huellasolar

OPENPLATFORM (user guide V2.0)

1. What is the OpenPlatform of huellasolar?

The huellasolar OpenPlatform is an environment that allows you to build and display radiation and sun exposure maps of your projects of cities.

Is specially designed to work with cities and urban environments but can be used with any sort of model.

Built maps are interactive and have a lot of features available to analyze the sun exposure and the radiation in the models.

2. What do I need to start?

1. First you need to have a geometric definition of your model including heights.
2. You need to format your data so the OpenPlatform can recognize and work with them (See point 4)
3. To build maps you must be registered in the web. Register is free and you can build maps for free up to 1,44Km2

3. Free accounts and business accounts

You can use the OpenPLatform and the huellasolar viewer for free. However there are some features only available for business account:

Free accounts

Free accounts allow you build and explore radiation maps with all the features available in the huellasolar online viewer
There is no limit to the number of maps you can create; however the size of each map is limited to $1.44Km^2$ with a number of tiles up to 4.
With free accounts you can only create open maps.

Business accounts

Business accounts allow you build bigger maps up to $116Km^2$ with a number of tiles up to 324.
In addition business accounts offer three ways to publish your maps:
- Open-Map.
- Pay-Map. You can earn money with your radiation maps
- Private-Map. Only you will have access to your maps

4. Formatting my data

The app works with geotif or png files.

Geotif files

These are files usually generated from digital model of terrain, clouds of points, lidar files etc.

These files should have only one band of data corresponding to the elevations from the sea level for each point. You can save this type of file using any GIS program like Qgis or Gvsig.

The installation of the databuilder includes examples with tif files. If you want to visualize them, we recommend opening them with GIS software.

PNG files

Depending on your necessities or your source of data, you can also work with png files but they must be formatted as follows.

They must be .png files where the rgb value of each pixel is the elevation in meters over the sea level. For example, if a point has an rgb value of #00003b its elevation is 00003b=59 meters over the sea level.

Visit the section 'Documentation' of the web to find tools and video tutorials explaining how to format these files from CAD or shp files.

The relation m/pixel must be 1 in both types of files.

The size of the tiles must be between 120m and 600m. Therefore the minimum size admitted is 120x120m (=pixel) and the maximum is 600x600m (=pixel)
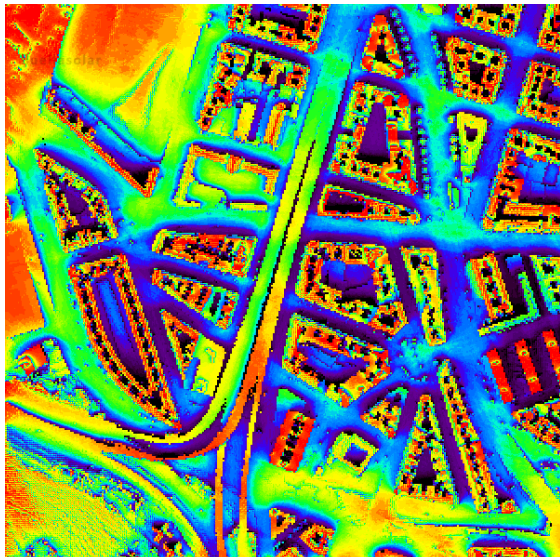
Results with TIF files vs results with PNG files

Tif files deal with decimal values but png files only support integer values.
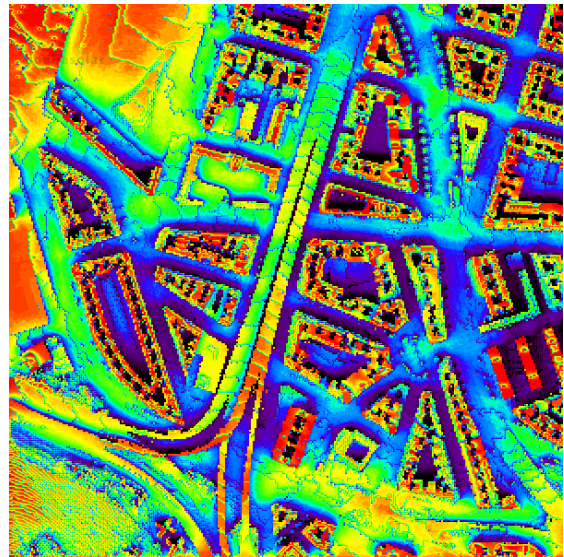
For example, a pixel which in a tif file has the value of 34.2, in a png file will be 34.

Therefore, results from tif files will have softer transitions than results from png files as it is shown in the following images.

Results from TIF   Results from PNG

Structuring the map

Every raster correspond to a tile of your map. You must split your model in tiles with the following conditions:
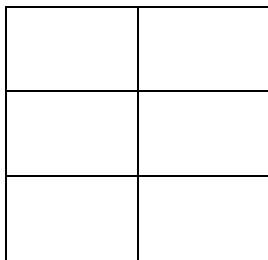
    a. Width and length of every tile must be between 120 and 600 meters
    b. Both dimensions width and length can be different but all the tiles in a map must have the same dimensions
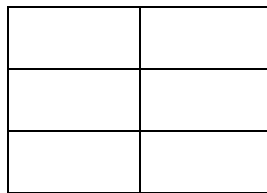
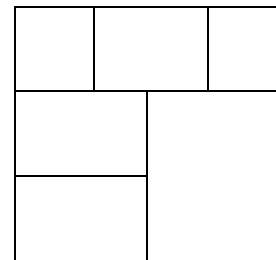   (i) Free accounts allow maps up to 4 tiles. If your tile is 600x600 meters you can build maps up to 1.44Km^2

