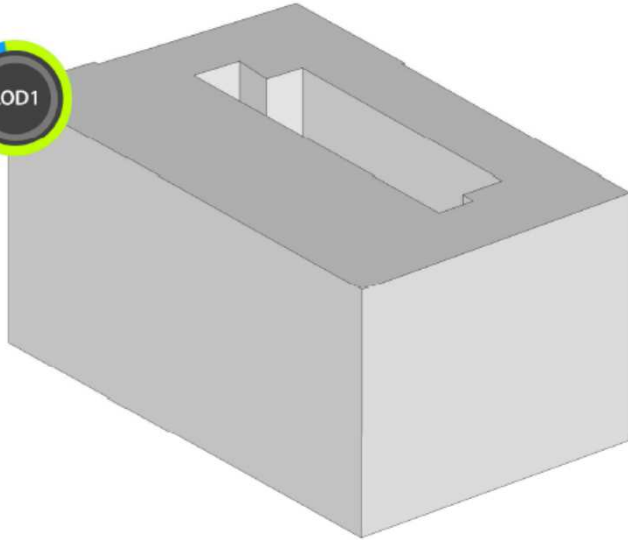




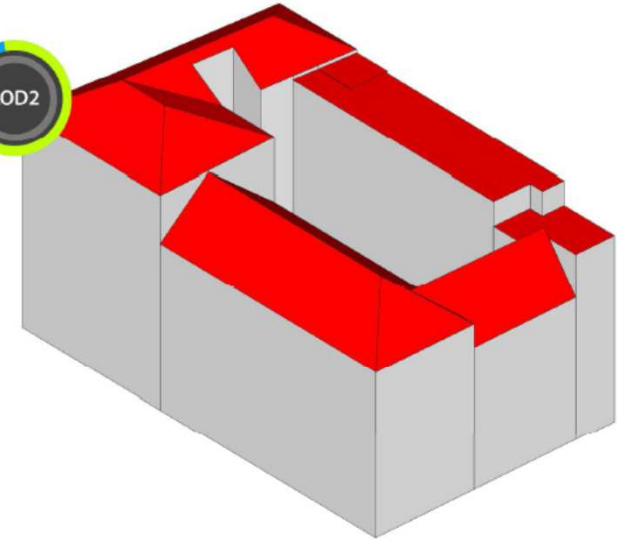
**New Urban Energy Simulation Platform  
based on CityGML + Energy ADE**

