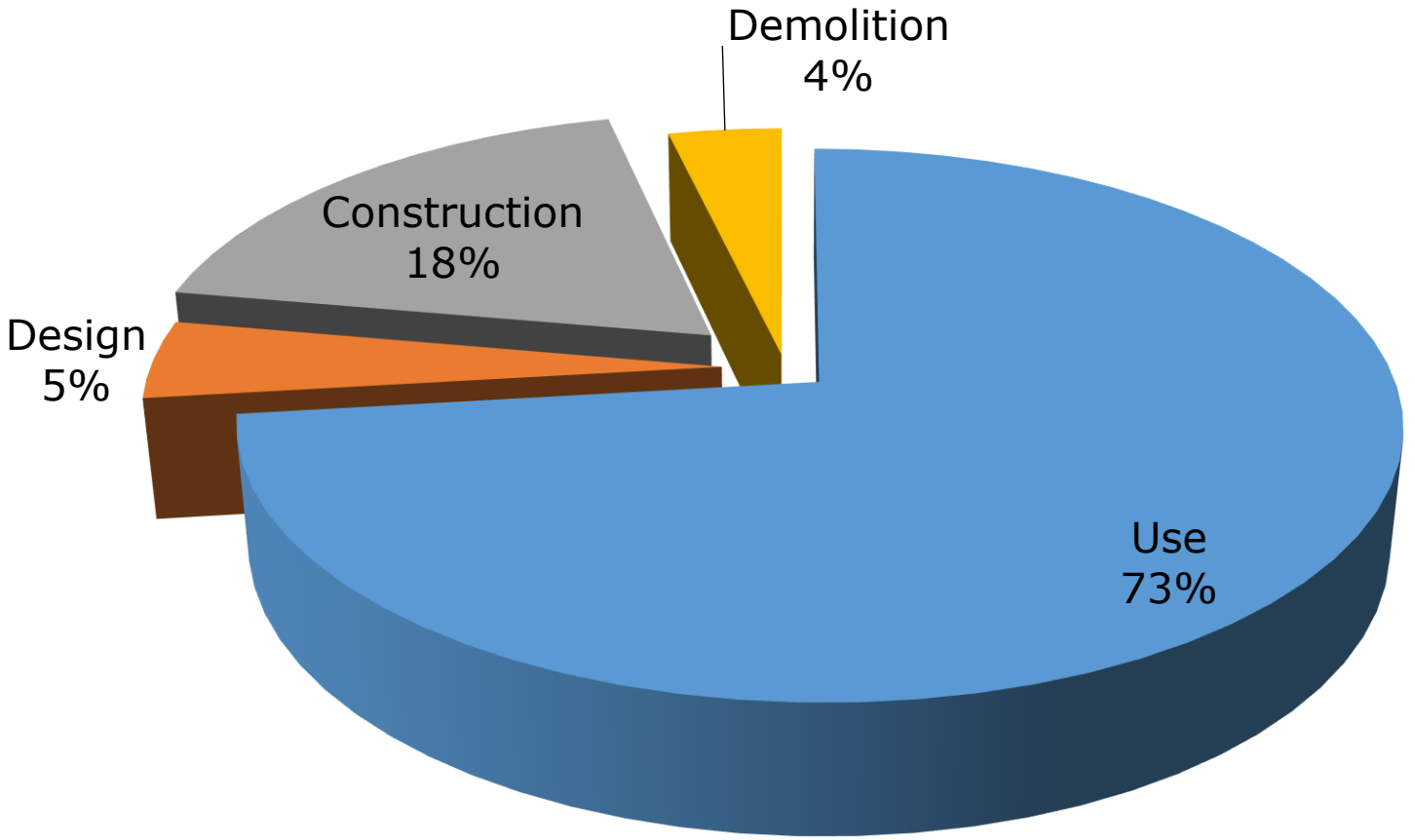
For a more complex building, **over 100k euro works**, the BIM modelling is economically convenient. Besides the values are more reliable as they are based on real geometry

