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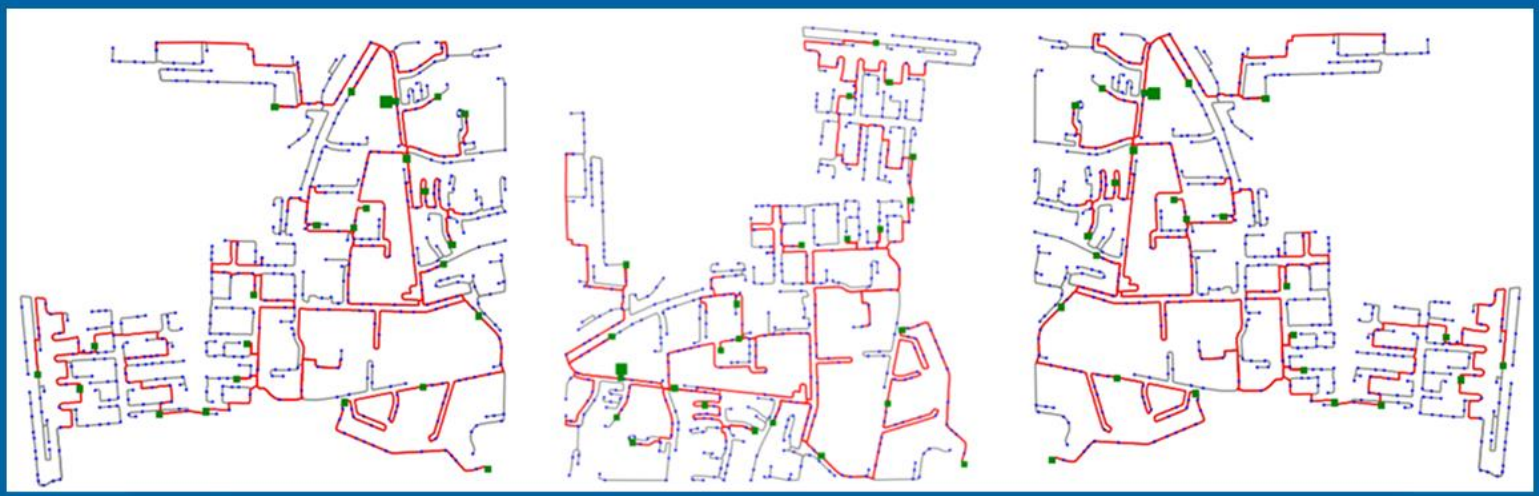
Distribution Network Models platform guideline

2020 – Version 3

Flammini, M.G., Grzanic, M., Prettico, G., Cavestro, J., Vitiello, S.



DiNeMo (Distribution Network Models module)

Joint Research Centre

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Contact information
Name: Giuseppe Prettico
Email: giuseppe.prettico@ec.europa.eu
Tel.: +39 0332783675

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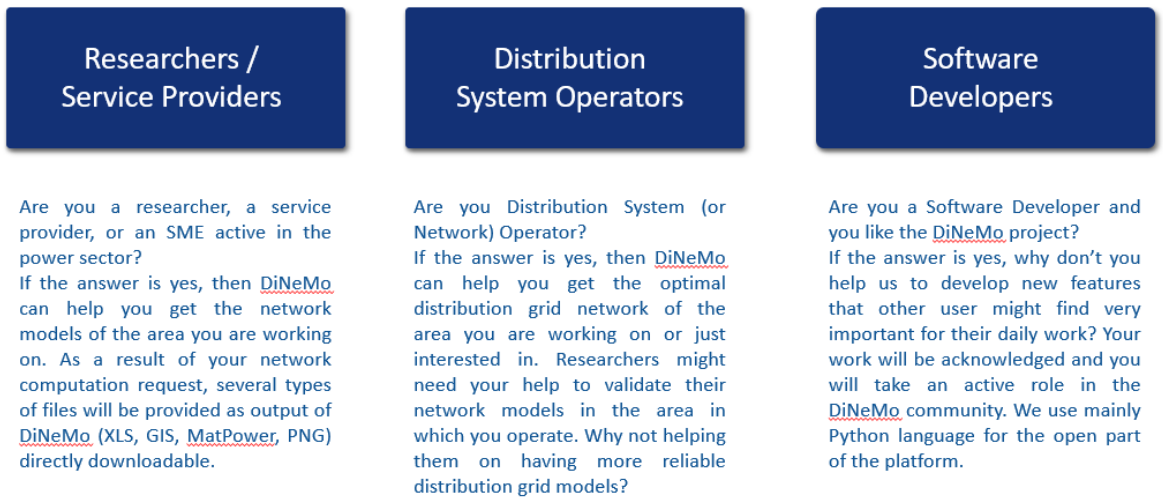
Abstract

The Distribution Network Model (DiNeMo) is the collaborative platform where it is possible to model the electricity distribution grids of your community, city or region. This document provide a helpful guideline to the user.

DiNeMo homepage is hereby presented.

1. Log in into DiNeMo platform to perform Network Computation Request.

a. When clicking on "More info on DiNeMo" the following page appear.



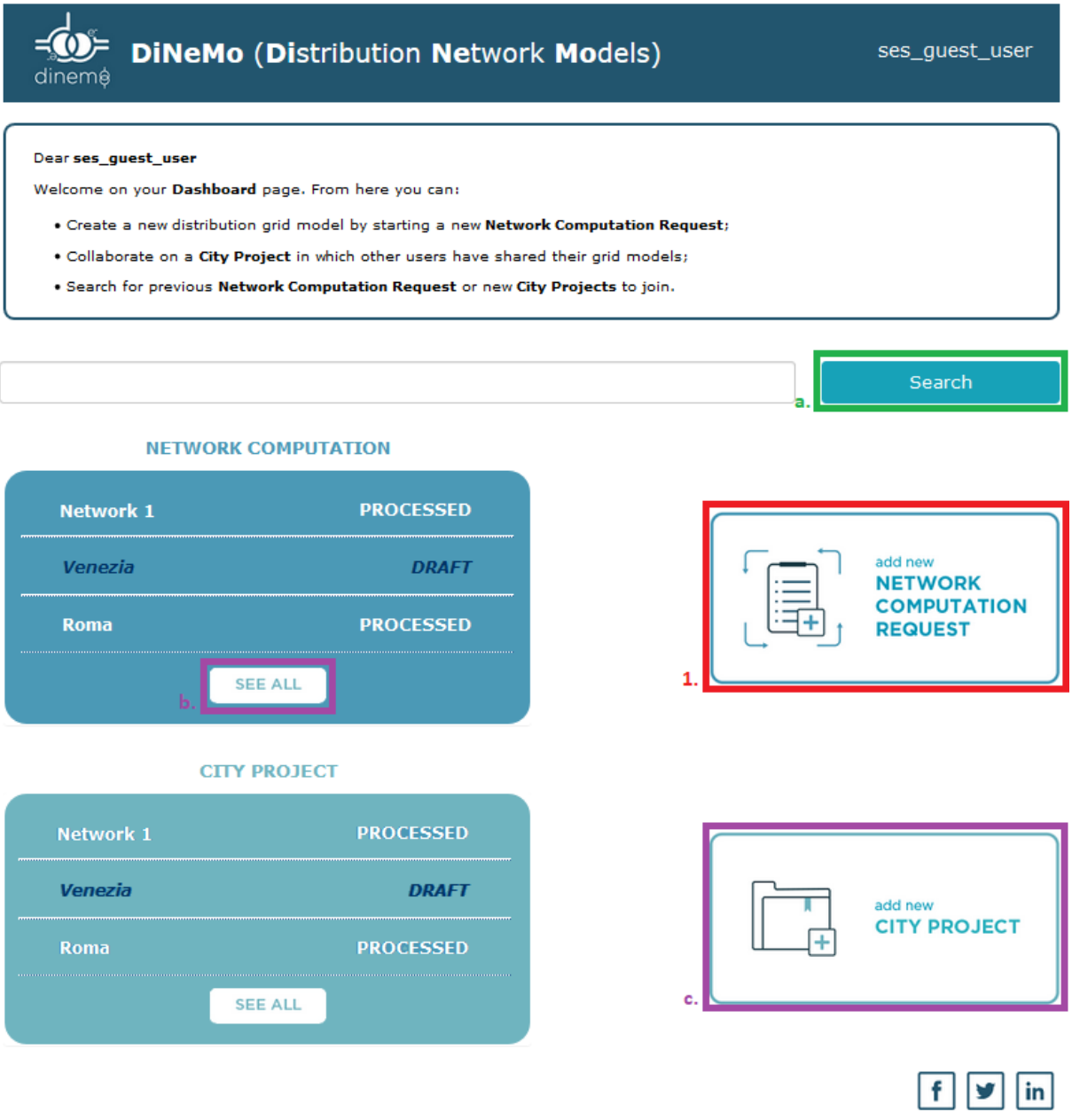
To make a New Network Computation Request on DiNeMo homepage:

1. Click on add new Network Computation Request;

a. Search within all the Network Computation Request elaborated and published by the authors;

b. Visualize all the Network Computation Request you have elaborated;

c. Create a new City Project (coming soon, only view mode is currently available)



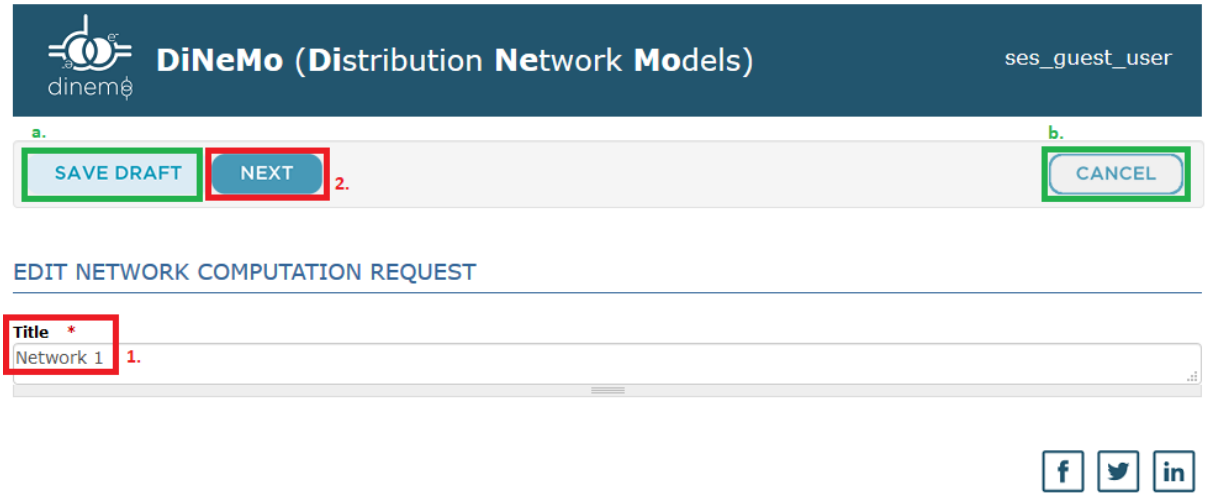
After adding the New Network Computation Request:

1. Enter the title of New Network Computation Request (mandatory);
2. Click on next to save the title and proceed.

The remaining buttons have the following meanings:

a. Save as a draft the title and move to your network computation request lists;

b. Cancel the title and go back to the dashboard.



If you process on save as draft, you will visualize the dashboard with all the Network Computation Request.

a. Create a new Network Computation Request;

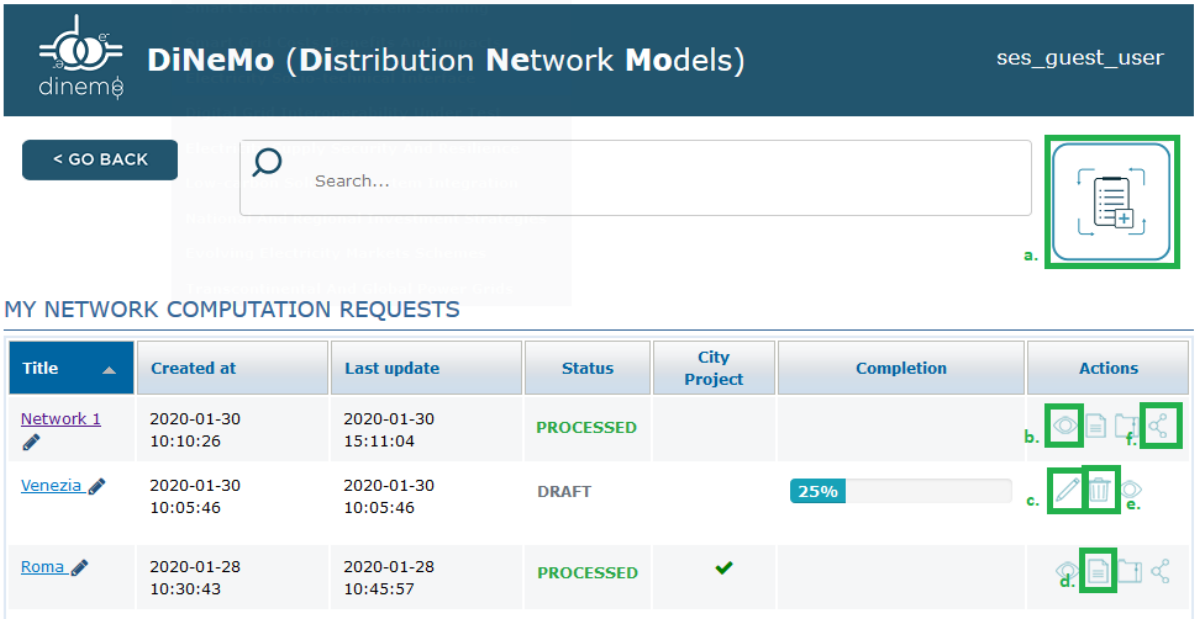
b. Visualize the summary of the input parameters, such as parameters, settings;

c. Edit the parameter in order to complete Venezia Network Computation Request;

d. Visualize the results of the elaboration;

e. Delete the Network Computation Request;

f. Create or Show a City Project



After saving the title of New Network Computation Request and clicked on next, the following page will appear where you can search the area of interest. The steps to following in this section are:

1. Enter the name of the area of interest;
2. Press search.

The remaining buttons have the following meanings:

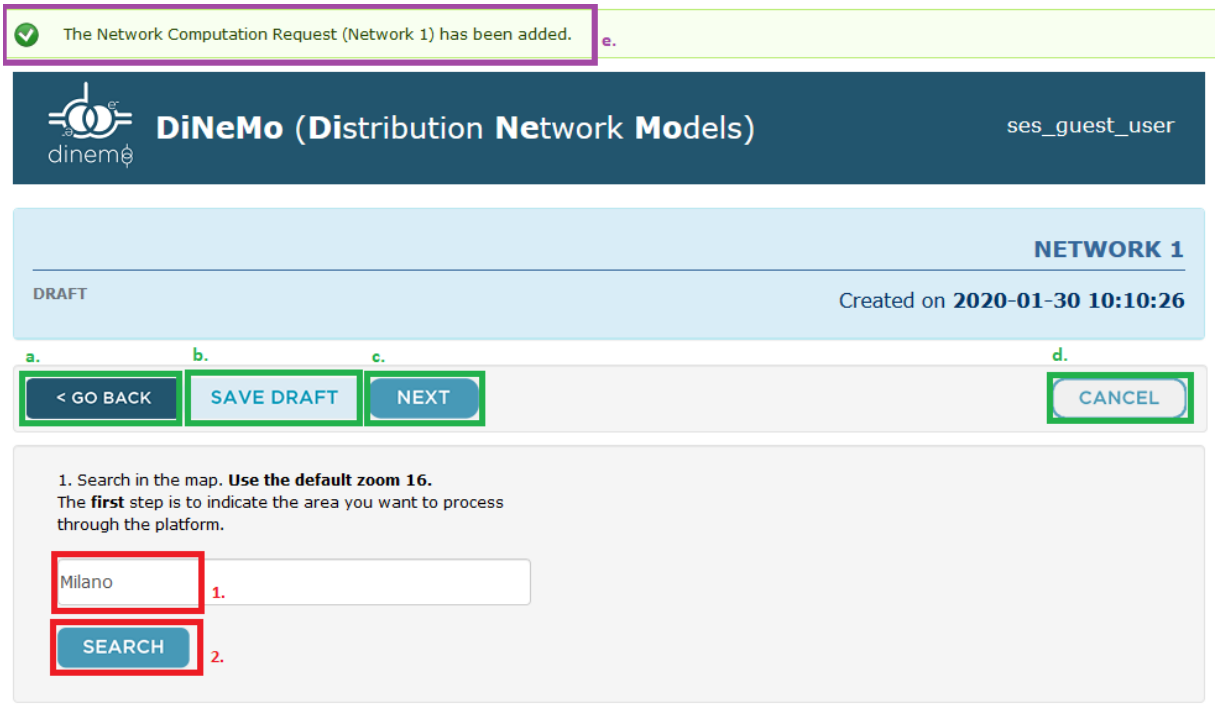
a. Go back to enter a different title for the Network Computation Request;

b. Save as draft the current project;

c. Proceed to the next page where you will be able to set the technical parameter (first it is necessary to select an area of interest);

d. Cancel the current project and go back you network computation request;

e. DiNeMo platform is informing you that the title of your project is stored.

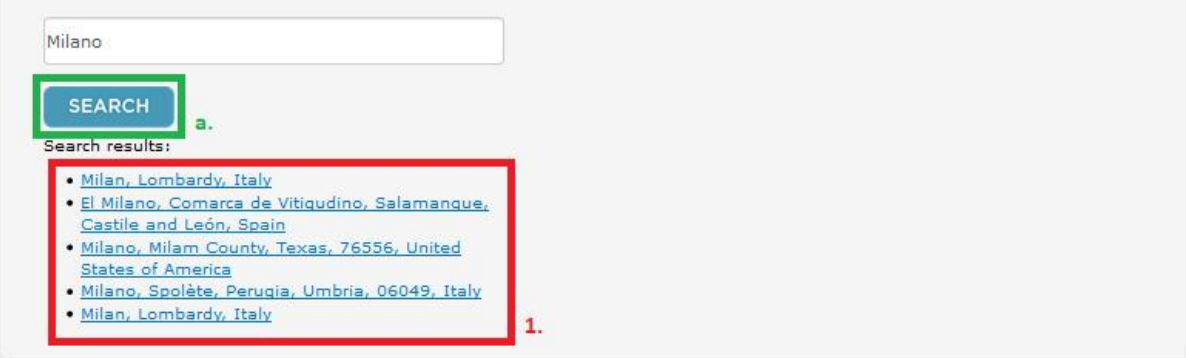


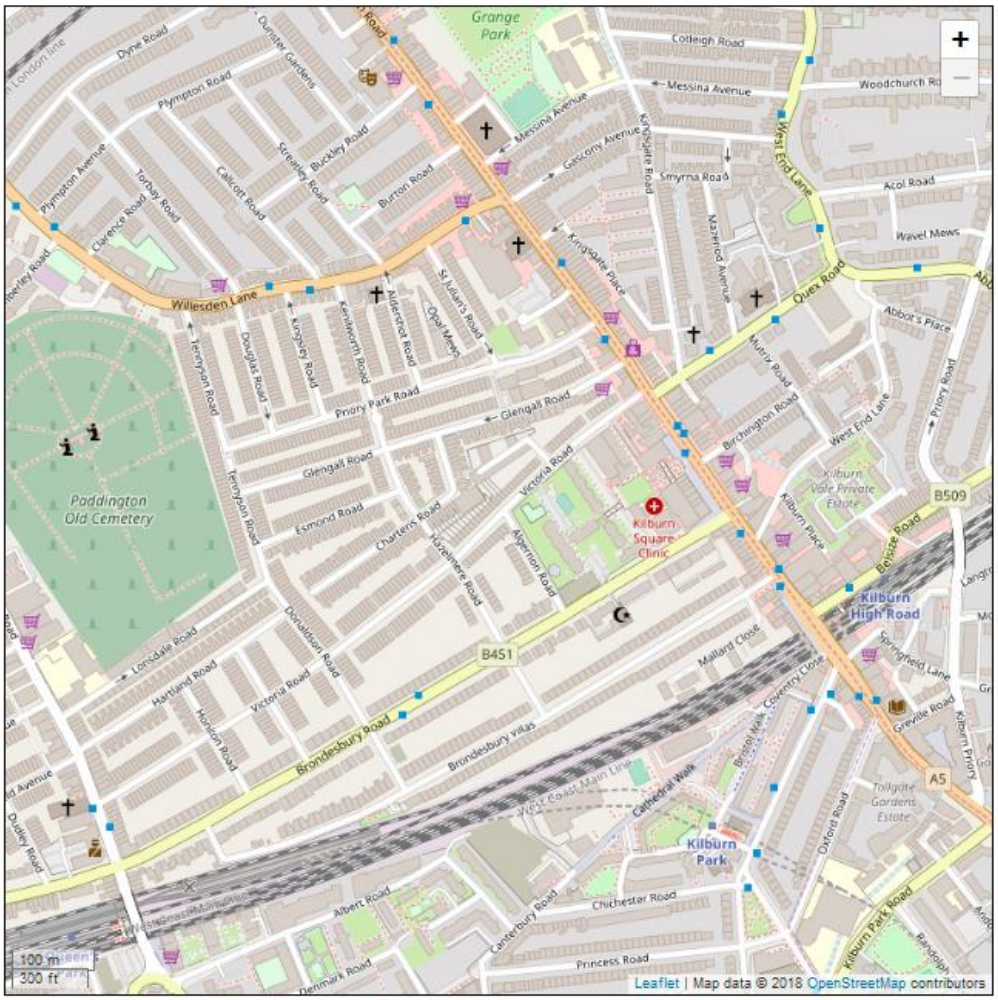
From the proposed Search results, choose the one representing your area of interest:

1. Select within the proposed area found with the name typed.

The remaining buttons have the following meanings:

a.. Search again for a new area of interest.