# Based on CityGML - handle different Level of Details

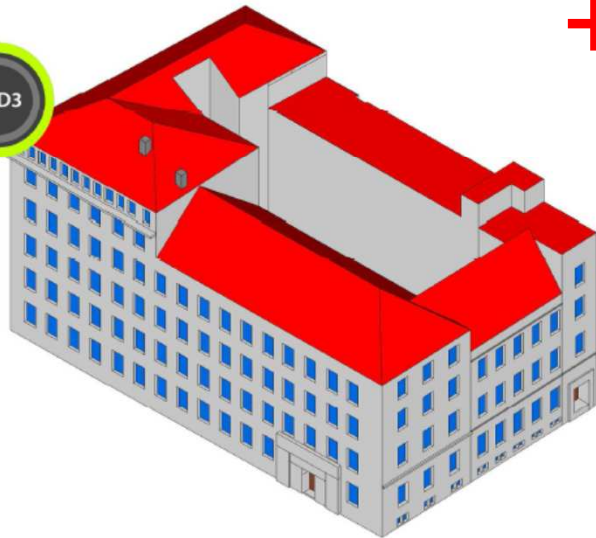
LOD1



LOD2

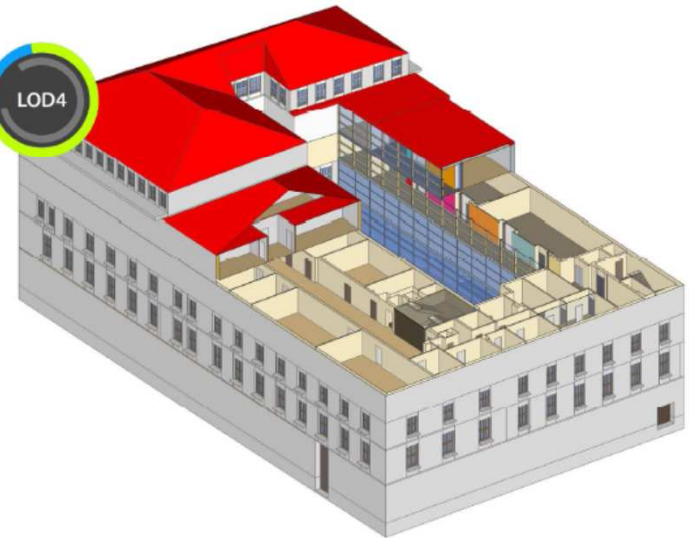


LOD3



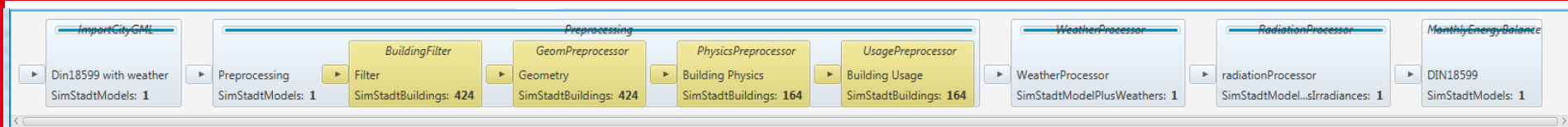
+ ...

