



# DELIVERABLE 1.5: FUNCTIONALITIES OF THE ENERMAPS DATA MANAGEMENT TOOL

E. Wilczynski, S. Pezzutto (EURAC)

Revised by  
D. von Gunten (CREM)

17 March 2021



## Executive Summary

This document is Deliverable 1.5 (D1.5): Functionalities of the EnerMaps Data Management Tool (EDMT) and was submitted during month twelve (M12) of the project. This internal report communicates the anticipated features that will be present in the EDTM with special consideration of the user needs identified by stakeholders in D1.1: User stories and prioritization (1).

Since the EDTM is still in early developmental stages as of the submission of this report and is being developed using the graphical user interface (GUI) of the HotMaps Toolbox (2), the features of the HotMaps Toolbox were a primary focus used to demonstrate the capabilities of the EDTM GUI in this deliverable. The features of the GUI, including the ability of users to interact with the map canvas, select and display data, and customise various visual options are highlighted in this report.

The EDTM will enhance several features of the HotMaps Toolbox while offering several functionalities that are not present in HotMaps. For example, the EDTM encompasses one of the two layers of the EnerMaps platform together with the EnerMaps Scientific Community Dashboard. The link between the Dashboard and the EDTM provides researchers with the ability to visualise and analyse select datasets that take advantage of this connection. In addition, the EDTM will be linked to the Kialo social network (3), creating a collaborative knowledge base and support system directly tied to the EDTM. Finally, improvements in the efficiency in the engineering, data flow, and frontend processes will enable the EDTM to offer a superior user experience over the HotMaps Toolbox.

## Table of Contents

List of figures.....	1
List of abbreviations.....	1
<b>1. INTRODUCTION.....</b>	<b>2</b>
<b>2. LINKS WITH OTHER TOOLS.....</b>	<b>3</b>
2.1. Link with the Scientific Community Dashboard.....	3
2.2. Link with the EnerMaps Wiki pages.....	5
2.3. Link with the Kialo Social Network.....	5
2.4. Link with desktop software.....	6
<b>3. GRAPHICAL USER INTERFACE.....</b>	<b>7</b>
3.1. Map canvas.....	7
3.2. Toolbar.....	8
3.3. OpenStreetMap basemap.....	9
3.4. Data layer selection.....	10
3.5. Spatial boundary selection.....	11
3.6. Zoom.....	11
3.7. Map selection tools.....	12
3.8. Selection information box and results display.....	12
<b>4. OTHER KEY FEATURES.....</b>	<b>14</b>
4.1. Efficiency improvements.....	14
4.2. Calculation Modules.....	14
4.3. Feedback submission.....	15



<b>5. CONCLUSIONS .....</b>	<b>16</b>
<b>6. REFERENCES .....</b>	<b>17</b>



## List of figures

Figure 1. Visual representation of the two-layer EnerMaps data management system.....	4
Figure 2. Screenshot of the current state of the EnerMaps Scientific Community Dashboard. ....	4
Figure 3. Map canvas of the HotMaps Toolbox.....	8
Figure 4. Left-hand side of the toolbar for the HotMaps Toolbox. ....	9
Figure 5. Right-hand side of the toolbar for the HotMaps Toolbox. ....	9
Figure 6. OpenStreetMap basemap as seen in the HotMaps Toolbox. ....	9
Figure 7. Data layer selection panel of the HotMaps Toolbox. ....	10
Figure 8. Options available for the data layer selection panel for the HotMaps Toolbox. ....	10
Figure 9. Spatial boundary selection panel for the HotMaps Toolbox.....	11
Figure 10. Zoom in and out buttons.....	11
Figure 11. Selection tools panel for the HotMaps Toolbox.....	12
Figure 12. Demonstration of the rectangular shape selection tool in the HotMaps Toolbox.....	12
Figure 13. Information box for selected features for the HotMaps Toolbox. ....	13
Figure 14. Example results menu display for the HotMaps Toolbox. ....	13