    (i) Business accounts allow maps up to 324 tiles. If your tile is 600x600 meters you can build maps up to 116.64Km^2
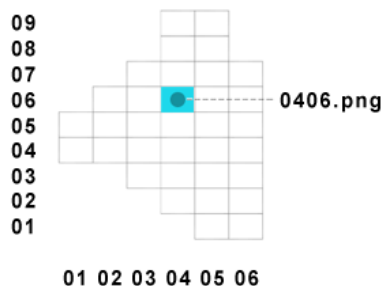
    ✔ Correct   ✔ Correct   ✖ Incorrect
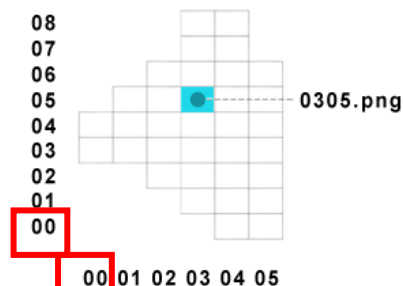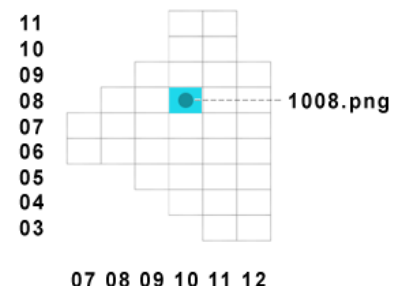
    c. Number the raster as in the following images

    ✔ Correct   ✖ Incorrect   ✔ Correct
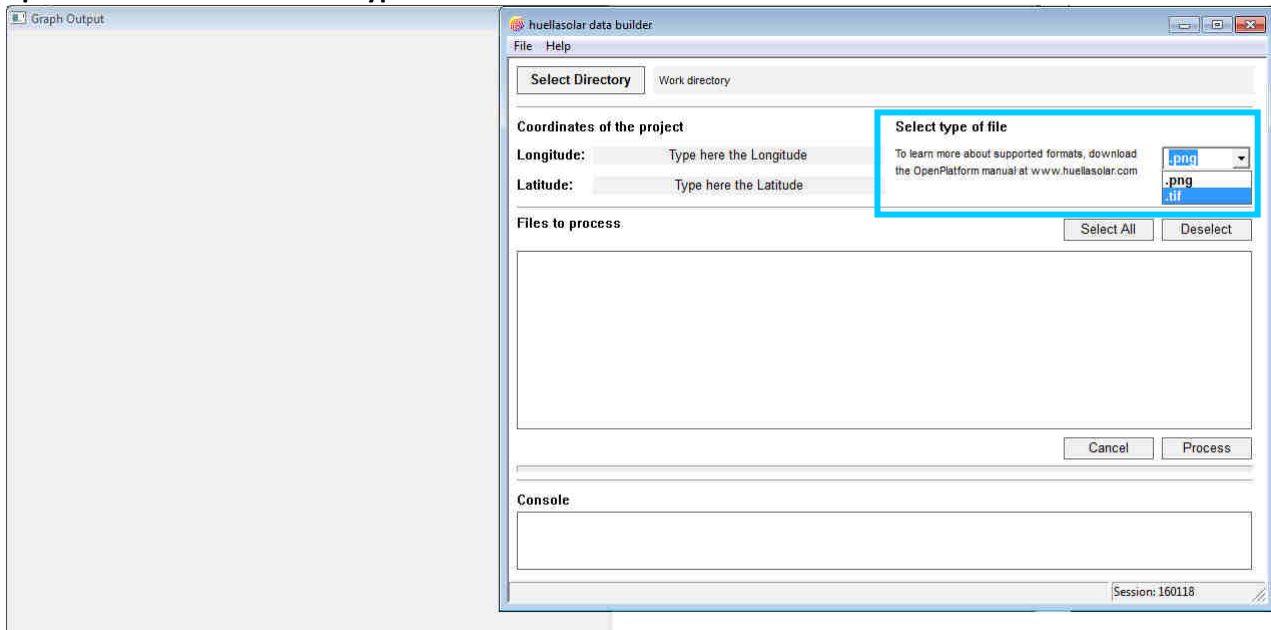
5. Building data packages with the desktop tool

Once you have the raster of your model you can start building your map.