LOD4



4 Level of Details von CityGML

# Modular structure, based on Workflows and Workflowsteps

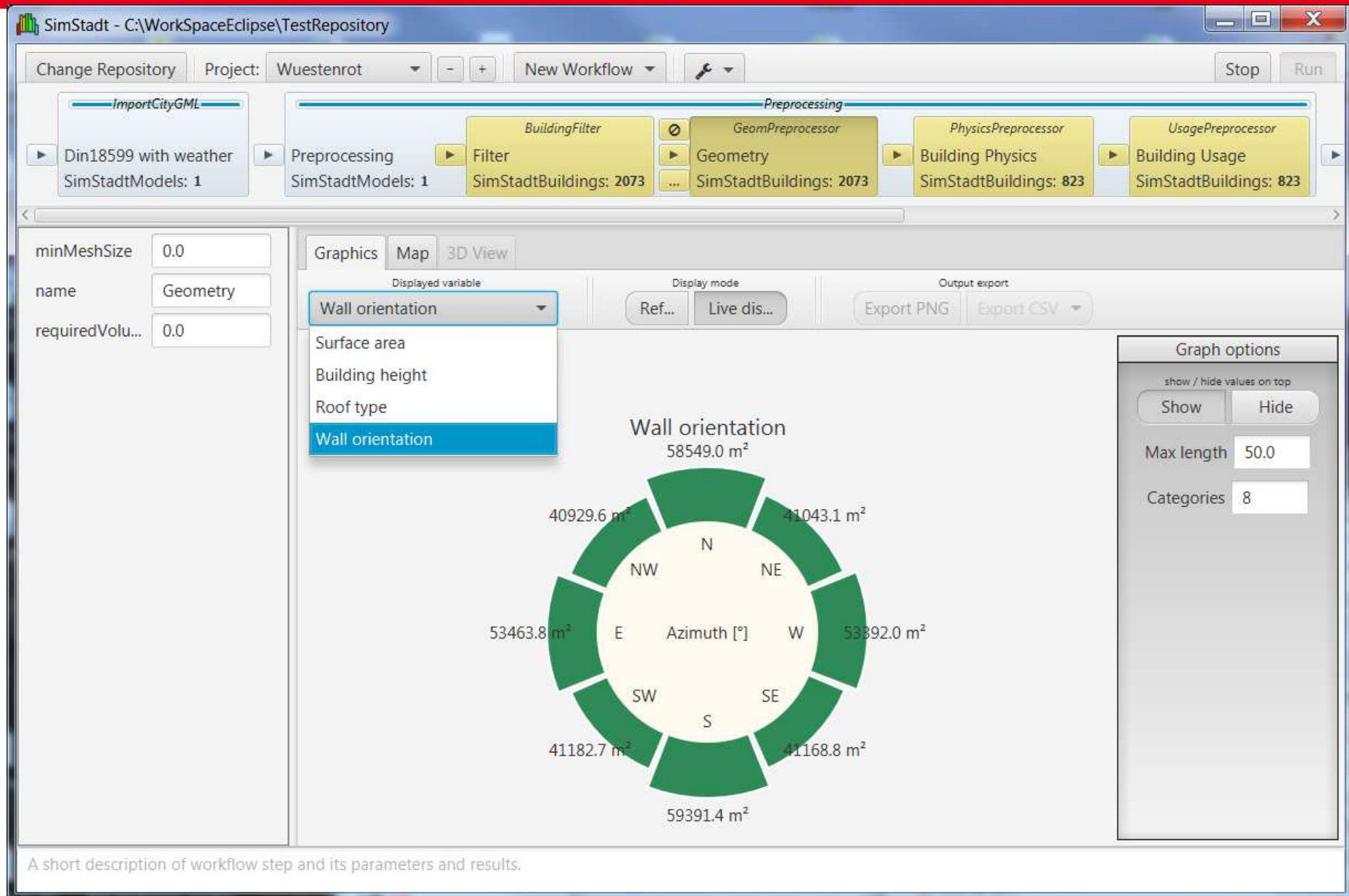


Implemented workflows:

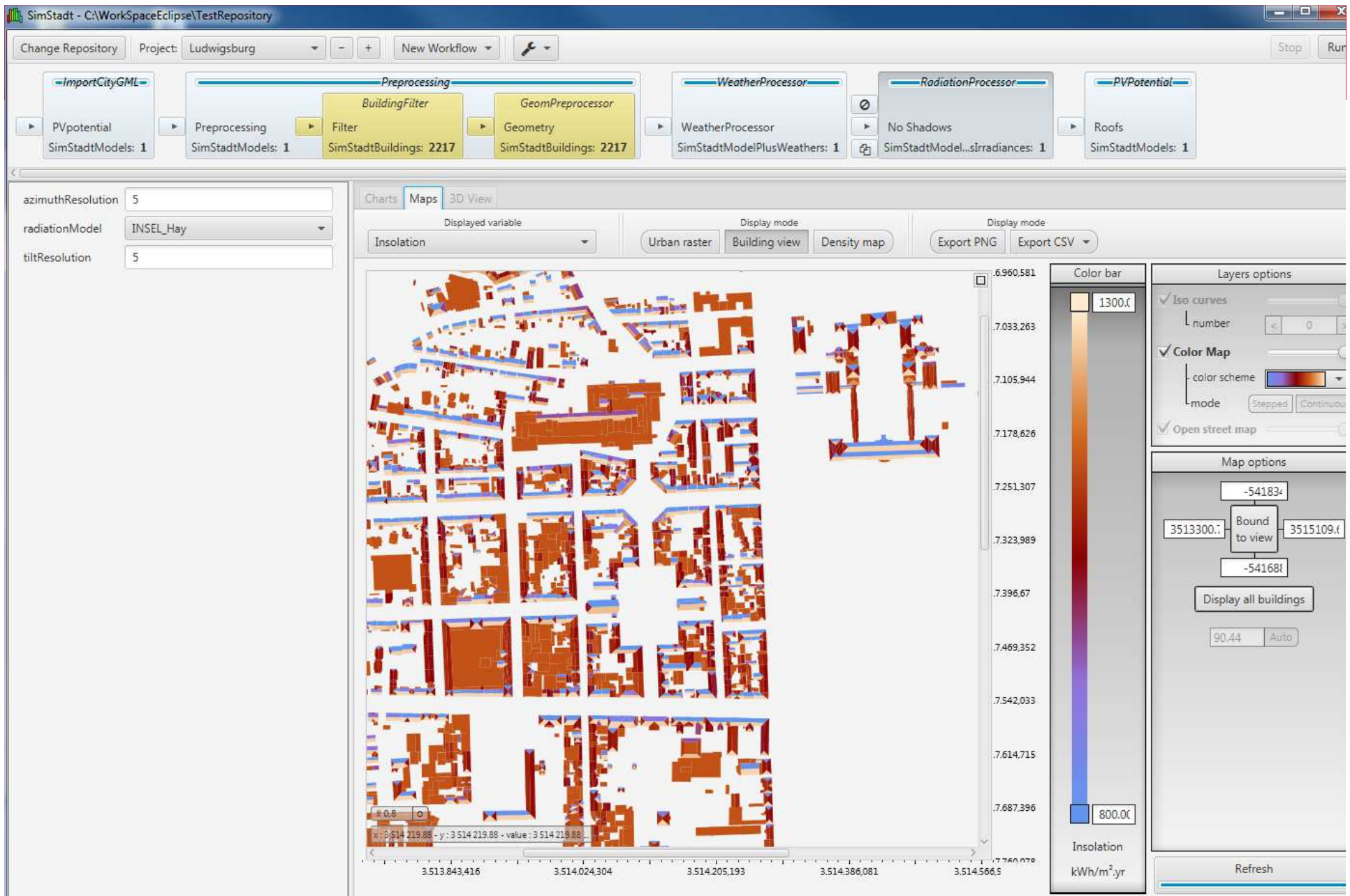
- Heating demand calculation based on monthly energy balance
- Solar and PV potential analysis
- Global CO2 emission analysis
- Refurbishment scenarii generation and simulation