For work **over 1 million euro**, it is cheaper to use BIM

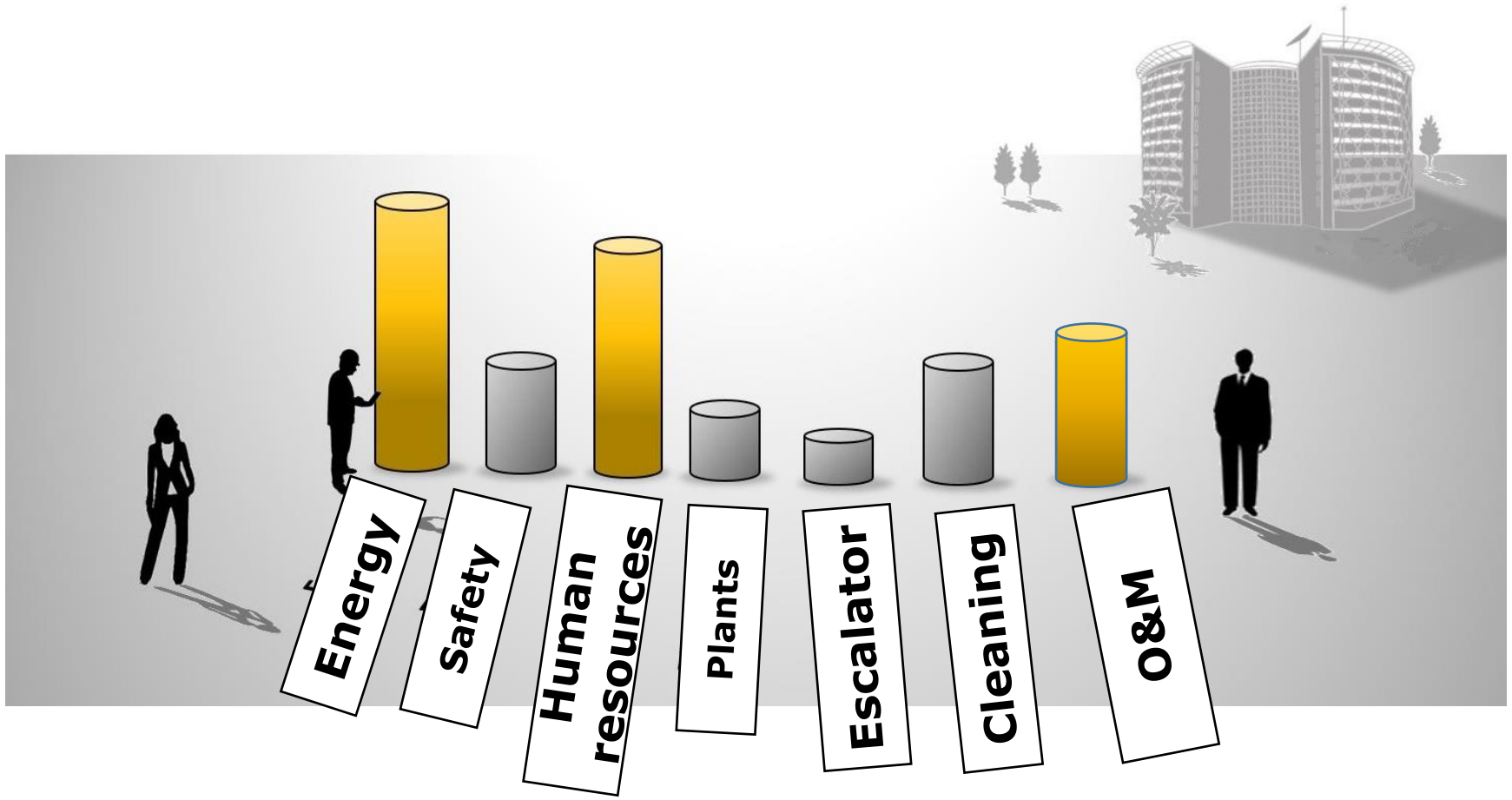
… but energy issues evaluation are important throughout the life cycle of a building



