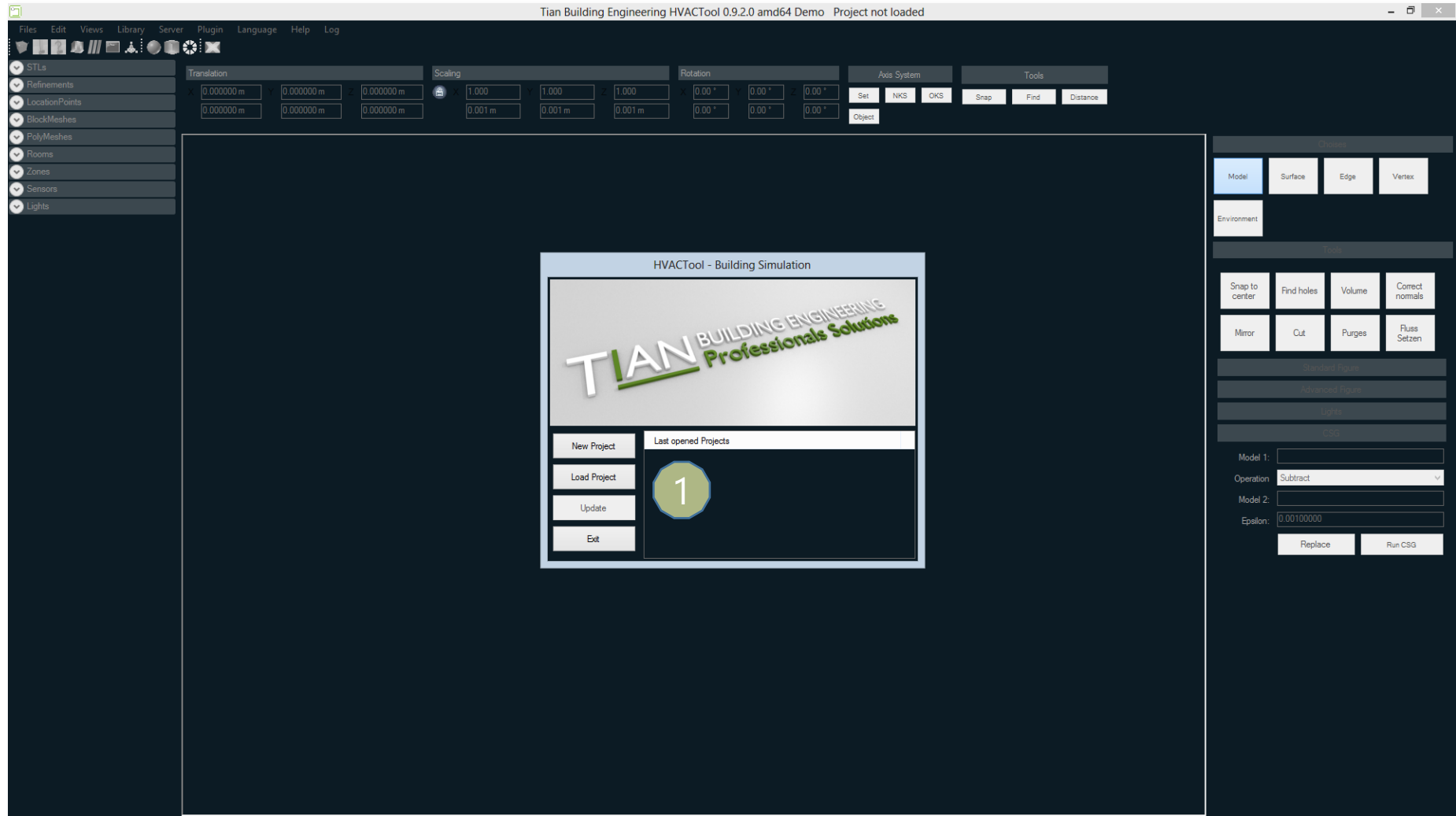


Shadow Coefficient for TRNSYS with the HVACTool

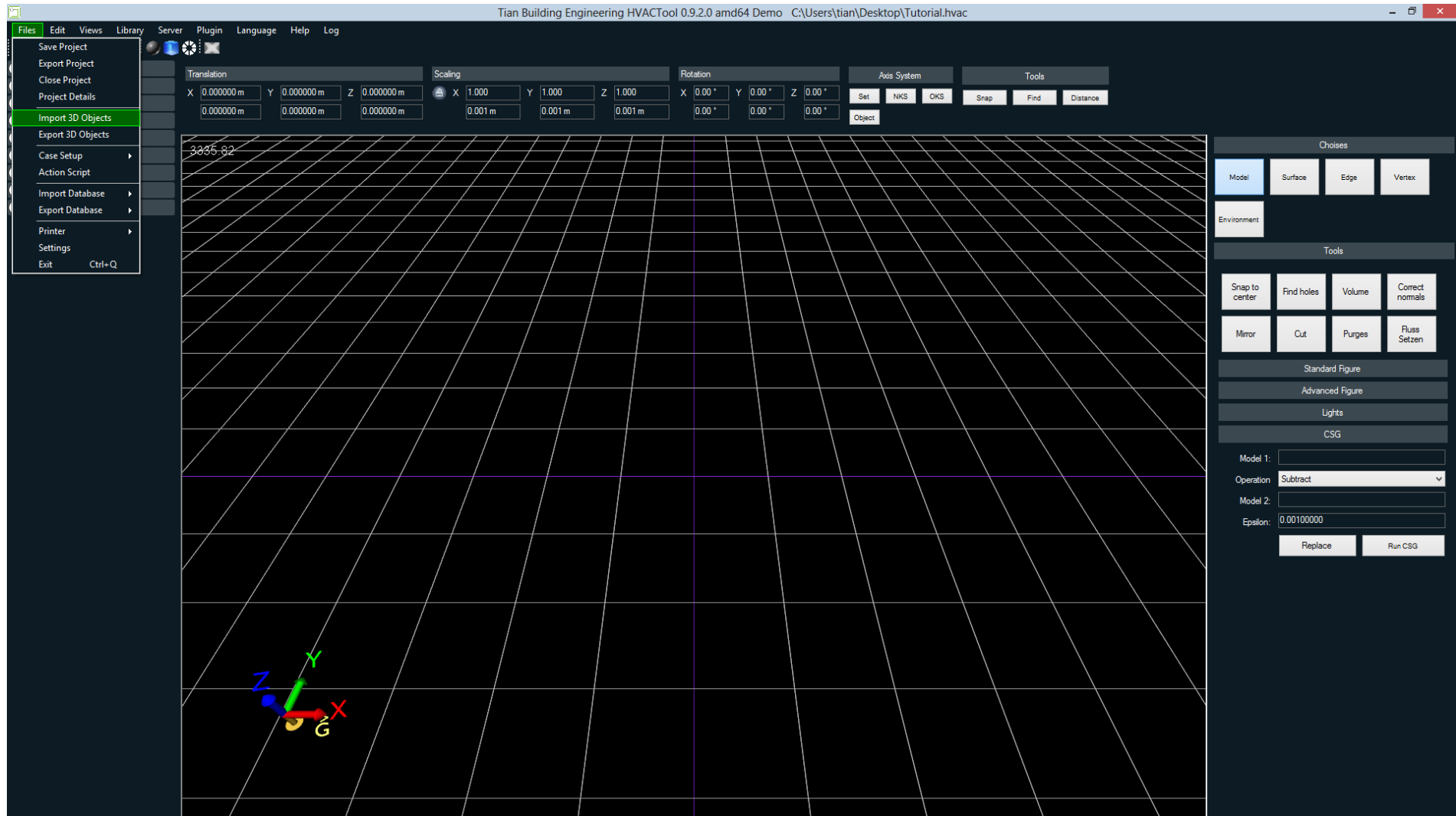
Import 3d objects like SketchUp and create the shadow coefficient with HVACTool as boundary condition for TRNSYS.