# Analyse at each step of the Workflows



Screenshot - SimStadt



A short description of workflow step and its parameters and results.

Screenshot - SimStadt

SimStadt - C:\WorkspaceEclipse\TestRepository

Change Repository Project: Ludwigsburg

Workflow steps:
 

- ImportCityGML
- PVPotential (SimStadtModels: 1)
- Preprocessing (SimStadtModels: 1)
  - BuildingFilter (SimStadtBuildings: 2217)
  - GeomPreprocessor (SimStadtBuildings: 2217)
- WeatherProcessor (SimStadtModelPlusWeathers: 1)
- RadiationProcessor (SimStadtModel...srradiances: 1)
- PVPotential (SimStadtModels: 1)

Building Surface Suitability

Include:

- LOD1
- Tilted roofs
- Public roofs
- Facades
- Flat roofs
- Private roofs

Max. flat roof elevation: 10 °  
 Minimum roof area: 40 m<sup>2</sup>  
 Minimum insolation: 1100 kWh/m<sup>2</sup>.a

PV System Parameters

- Module area to flat roof area: 30 %
- Module area to tilted roof area: 40 %
- Module efficiency: 15 %
- Performance ratio: 85 %
- Tilt on flat roof: 25 °

Results

Total suitable roofs :	2 428
Total potential power :	16 275 kWp
Total potential yield :	17 257 MWh/a