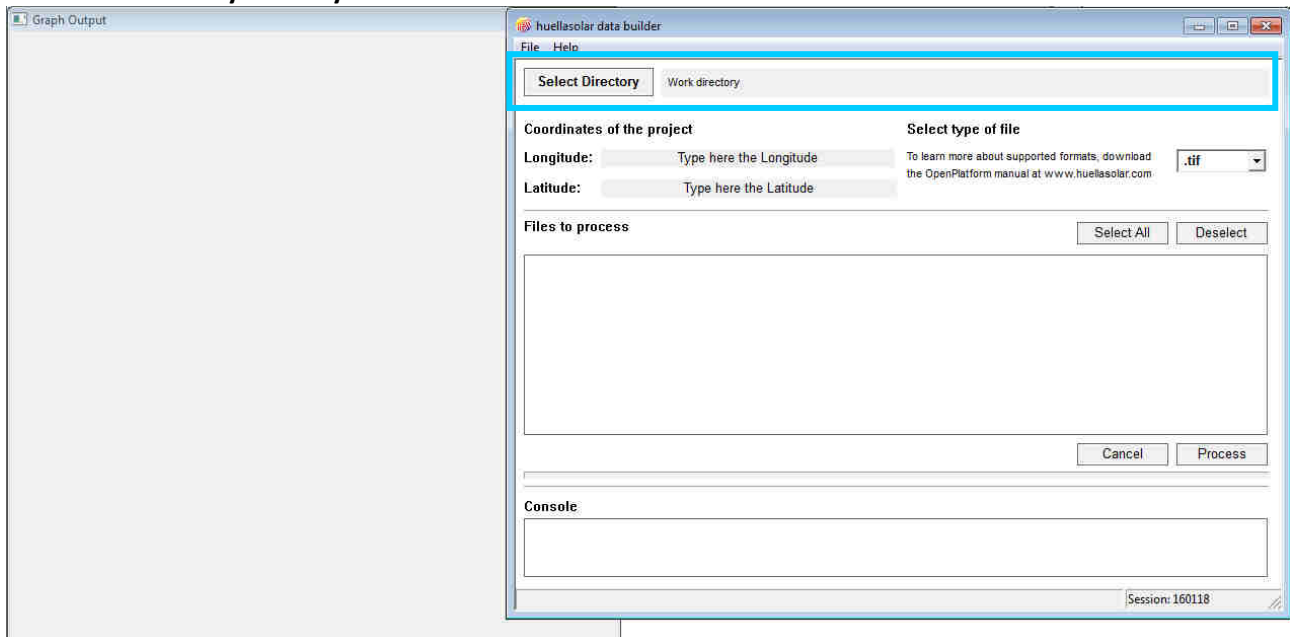The first step is to generate data packages with the desktop tool.

The desktop tool is a free download. Visit the documentation page in www.huellasolar.com and download it.

This tool is a little windows application that will compile a number of data packages that you must upload to your project from you edition panel (See point 7.2)

Open the tool and select the type of file

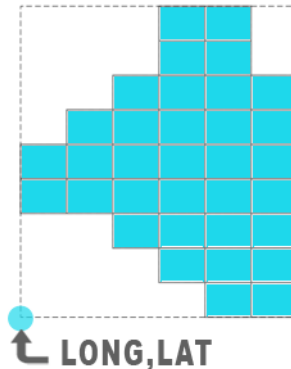### Select the directory where your raster are located
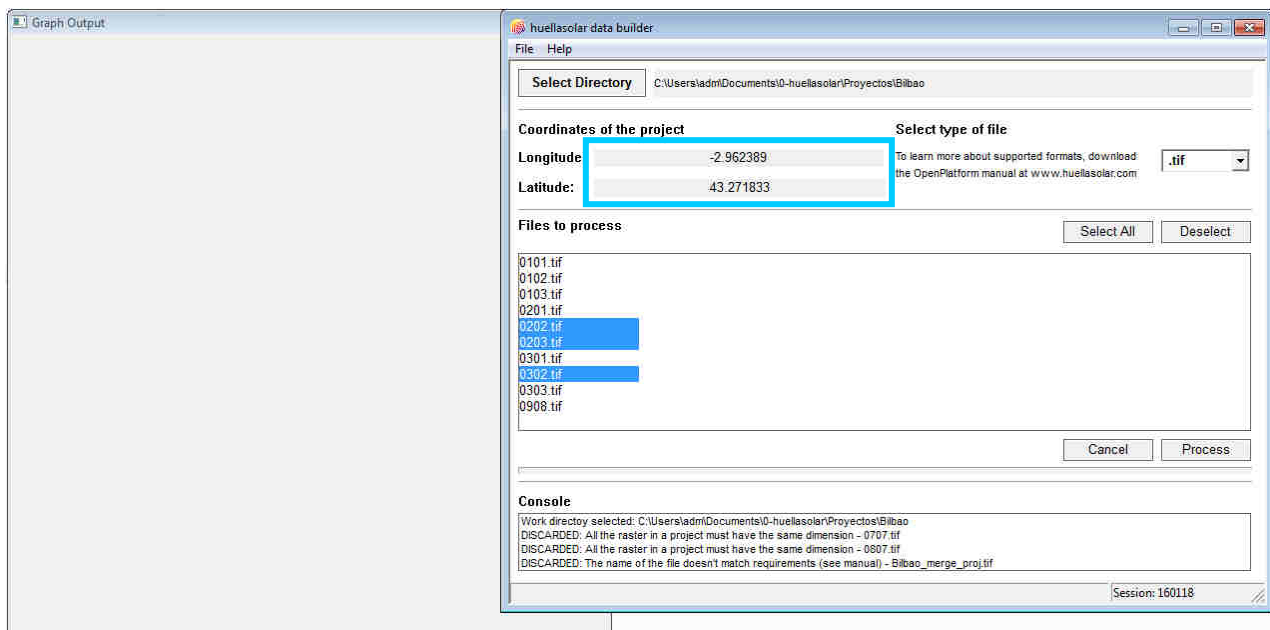

A list with the raster available will be displayed

(i) We recommend you to place the raster files of each project in different folders to avoid errors

(i) Only raster numbered according point 4 will be displayed. In the console log the discarded files will be prompted

Type the values of longitude and latitude of your project and select the files to process

These coordinates must correspond to the lower left corner of the square circumscribing your map as in the following image:

Select the files you want to process clicking on them in the list

(i) West and south values are negative

(i) You don't need to type the coordinates every time. Next time the tool will load the last values of longitude and latitude for the project

Start processing the data

Click the 'Process' button to start compiling the data.
A progress bar will indicate the state of the progress. Additionally a graphical output will be displayed in the little window.