## List of abbreviations

<b>API</b>	Application programming interface
<b>CM</b>	Calculation Module
<b>CSA</b>	Coordination and Support Action
<b>CSV</b>	Comma-separated values
<b>D</b>	Deliverable
<b>EDMT</b>	EnerMaps Data Management Tool
<b>GIS</b>	Geographic information system
<b>H2020</b>	Horizon 2020
<b>M</b>	Month
<b>OSM</b>	OpenStreetMap
<b>WMS</b>	Web map service
<b>WP</b>	Work package

# 1. INTRODUCTION

EnerMaps is a Coordination and Support Action (CSA) project that aims at improving data management practices in energy research and management. Currently, energy data is often difficult to find, mixed in different repositories, and fragmented, which can slow project progress, increase project costs, and create an overall lack of efficiency in the field of energy. EnerMaps will act as a quality-checked database of crucial energy data that will communicate and disseminate data effectively and efficiently using practices to make the data findable, accessible, interoperable, and re-usable (FAIR) (4).

This document is Deliverable 1.5 (D1.5) of the EnerMaps project, which is the Functionalities of the EnerMaps Data Management Tool (EDMT) internal report that was created as a result of Task 1.5: Indicators for industrial and social innovations. This report describes the expected capabilities of the EDMT, including the anticipated features that will be available to users of the EnerMaps platform. When possible, consideration of the features was noted within the context of the specific user needs of researchers of different target groups, including industrial users, researchers, and social innovation experts. The stakeholder interviews presented in the public report D1.1: User stories and prioritization were used to provide justification and context for many of these user needs, and direct quotes of user stories were included when appropriate (1).

The purpose of the report is to provide insights for future work packages, especially work package 2 (WP2) and work package 3 (WP3). The Functionalities of the EnerMaps Data Management Tool report was submitted by month twelve (M12) of the project.



## 2. LINKS WITH OTHER TOOLS

The EnerMaps Data Management Tool (EDMT) has several functions. First, and foremost, it is the visualisation tool of the EnerMaps project, where data can be displayed and explored, allowing users to find new datasets and observe datasets of interest directly through their browser. The EDMT will be linked with several other tools mentioned in this section in order to enhance its own usefulness and provide a multitude of further resources for its users.

### 2.1. Link with the Scientific Community Dashboard

An important feature of the EDMT is its connection with the EnerMaps Scientific Community Dashboard, which will be finalised by EURAC as part of Task 4.3: Ensuring coherence between the EnerMaps Data Management Tool and the Scientific Dashboard. As shown in Figure 1, the Scientific Community Dashboard and the EDMT make up the two-layer EnerMaps data management system.

The Scientific Community Dashboard, developed by OpenAIRE during Task 4.2: Creation of a Scientific Community Dashboard through the creation of an Open Research Gateway, serves as the first layer of the EnerMaps data management system. Figure 2 shows the current appearance of D4.2: OpenAIRE Scientific Gateway which is located at <https://enermaps.openaire.eu/> (5).

The Dashboard connects the EnerMaps research community to a comprehensive collection of energy-related data, including links to any publications associated with datasets—which will be especially important for research users. The Dashboard includes user-visible web links for a select number of qualifying datasets to the second layer of the EnerMaps data management system: the EDMT. Here, users can dive deeper into the data through various data selection and visualisation tools mentioned in later sections of this report and by taking advantage of several analysis tools.