Charts Maps 3D View

Displayed variable: PV suitability

Display mode: Urban raster Building view Density map

Export PNG Export CSV

Color bar: 1.00 0.00

Layers options

- Iso curves
- Color Map
- Open street map

Map options

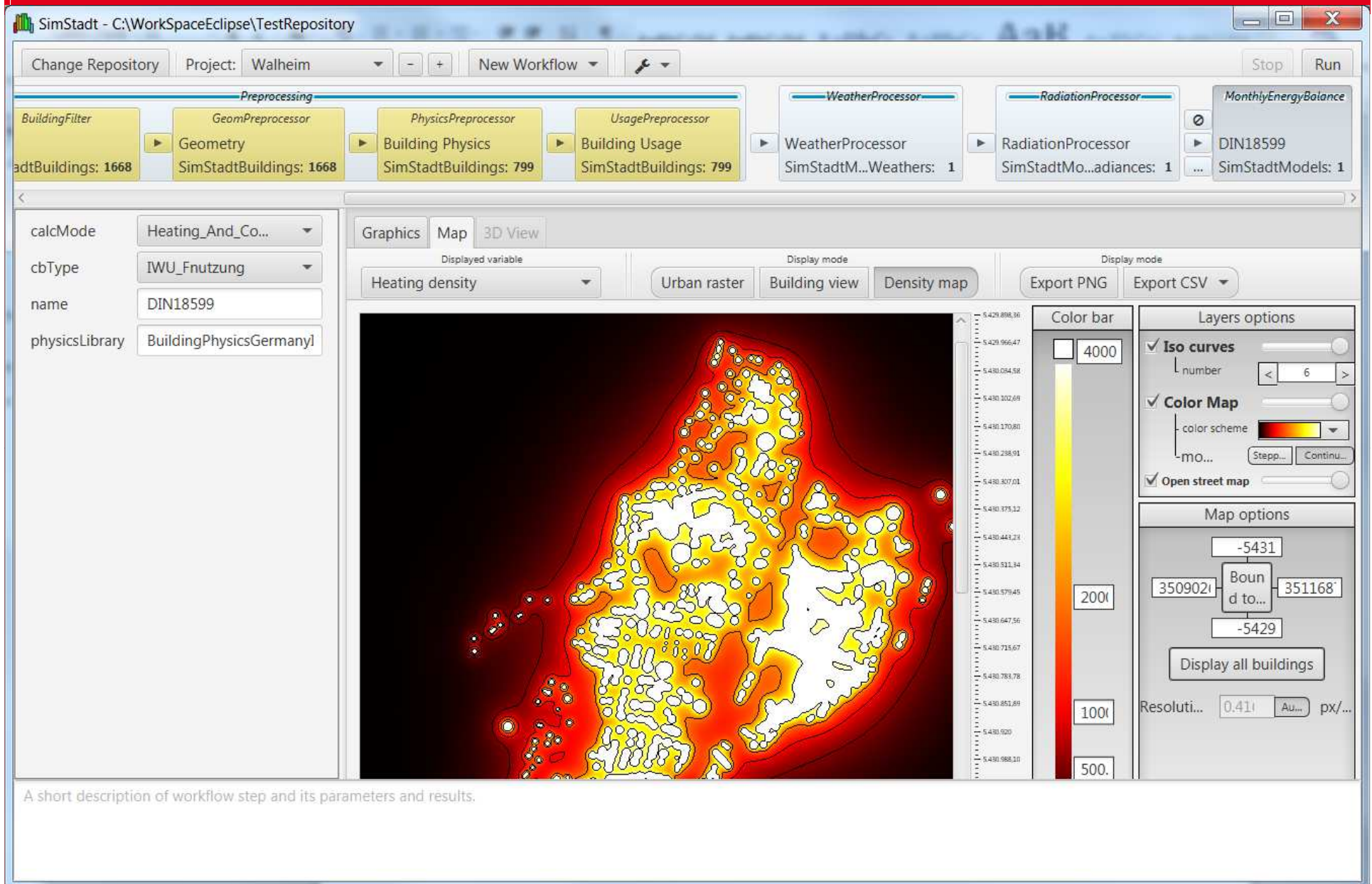
- 54183
- 3513300
- Bound to view
- 3515109
- 54168
- Display all buildings
- 0.00 Auto