ⓘ Notice that computing many raster can take several minutes, and depending on the number and size of the tiles it could take even hours. Nevertheless you can always cancel the process and start it again from the tile where it was canceled

Once the process is finished a dialog will be displayed with the directory where the packages have been stored and the errors log if any.

The results are stored in the following path:
"[Your work directory selected]\Session [your id session in the lower right corner of the tool]"

Look at the results path. You will find a number of files with the following names:
"hso_package_[the raster number]_[the id package number].hsp"
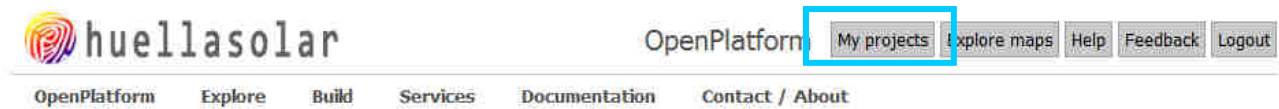Ex.: hso_package_0512_5.hsp

Additionally you will find png files for each tile formatted as it is explained in the point 2 of this manual.
If you are working with png files, they will be just a copy of them.
If you are working with tif files, these png files are the ones which you should upload to your edition panel in the web huellasolar, see point 7.2 of this manual.

6. Creating a Project

Go to your dashboard projects in the www.huellasolar.com web. Select the option 'My Projects' of the OpenPlatform menu at the top of the page (must be logged)

This will load your projects panel from where you can manage and create new projects. Go to the 'Create new project' section:

Fill the form and push 'Create'

(i) Title is a unique value for all your projects. You can repeat the title in other project

(i) Values of Longitude and Latitude must be the same you used in the desktop data builder. See point 5 of this manual

(i) If you are going to create a private map the license selected has no effect because only you will access the map (Private maps is a feature only available in business accounts)

An empty project will be created and a link to the edition panel will be showed.

Create New Project

Title:
The title indentify your project. Users can see the title and description of published proyects

Example Project

Description:

This is an example project for the openplatform manual

Coordinates of the project
Type here the coordinates of the lower left corner of the square circumscribing your map. These coordinates must be the same you used to generate data in the desktop tool (View an example)

Longitude -2.480587   Latitude 36.841825

Enter the country of your project

Spain ▾

License:
Select the type of license for your map. We recommend select one of the Creative Commons options, nevertheless you can select other license if you like. Notice that, if you are thinking in sell the access to your map, a restrictive license may discourage users to purchase your map. You can always modify it from the project edition panel.

Creative-CommonsAttribution ▾   (cc) ①
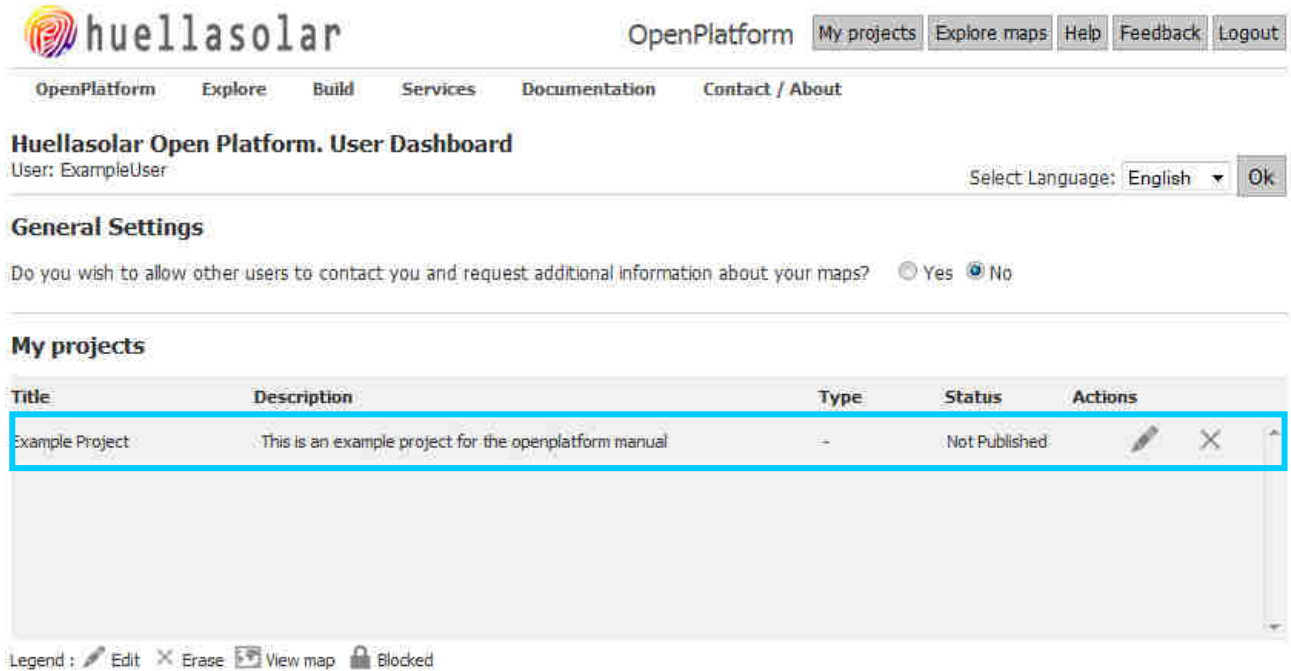
If you have selected 'Other' please, specify:

Attribution

Author : huellasolar

Project succesfully created! Start editing   [Create]

The new project is added to your list of projects:

From your list of projects you have a briefing with basic information and actions:
- Title and description of the project
- Type: Open Map, Pay-Map, Private Map (Showed when the map is published)
- Status: Published, Not Published
- Actions:

           Edit the map

           Erase the project. This will completely erase the project. This action can't be undone

           View the map. This link will redirect you to the huellasolar viewer and load your project. The project must be published first

           If there is any problem with licenses or permissions the project may be temporally blocked while the issue is solved.