When you have selected the area from the proposed Search results, on the following screen you need to:

1. Search and navigate through the map below to fit the area of interest;
2. Press Capture button to save the image of the area.

The remaining buttons have the following meanings:

a.. Search again for a new area of interest.

1.

After pressing the Capture button, a notification will appear "*The map has been captured and saved on the server*". On the following screen you need to:

1 Click on next to proceed to the page where you will be able to locate the substation.

The remaining buttons have the following meanings:

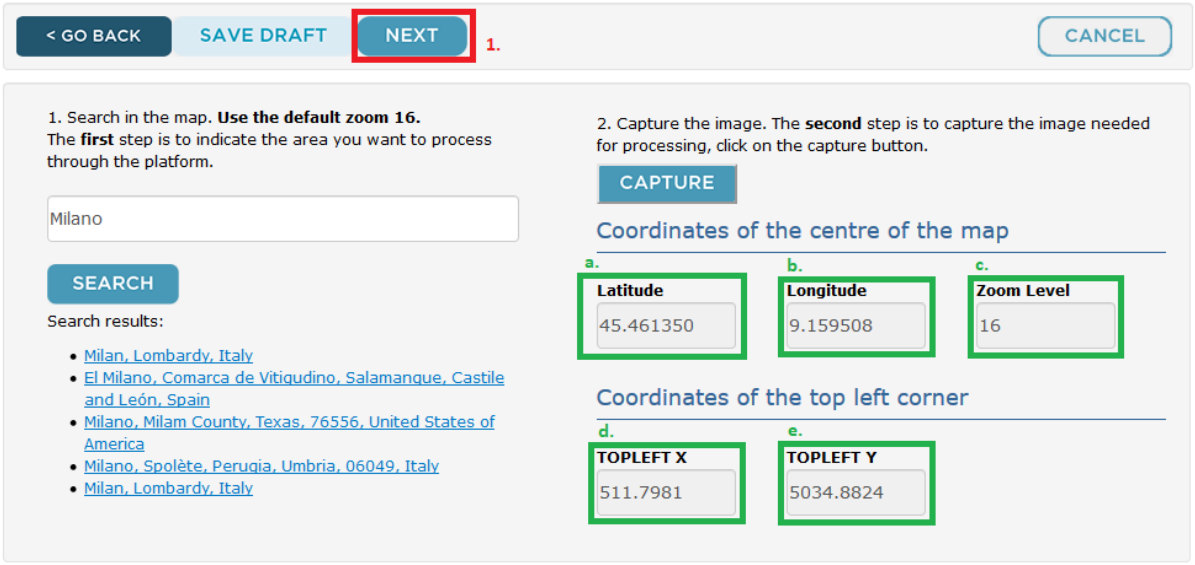
a. Save the latitude of the area of interest;

b. Save the longitude of the area of interest;

c. Save the zoom level according to OpenStreetMap settings;

d. Save the top left X coordinates of the map in Universal Transverse Mercator (UTM);

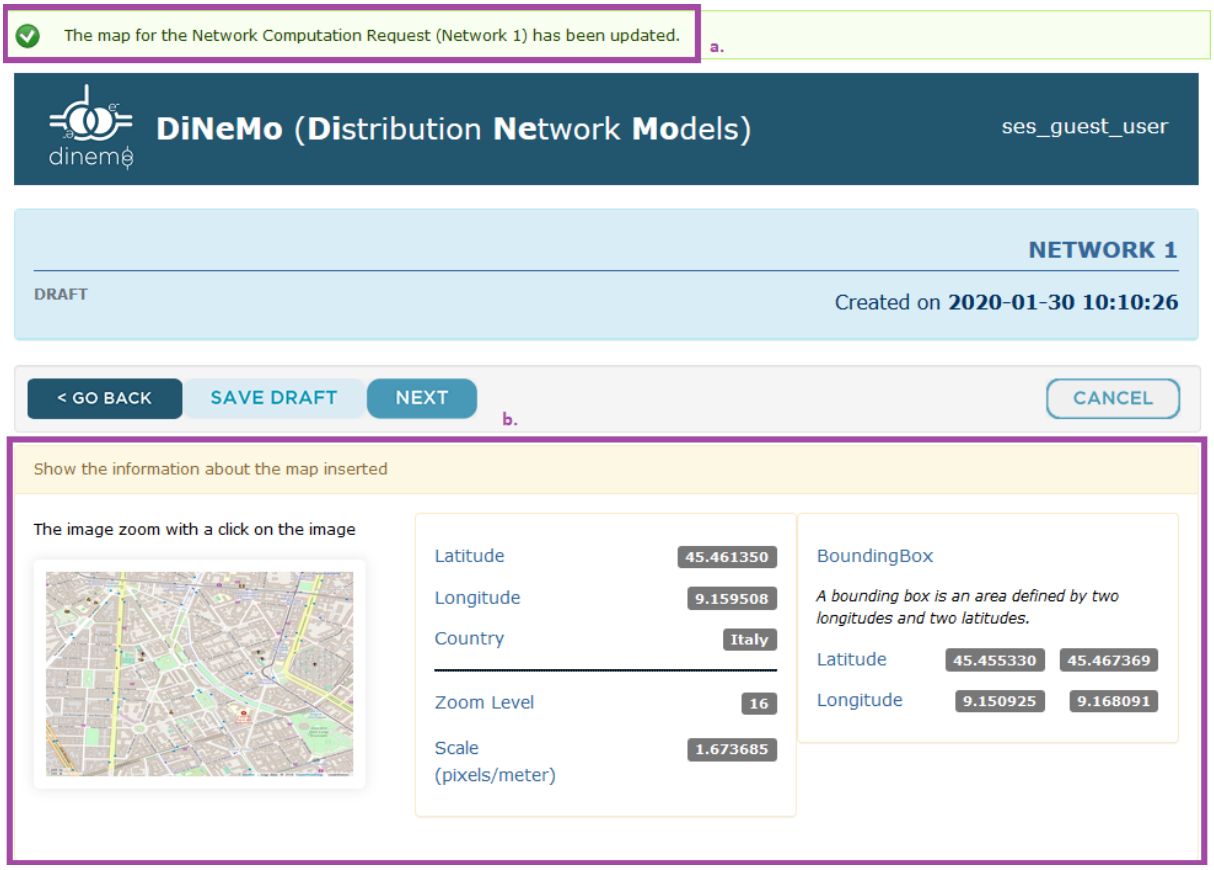
e. Save the top left X coordinates of the map in Universal Transverse Mercator (UTM).



After clicking on next the following page will appear where a summary of the information saved are provided.

