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Setting the scene: Using BIM for the EPC generation process

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Why use BIM to generate Energy Performance Certificates?

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According to a consultation carried out in 2021 by the European Commission, EPCs:

Outdated

Inaccurate

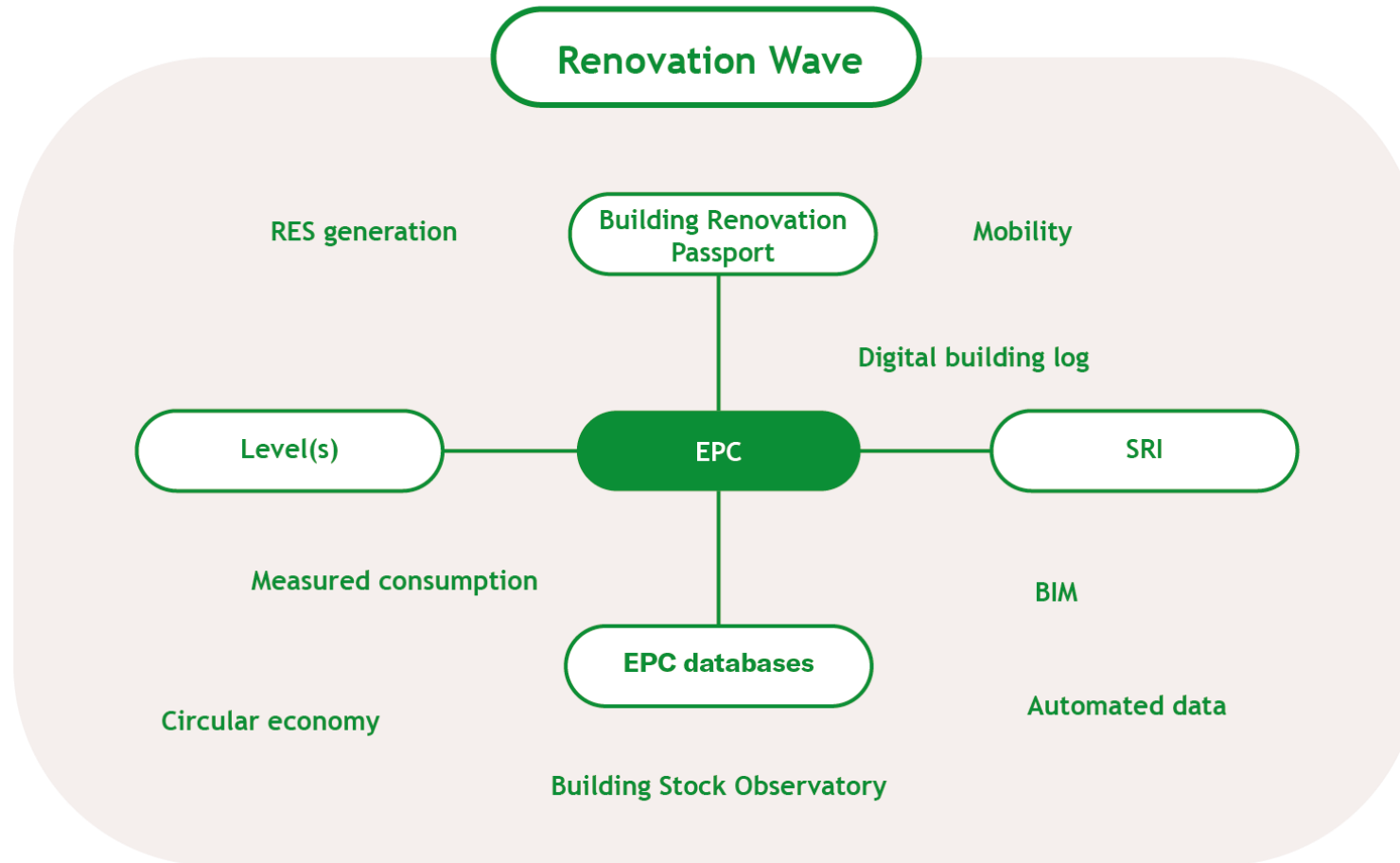
Incomplete

They do not reflect the actual characteristics and conditions of the building

