

CARNOT Usermeeting 2023

From IFC to a comprehensive thermal finite element analysis as the basis of the next-generation BES



# Fraunhofer Italia

Who are we

# Digital and Sustainable Construction

Unser interdisziplinäres Team



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domotronician



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Civil engineer



**Eliana Bortot**

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Civil engineer



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Physicist



**Mariana Ataide**

Building Permit  
Architect



**Orjola Braholli**

Sustainability  
Architect



**Julius Emig**

Interoperability  
Civil engineer



**Ilaria Di Blasio**

Environment  
Environmental engineer



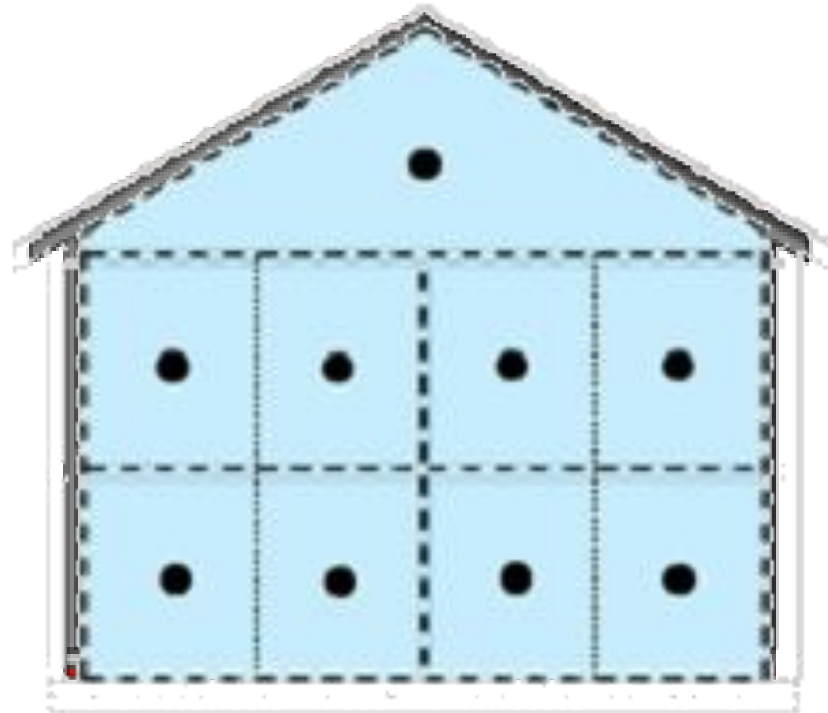
# Building Energy Modelling

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How does it work now?

# Building Energy Modelling

Actual approach

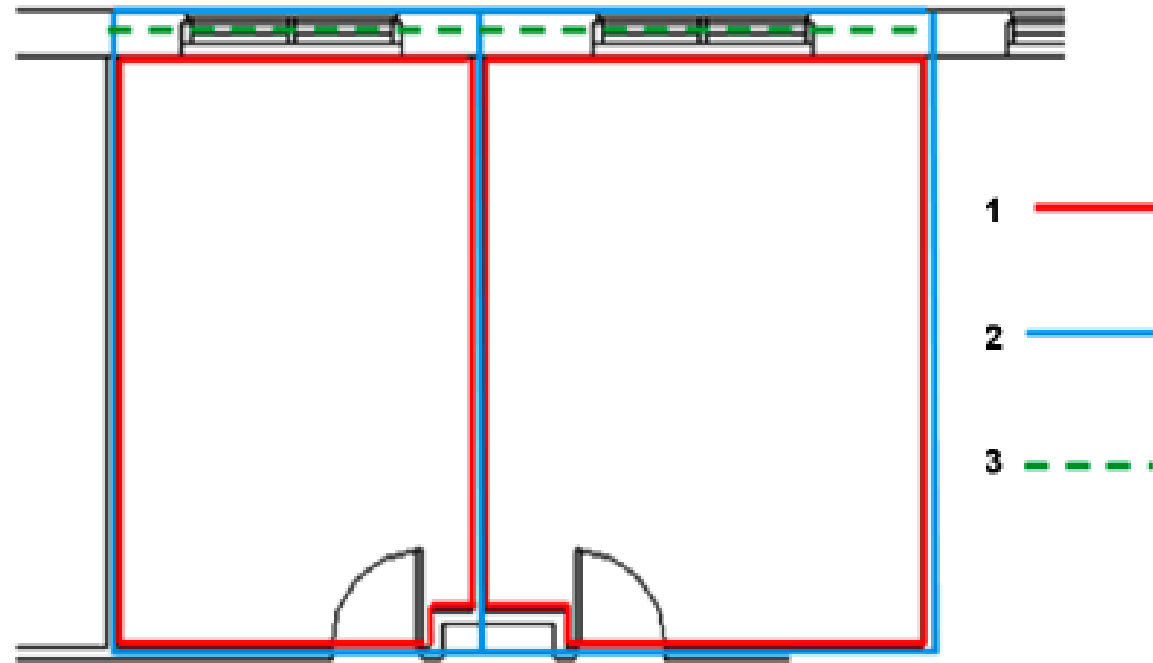
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Source: Autodesk