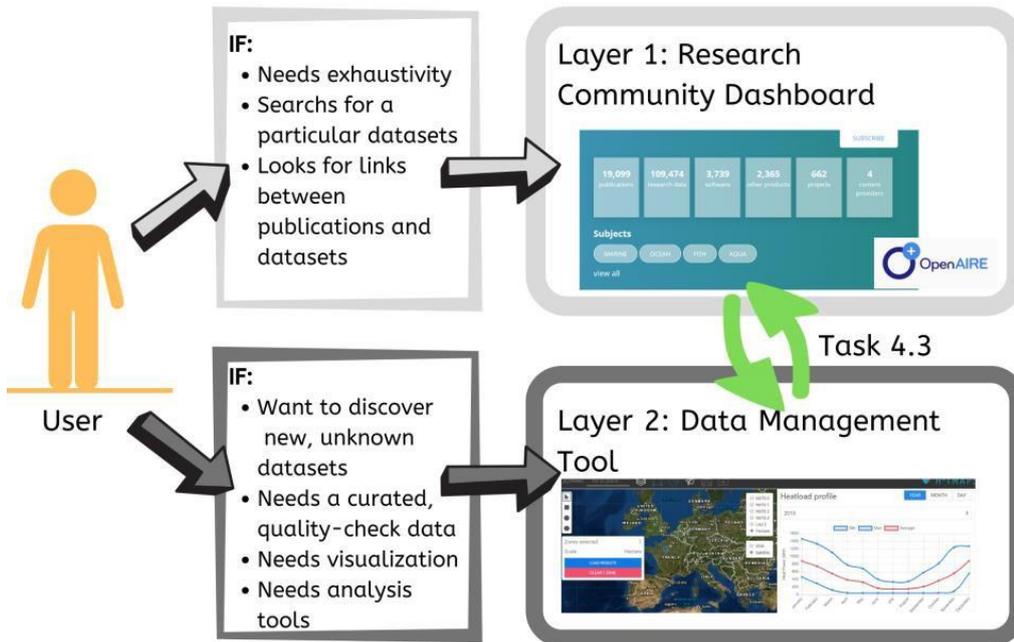
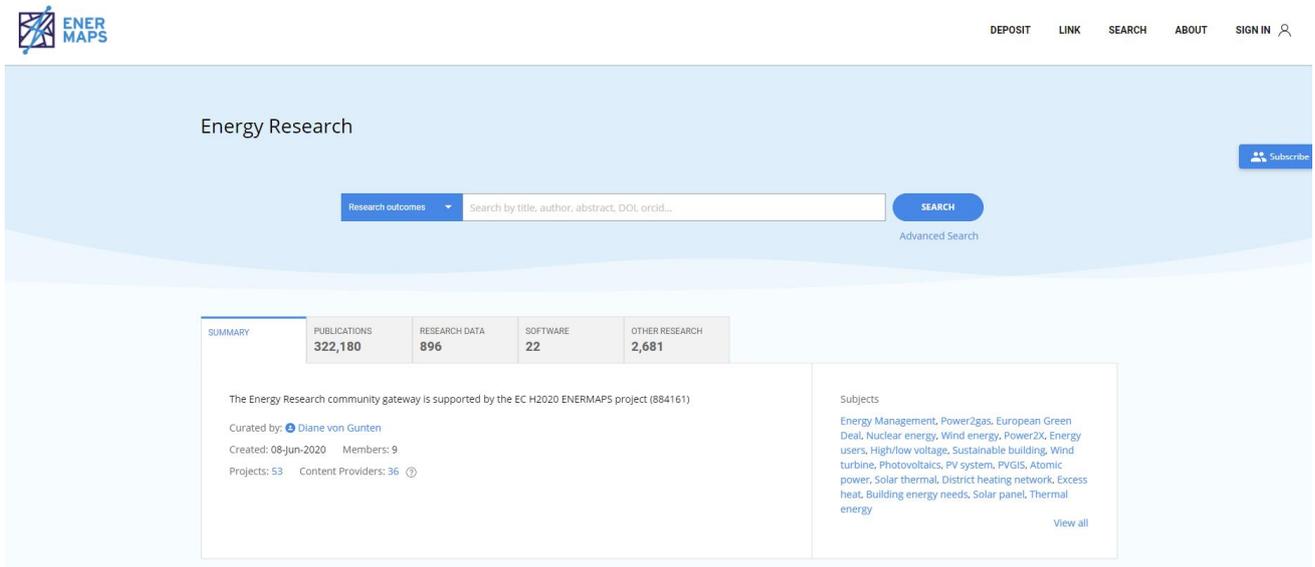