Lack of reliable and standardised input data

Heterogeneity in tools and methodologies

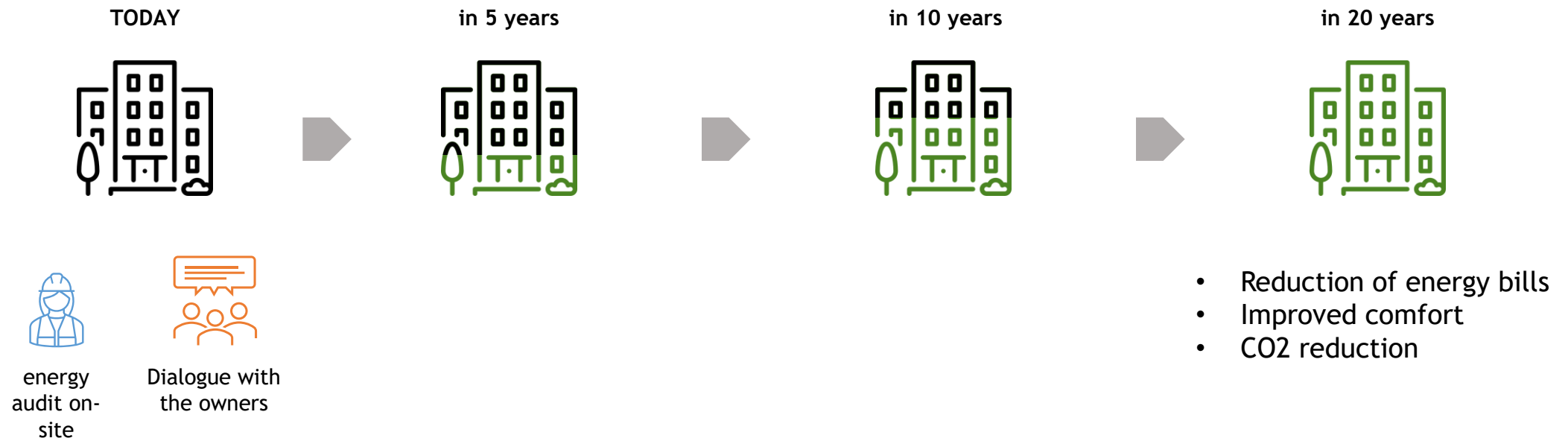
What does the EPBD recast say about BIM?



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Building renovation passports

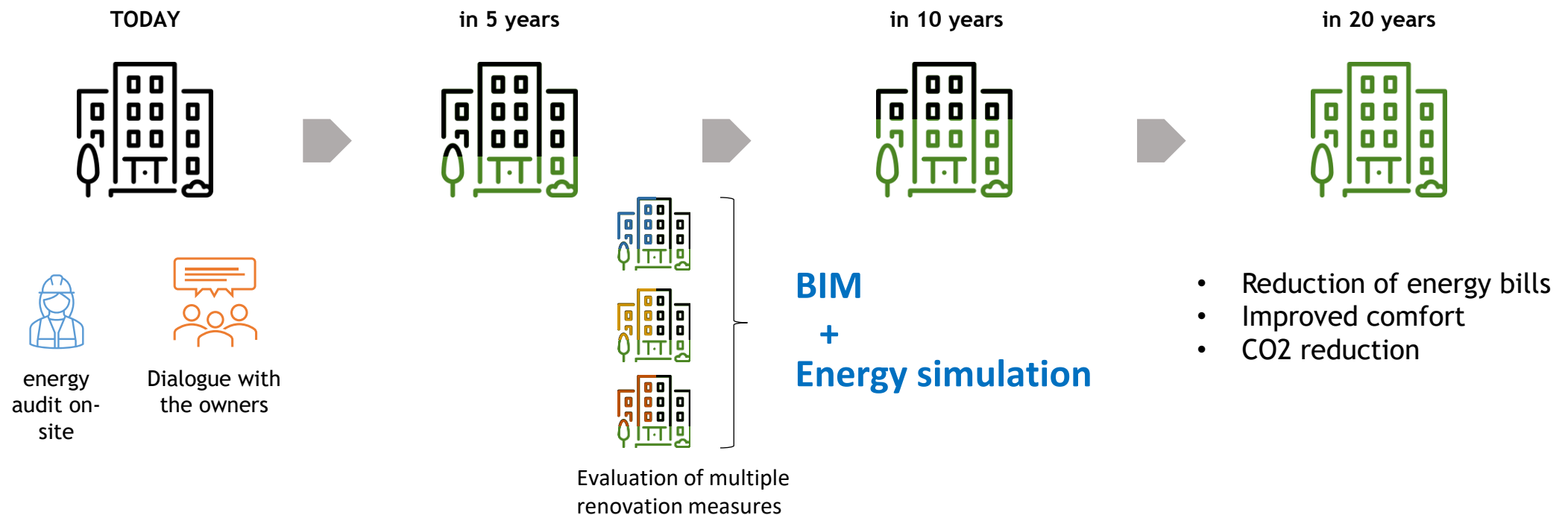
A Building Renovation Passport is defined as a document - in electronic or paper format - outlining a long-term (up to 15 or 20 years) step-by-step renovation roadmap for a specific building.