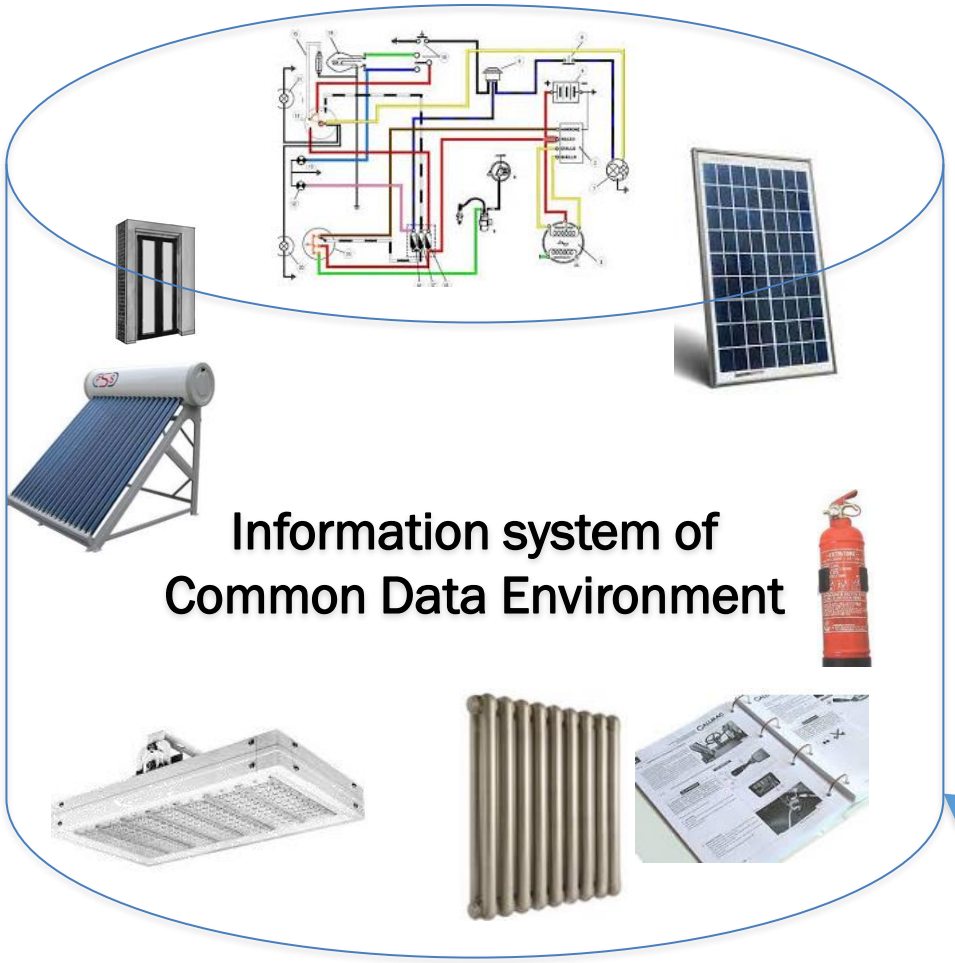
Life Cycle Cost (LCC)