New Project

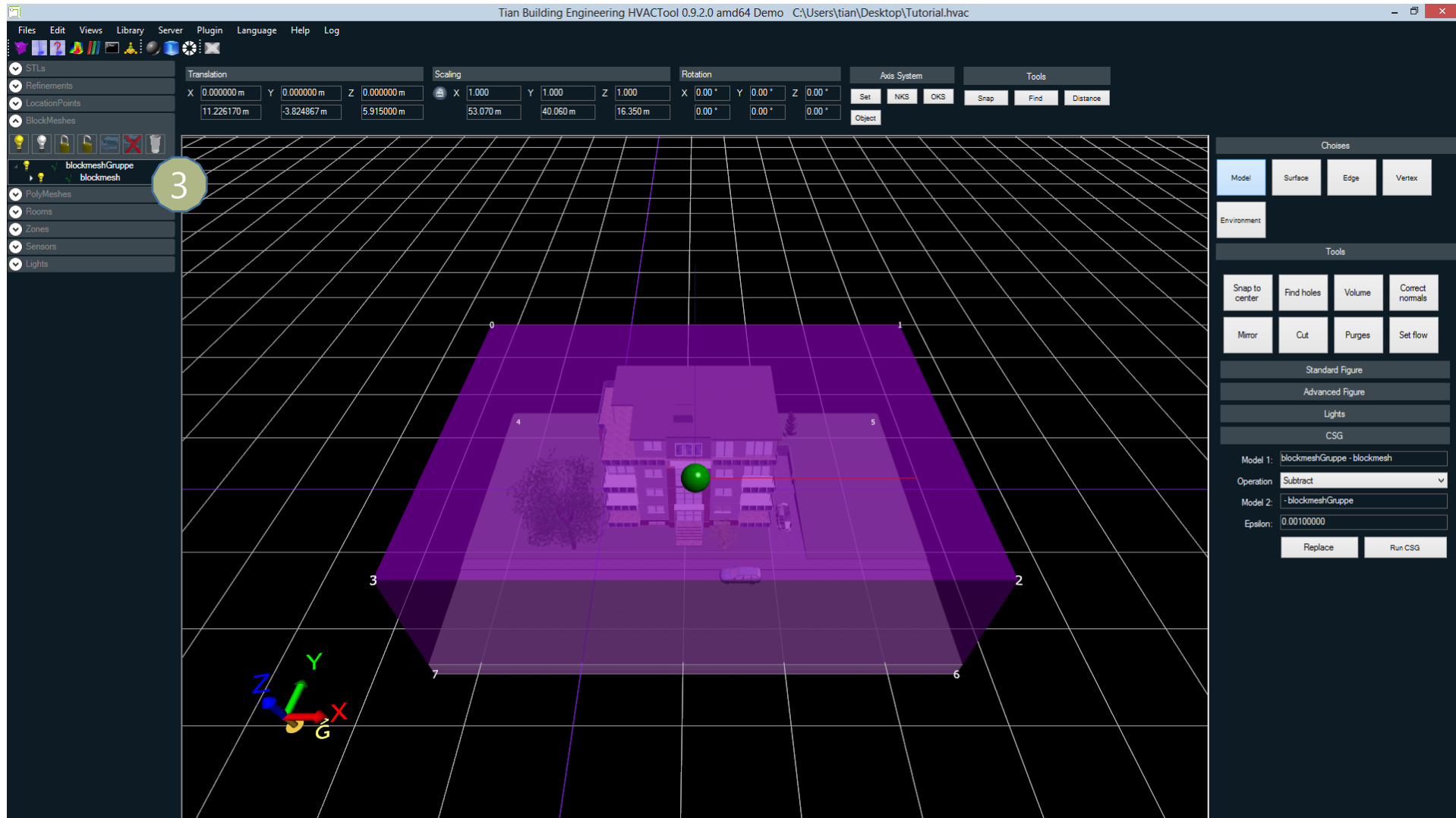


Import your geometry

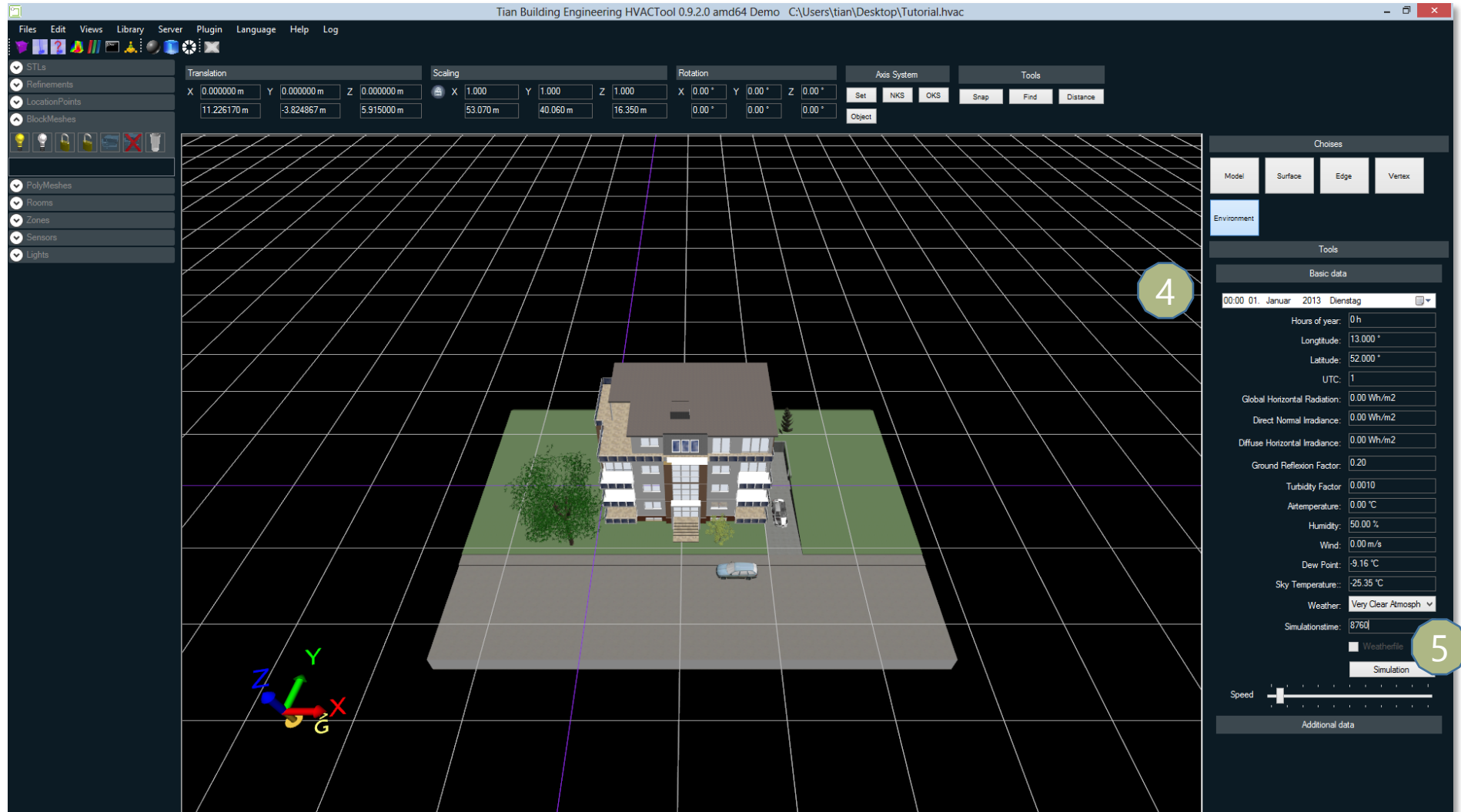
2



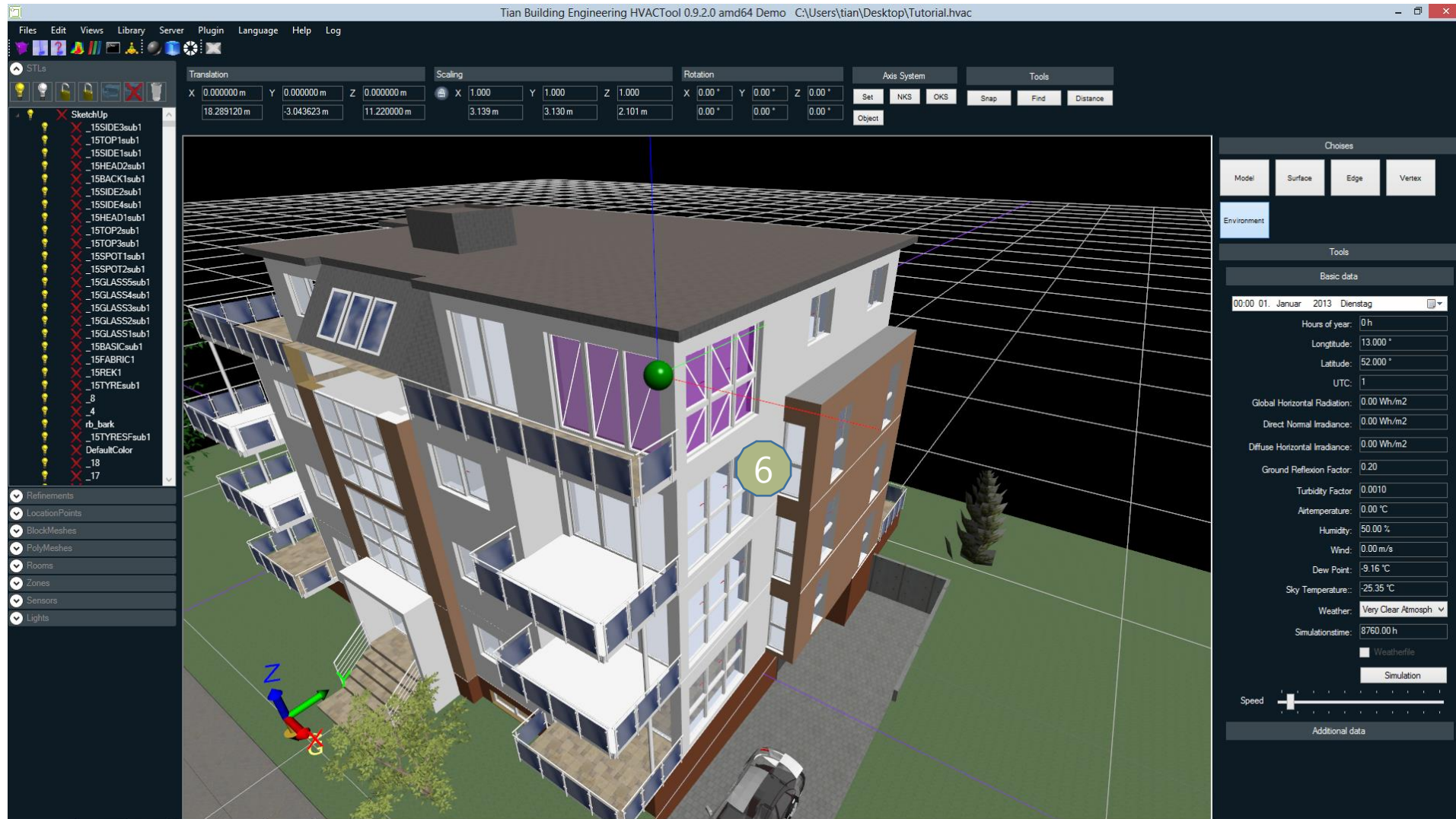
Delete the blockMesh



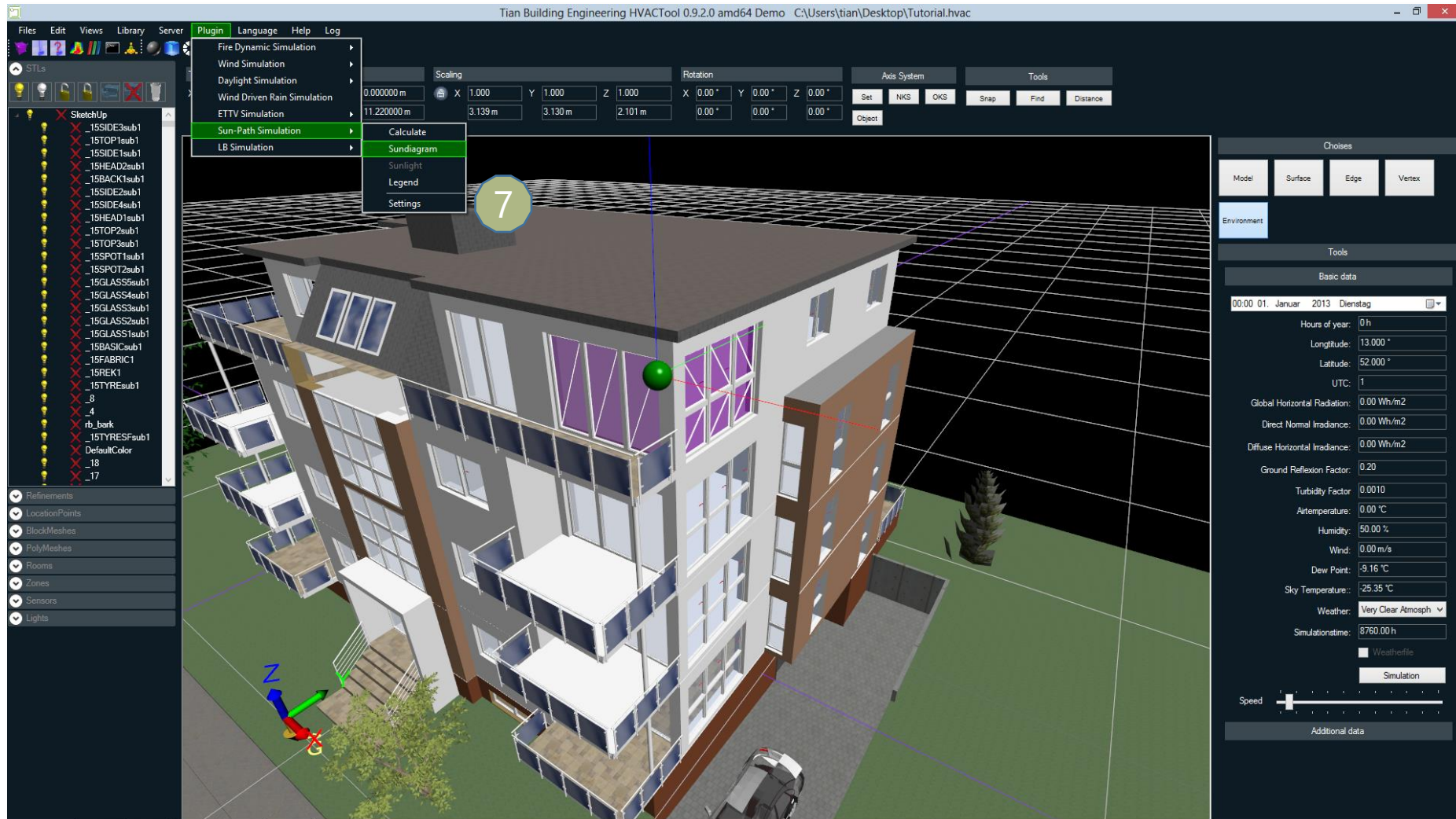
(4) Change the date to 01.01.2013 and
(5) Simulation run time to 8760h



Select the windows



Turn on the sun diagram



Setup location for longitude and latitude.

The screenshot displays the Tian Building Engineering HVACTool 0.9.2.0 software interface. The main window shows a 3D model of a building with a dome, overlaid with a grid and a coordinate system. The interface includes a menu bar (Files, Edit, Views, Library, Server, Plugin, Language, Help, Log) and a toolbar. A list of STLs is visible on the left, and a right-hand panel contains environment settings.

Translation: X: 0.000000 m, Y: 0.000000 m, Z: 0.000000 m
X: 18.289120 m, Y: -3.043623 m, Z: 11.220000 m

Scaling: X: 1.000, Y: 1.000, Z: 1.000
X: 3.139 m, Y: 3.130 m, Z: 2.101 m

Rotation: X: 0.00°, Y: 0.00°, Z: 0.00°
X: 0.00°, Y: 0.00°, Z: 0.00°

Axis System: Set, NKS, OKS, Object

Tools: Snap, Find, Distance

Choses: Model, Surface, Edge, Vertex

Environment:

Tools:

Basic data:

00:00 01. Januar 2013 Dienstag

Hours of year: 0h

Longitude: 13.000°

Latitude: 52.000°

UTC: 1

Global Horizontal Irradiation: 0.00 Wh/m²

Direct Normal Irradiance: 0.00 Wh/m²

Diffuse Horizontal Irradiance: 0.00 Wh/m²

Ground Reflexion Factor: 0.20

Turbidity Factor: 0.0010

Air temperature: 0.00 °C

Humidity: 50.00 %

Wind: 0.00 m/s

Dew Point: -9.16 °C

Sky Temperature: -25.35 °C

Weather: Very Clear Atmosph

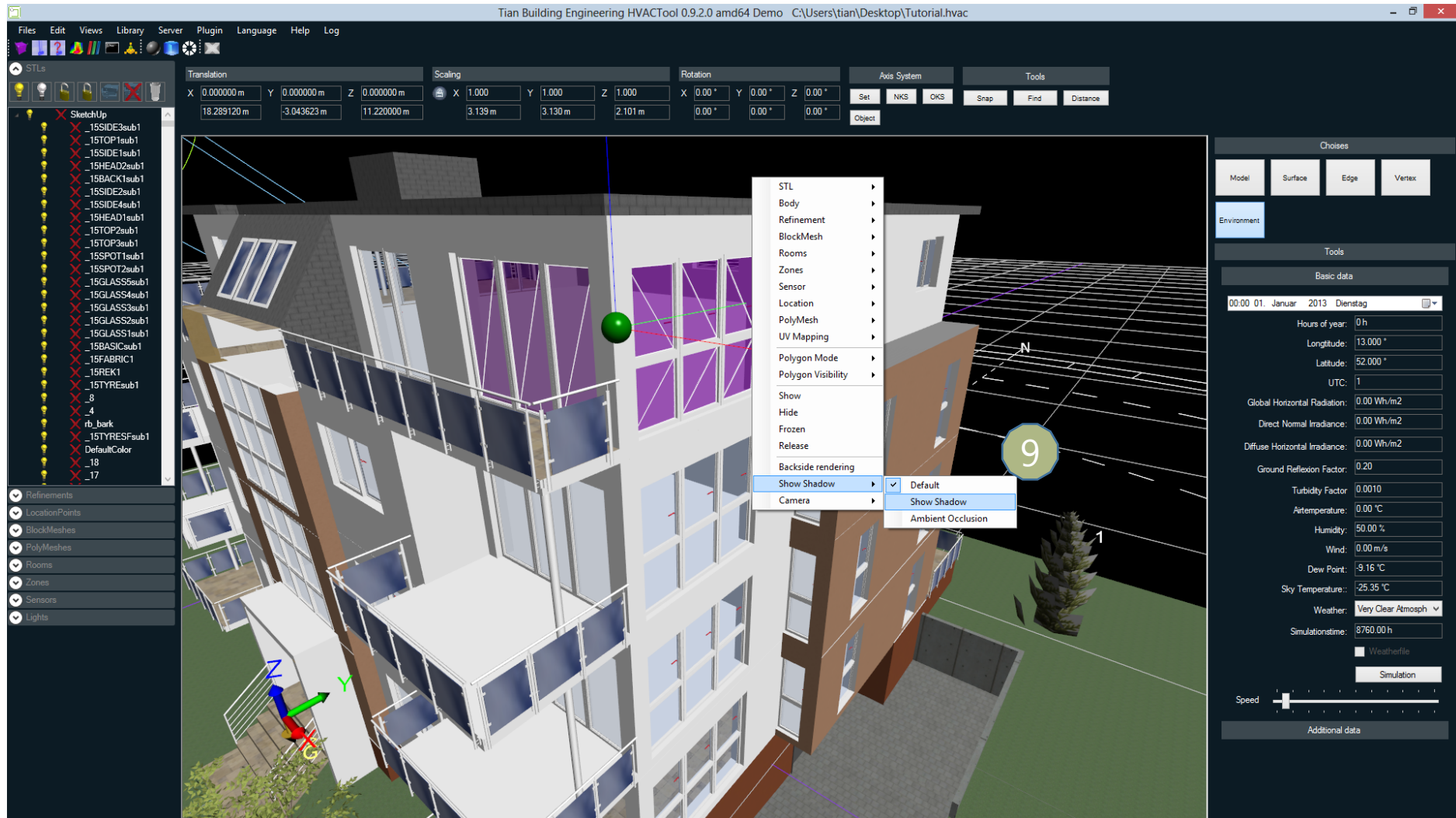
Simulation time: 8760.00 h

Simulation

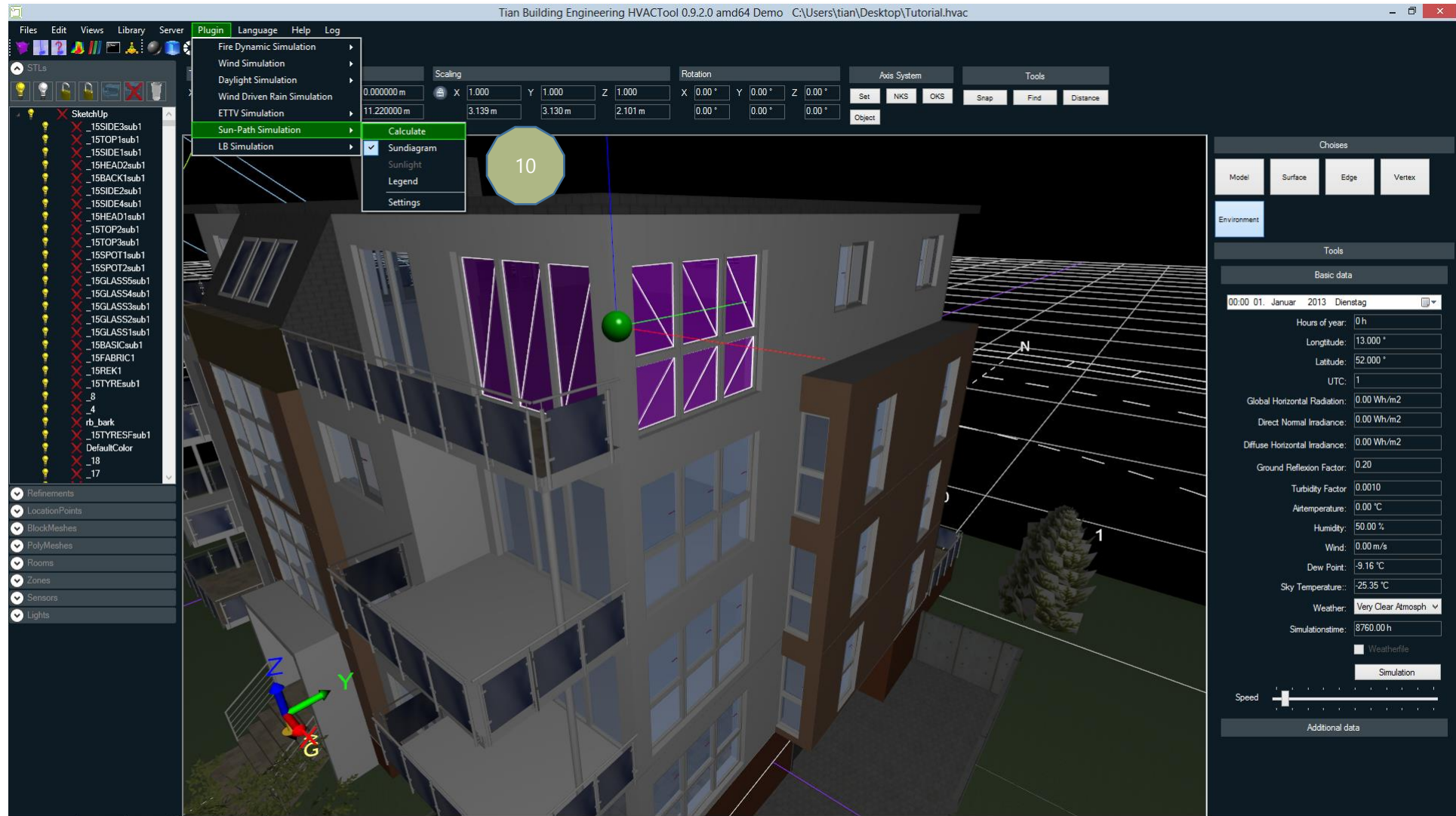
Speed: +

Additional data

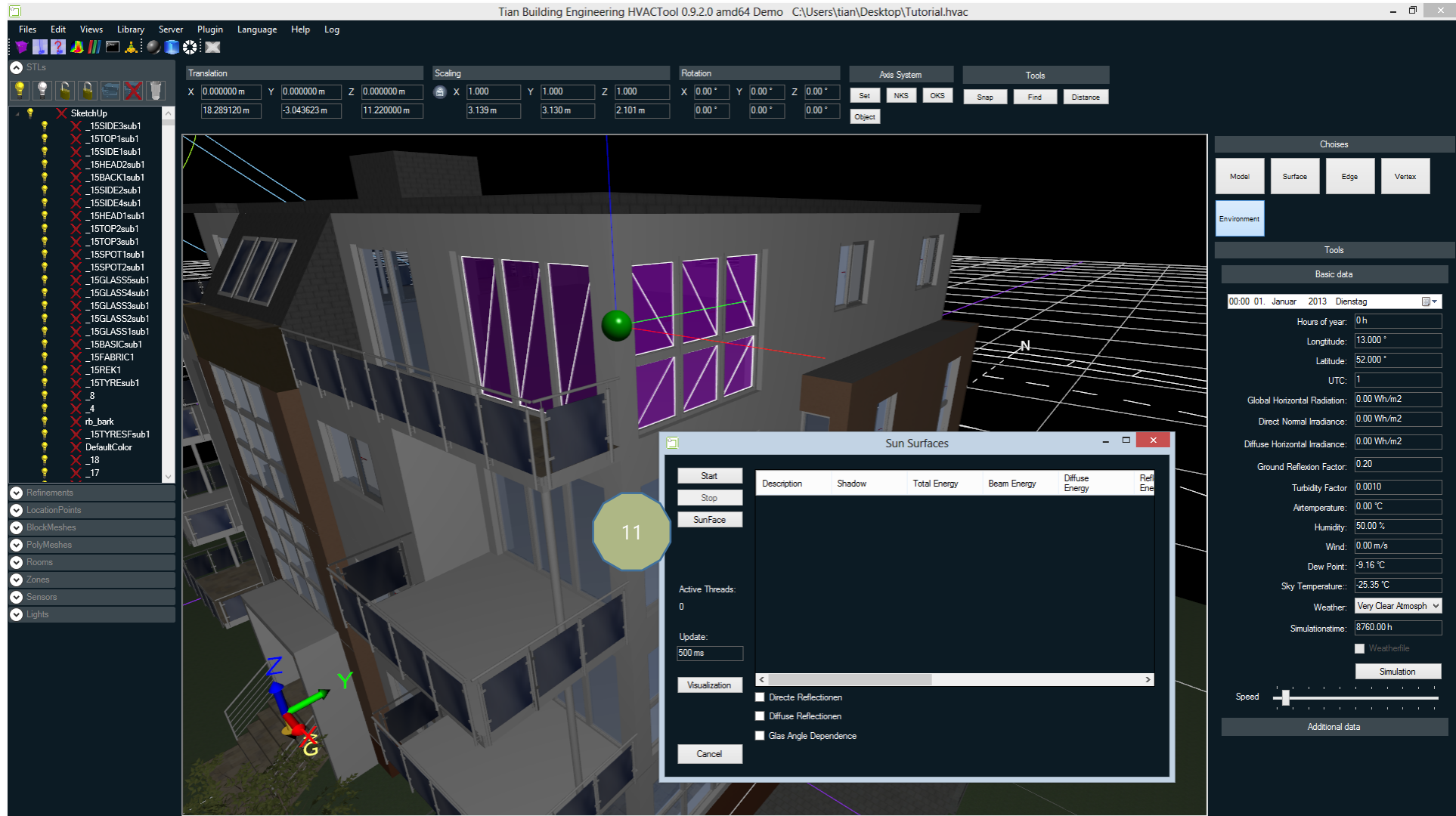
Turn on the shadow mode (right mouse button menu)