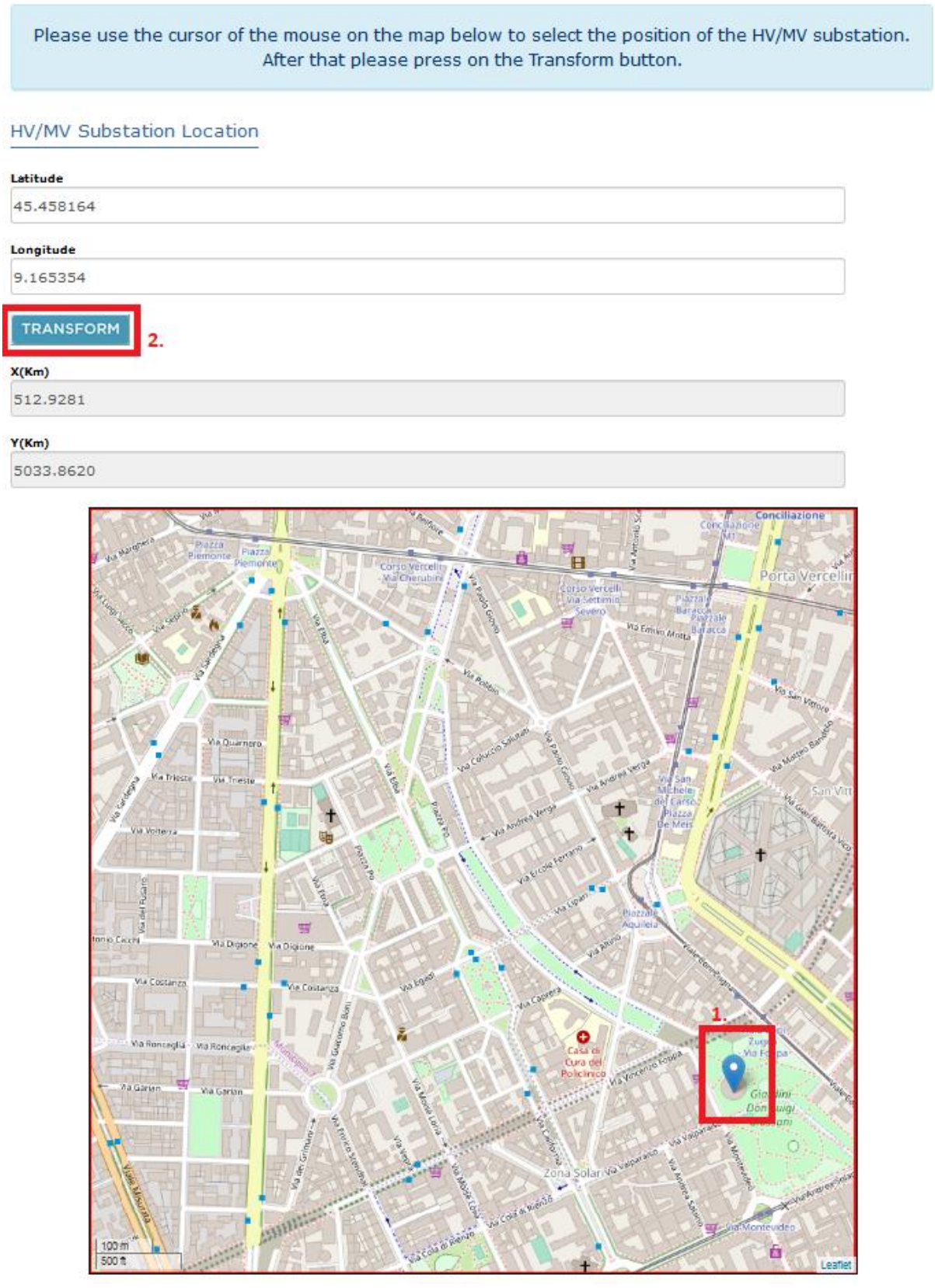
a. The map of the Network Computation Request named Network 1 has been updated;

b. This box provided information concerning the map image, latitude, longitude, country, zoom level and the scale that will be used for further calculation.



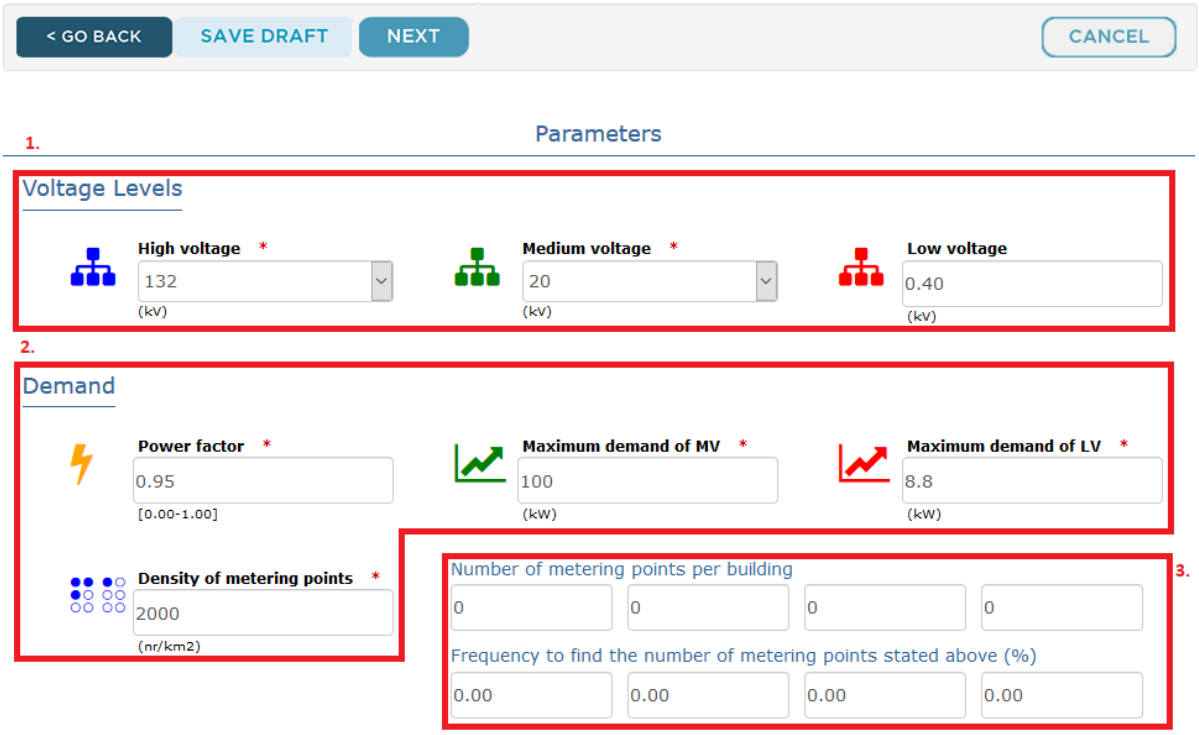
In this page. it is possible to move the cursor of the mouse on the map and locate the HV/MV substation.

1. Search and navigate through the map and click where you want to locate the HV/MV substation. In case you do not know where to locate it, the platform will set it in the middle of the map;
2. Transform the coordinates of the substation into UTM, and click on next in top part of the page to proceed.



After clicking on next, thus having selected the location of the HV/MV substation, the following page will appear where you need:

1. Set the HV and MV voltage levels parameters according to your network characteristics. The options of HV and MV depends on the country that you select. The LV level is locked to 0.4 kV as it is the most used in all Europe;
2. Set the demand parameters, thus the power factor, the maximum demand of MV voltage consumers, the maximum demand of LV consumers, and the density of metering points per km^2;
3. Enter the numbers of metering points per building, and the frequency to find the number of metering points (%). The sum of probabilities of consumers per building must be 100%.



In the same parameter page, the user is able to:

1. Change lower and upper limit of MV/LV substation;
2. Check the overhead lines and underground cables characteristics according to chosen voltage level;
3. Check transformer characteristics according to chosen voltage level.