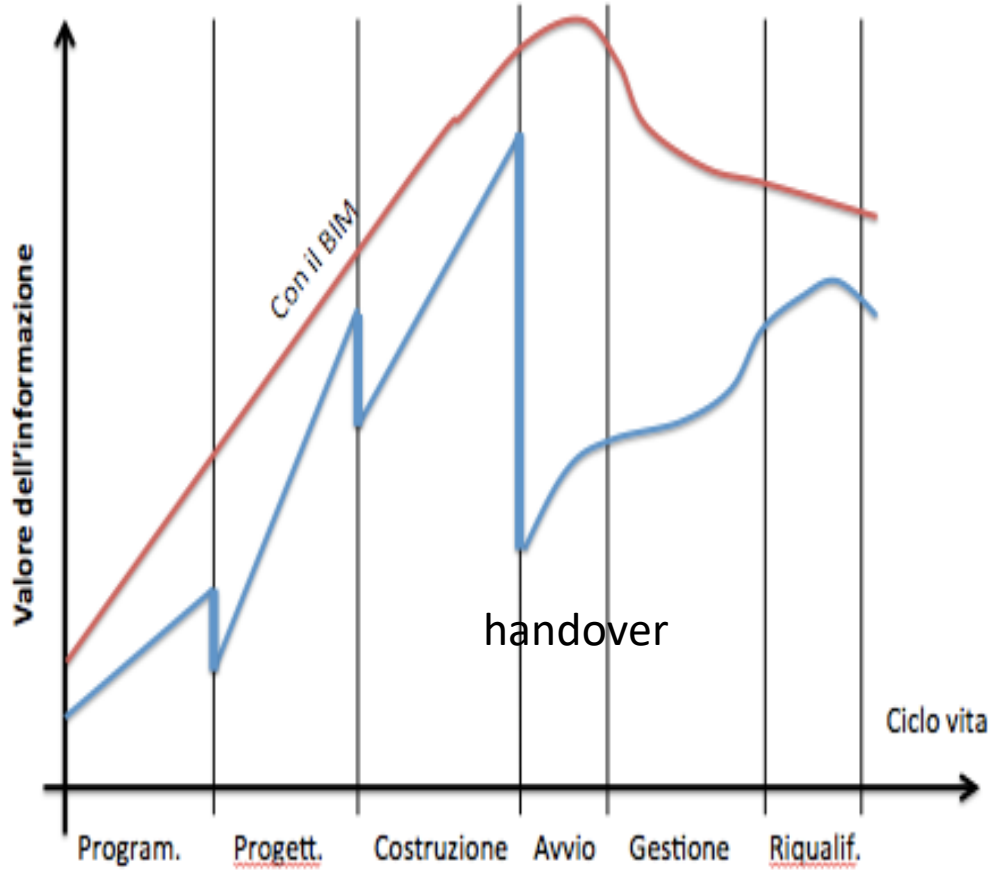


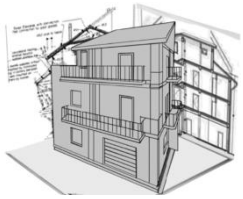
The highest costs during the use of a building



Why BIM is always important for owners







The 3D model of the building

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The point of cloud of S.Maria Novella

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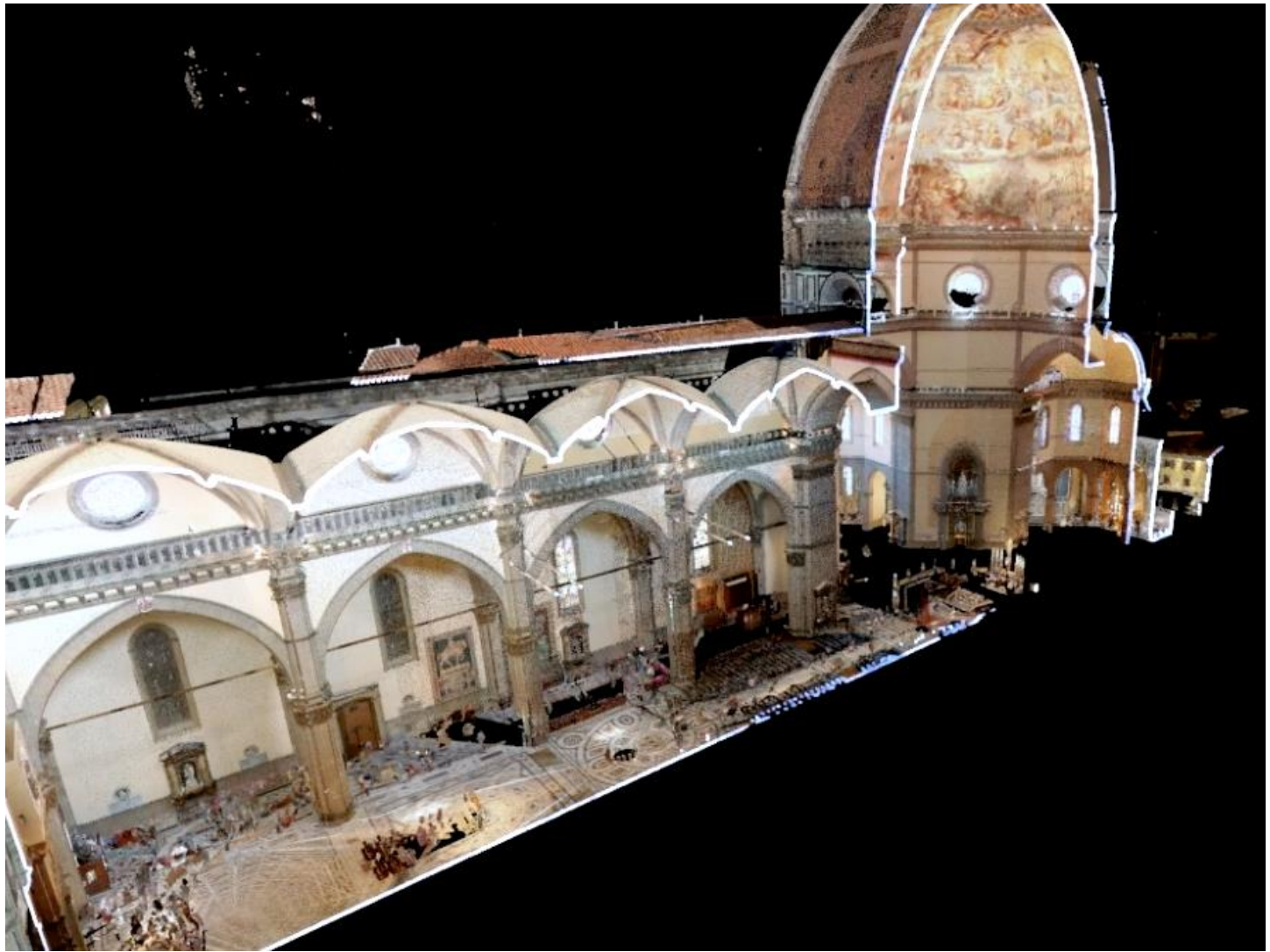