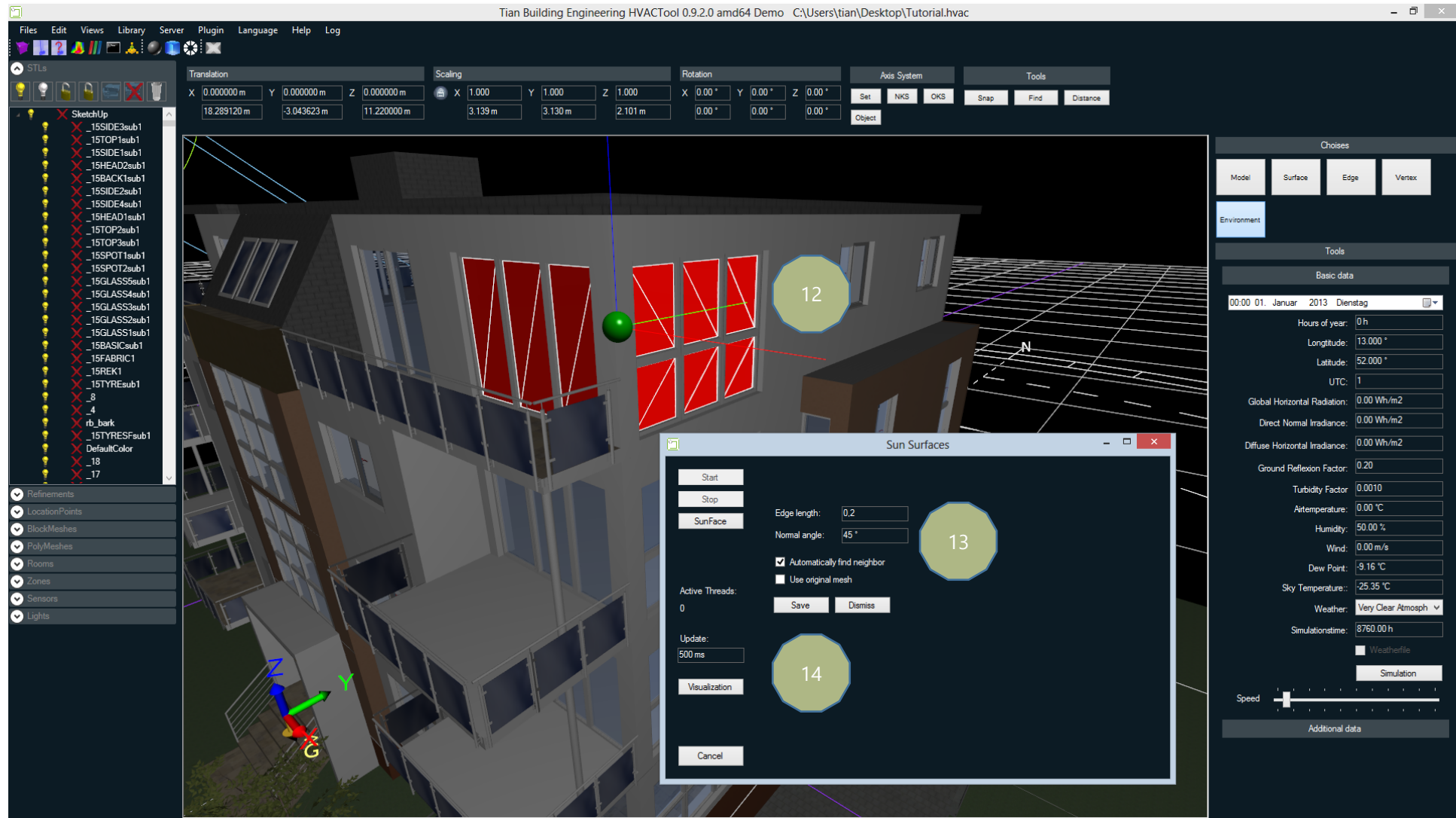
Go to the Sun Path PlugIn -> Calculate



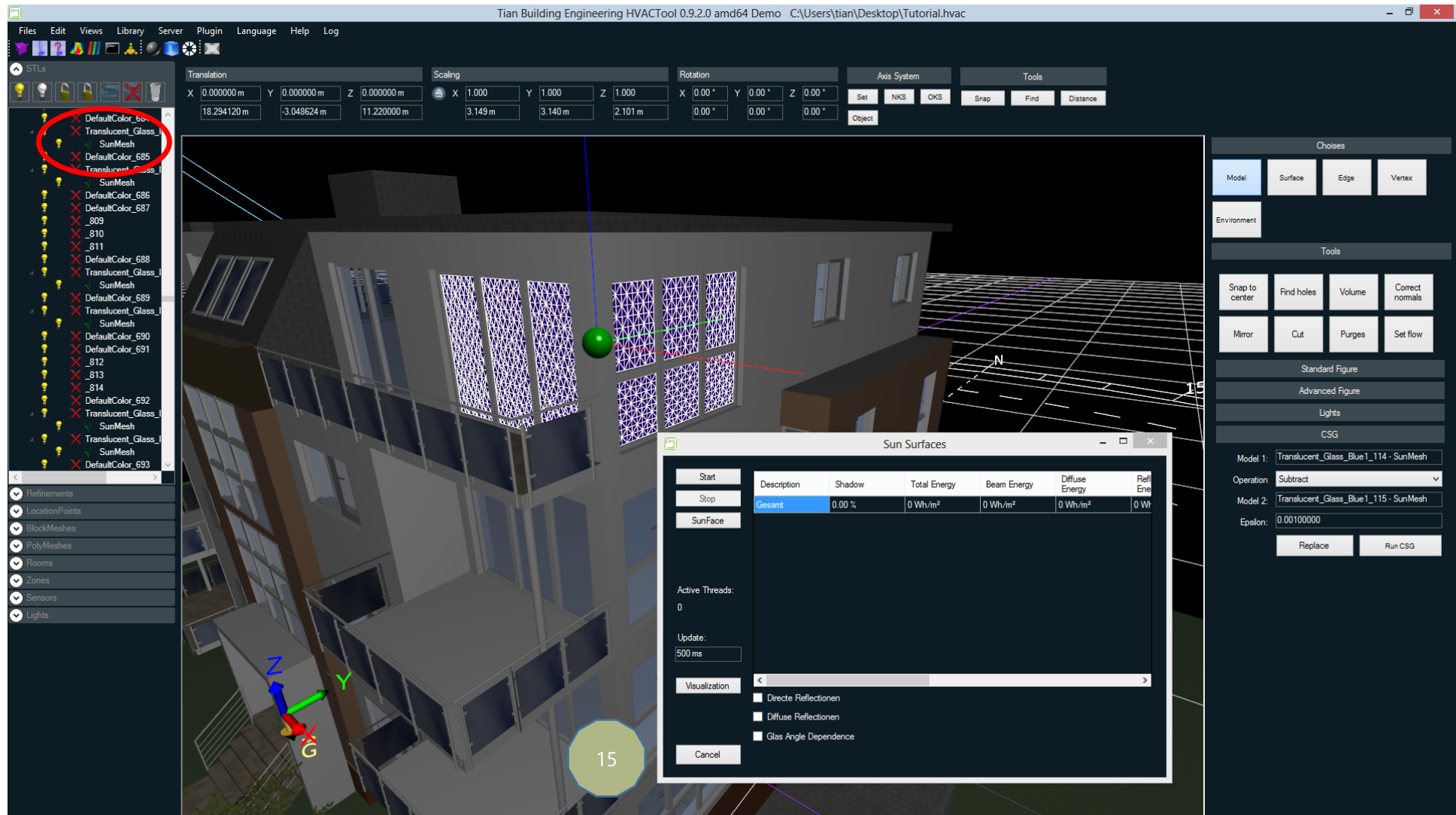
Press the „SunFace” button



(12) Select all windows (yellow turn to red) and
(13) use an edge length of 0,2m. (14) After that press „Save“

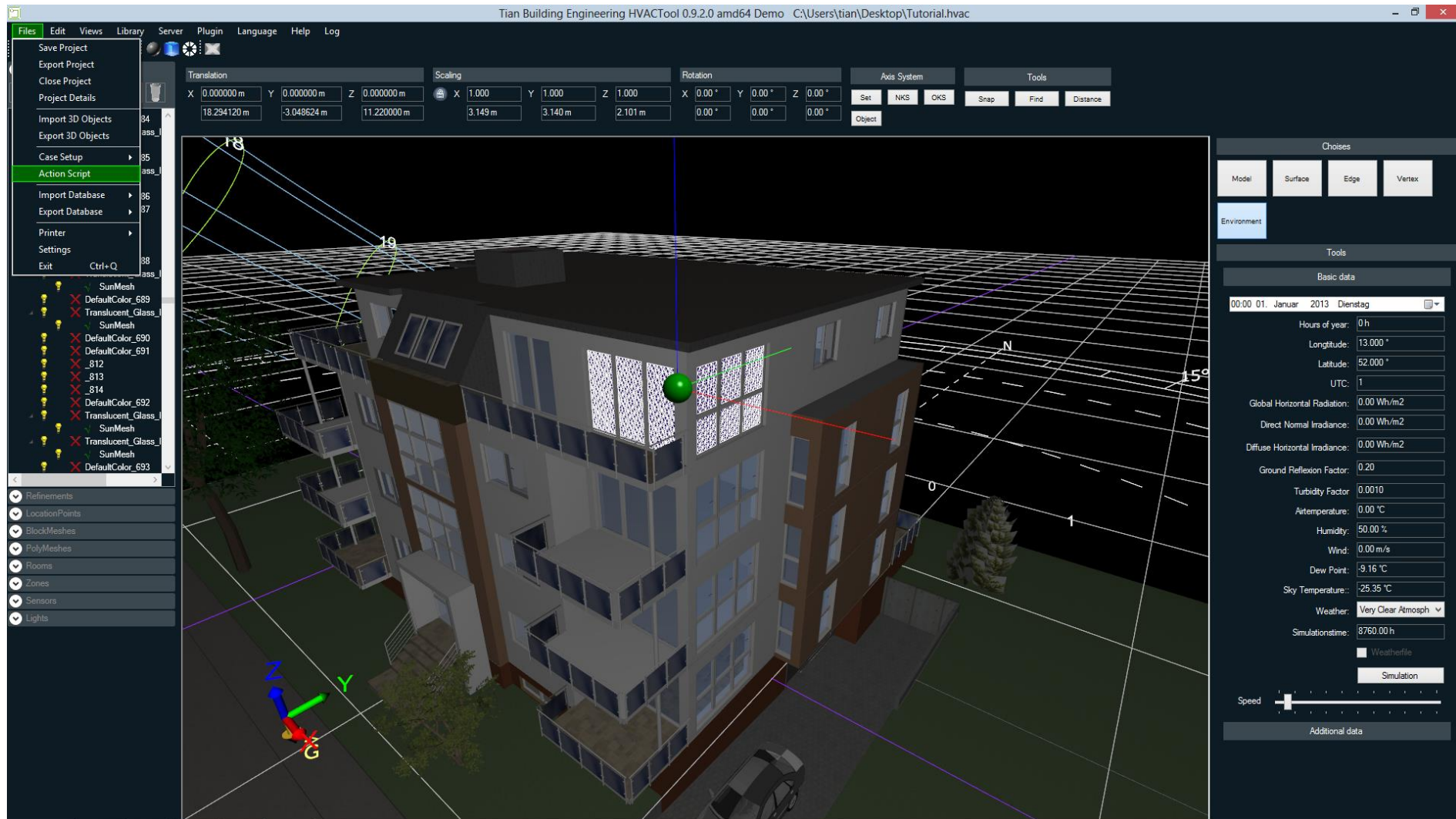


We create our sun mesh. We can close the window.