What does the EPBD recast say about BIM?

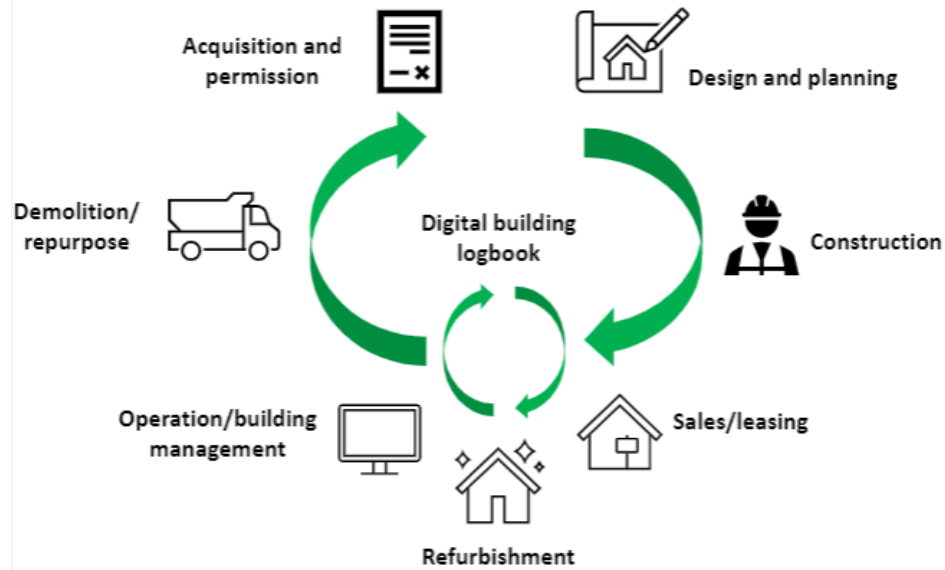
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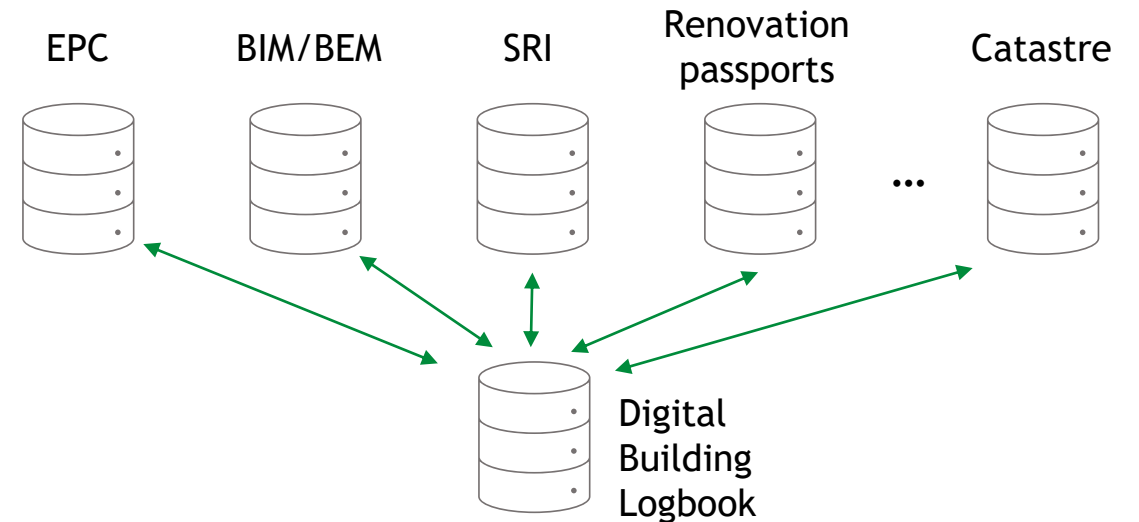


What does the EPBD recast say about BIM?