Figure 1. Visual representation of the two-layer EnerMaps data management system



Energy Research

DEPOSIT LINK SEARCH ABOUT SIGN IN

Research outcomes Search by title, author, abstract, DOI, orcid... SEARCH Advanced Search

SUMMARY	PUBLICATIONS	RESEARCH DATA	SOFTWARE	OTHER RESEARCH
	322,180	896	22	2,681

The Energy Research community gateway is supported by the EC H2020 ENERMAPS project (884161)

Curated by: Diane von Gunten  
Created: 08-Jun-2020 Members: 9  
Projects: 53 Content Providers: 36

Subjects  
Energy Management, Power2gas, European Green Deal, Nuclear energy, Wind energy, Power2X, Energy users, High/low voltage, Sustainable building, Wind turbine, Photovoltaics, PV system, PVGIS, Atomic power, Solar thermal, District heating network, Excess heat, Building energy needs, Solar panel, Thermal energy

Figure 2. Screenshot of the current state of the EnerMaps Scientific Community Dashboard.

## 2.2. Link with the EnerMaps Wiki pages

EnerMaps will have its own dedicated “wiki,” which is a web-based knowledge base with content provided by multiple collaborators that provides explanations on the wiki’s area of focus. The following user story from D1.1: User stories and prioritization (1) explains one reason why creating a dedicated knowledge base is an important feature of any data provider:

“It is important when you get the data that you get the clear explanation of what each dataset means. Also, because sometimes you can find mixing units and if you want to use these data for something and you are not aware the you are using different units for the same variable you are in trouble.” (Interview 5)

EnerMaps users will not need to search fruitlessly for explanations on the data or tools provided by the EDMT. The EnerMaps Wiki will provide detailed information on selected dataset layers as well as information on Calculation Modules. Links to Wiki pages will be found throughout the EDMT so users can have quick access to this information based on whatever section of the EDMT they are using. The EnerMaps Wiki will be created as part of Task 5.1: EnerMaps Wiki and will be based on the same Wiki platform used for the HotMaps Wiki (6).

## 2.3. Link with the Kialo Social Network

An interactive scientific community that promotes collaboration and engagement among its users will be enabled through the creation of a dedicated social network through Kialo (3). Through the Kialo social network, users can discuss datasets, their own research, and ask each other and the EnerMaps consortium questions related to EnerMaps or energy data, in general. In addition, EnerMaps training exercises will be performed through this network (for full details on the EnerMaps training strategy, please refer to D6.3: Capacity building strategy (7)). The Kialo social network will be directly linked with the EDMT and will act as its main knowledge base for community engagement.

Creating a direct implementation of Kialo with the EDMT will satisfy the demands of energy data users of all types. The importance of creating a scientific community tied to energy data is exemplified in the following user story from D1.1: User stories and prioritization (1):

“I have a very simple definition of community and it is what happens when there is some problem, what is the response. That’s my simple definition: it is people that get together to solve common problems, really. You know, people put a lot of effort into solving common problems, it is very gratifying for me to see.” (Interview 2)

The justification for including this link is clear. By using the Kialo platform, integration into the EDMT will be seamless and maintaining this scientific community will be much simpler as the services will be provided by a third-party.



## 2.4. Link with desktop software

Through the use of Web Map Service (WMS) protocols, it is possible to load images of the data layers that are available in the EDMT onto desktop geographic information system (GIS) software, such as QGIS (8) and ArcGIS products (9). This allows users to take advantage of the further visualisation tools available in these powerful desktop tools and enables users to display data provided in the EDMT with their own data located on their personal machines or hosted in other servers.