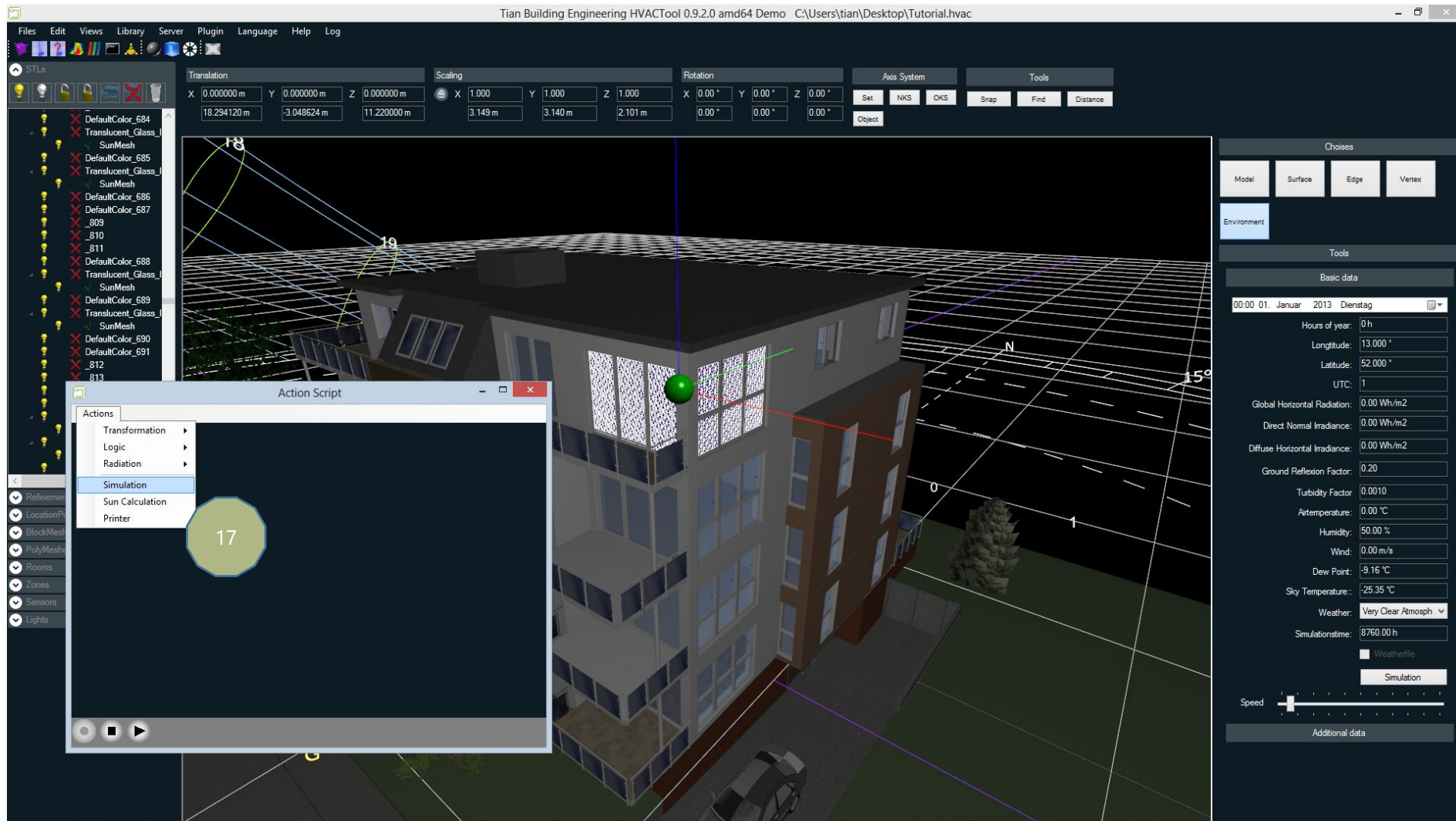


Start the Action Script

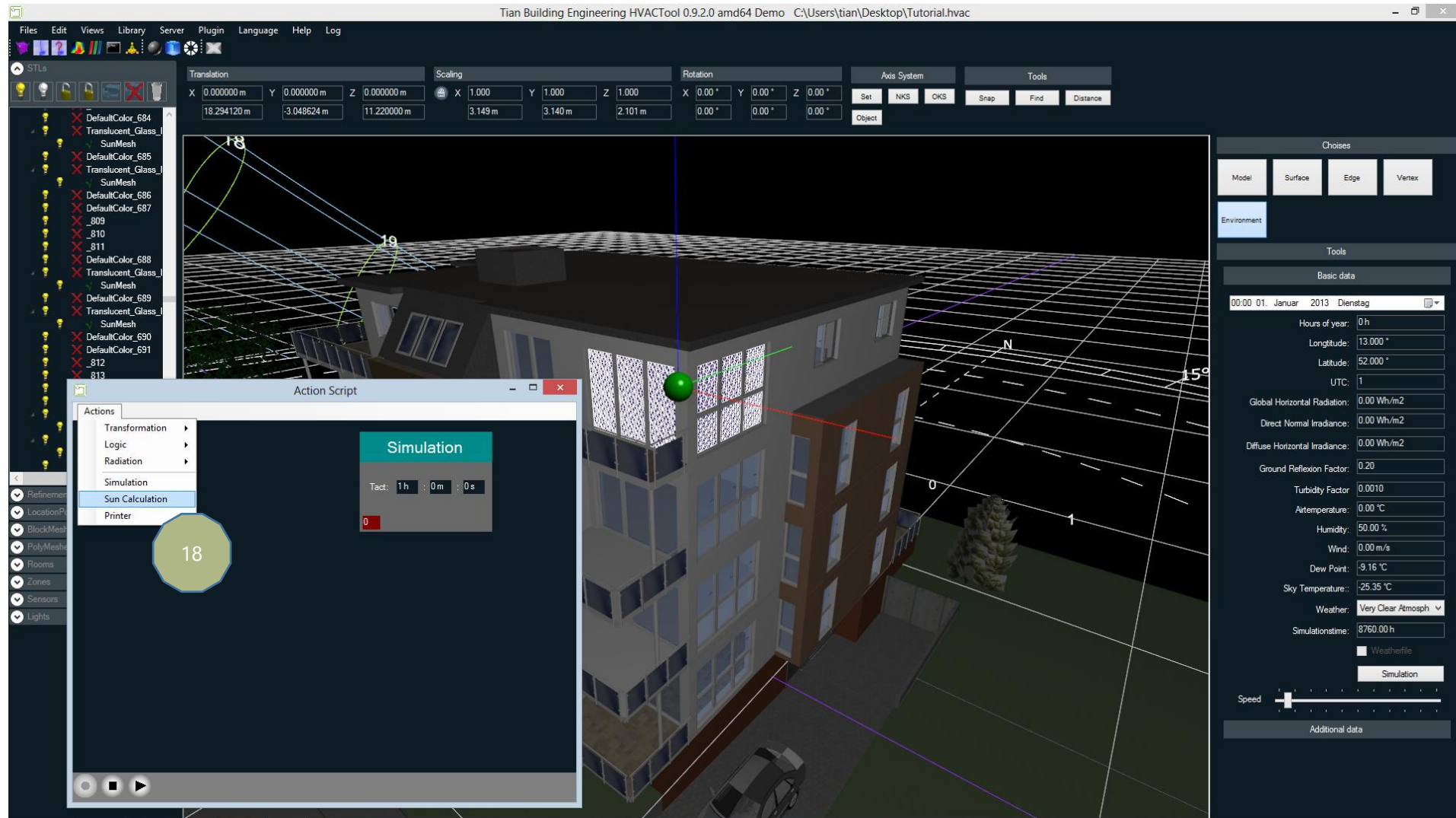
16



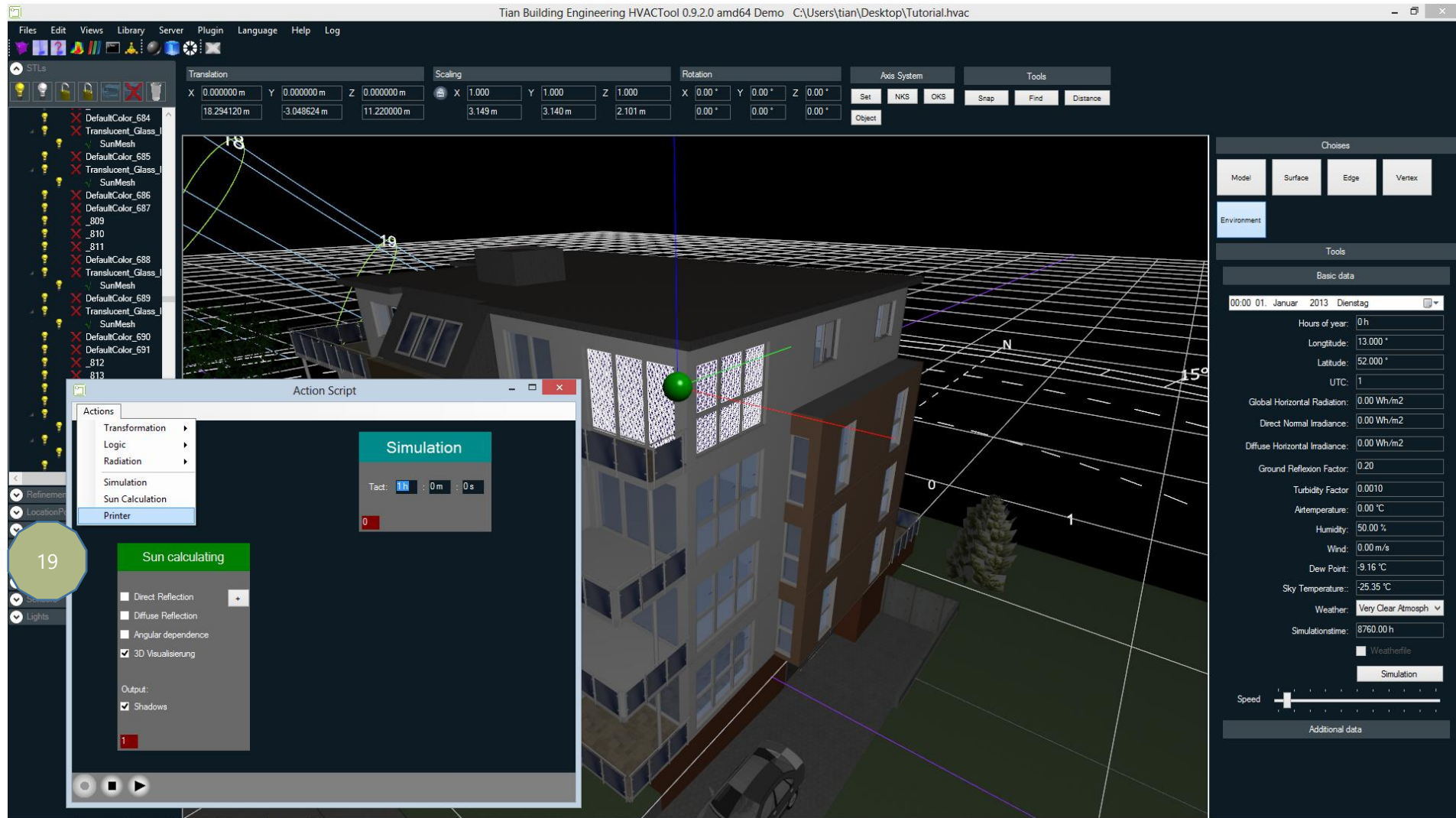
Build our Action Script. Choose „Simulation“