7. Editing your project

Access the edition panel of your project from your dashboard clicking on the button ✐
The edition panel is the core of your project where all necessary elements are configured.
It has five tabs that are explained in the following sections.

7.1. Project Tab

This tab contains the basic information you gave when the project is created. Here you can edit some values as description and license.

ℹ️   Notice that title and coordinates can't be edited once the project is created.

7.2.   Map Tab

This tab manages all the graphical information of your project.
Here you have to upload the raster files and the data packages created with the desktop tool (See point 5)

The first section is a list with the current status of your map. This list will be filled while upload data to your project

Uploading the data:
Below the status list there are located three fields to upload the following data:

a. Raster with altitude data. These are the same files you used to compile the huellasolar data packages in the point 5 of this manual.

b. Huellasolar data packages. The files compiled with the desktop tool

c. Mask raster. These are optional data. Yu don't need to upload them to build your map but mask raster add some features may be interested.

Mask raster are used in the huellasolar viewer when you apply filters to overprint areas that match to some sun exposure conditions. In these cases, if a mask raster is present, the app will output the results for the matching areas distinguishing the ones inside the mask and the ones outside.

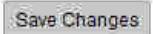For example, if you want to differentiate between built areas and open spaces you can make a png file as in the image below:

In this example buildings are set to black and open spaces are in white.

Mask raster must be black and white png files and must be named as the raster of altitudes adding '_mask' at the end.
For example: 0309_mask.png

Notice that, although the most frequent use for this option is the above described, you can define mask with any other purpose, for example for some sort of buildings or some specific areas.

Uploading the raster of altitudes:

Drag and drop the raster files inside the gray rectangle 'Altitudes Raster'

Altitudes Raster (Required data):

Drop here the raster with the information of elevations. This must be the same raster you used to generate data with the desktop tool. Only files named according to the rules described in the guide will be listed (Additional info)

> Drop your raster here

Clear list

Altitudes Raster (Required data):

Drop here the raster with the information of elevations. This must be the same raster you used to generate data with the desktop tool. Only files named according to the rules described in the guide will be listed (Additional info)

> Drop your raster here
>
> 0414.png 🗑
> 0512.png 🗑
> 0612.png 🗑

Clear list

Push the button ⬆ to upload the files

ⓘ Notice that only files named according to the rules in the point 4 of this manual will be listed. Make sure you are dropping the correct files in the proper area

Uploading the data packages:

Follow the steps above in the section 'Data Packages' to upload them

ⓘ   You can upload only data packages of one tile at the same time. (In the image the tile 0414)

Uploading the mask raster (Optional):

Follow the same steps to upload mask raster.

ⓘ   Remember that mask raster must be named with a tag '_mask' For example. 0414_mask.png. Otherwise files will be ignored

While you upload data to the map the status list at the top is being updated:

7.3.   Radiation Tab

In this tab you can configure values for the estimation of radiation.
If you are only interested in sun exposure values can leave these values to default, otherwise, if you are going to take radiation data from your map we recommend you to set up this section.

Linke atmospheric turbidity factor:

Type here the values of the Tlk factor for your location. If you are not sure about what values are suitable for your project, the web offers a link to values around the world.
You can also get this data from the SoDa (Solar Energy Services for Professionals) web page.

January	February	March	April	May	June	July	August	September	Octuber	November	December
3.18	3.3	3.44	3.65	3.86	3.91	3.99	4.04	3.94	3.61	3.25	3.08

Set Default   Save Changes

ⓘ   Notice that, although the app provides defaults values, using them without check your local values would cause a loss of reliability for the results of radiation in your map.

Cloudiness Index:

If you have cloudiness index values for your location you can type them in this form. If you don't have such values or you don't want to compute real sky conditions just leave this fields to cero.
In that case radiation values will be calculated in conditions of clear sky without take into account cloudiness.

ⓘ   Note: If your map is located in Europe you can get cloud index values at www.satel-light.com

Set Default   Save Changes

January

Fill month with value = 0 ▶

hour	8	9	10	11	12	13	14	15	16
coef	0	0	0	0	0	0	0	0	0

February

Fill month with value = 0 ▶

hour	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5
coef	0	0	0	0	0	0	0	0	0	0

March

7.4.   Production Tab

This tab is used to set up values to evaluate power production with solar collectors.
Type values of dimensions, peak power and performance for the collectors

Solar panels and installation characteristics:

Type here the characteristics of the installation to estimate electrical production.

Take into account that, in order to estimate the number and distance between panels, when they are located over a horizontal surface with a given inclination for them, the tool will consider the width dimension as the one parallel to the surface and the height dimension as the one raising from it.

Panel Height (m)	1.7	Panel Width (m)	1	Panel Peak power (W)	230
Performance of the installation (coef)	0.702				

Set Default

Here you can also type values of prices of power in the area of your map to evaluate savings arising from a photovoltaic installation.