While this link may not be explicitly available to users in the EDMT, documentation providing instructions for users to accomplish this will be created and made available (possibly in the EDMT Wiki). This feature is anticipated to primarily be of interest for advanced users with large or confidential datasets that they hope to analyse alongside the data located on the EDMT without having to manually download and project the data layers found on the EDMT themselves.

# 3. GRAPHICAL USER INTERFACE

The EnerMaps project is the follow-up project to the H2020 HotMaps project (6). As such, certain aspects of the HotMaps project will guide the development of the EnerMaps project. Many features of the EDMT will mirror that of the HotMaps Toolbox (2) since the graphical user interface (GUI) for the HotMaps Toolbox inspired the EDMT. Using the HotMaps GUI will provide the EDMT with a user-tested and scrutinised GUI. Though the EDMT is still under development, many of the features can be described in this section. Since the features described in this section are present in the HotMaps Toolbox and that the EDMT GUI is still in development, the screenshots used in the following subsections were captured from the HotMaps Toolbox. More information on the HotMaps Toolbox GUI can be found in two deliverables from the HotMaps project: D4.5: Dedicated GUI, GIS based (10) and D4.7: Release of versions after testing with the target group (11).

Creating a user-friendly experience is one of the main objectives of the EDMT. The following user story from D1.1: User stories and prioritization (1) is from a stakeholder describing their experience with data acquisition software, and provides an excellent context for why an intuitive interface is so important:

“My main problem is that it is difficult, and I believe that this a problem for many of the local authorities who attended the trainings. It is very difficult going from the level “I do the exercise because you asked me to find this data” to “I understand what I am doing”. [...] I can perform the calculations, but I do not really understand the mechanism behind them.” (Interview 3)

The EDMT is designed specifically to be usable by both technical and non-technical users. While numerous trainings and support documentation will be provided to aid users in understanding how to use the EDMT, the following section will describe the tools that users will have at their disposal to customise and optimise and their own experience so that they can successfully use the EDMT without the need for constant requests for support.

NOTE: As mentioned above, the below figures were captured from the HotMaps Toolbox, and the same features within the EDMT may differ in function and appearance. To get an idea of the aesthetic style of the EnerMaps project, please refer to D6.2: Visual identity and website (12).

## 3.1. Map canvas

The default view of the EDMT will be a canvas displaying a map with some pre-selected options that the user can customise according to their preferences. Figure 3 shows the map canvas for the HotMaps Toolbox, which will be similar to the map canvas of the EDMT. From here, the user has an immediate view of various options



that will be discussed in further areas of this section. Notably, the EnerMaps logo will be prominently displayed that, when clicked, will open an additional tab in the user's browser that navigates to the EnerMaps project homepage (<https://enermaps.eu/>). In addition, information on the Horizon 2020 funding grant agreement will be displayed in the corner of the map canvas.

The map canvas will be organised in such a way to optimise user comfort and intuitiveness. Menus and tool panels will be displayed for easy access to the user but oriented in a manner that does not obstruct a significant viewing portion of the map. This way, the user can observe the changes they make in real-time by always having visual access of the map and the datasets of interest.