Refresh

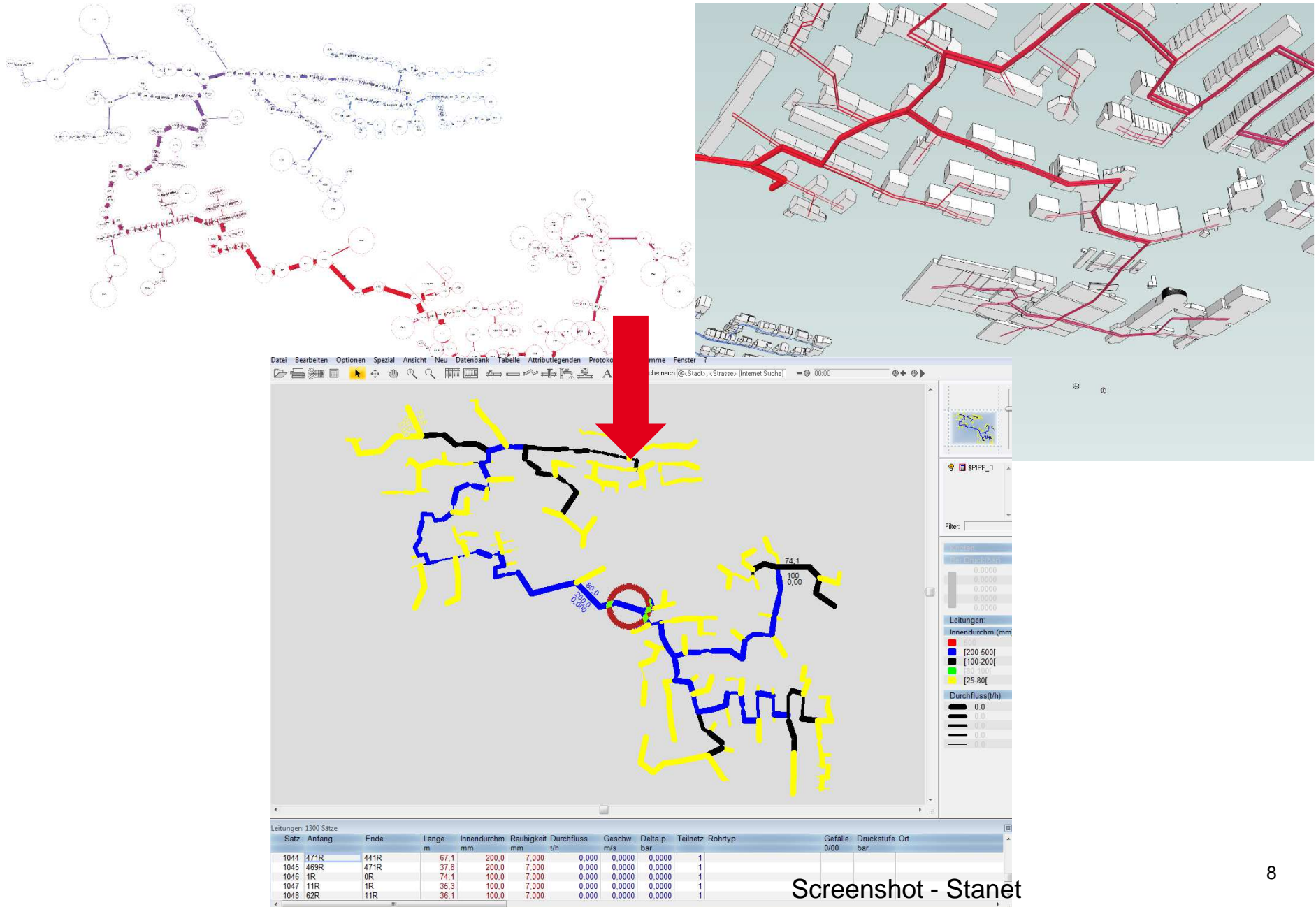
A short description of workflow step and its parameters and results.

Screenshot - SimStadt

# Heat density map



# District network – Optimal layout and sizing




Screenshot - Stanet

# Data preprocessing with Building Libraries

LibraryEditor

File Edit Admin access

Building typology

Selected category:  Multi Family House

1919 - 1948

AdvancedRefurbishment

Global properties

Average storey height: 2.8 m

Thermal capacity: 130 kJ/K.m<sup>2</sup>

Indirectly heated area ratio: 0.15 -

Thermal bridge U-value: 0.03 W/K.m<sup>2</sup>

Shell properties

Out walls | Ground | Top ceiling | Pitched roof

Construction

Construction type: Dense brickwork-32cm\_RefAdv

Shortwave reflectance: 0.30

Openings

Window type: Low-E triple-glazed window

Shading type:

Window ratio: 0.20

Window operable ratio:

Constructions

Construction type | Window type | Shading type

Out wall

Wood ceiling infill cob\_R

Material name	Thickness (cm)
Expanded polyst	12.0
Hardwood (oak, 2.0	
Loam	25.0
Hardboard med	1.0

U-value: 0.23 W/K.m<sup>2</sup>

Materials

Name	Conductivity (W/K.m)	Heat capacity (J/K)	Density (kg/m <sup>3</sup> )
▶ Brick			
▶ Concrete			
▶ Ground covering			
▶ Insulation			
▶ Metal			
▶ Others			
▶ Plaster			
▶ Stone			
▶ Tile			
▶ Wood			

Screenshot - SimStadt

# Data structure