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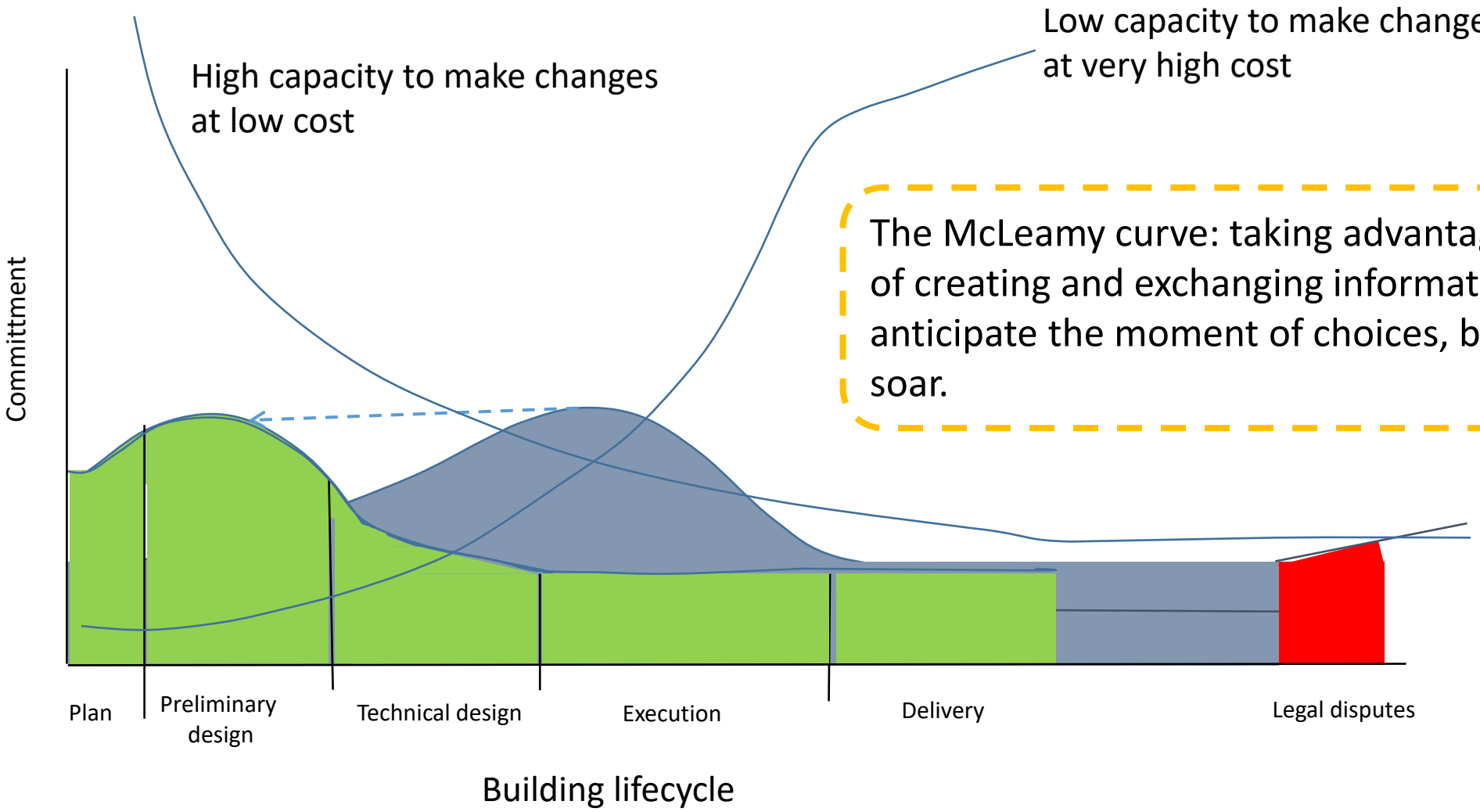
Change of use in a historical building: Forte Bravetta

Why BIM is considered a transparent tool: McLeamy curve



The McLeamy curve: taking advantage of the speed of creating and exchanging information digitally, anticipate the moment of choices, before the curves soar.