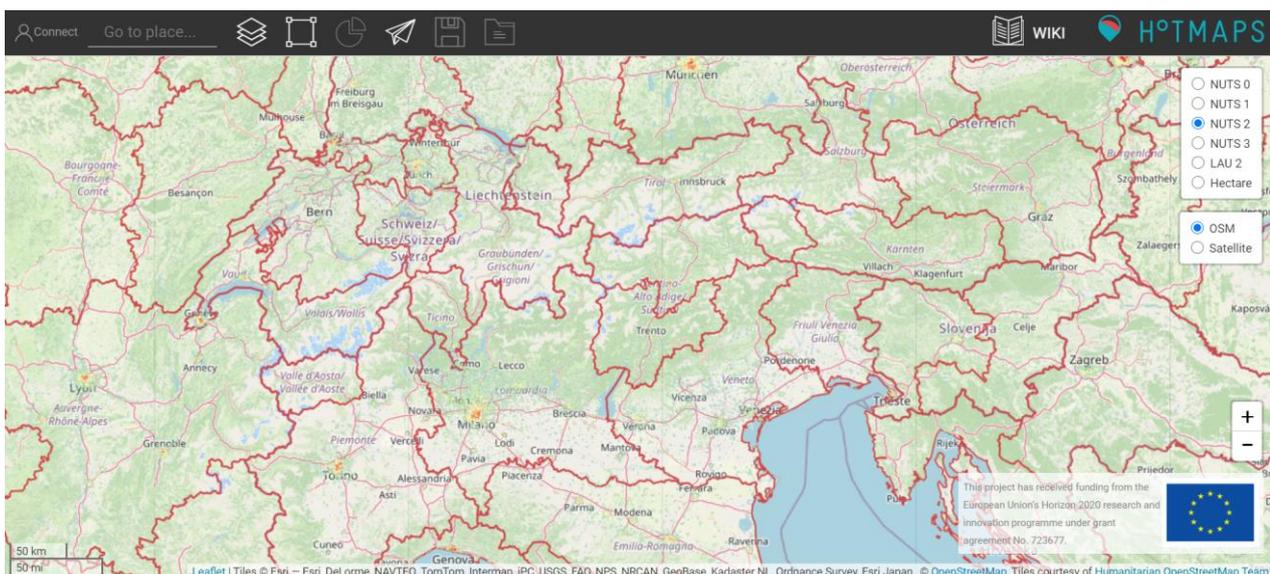


Figure 3. Map canvas of the HotMaps Toolbox.

## 3.2. Toolbar

The toolbar sits permanently at the top of the EDMT, directly above the map canvas, and provides several, easily accessible menu items for users. The exact items that will be available in the EDMT is still to be determined, but some ideas can be gathered from the toolbar that is available for the HotMaps Toolbox. As seen in Figure 4, the toolbar for the HotMaps Toolbox provides an option to view/login to a user account (see label 1), a search box where users can search for a specific location (label 2), an option for toggling the layer panel (label 3, and discussed further in Section 3.4: Data layer selection), an option for toggling the selection tools panel (label 4, and discussed further in Section 3.7: Map selection tools), an option to show a summary of the data results for the current layer and location selections (label 5), an option to allow the user to submit feedback (label 6), and options where the user can save data and see their account folder (label 7 and 8, respectively). Links to the HotMaps project Wiki and the project logo are also present (as seen in Figure 5).

It is anticipated that the EDMT will utilise all of the features present in the HotMaps Toolbox. However, since EnerMaps aims to enhance many features of HotMaps, the nature of many of these features may differ from those found in the HotMaps Toolbox, including the appearance and options present in the EDMT toolbar.



Figure 4. Left-hand side of the toolbar for the HotMaps Toolbox.



Figure 5. Right-hand side of the toolbar for the HotMaps Toolbox.

### 3.3. OpenStreetMap basemap

A basemap is the style of the map in the background behind the data layers. In the EDMT, an OpenStreetMap (OSM) (13) basemap which provides detailed place labels, boundaries for political borders, as well as visualisations of shapes for different urban coverages will be used. This basemap will be especially useful for social scientists, engineers, or urban planners who are interested in having an easy-to-read, well-labelled basemap that enhances, rather than disrupts, the visualisation of the data layers. Figure 6 shows a visual example of the OSM basemap zoomed into the street level.