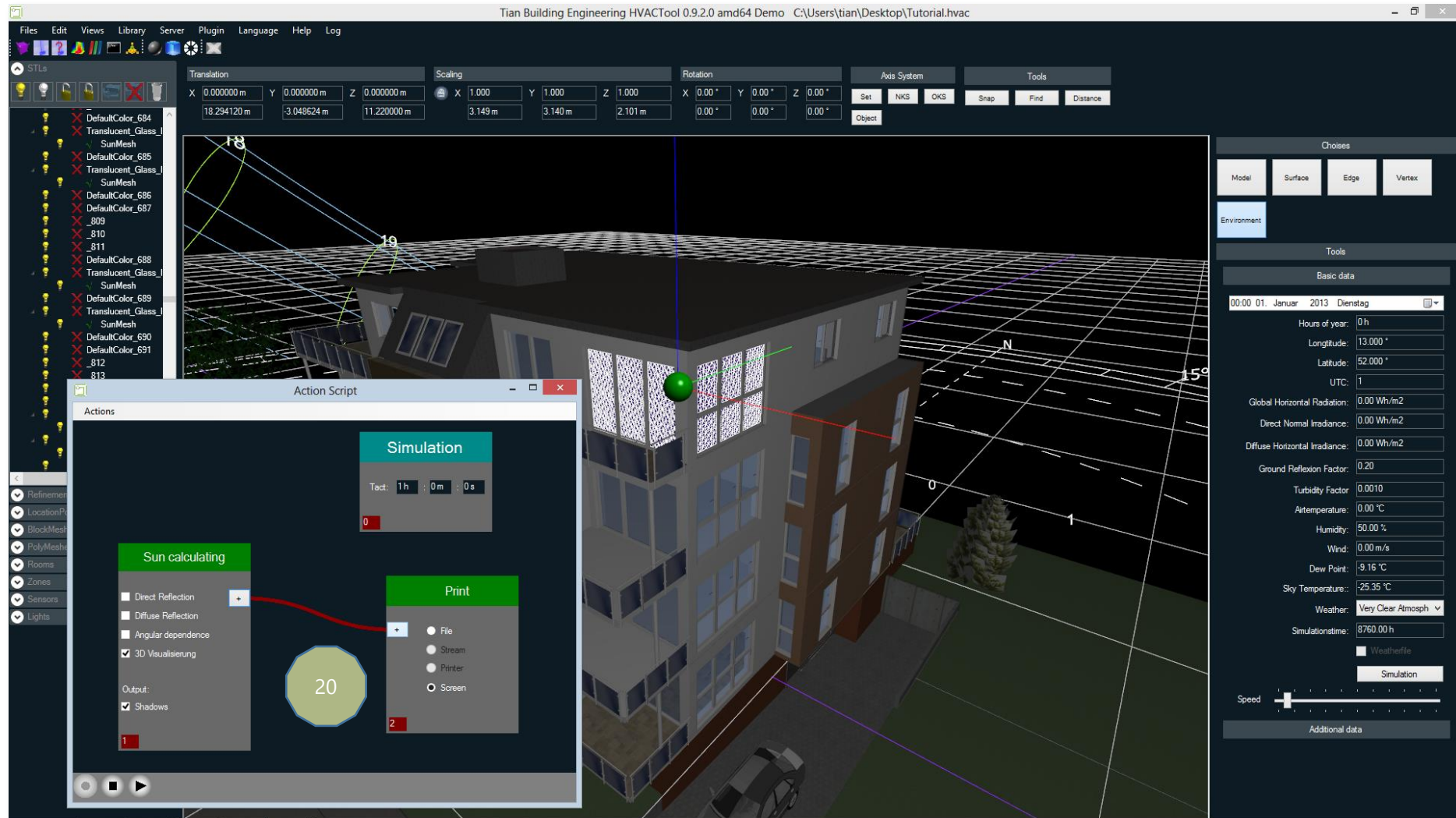
Choose „Sun Calculation“



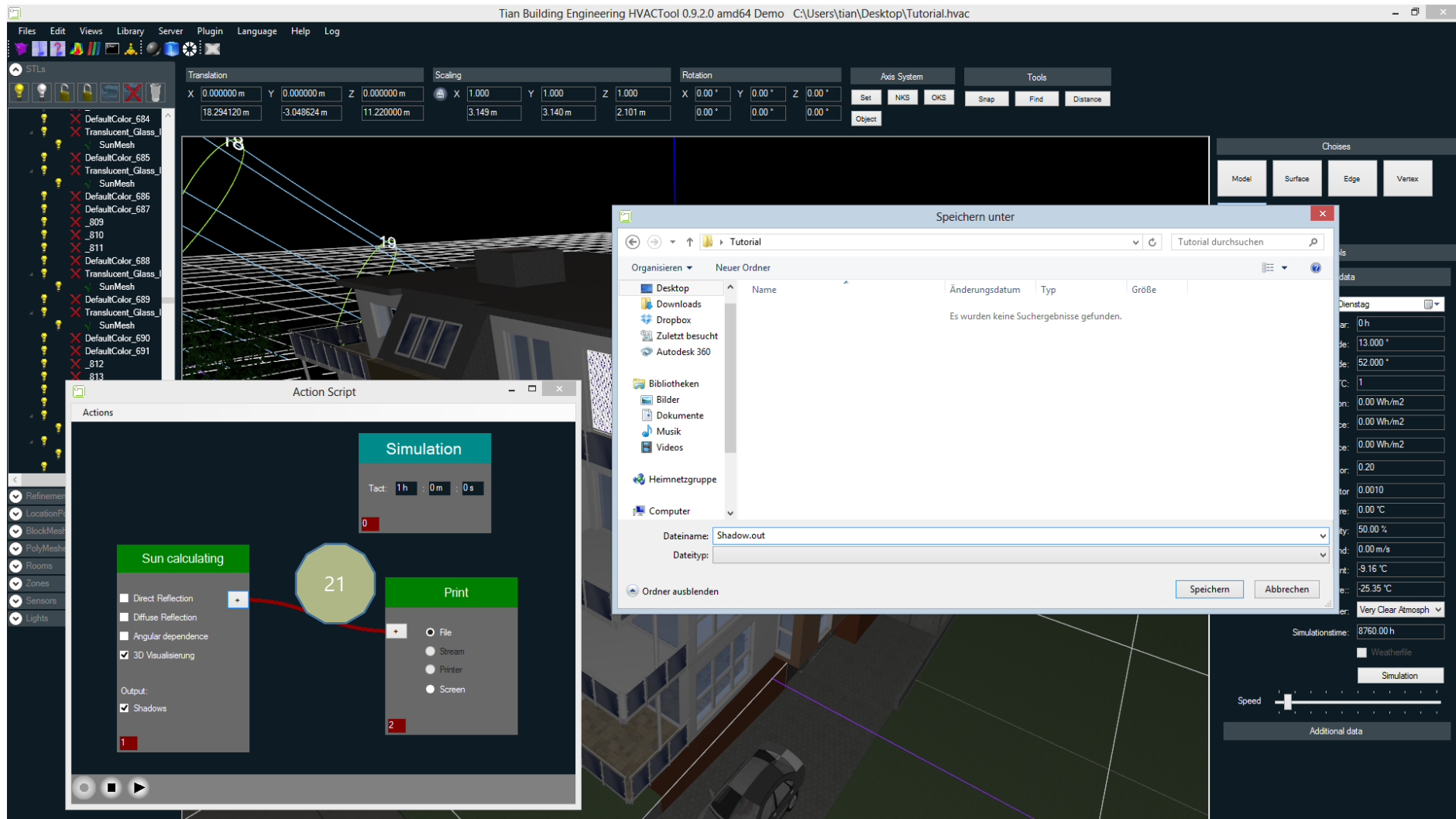
Choose „Printer“



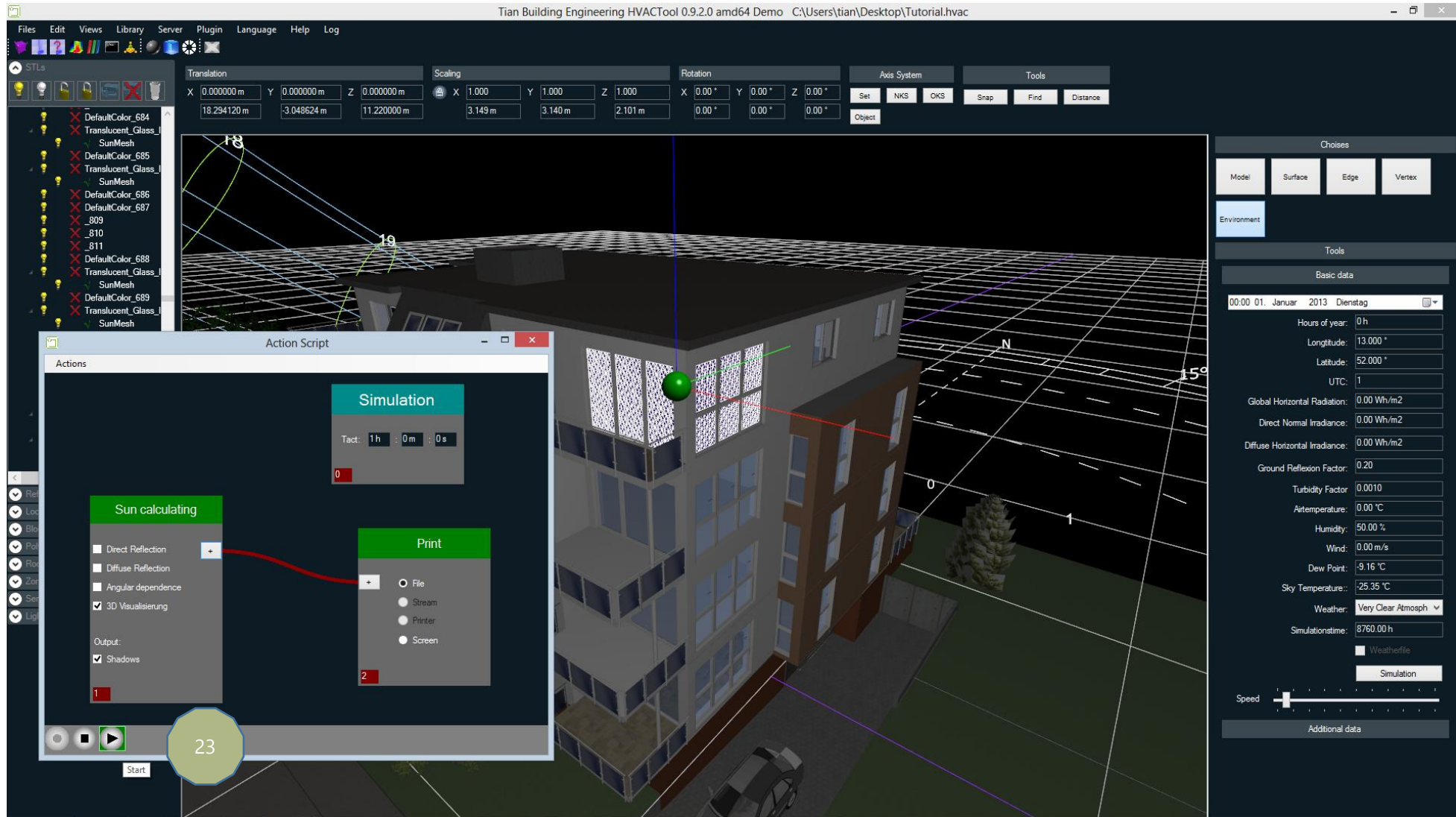
Connect it together



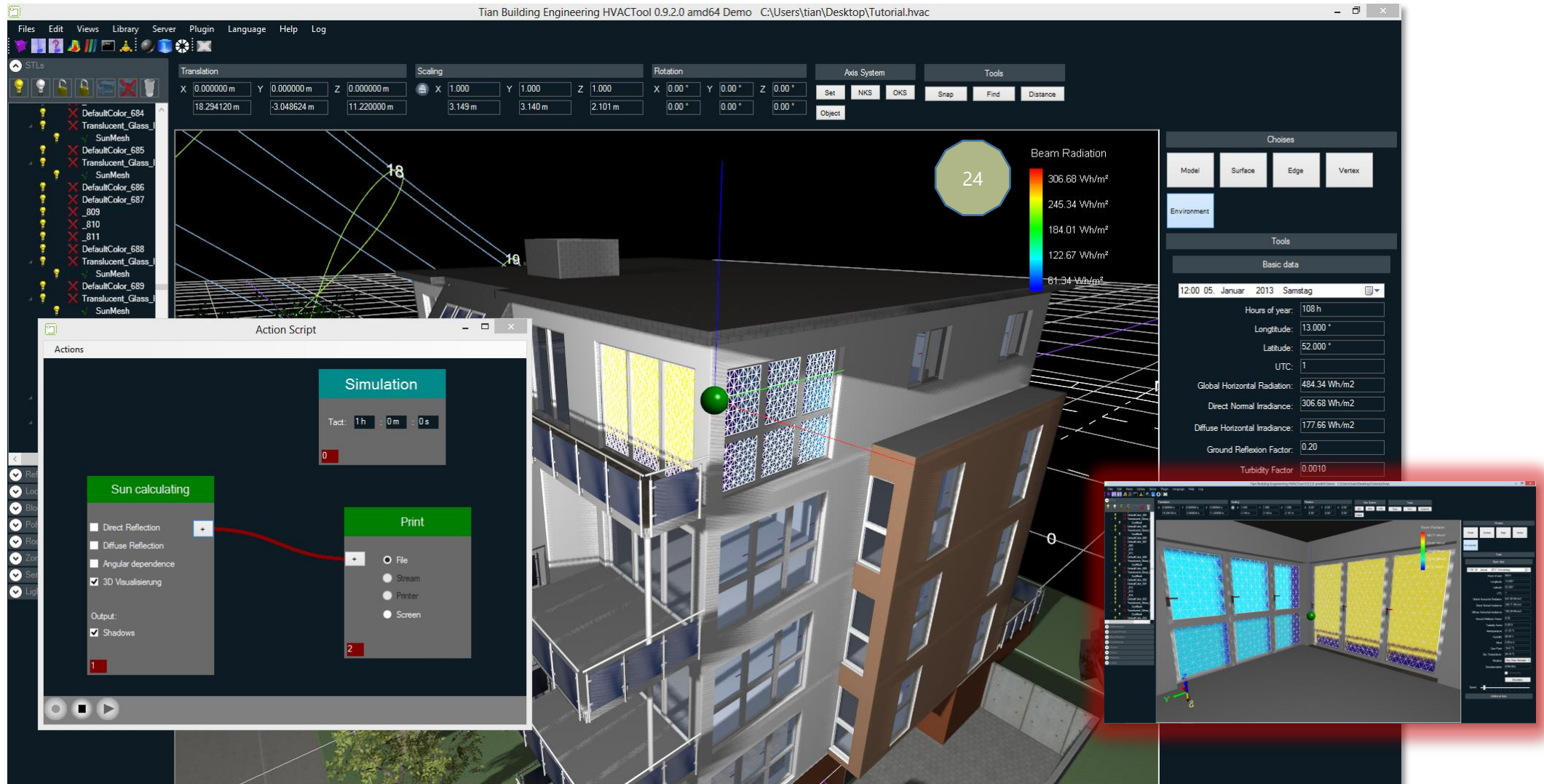
Click on „File“ and choose a storage place like „Shadow.out“.