The BEEP project: BIM for Energy Efficiency of Public historical buildings in the Med area

- The project is under way with pilot activities in 7 countries (Italy, Spain, Cyprus, Lebanon, Jordan, Palestine, Egypt)
- One of the output of the project is to realize a **guideline to use BIM for Energy Performance Contracting** (EPC) to refurbish public historical buildings (due by the end of this year)
- At least three types of intervention at short, medium and long term, will be presented with three BIM models "**as it will be**" to allow the evaluation of the return of investment and take informed decisions.
- The owner of the buildings will receive the BIM model to be used for the **public tender** and, afterwards, for **O&M**.

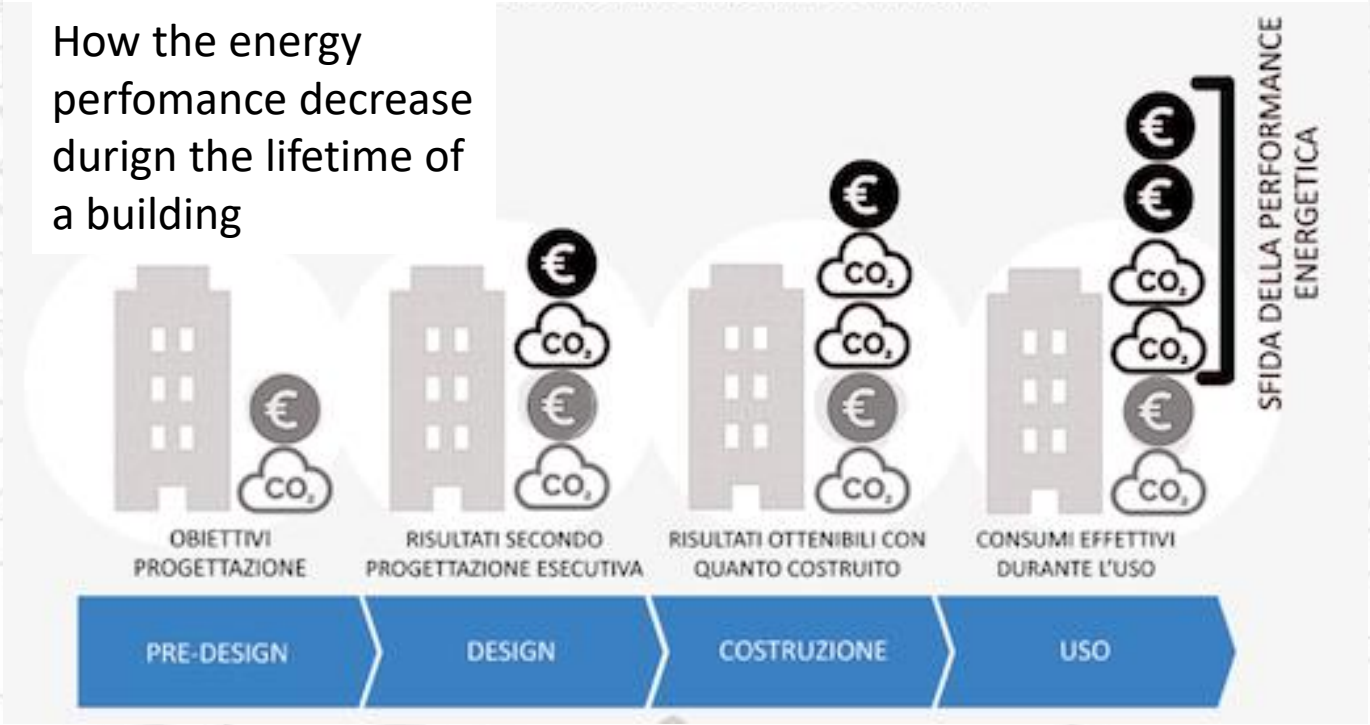
For any use of BIM it is necessary:

- Define the **objectives of the model**
- Identify the **elements** needed to build the model
- Identify the **exchange of information** required among the different actors
- Identify the performance objectives to be used to measure or **pre-qualify the skills of the project team**
- Assign responsibilities to the design team
- Fill the semantic gaps between the companies working on the project