# Building Energy Modelling

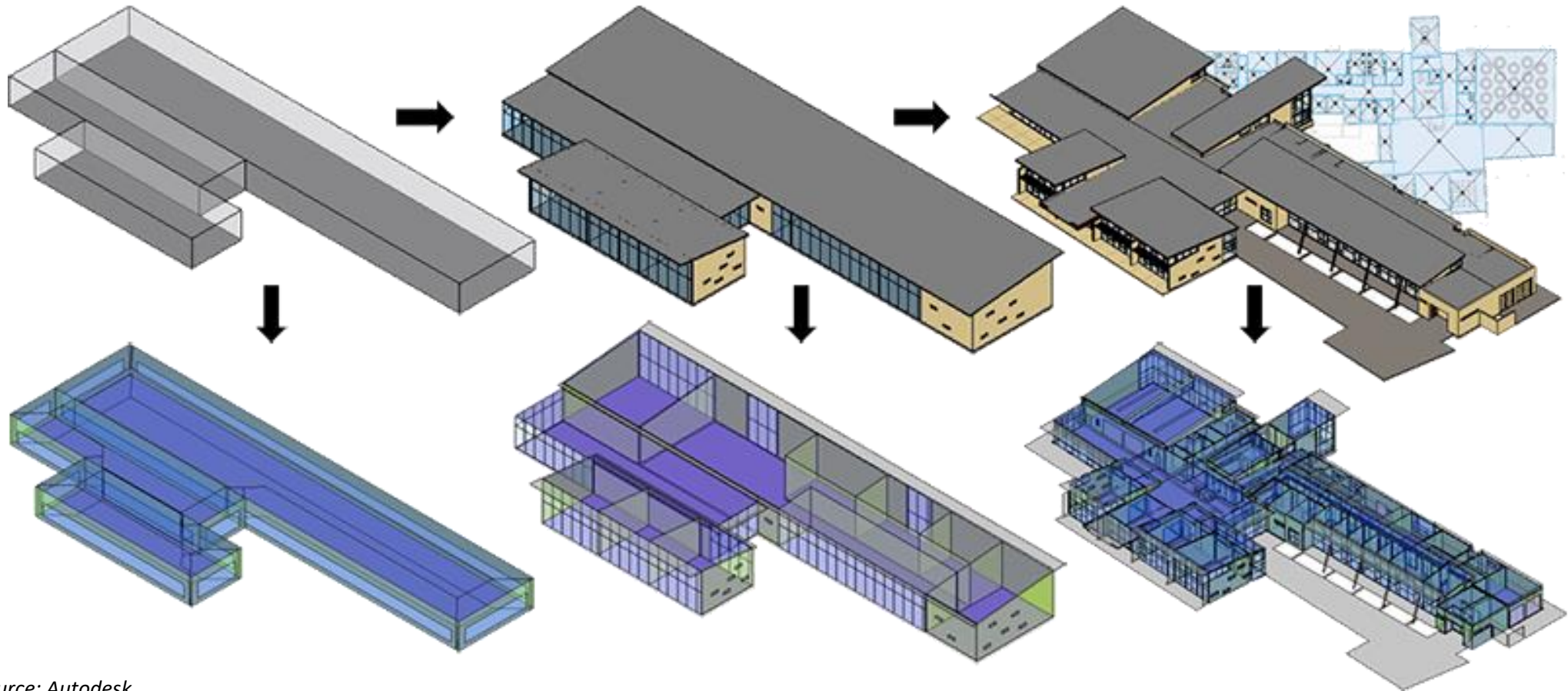
## Actual approach



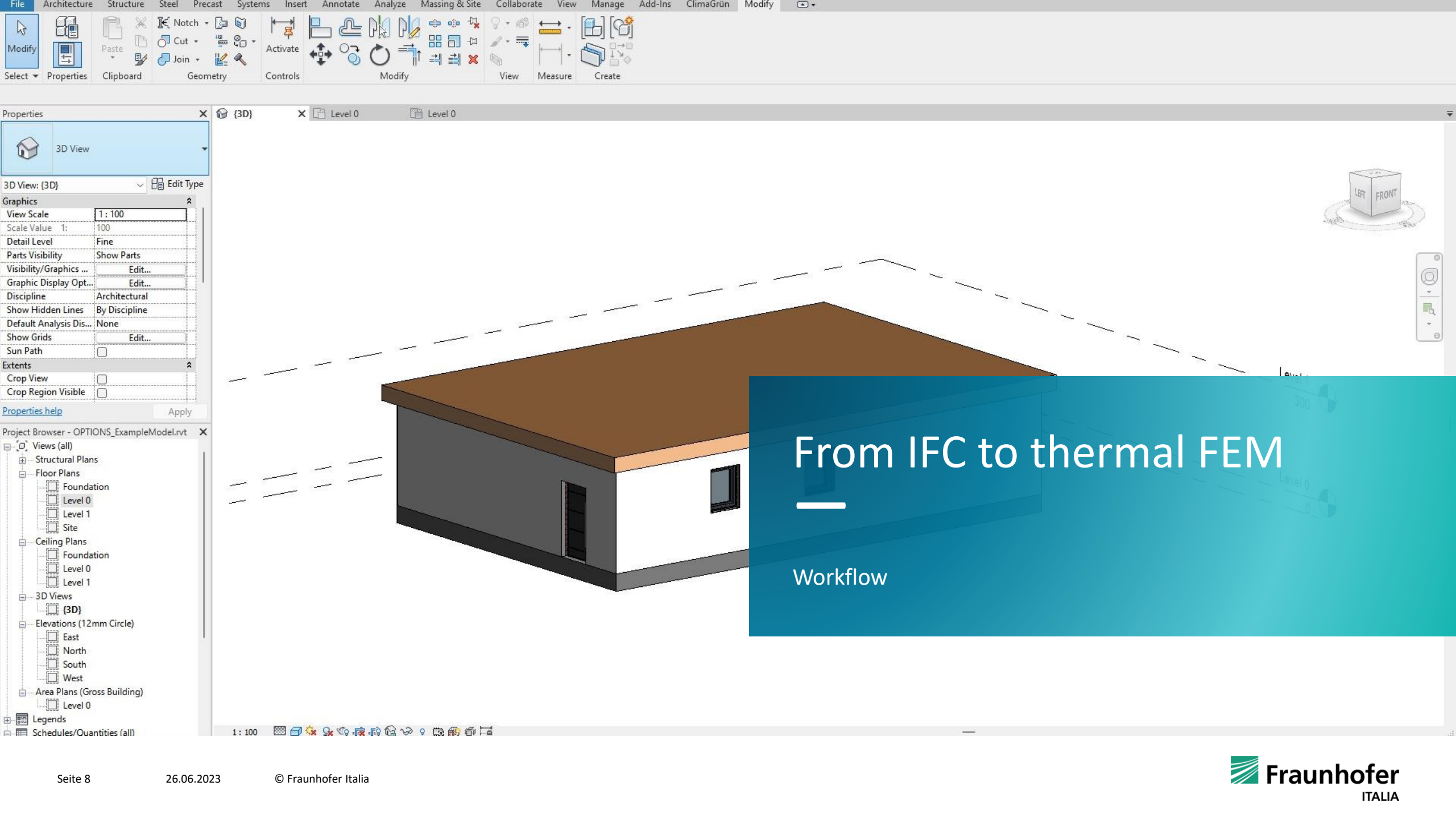
Source: Autodesk

# Building Energy Modelling

Actual approach



