DIGITAL MAPS FOR SOLAR ENERGY

LOD2 3D buildings with sloping roof elements along with 3D vegetation are key initial sources for evaluating solar resource availability and running solar energy simulations

High-accuracy 3D datasets provide high solar project value and increase its performance.
Therefore, data details, accuracy, and relevance are critical parameters for solar resource assessment and modeling

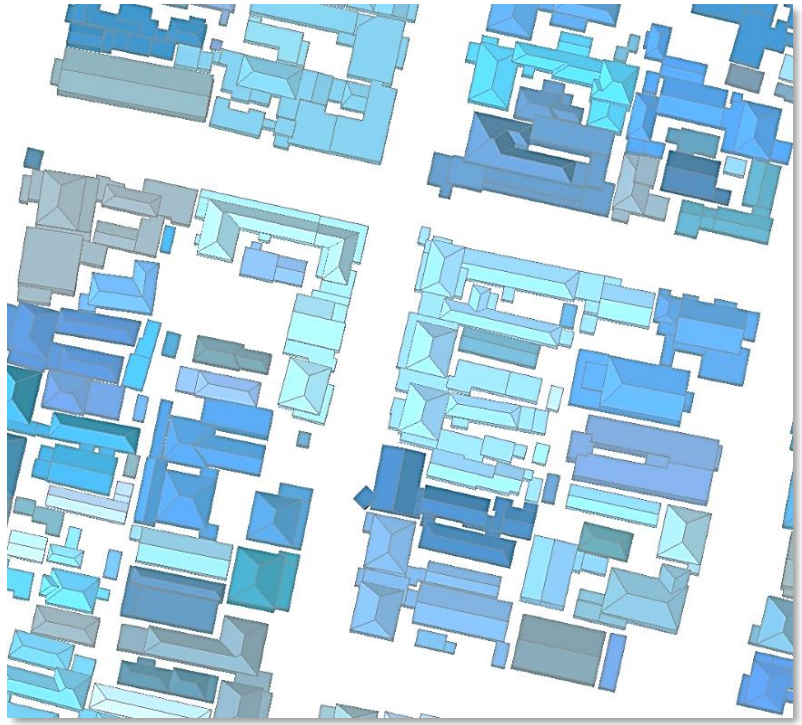
PRODUCTS OVERVIEW

DELIVERED DATA LAYERS

- Digital Terrain Model
- Digital Surface Model
- 3D Buildings LOD 2
- 3D Vegetation crowns
- Orhtorectified imagery

The assigned roof parameters

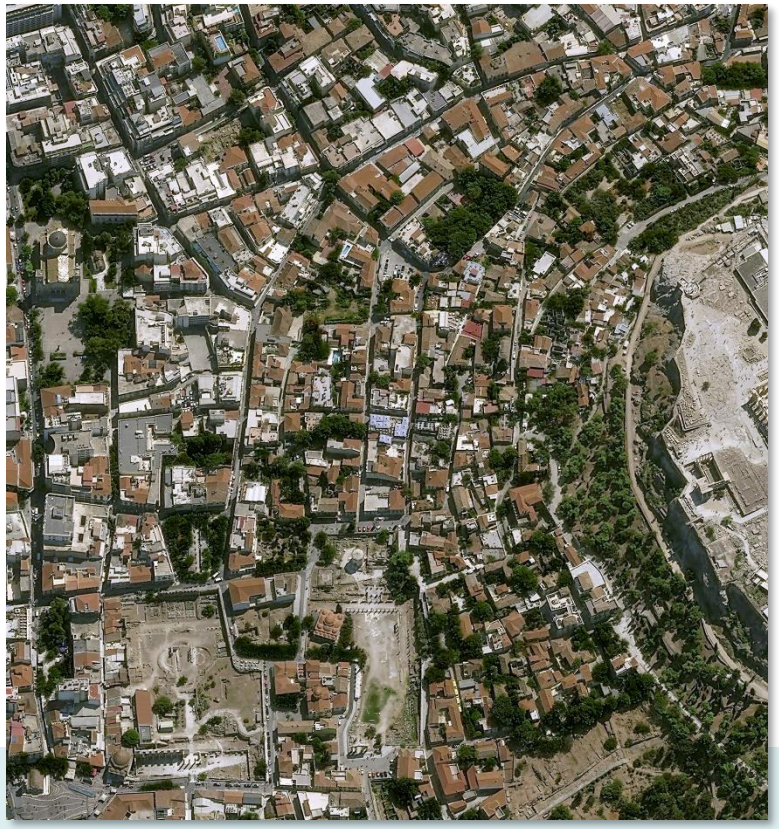
- Azimuth
- Tilt angle
- Area of flat parts
- Roof height
- Roof ID
- AGL/AMSL