Power costs and average consumption:

Type here the price of the Kwh and the currency in your map.

This value will be used to output estimates about the savings that a photovoltaic installation would arise

Notice that, although a default value is displayed, it can be quite far from the values for your region.

Kwh Price	0.149	Currency	euro
Housing average consumption (Kwh/year)	3272		

Set Default

(i) Notice that, although defaults values are displayed, they can be quite far from the values for your region so we recommend to customize your data

7.5.   Publish Tab

When your data are set up the last step is to publish the project. This will make your map accessible from the huellasolar online viewer and your map and data will be ready to explore them with all the features in the app.

(i) You can always edit your map and publish it again with the modifications. This process can be done every time you want to modify the map or change the access permissions
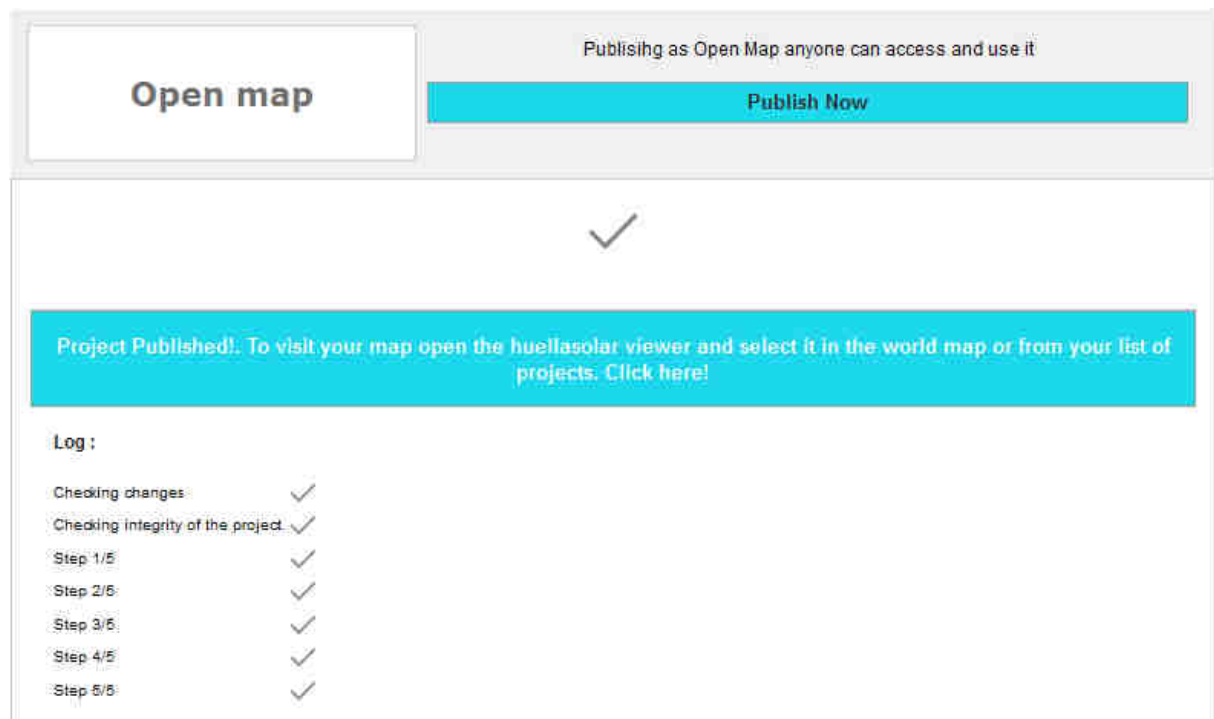
There are three ways to publish your project:

Open-Map

It's the default type for free accounts. An Open Map can be loaded by any user. However your map if offered with the license that you set up in the Point 6.1.
To publish as Open Map just click on the button 'Publish Now'

The app will start the process. An information dialog will be displayed under the button. If there is an error during the process a message with instructions will be shown.

Pay-Map

This is a feature of business accounts. Pay-Maps require a fee to be accessed. This way you can earn money with your data.