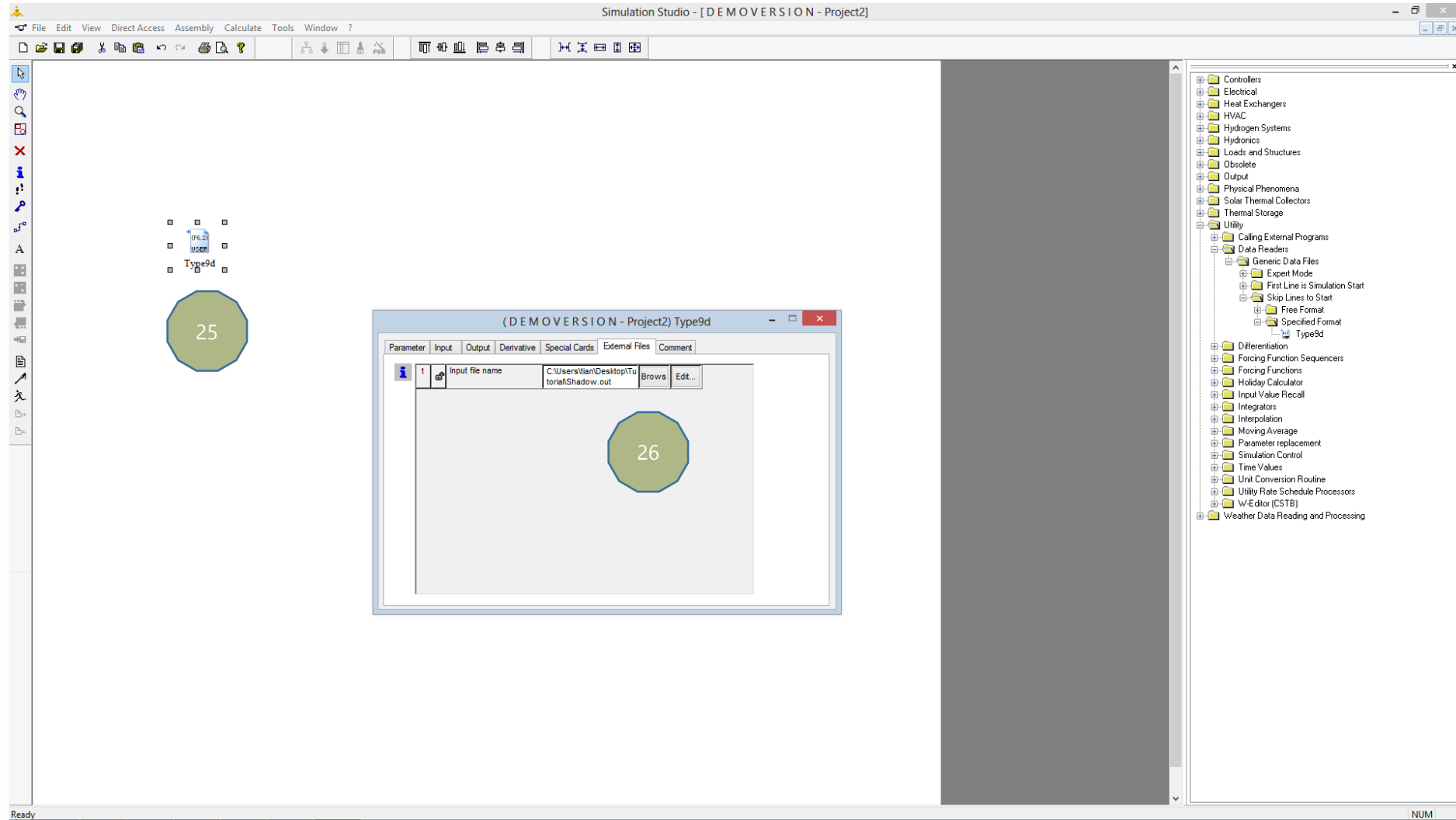
Press „start“ and drink some coffee.



During the HVACTool is working you can turn on the legend and have a look to the colorful sun mesh.

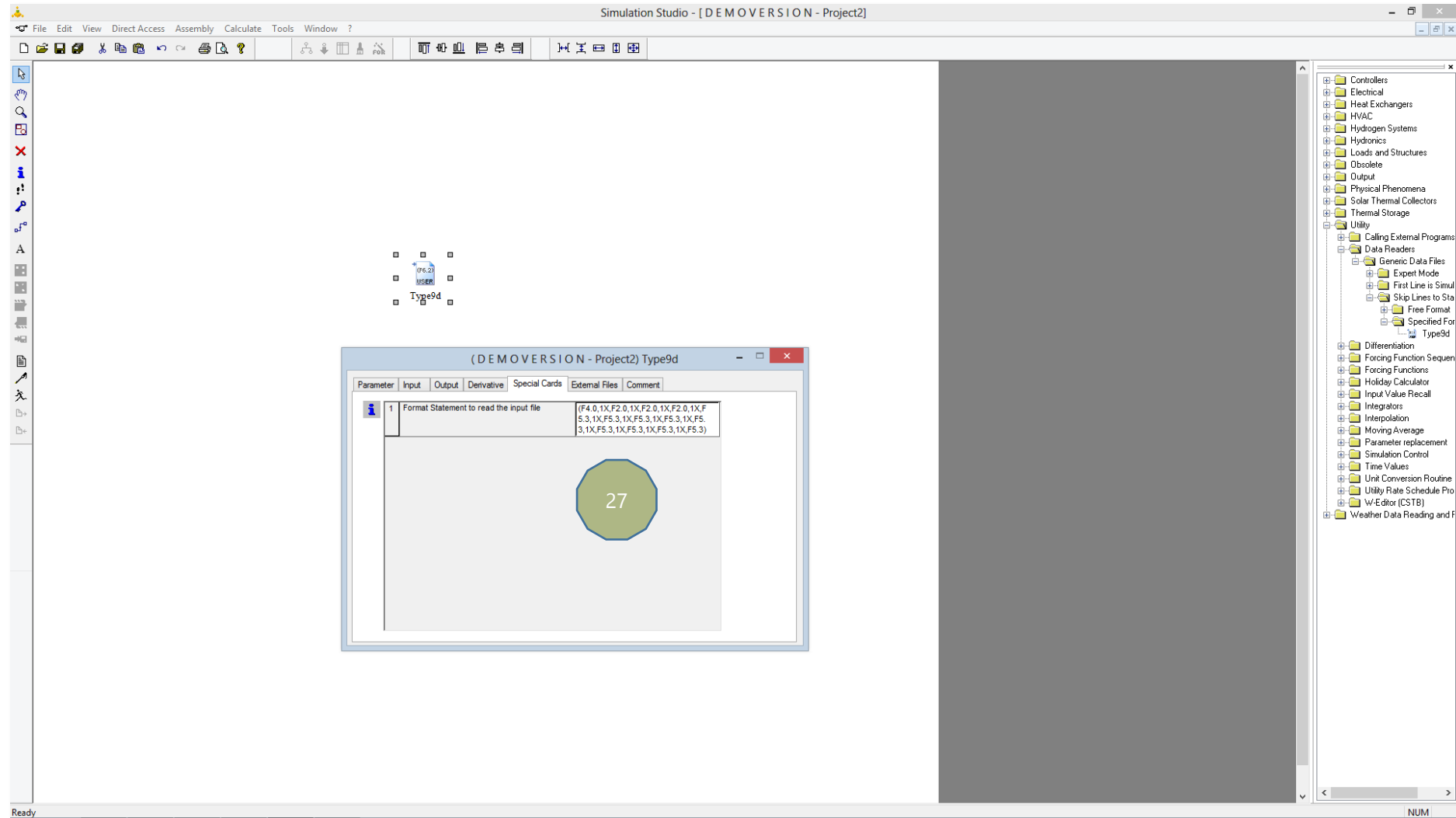


Start a new project in TRNSYS and use Type 9d Select the external shadow file



Adjust your import like

(F4.0,1X,F2.0,1X,F2.0,1X,F2.0,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3,1X,F5.3)



Skip header to „1“ and connect a online plotter with Output 5. Number of values to read: 13

The screenshot shows the Simulation Studio interface for a project named "DEMOVERSION - Project2". The main workspace displays a diagram with a "Type9d" component connected to an "Online Plotter" component. A parameter table for "Type9d" is open, showing the following settings:

Parameter	Input	Output	Derivative	Special Cards	External Files	Comment
1	Mode	5	-			More...
2	Header Lines to Skip	1	-			More...
3	No. of values to read	13	-			More...
4	Time interval of data	1.0	hr			More...
5	Interpolate or not-1	1	-			More...
6	Multiplication factor-1	1.0	-			More...
7	Addition factor-1	0	-			More...
8	Average or instantaneous value-1	1	-			More...

A green circle with the number "27" is overlaid on the "No. of values to read" parameter. The right-hand pane shows a hierarchical tree of components, including "Online Plotter Without File" and "Type65d".

Now you can do what ever you want to do