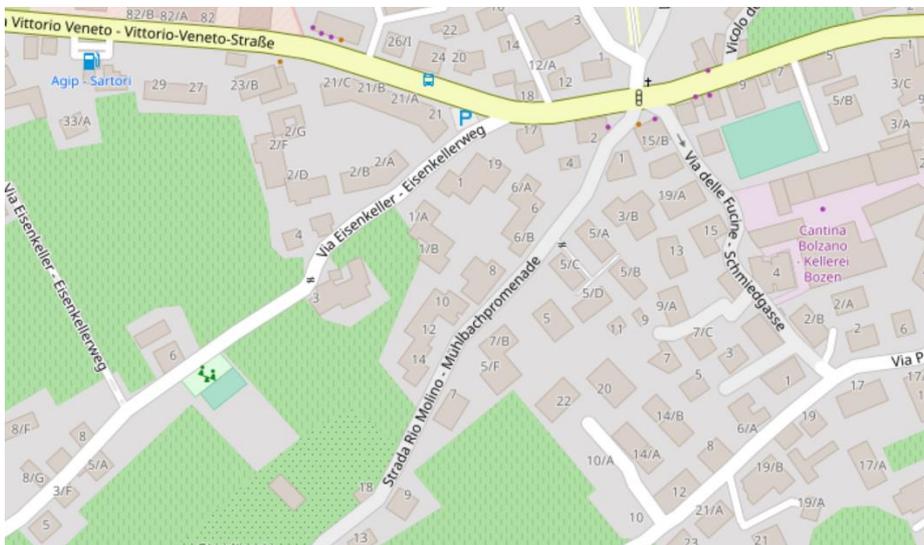


Figure 6. OpenStreetMap basemap as seen in the HotMaps Toolbox.

### 3.4. Data layer selection

The core function of the EDMT is to allow users the ability to view selected data layers. To accomplish this, users can either select the data layer of interest via the Scientific Research Dashboard which then navigates the user to the EDMT (as mentioned in Section 2.1: Link with the Scientific Community Dashboard) or users can open the data layer selection panel within the EDMT and find/select their desired datasets this way.

Figure 7 shows what this panel looks like in the HotMaps Toolbox. As seen below, data layers in the HotMaps Toolbox are organised by pre-defined categories for easier navigation. Since the EDMT will contain a larger variety of data, the categorisation will likely differ compared to that shown in Figure 8. Users can expand on the categories to show the list of data layers than are available. Selecting these datasets will bring up several new options for the user, as shown in Figure 8. After selecting a layer, the user can see what the symbology of the layer looks like (see Figure 8, label 1), which shows the colours and labels being used to visualise the data. The user also has the ability to see more information on the data (label 2) or to download the data to their computer (label 3).

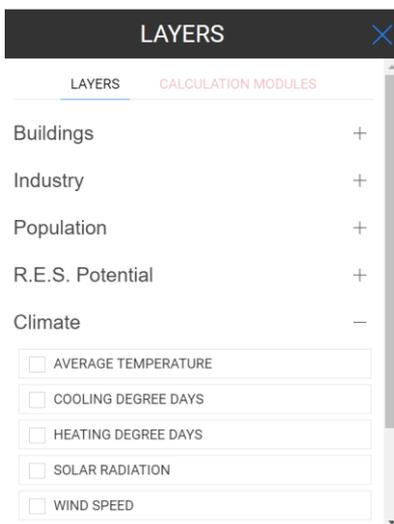


Figure 7. Data layer selection panel of the HotMaps Toolbox.

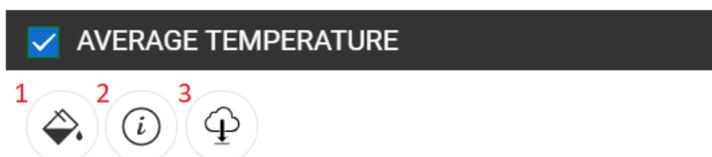


Figure 8. Options available for the data layer selection panel for the HotMaps Toolbox.

### 3.5. Spatial boundary selection

Different users will have different preferences on the spatial boundaries that they are interested in based on the nature of their work. For this reason, the EDMT will include a panel allowing users to change the displayed spatial boundaries that are highlighted on the map canvas. Figure 9 shows this feature as it appears in the HotMaps Toolbox. Here, the user can select the radio button next to their desired preference for spatial boundary.