Building digital logbook



Building life-cycle *



* European Commission, Executive Agency for Small and Medium-sized Enterprises, Volt, J., Toth, Z., Glicker, J. (2020). *Definition of the digital building logbook : report 1 of the study on the development of a European Union framework for buildings' digital logbook*, Publications Office. <https://data.europa.eu/doi/10.2826/480977>

Current status

- EPCs are outdated, inaccurate and incomplete (unreliable input data).
- EPBD calls for step-by-step renovation and centralisation of existing building data.

Why is BIM a possible solution?

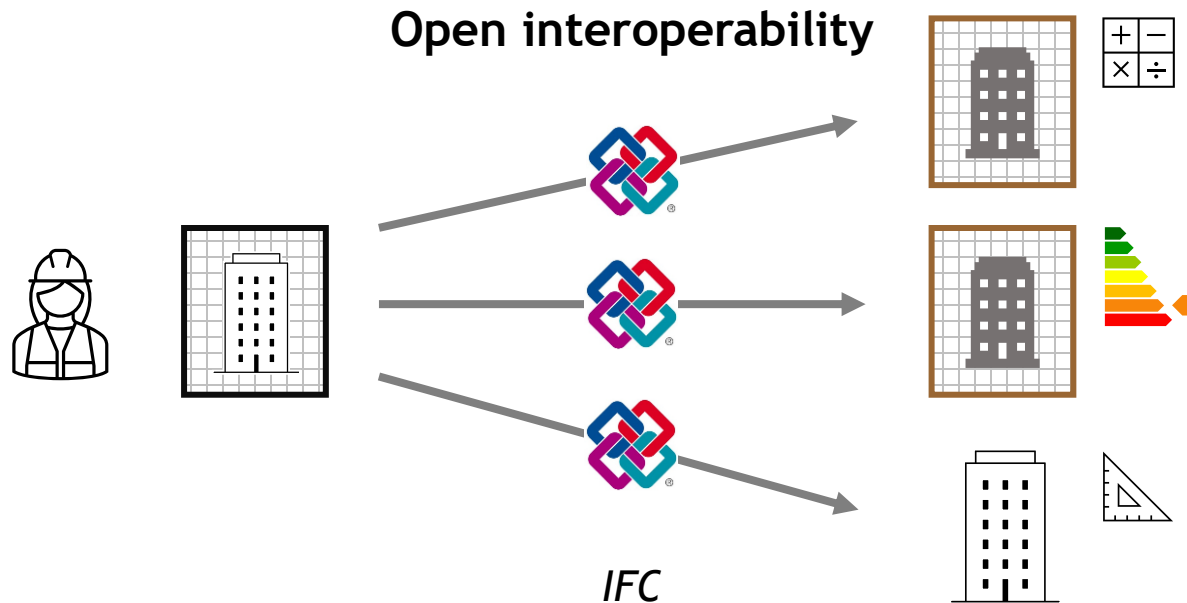
BIM offers:

- Accuracy and reliability (reduces human error)
- Data reuse
- Open methods of interoperability