Substation features *

Transformation capacity of MV/LV substations (upper limits in kVA) *	Transformation capacity of MV/LV substations (lower limits in kVA) *
1000	400

1.

Lines, Cables, Transformers

2.

Type	Classification	R (ohms/km)	X (ohms/km)	Ampacity (A)	Voltage (kV)
OVERHEAD	LV_IA_1	0.27	0.25	271	0.40
OVERHEAD	LV_IA_2	0.32	0.08	228	0.40
OVERHEAD	MV_A_1	0.29	0.34	325	20.00
OVERHEAD	MV_A_2	0.60	0.36	205	20.00
UNDERGROUND	LV_US_1	0.09	0.07	420	0.40
UNDERGROUND	LV_US_2	0.16	0.07	320	0.40
UNDERGROUND	MV_S_1	0.13	0.11	472	20.00
UNDERGROUND	MV_S_2	0.56	0.13	211	20.00

3.

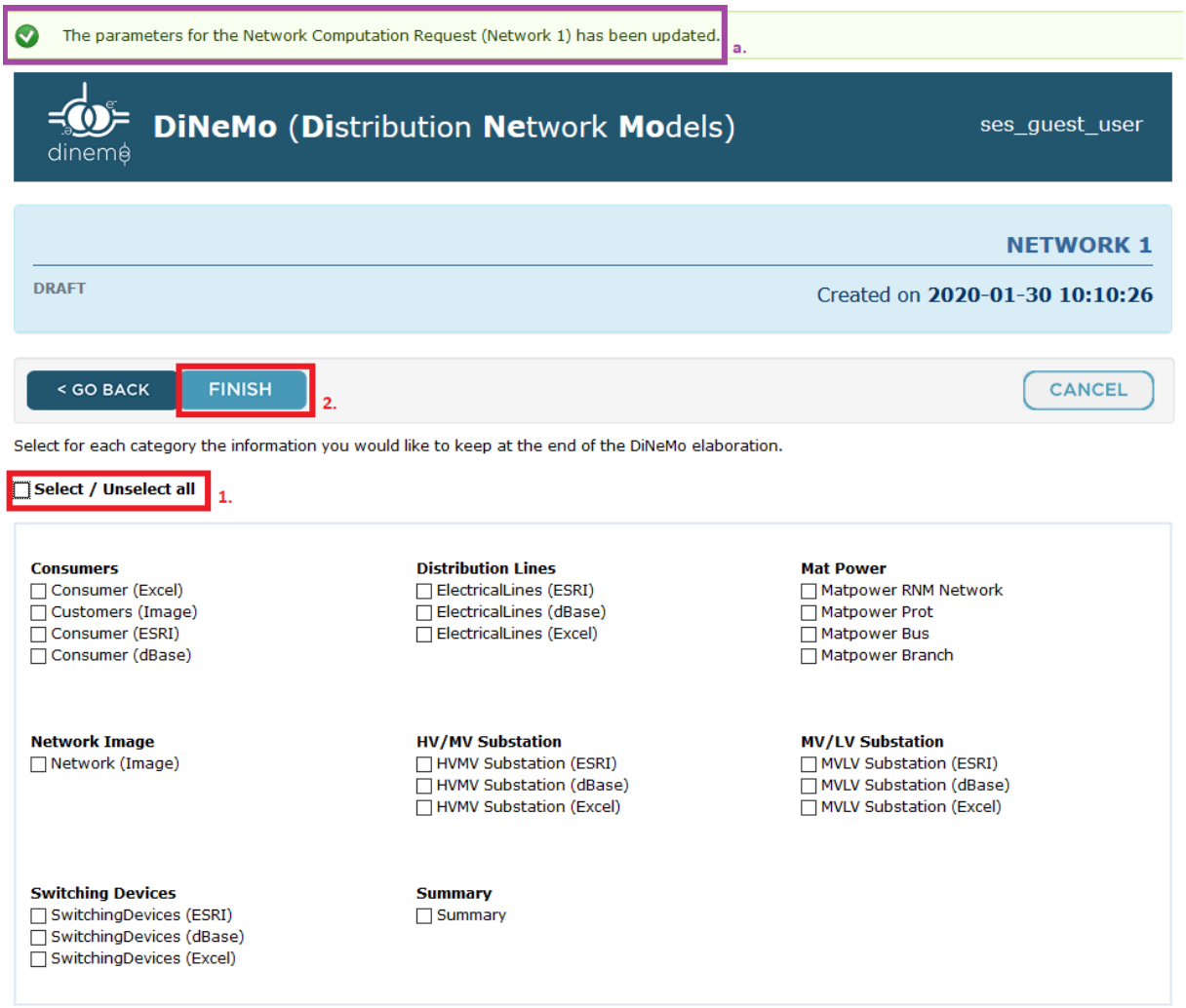
Type	Classification	Capacity (kVA)	Secondary voltage (kV)	No load losses (kW)	Load losses (kW)
INTERURBAN	CT_C_06	400	0.40	0.92	7.97
INTERURBAN	CT_C_07	630	0.40	1.00	11.24
INTERURBAN	SEI10	80000	20.00	47.00	0.61
INTERURBAN	SEI12	120000	20.00	71.00	0.90
INTERURBAN	SEI3	20000	20.00	16.00	0.19
INTERURBAN	SEI5	40000	20.00	33.00	0.38
URBAN	CT_LS_06	400	0.40	0.92	7.97
URBAN	CT_LS_07	630	0.40	1.00	11.24
URBAN	CT_L_08	1000	0.40	1.70	18.19
URBAN	SEU10	80000	20.00	47.00	0.61
URBAN	SEU12	120000	20.00	71.00	0.90
URBAN	SEU3	20000	20.00	16.00	0.19
URBAN	SEU5	40000	20.00	33.00	0.38

If you proceed with the Network Computation Request by clicking the following page will open where you can:

1. Select or unselect all categories you would like to keep at the end of the DiNeMo elaboration or, select specific categories from the list you would like to keep at the end of the DiNeMo elaboration and;
2. Click on Finish to complete the Network Computation Request process.

The remaining buttons have the following meanings:

a. The parameters of the Network Computation Request named Network 1 has been updated.