Source: Autodesk



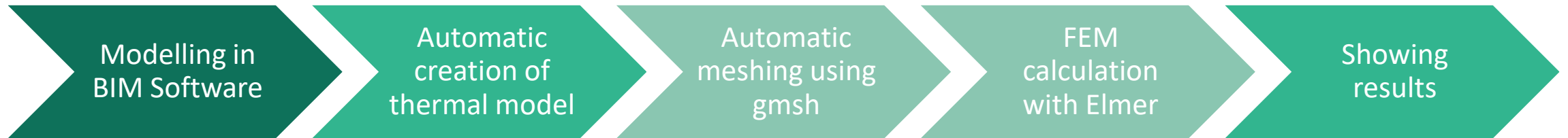
# From IFC to thermal FEM

Workflow



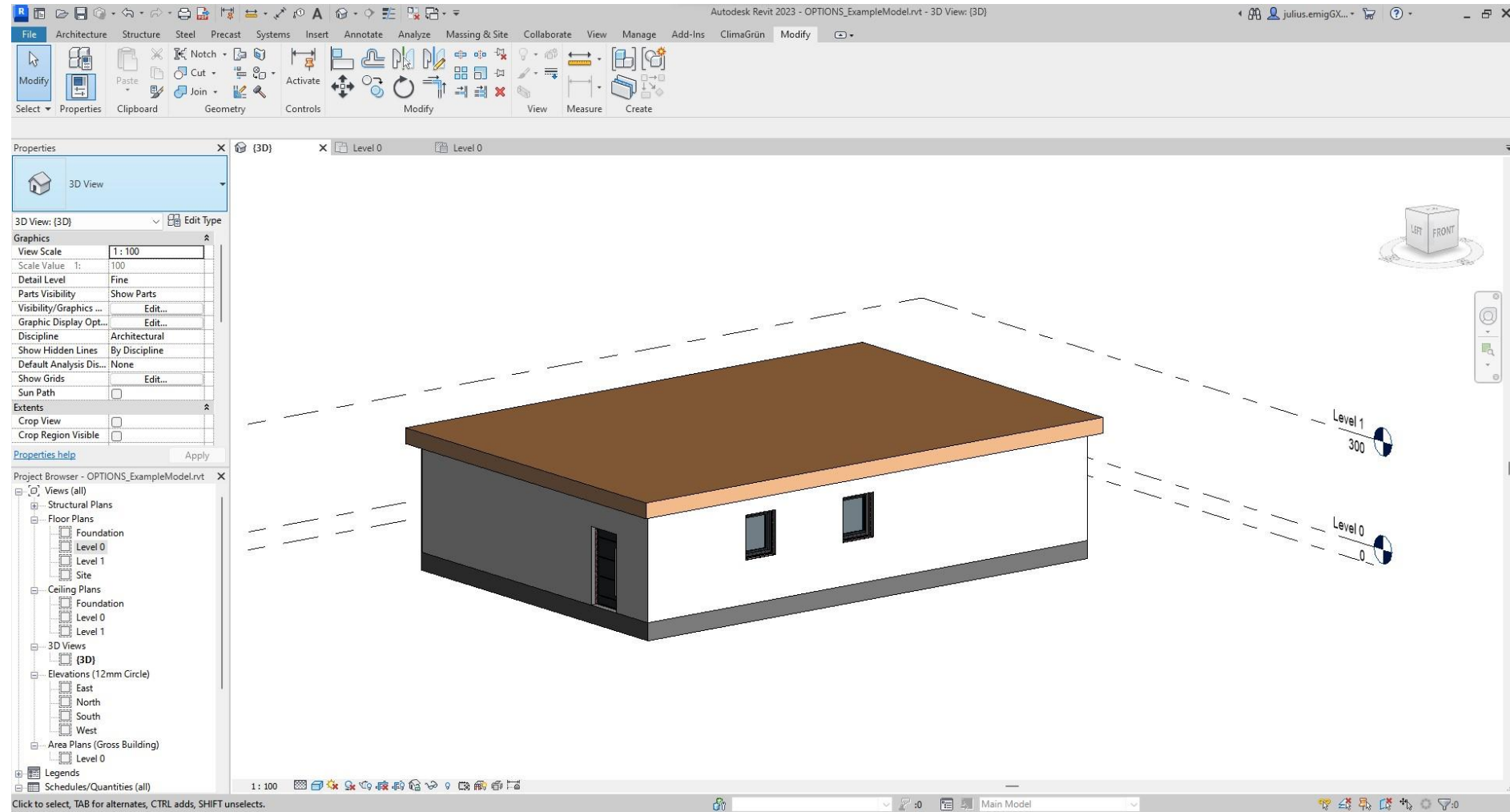
# From IFC to thermal FEM

## Workflow



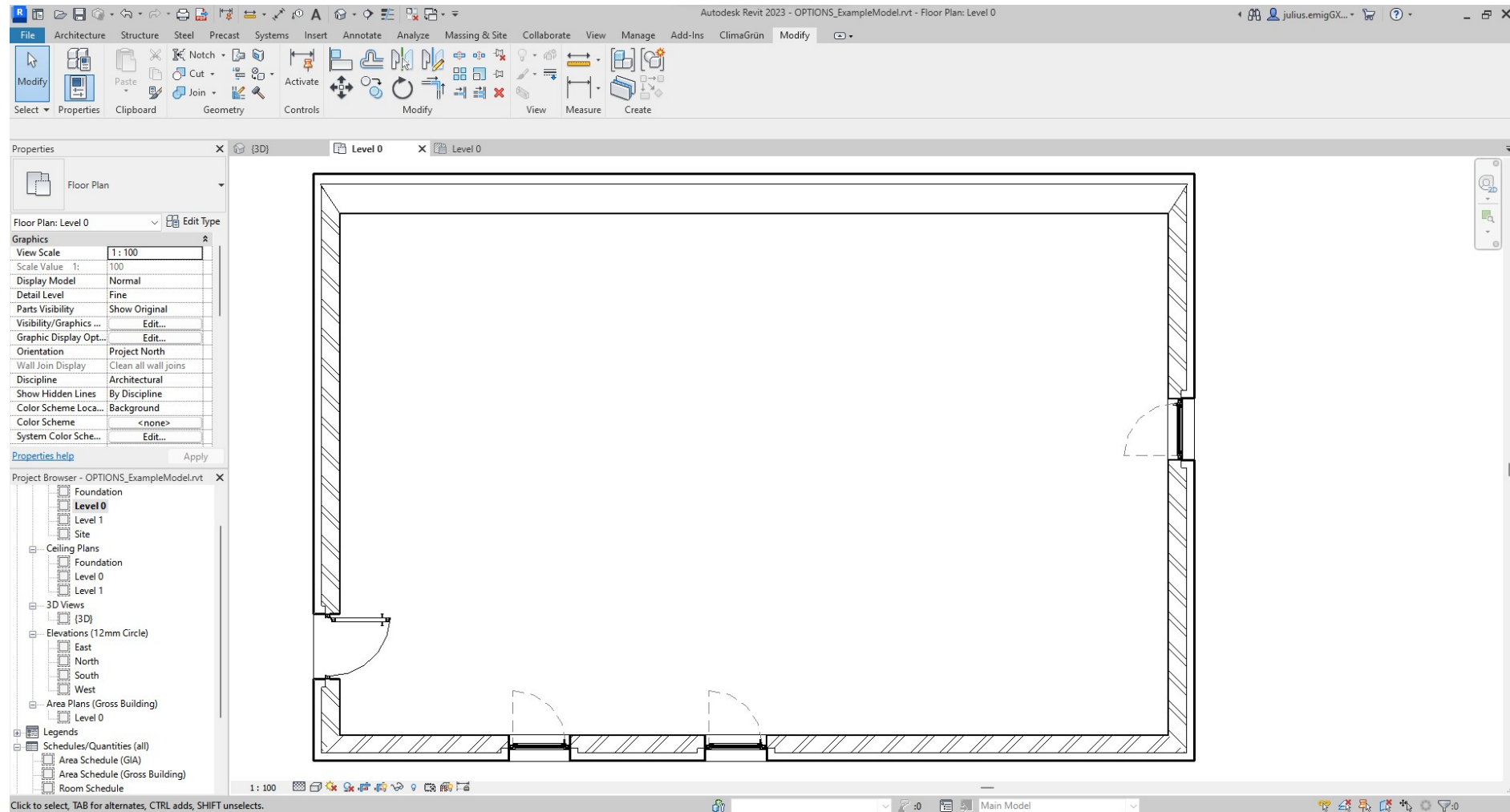