How it works?
When a user wants to access to your map the process is the following:
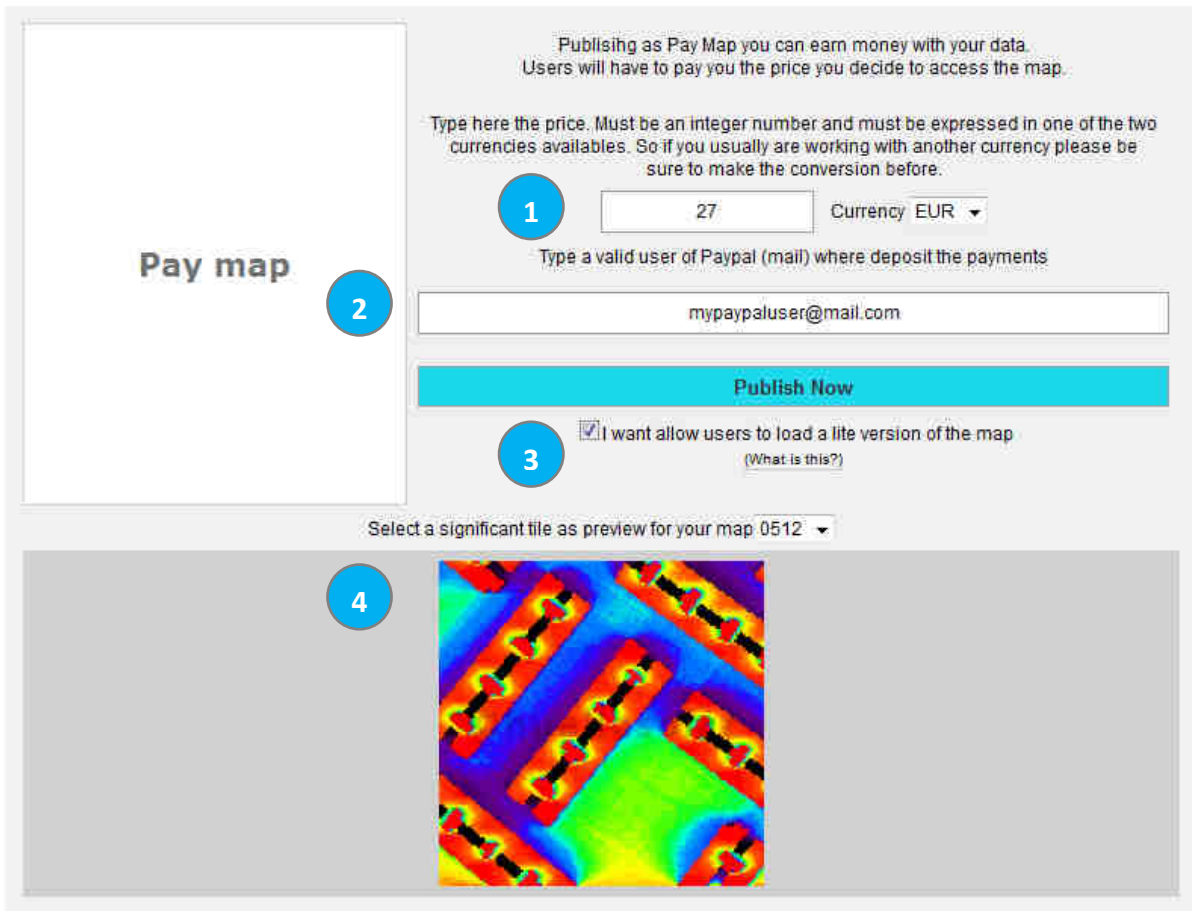
- If the user is not registered in the web he will be asked for it. (Only registered users can access these type of maps)
- We redirect him to the internet safe payment environment Paypal
- Payment is distributed in two portions 80% and 20%
- User pays you directly into your account the 80%
- User pays us the 20%

ⓘ Notice that the user pays you directly in your Paypal account. Huellasolar does not retain your fee to afterwards reimburse you

Payment gives access for a period of a month. After this period user must purchase again the access if he wants to continue using the data.

When you are going to publish a pay-map you will be asked to fill in the following information:

1. Put a price to your map and select the currency. Remember the price is for a month
2. Type the Paypal user where payments will be deposited
3. Allow lite version. When active, users can load a lite version of your map. This is useful for users who prefer have a look to the map before purchasing it.

Lite versions have the following features:
   a. Load and navigate the map
   b. Get basic data of sun exposure on points (diary sunny and shady hours, sun exposure percentages and annual averages of sun exposure)
   c. Estimate electrical production for areas with less than 50m2

4. Pay-maps always offer a preview image. Here you can select one of the tiles of your map as preview

ⓘ Pay-map is a business account feature. Take into account that, if you revoke your business account you will lose the associate advantages and the map may be blocked

ⓘ When your pay-maps have users active (users who have purchased your map and the access period is not expired) you are not allowed to erase the project, erase tiles inside the project or change the access permissions

Private-Map

Publishing as Private Map only you will access the map.
This is a special sort of publication mainly oriented to business and you will have to pay a fee for each map you publish in this modality.

How it works?

The fee is calculated according to the size of the project and is requested in the moment you are going to publish the project.

If afterward you increase the size of the project you will be asked for additional payment only for the new tiles added.

Once you buy the rights for private publishing you can freely change the permissions without additional payments.
For example, if you publish as private and afterward you prefer set as pay-map you can go back again and make your map private without additional payment.

Private map

Publisihg as Private Map only you will access the map.
This is a special sort of publication mainly oriented to bussiness and you will have to pay a fee for each map you publish in this modality.

Publish Now

Learn more about Private map

Push the button 'Publish now'. The app will start the preliminary checking and will calculate the fee for the private publication

A dialog will be shown:

Clicking 'Buy and publish' will redirect you to the safe payment environment in Paypal. Once the payment is finished the system will proceed to publish your map and a notification email will be sent to you.

- ⓘ Private-map is a business account feature. Take into account that, if you revoke your business account you lose the associate advantages and the map may be blocked

- ⓘ Reverse the map permissions will not generate refunds. If you publish a private map and afterward decide make it open or pay-map this action will not give you rights for repayments