Reduction of 25% energy compared to baseline figures.
Leading to a 32% increase in profit and 36% reduction in CO2 emissions.
Made more efficient (in terms of both cost and water consumption)
Up to 30% of Energy Saving Up to 30% Emission reduction
Achieve PassivHaus certification.
Using integrated design technologies as well as simulation software.
GWP reduction of 60%. Operational energy consumption reduction of 35%
Operational energy reduced by 35% and energy running costs reduced by 35%

The energy performance gap

How the energy perfomance decrease durign the lifetime of a building



The problem of the “energy gap” between what has been designed and what is in O&M

An example: the exchange of information during preliminary analysis with BIM

Authorization body

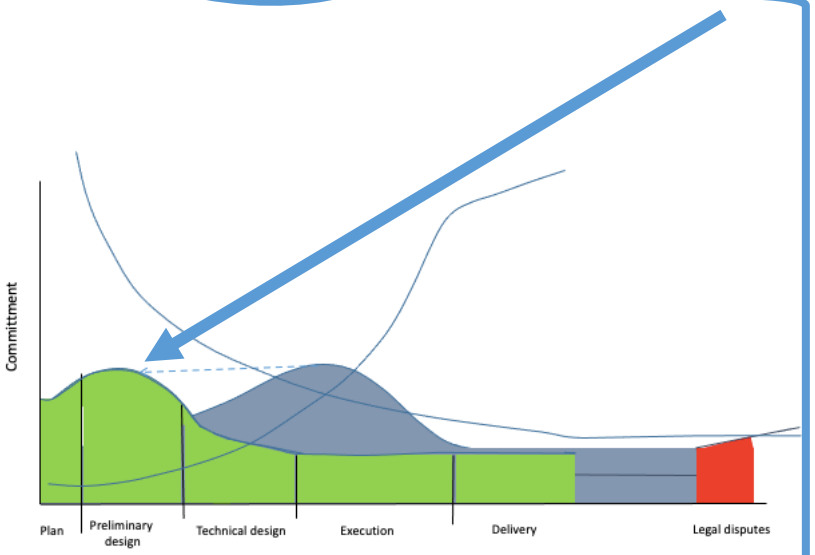
Owner

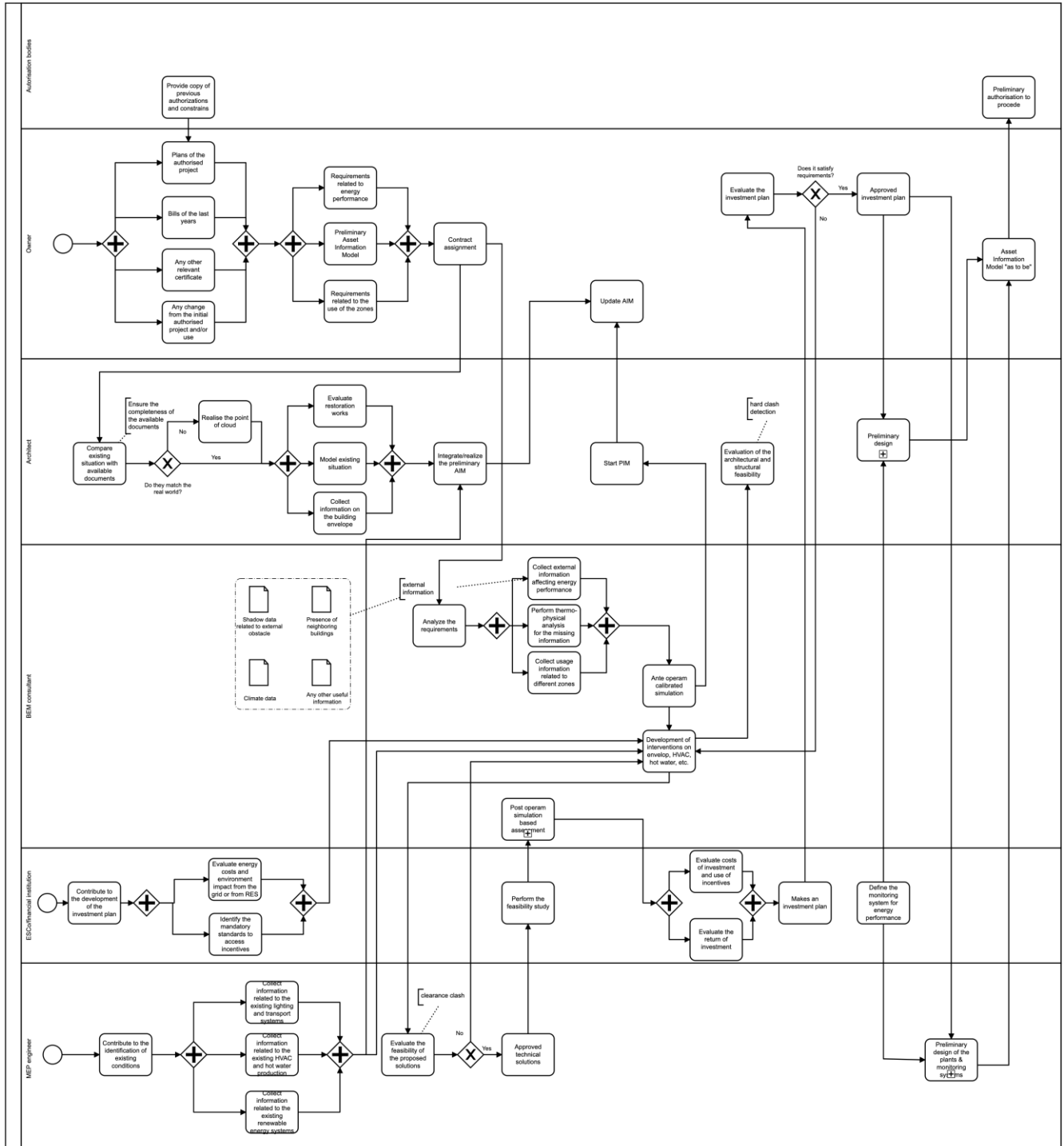
Architect

BEM consultant

ESCo/Financial institution

MEP engineer





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The **recognition of skills and competences**: the European ARISE project (starting in September and lasting 30 months)

Revolutionizing the learning process by changing the face of delivery and ***recognition of sustainable energy skills*** *in the construction sector by working on:*

1) Skills delivery method
2) Learning accounts transaction and recognition
3) Matrix of skills maturity, leading to new qualifications and jobs
4) Task –based learning content
5) Impacts of skills on buildings' energy performance
6) New market and regulatory models of skills demand
7) Stimulation of investments in high energy performance buildings

The roadmap for the digitalization of the authorization process: BIM maturity level of the public administration to speed up procedures

Communication by mail or e-mail. Data exchange by forms, drawings and maps. Digital (e.g. pdf), paper or combined.

Key word describing the stage: Paper, pdf, people to people communication, manual