# From IFC to thermal FEM

## Workflow



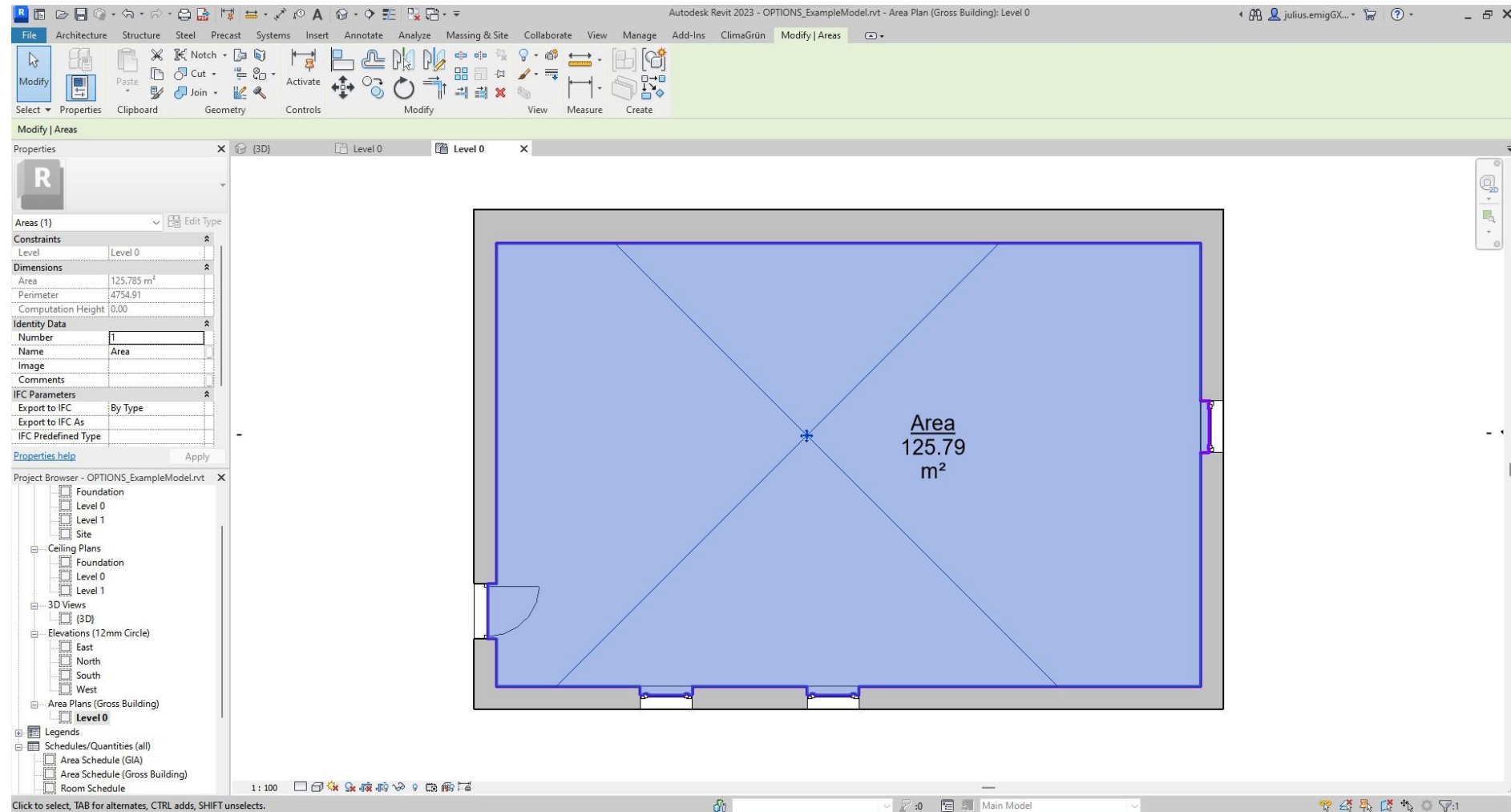
# From IFC to thermal FEM

## Workflow



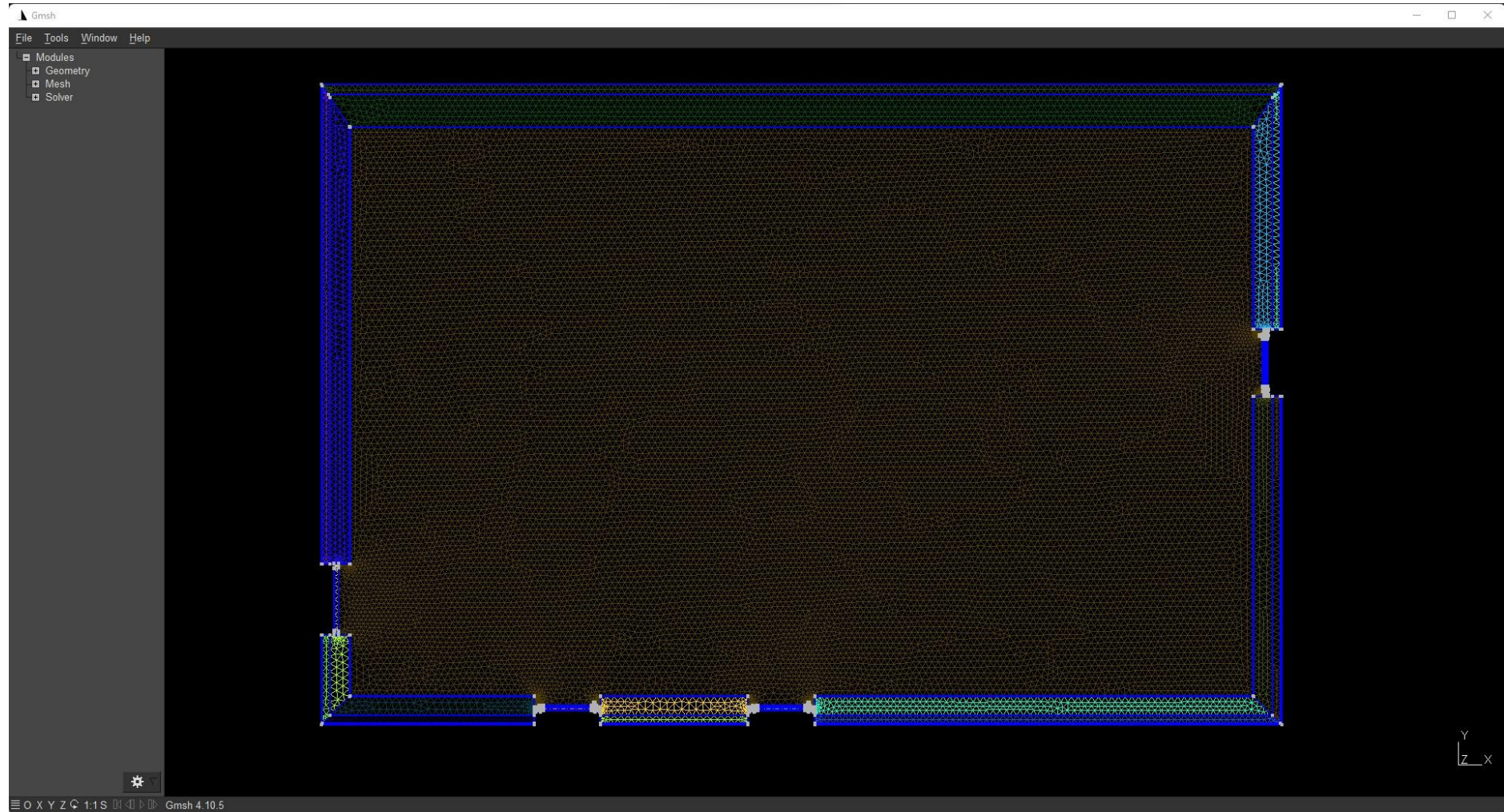
# From IFC to thermal FEM