- ⓘ Notice that, although private maps are not accessible for other users, it will be possible to find it in the list of projects of the platform. Title and description are always visible
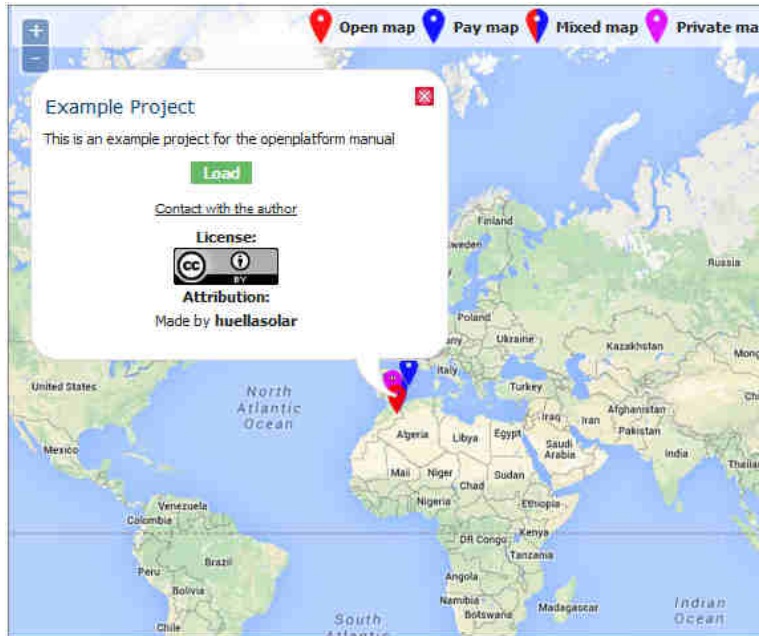
8.   Displaying your maps

Once your map is published you have different ways to access it.

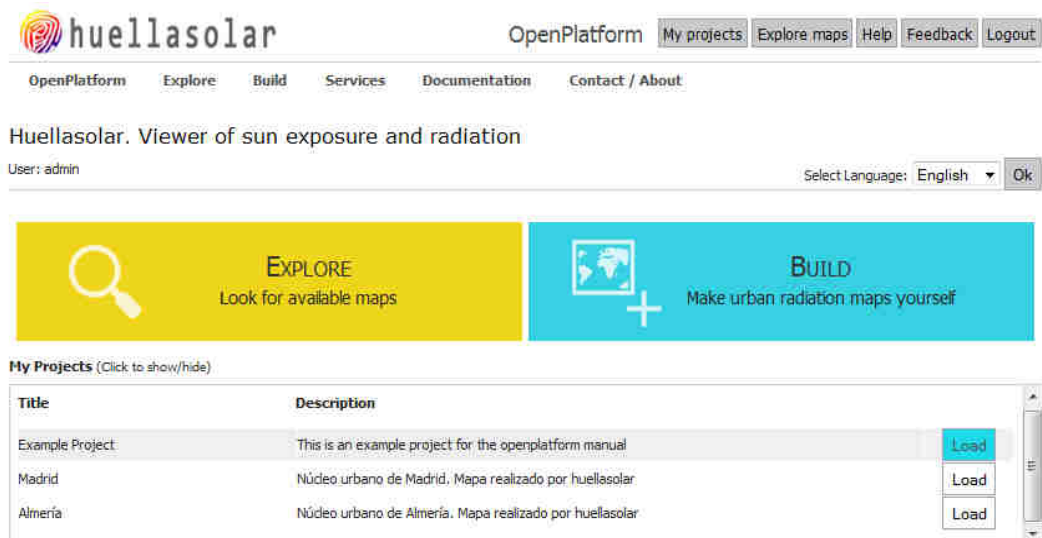**From the huellasolar viewer**
      a. Using the world map and selecting you map.
         Click on the mark of your map and click on the 'Load' button in the message that is shown.

ⓘ   Notice that if your map requires special permissions you must be logged to freely access it
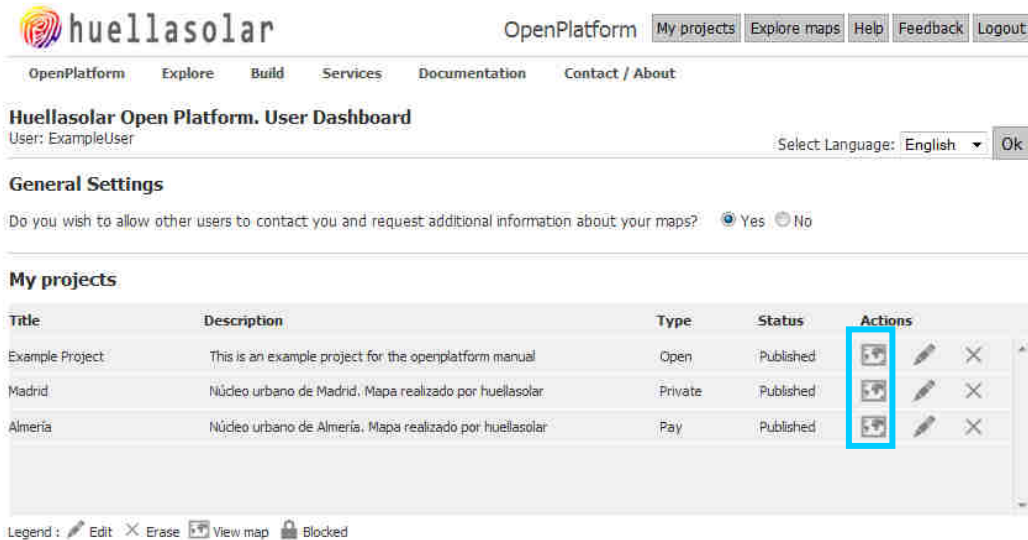
      b. Using the list of your project.
         When you are logged and access to the huellasolar viewer a list with all your projects is
         shown in the upper part of the page. You can load any of your maps from there

From your dashboard panel

Use the button from the list of your projects to load the map in the viewer

Now you can start analyzing your model with all the features included in our viewer.
Remember that you have available another manual for the huellasolar viewer where are explained all the features you can apply on your maps.