The roof parameters are calculated for each element separately, creating the background for producing solar rooftop maps (solar cadaster)

The high accuracy of the building elements' footprints is tailored explicitly to the estimation and calculation of the solar energy potential for each roof

TYPES OF SATELLITE IMAGES USED FOR DATA PRODUCTION



- WorldView 1,2 - 0.5m resolution
- WorldView 3 - 0.3m resolution
- Pleiades - 0.5m resolution

PRODUCTION PROCESS

1

SATELLITE IMAGES PROCESSING

- ❑ Selection of appropriate images
- ❑ Radiometric and atmospheric correction
- ❑ Georeferencing and geometric correction
- ❑ Orthorectification
- ❑ Image fusion
- ❑ Mosaicing

2

DTM EXTRACTION

- ❑ Stereo satellite images data are used
- ❑ Picket and relief structure lines capturing

3

3D BUILDINGS MODELIING

- ❑ Stereo satellite images are used
- ❑ Extraction of buildings outlines and heights from stereo pairs of satellite images
- ❑ Roof parameters calculation

4

3D VEGETATION MODELIING

- ❑ Vegetation outlines recognition from satellite images
- ❑ Segmentation of vegetation polygons
- ❑ Vegetation heights defining by Convolutional Neural Network (CNN) model

5

DSM PRODUCTION