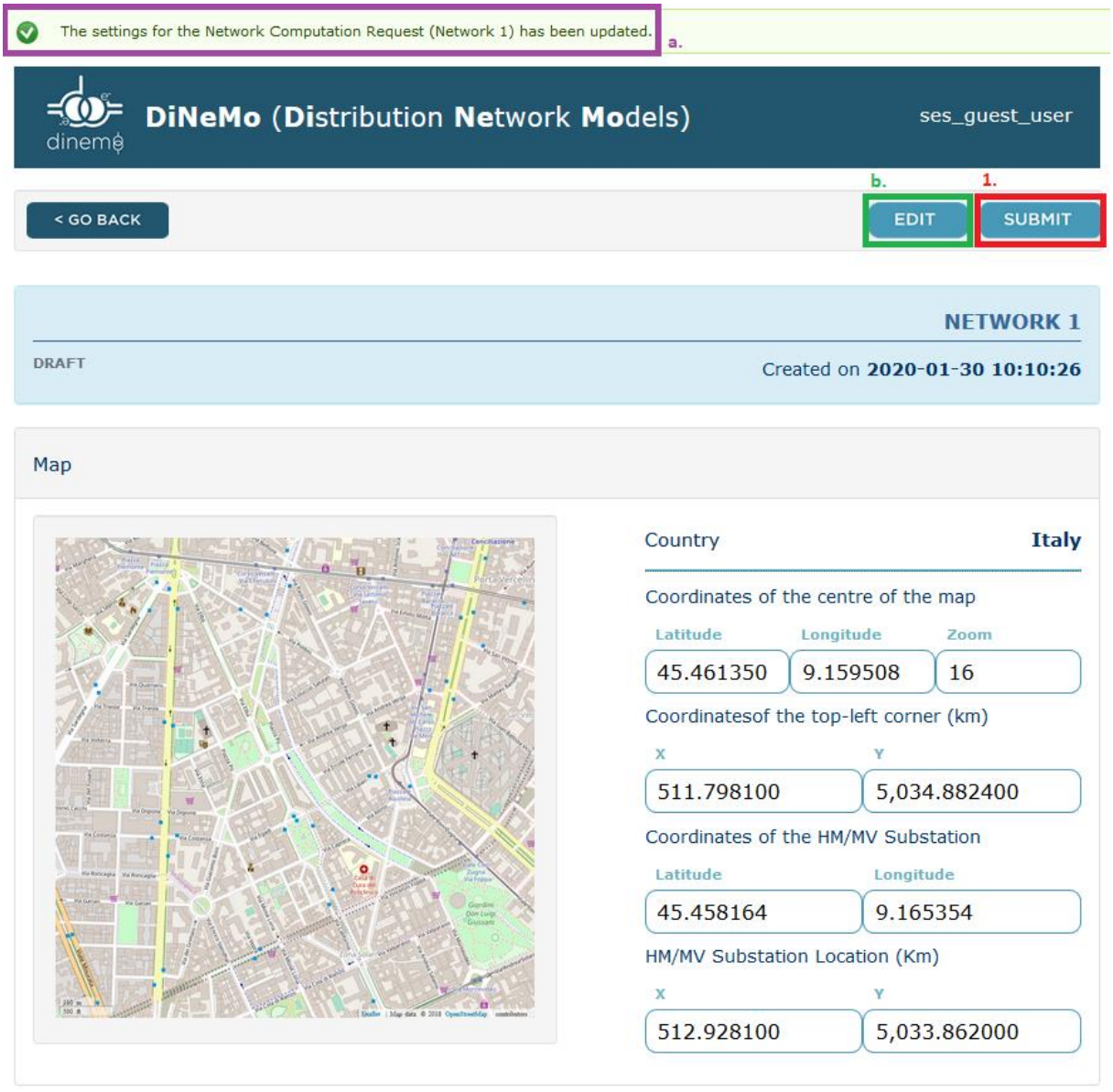
After saving, the information you would like to keep at the end of DiNeMo elaboration, in the following page you can check that you have entered all requested parameters (100%).

1. Submit the Network Computation Request.

The remaining buttons have the following meanings:

a. The settings of the Network Computation Request named Network 1 has been updated;

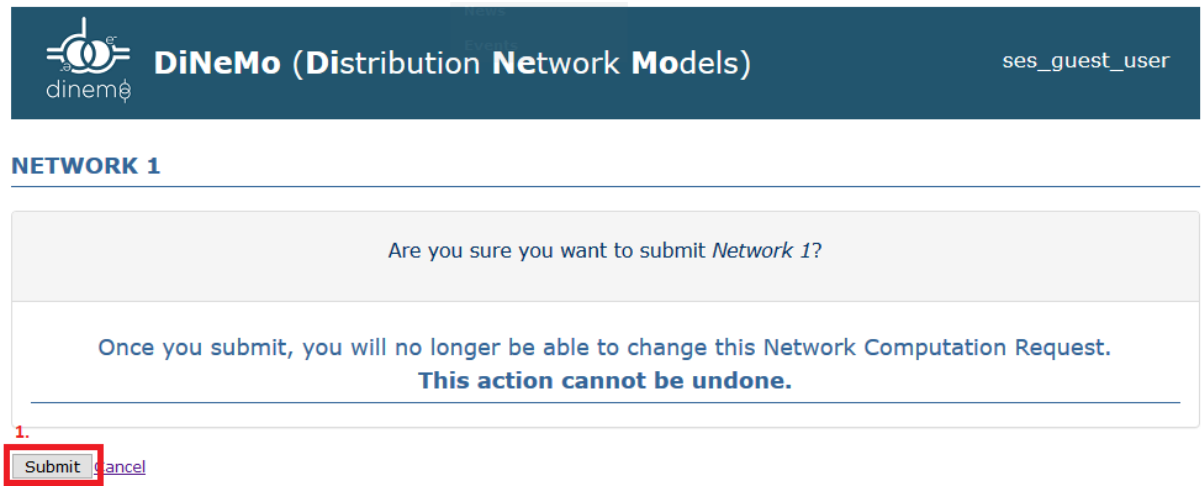
b. Edit the Network Computation Request parameters, settings, etc.



After choosing to submit the Network Computation Request, you will be asked for the last time if you want to submit or cancel. Please keep in mind that after clicking the Submit button, you will not be able to change Network Computation Request any more.

What's next?

1. Once you have submitted the Network Computation Request successfully (status QUEUED), you need to wait for the request being processed.

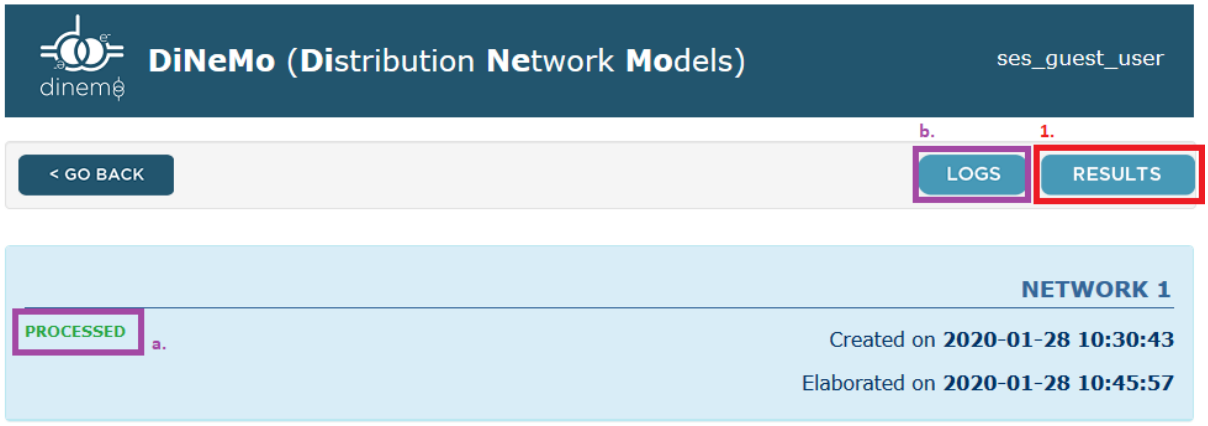


Once the request is successfully processed, you can:

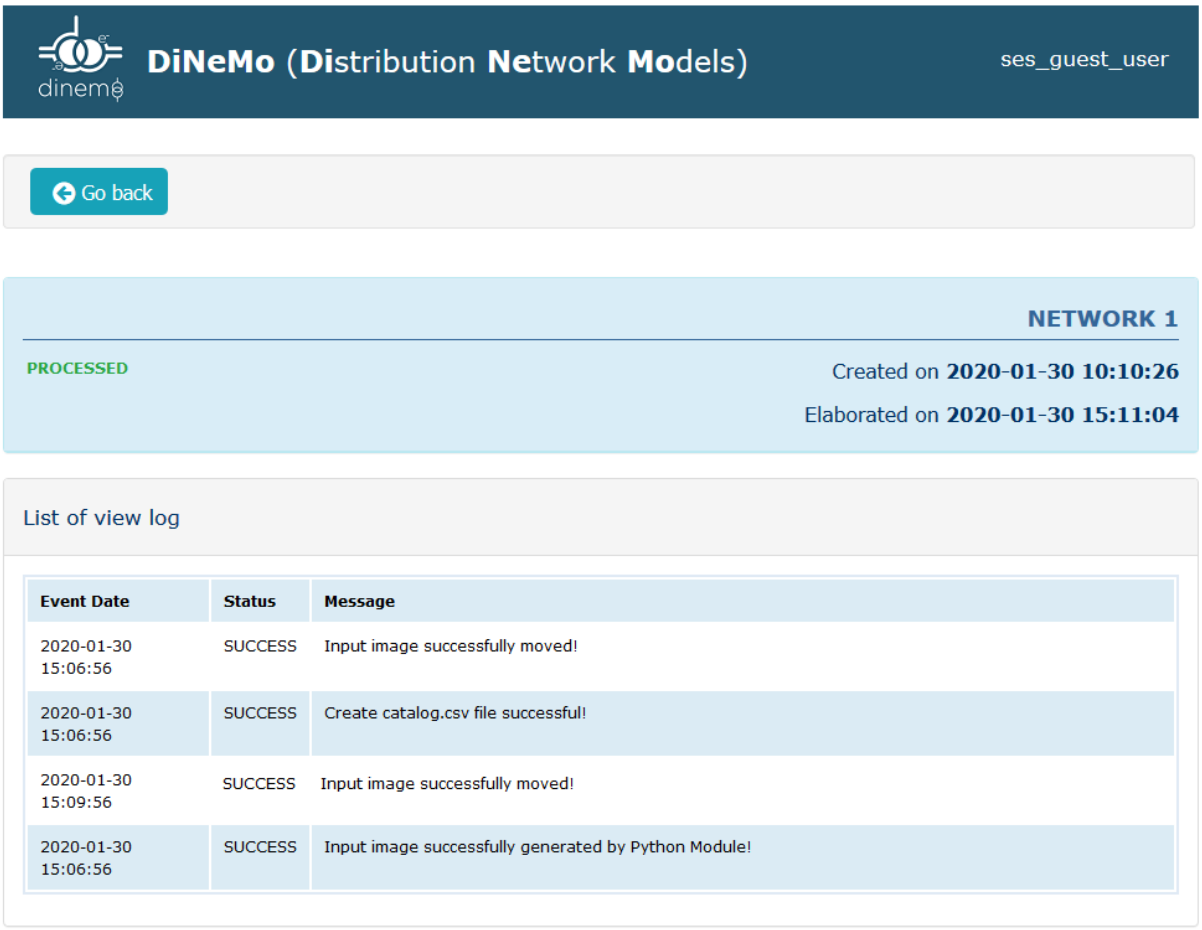
1. View Results of elaboration;

a. Verify that the Network Computation Request has been properly processed;

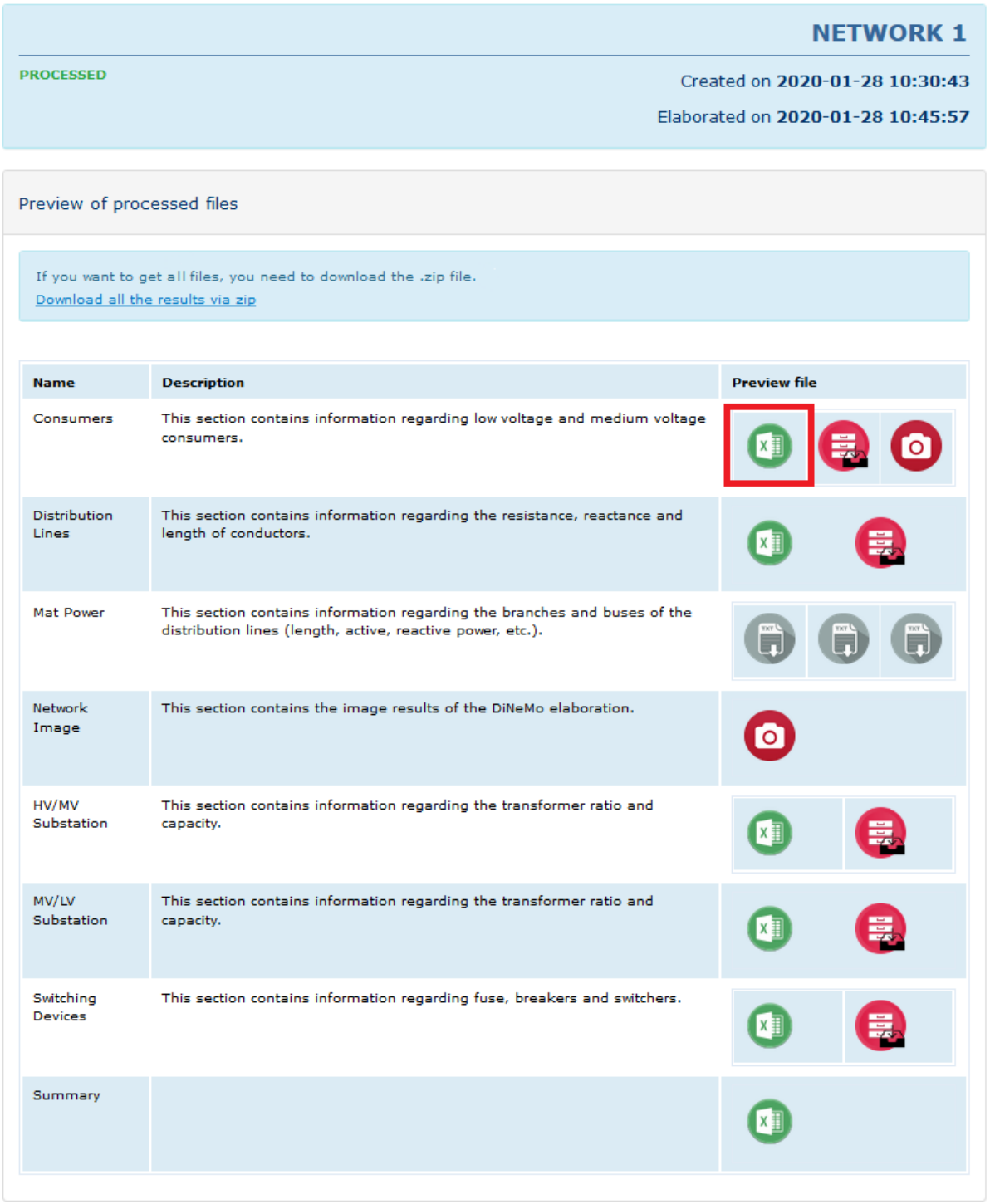
b. View Log of the elaboration.



If you choose to view Log of the elaboration, the following page will show that all requests have been successfully processed:



If you choose to view Results of elaboration, on the following page you can download the selected result file by clicking on the icon in the box:



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