## Workflow



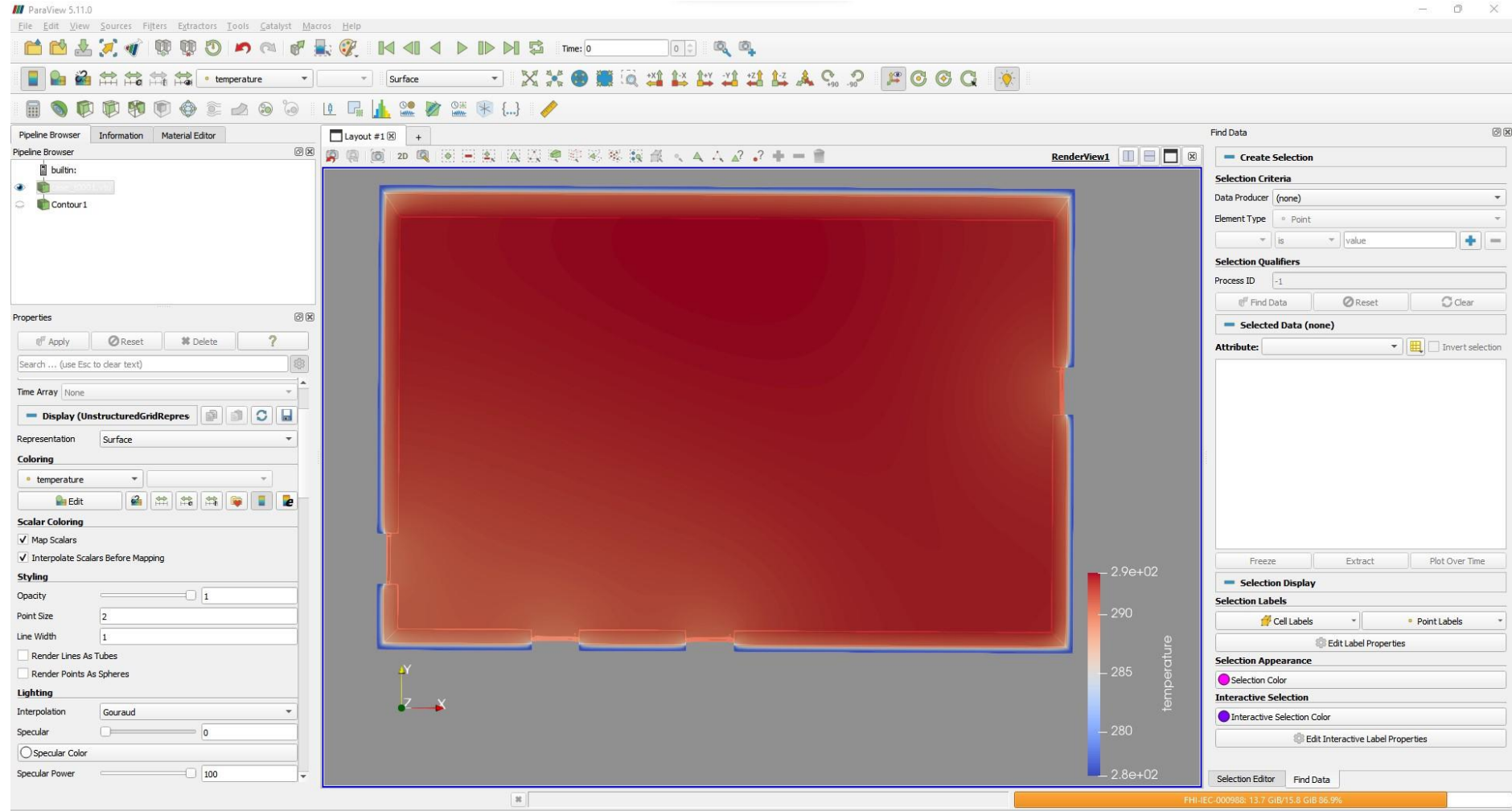
# From IFC to thermal FEM

## Workflow



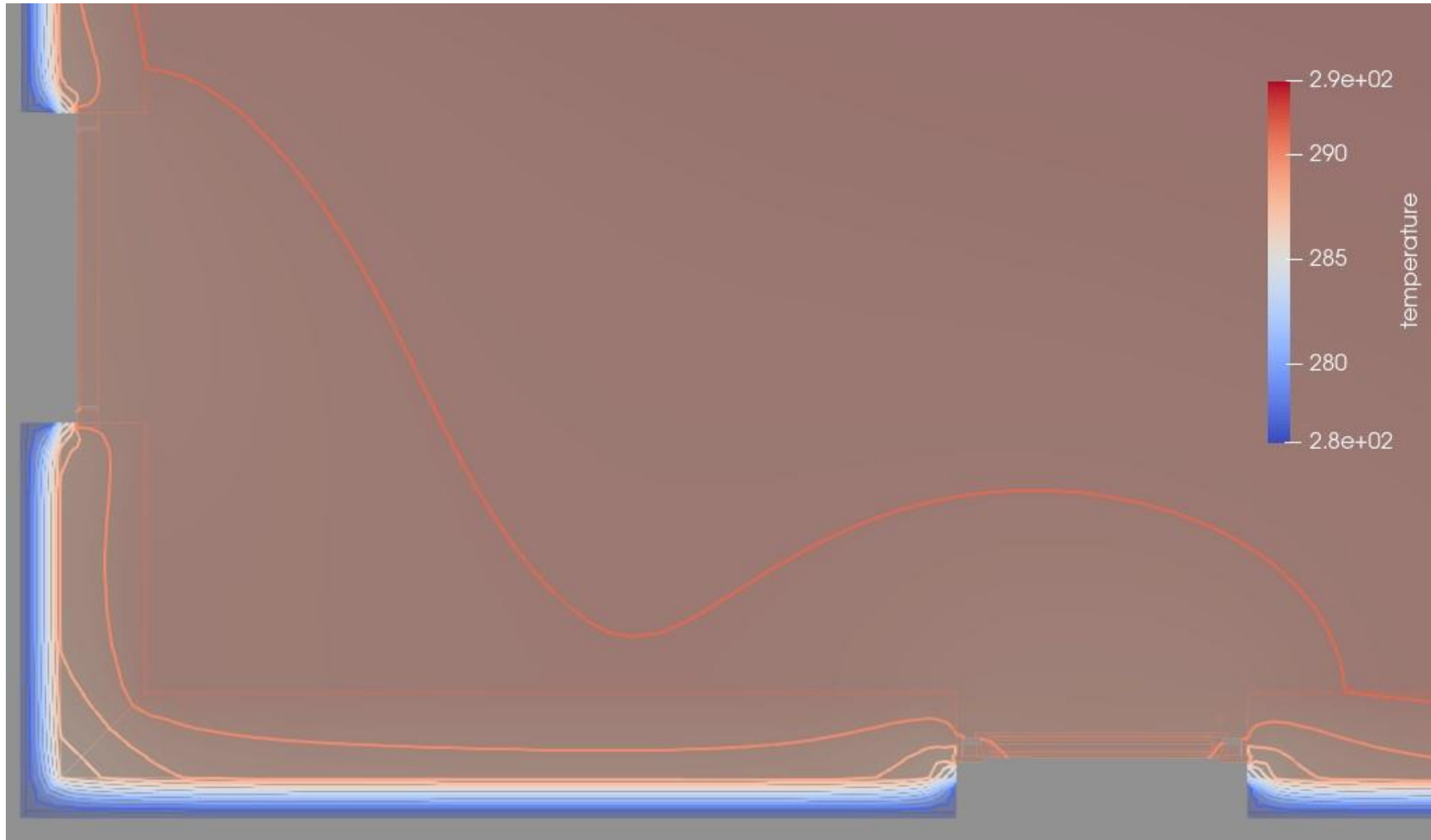
# From IFC to thermal FEM

## Workflow



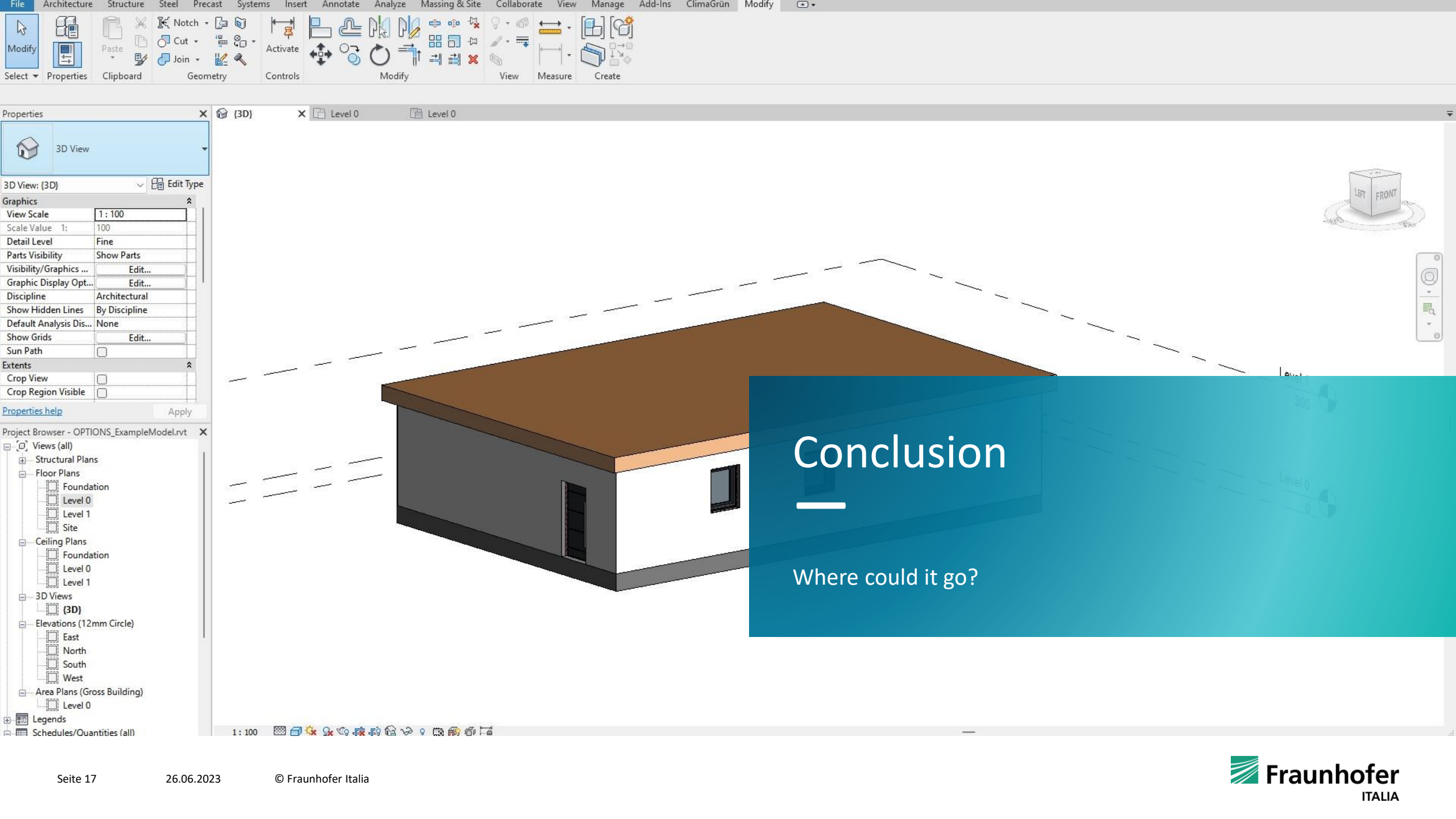
# From IFC to thermal FEM

## Workflow



(ifc-fem-env) C:\Users\jemig\001\_Git Projects\03\_ifc\_fem\_interface\tests>





# Conclusion

Where could it go?

# Conclusion

## The future of BES?

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- On short term:
  - Validation and parametrizing of BES models by steady state simulations or (short-time) transient simulations.
  - Complex details (thermal bridge) as transient simulation (maybe without mass).
- On long term:
  - Full transient simulations enabled by partitioning and GPU support.

# Contact

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