No ambitions

Manual

Current implementation in most countries worldwide

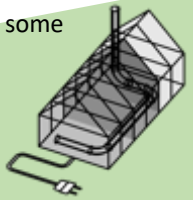
Digital communication and data exchange between authorities and asset owners and the construction value chain. Increasing interoperability and automated data control.

Key word describing the stage: Digital communication, reuse of public data, 3D models for visual use, xml, partly automated, open BIM, existing legislation

Low hanging fruits

BIM initiation

Current implementation in some countries



Advanced BIM

Hybrid

Current pilot projects in a few countries

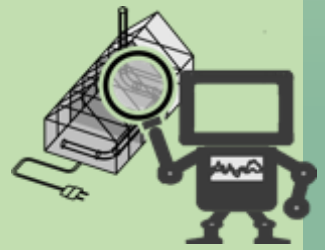
Interoperable data exchange with CDE and relevant private and public databases Automated regulatory control and permit.

Key word describing the stage: Integrated, BIM, automated, robot, machine readable and interpretable regulations, open standards, digital friendly legislation

Long term ambitions

Automated

A few research projects



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Conclusions: the opportunity for EEMI to **increase the financial impact** by increasing the demand for the use of BIM and the use of qualified personnel

- Produce a **list of requirements** to finance an energy requalification intervention especially for ”listed" buildings to be introduced in the “BIM use”
- Participate to the BEEP working group to develop a **guideline** for the use of BIM for the refurbishment of historical buildings
- Establish the requirements for the working team to guarantee the quality of the work and therefore the RoI
- Become an associated partner of ARISE to contribute to increase the demand for **qualified personnel** needed to correctly intervene on energy requalification
- Participate in the regulatory room, or, at least, identify big-players capable of **speeding up the digitization of authorization processes**

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