Combining of DTM, 3D Buildings layer and 3D vegetation layer

6

CONVERTION DTM, DSM, ORTHOIMAGE IN GEOTIFF FORMAT

QUALITY CONTROL
are applied after each production stage

SOFTWARE	Leica Photogrammetry Suite MicroStation ArcGIS FME Tool

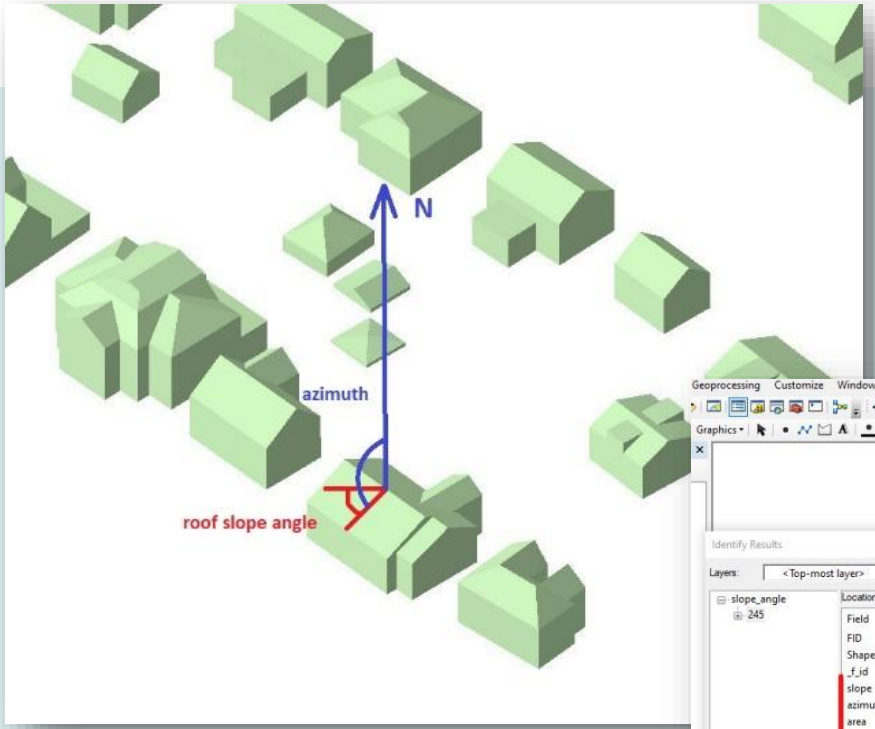
THE ROOF PARAMETERS CALCULATION

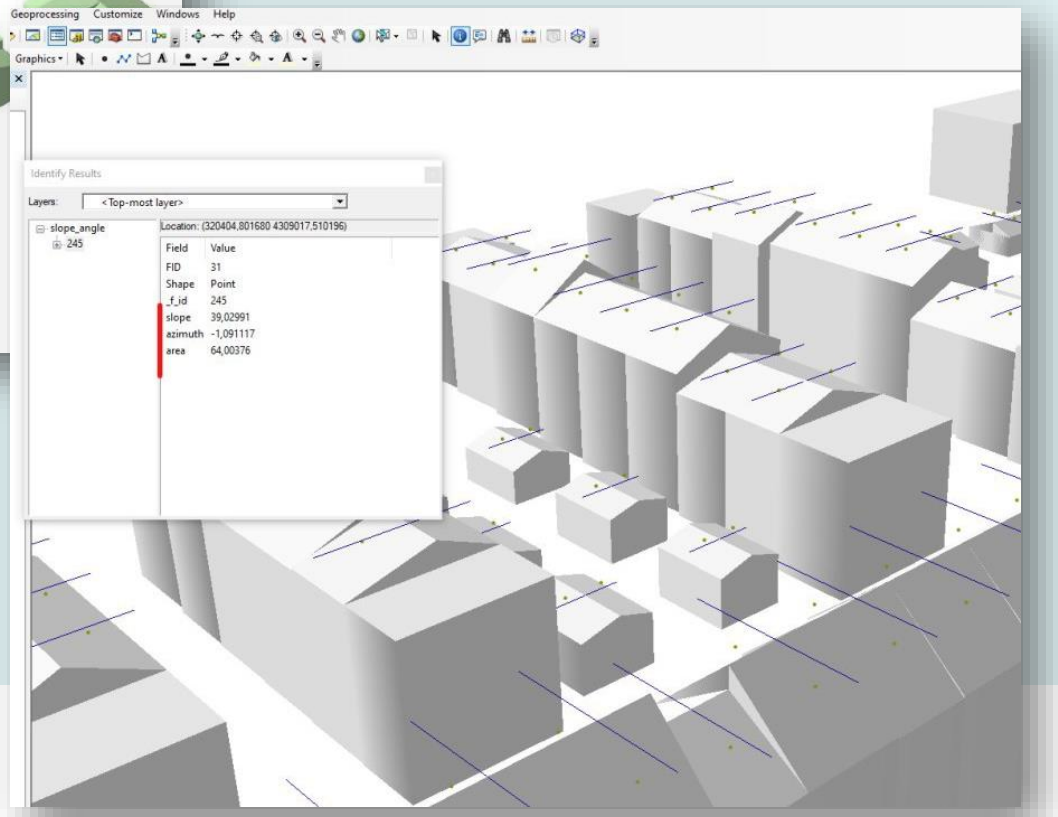
INPUT:
The captured data (3D buildings, SHP MultiPatch) obtained after the plotting serve as initial data for the calculation.

FME Tool

STAGES OF PROCESSING:

- ❑ The buildings are divided into the geometry components (roofs, walls, foundations)
- ❑ All the roofs are assigned with the attribute feature (ROOF=1)
- ❑ The following parameters are calculated:
  - ➢ AMSL (Above Mean Sea Level)
  - ➢ AGS (Above Ground Level)
  - ➢ Area of a roof element
  - ➢ Tilt/Elevation angle of a roof element relative to the ground
  - ➢ Azimuth angle (horizontal angle between center line of a roof element and North)
  - ➢ X,Y,Z coordinates of a central point of a roof element (centroid coordinates)





Output formats:
3D SHP
OGC GeoPackage

VISICOM®

OUTPUT PREVIEW

OUTPUT PREVIEW

OUTPUT DATASET:
3D Buildings and 3D Trees (if required)

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