Barriers

- High costs
- High execution time

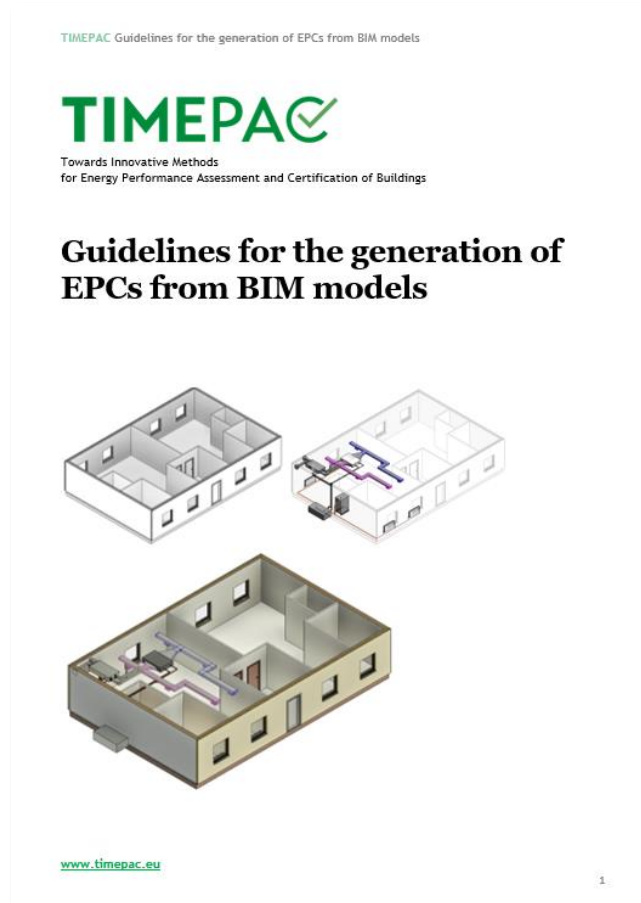
Limitations and challenges



Limitations:

- Importing/exporting IFC between applications from different developers
- Each discipline (ex: energy simulation) requires specific data and has constraints on how it is modelled

BIM-EPC guidelines



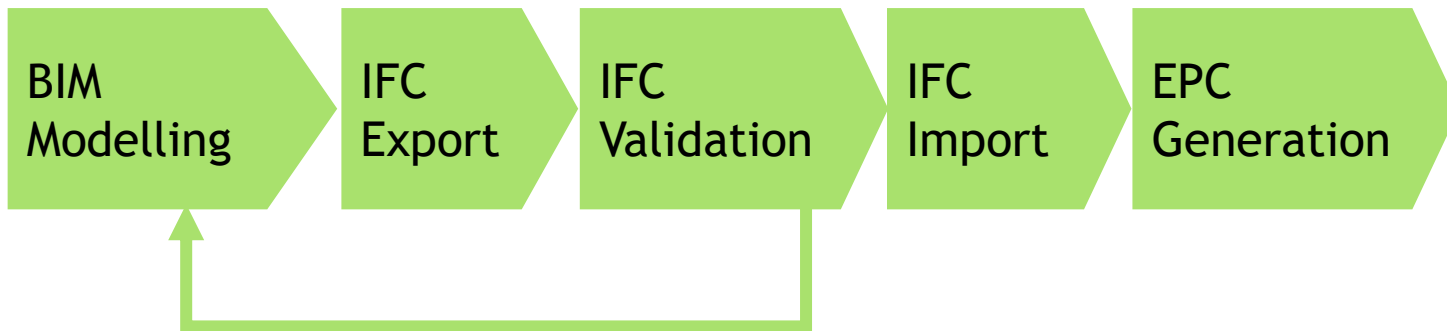
Guidelines for the generation of EPCs from BIM with a focus on open interoperability

- Check that all data required for an EPC are present in the BIM model.
- Ensure that the BIM model has been generated in such a way that it can be imported by EPC tools.

BIM-EPC guidelines

Scenarios:

- A BIM model must be created
- A BIM model has already been created



Tools

BIM

- CYPE
- Revit

IFC Viewers

- usBIMviewer
- Solibri
- BIMserver.center

EPC

- CYPETHERM HE Plus
- Edilclima EC700
- ETU-Software

Application cases



Cases

- 30 buildings in 6 countries
- BIM from scratch
- BIM model validation

Uses:

- Residential
- Tertiary

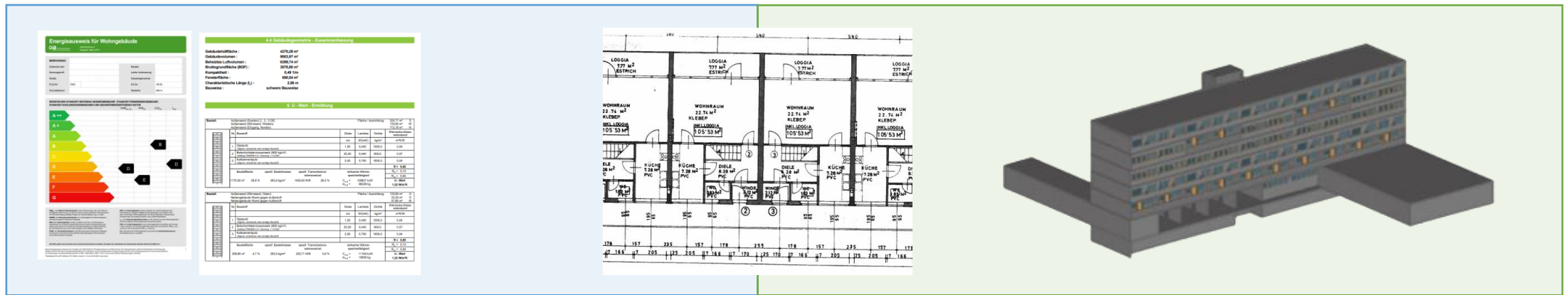
Input data:

- Floor plans
- EPCs
- BIMs

Time:

- BIM: ~ 8 hours
- No BIM: ~ 12 hours

Reliability assessment

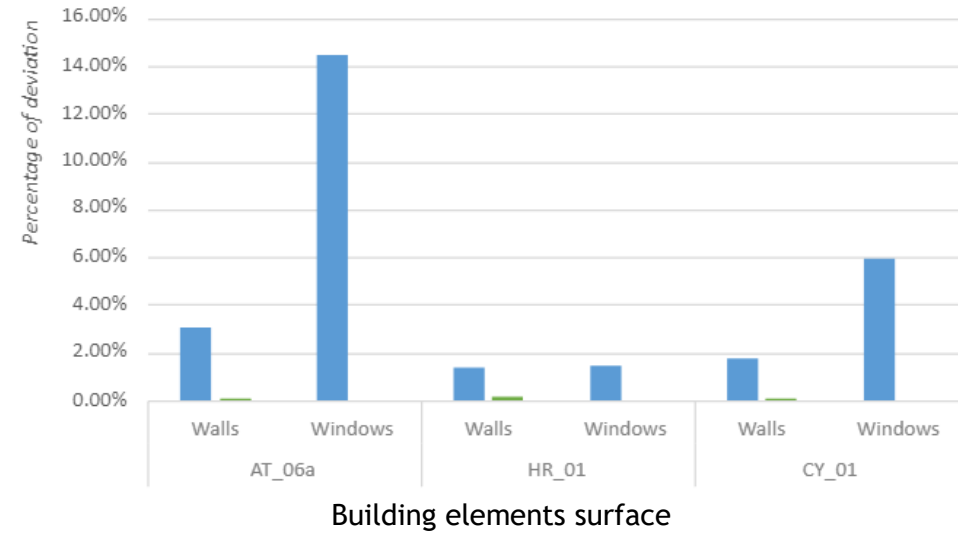
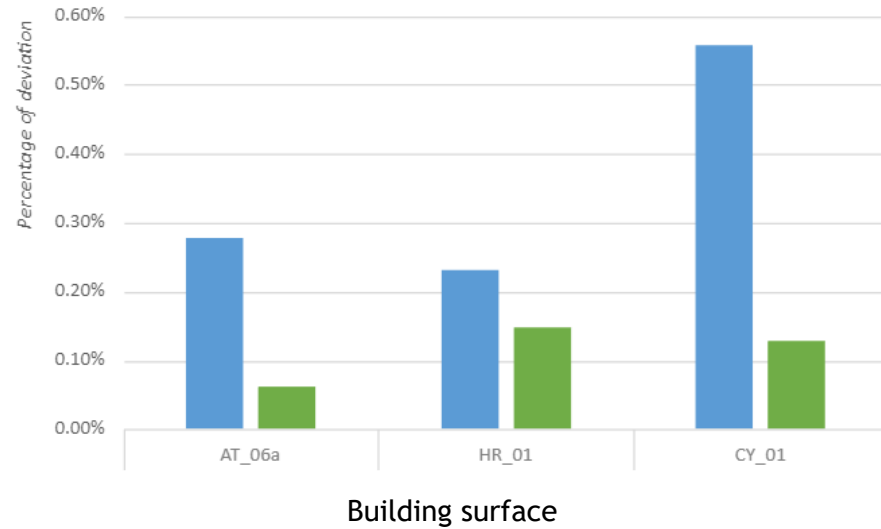


EPC

architectural drawings

BIM model

Reliability assessment



EPC

architectural drawings

BIM model

Conclusions

We have proposed guidelines for the generation of EPCs from BIM with a focus on open interoperability.

Data interoperability is the key challenge, requires the collaboration of multiple stakeholders.

Using BIM models to generate EPC improves the quality of the input data for EPC generation.

**If you would like more information,
please contact us at**

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Thanks for your attention!