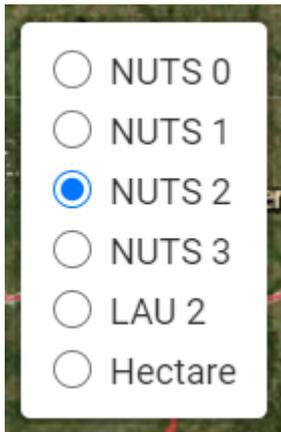


Figure 9. Spatial boundary selection panel for the HotMaps Toolbox.

### 3.6. Zoom

The “zoom” feature allows the user to zoom into the map (e.g., to narrow in on a certain location) or to zoom out (e.g., expand the map outward to see a larger area). The user can accomplish this by either scrolling their computer mouse’s wheel (scrolling upward will zoom in, scrolling downward will zoom out) or by using the plus/minus buttons located on the map, as shown in Figure 10 (the “+” button will zoom in, and the “-“ button will zoom out).



Figure 10. Zoom in and out buttons.

### 3.7. Map selection tools

An array of tools will be available to the user that will allow them to select features on the map based on their preferred method. The selection tools for the HotMaps Toolbox (as shown in Figure 11) includes a simple pointer tool where the user selects each feature individually as well as several shape selection tools that allow the user to select multiple features at once (as demonstrated in Figure 12). It should be noted that in the EDMT, the hexagon selection tool will not be included due to lack of user interest in this particular selection tool in the HotMaps Toolbox.



Figure 11. Selection tools panel for the HotMaps Toolbox.

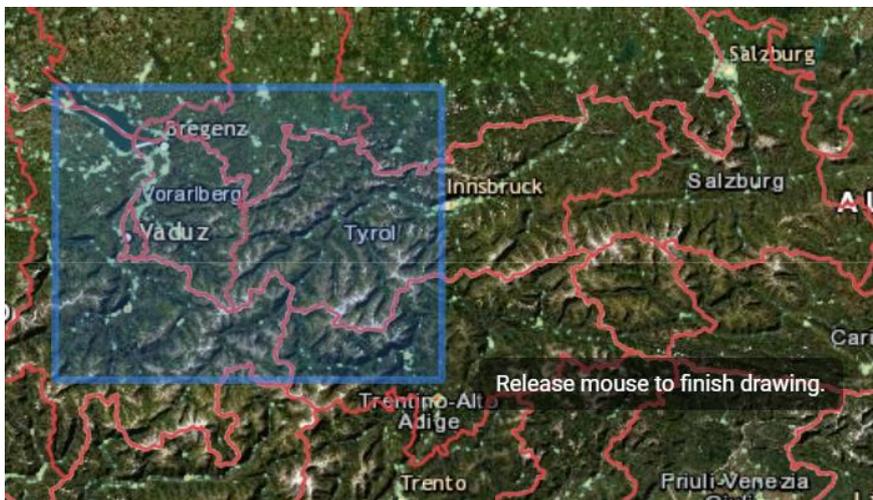


Figure 12. Demonstration of the rectangular shape selection tool in the HotMaps Toolbox.

### 3.8. Selection information box and results display

The data selection information box provides users with key summaries of the data they are selecting as they interact with the EDMT. Figure 13 demonstrates what this feature looks like in the HotMaps Toolbox. When a

selection is made in the HotMaps Toolbox, the information box will display key information to communicate to the user how many features they have selected, the current scale of spatial boundary, and the total area of the selected features.

If users have a data layer selected, they can select the blue “load results” button to load the to display a summary report detailing the data of interest for the features they have selected. An example of this for the HotMaps Toolbox can be seen in Figure 14. As is also shown in Figure 14, the ability to view results by indicator or graphical results (if available) is possible, as is the export of the results. Finally, the red button found in the selection information box (as seen in Figure 13) allows the user to clear the current selection of features so that they can start a new selection of features.

In the EDMT, this feature will be present in the form of an analysis tool called a Calculation Module (discussed more in-depth in Section 4.2: Calculation Modules).

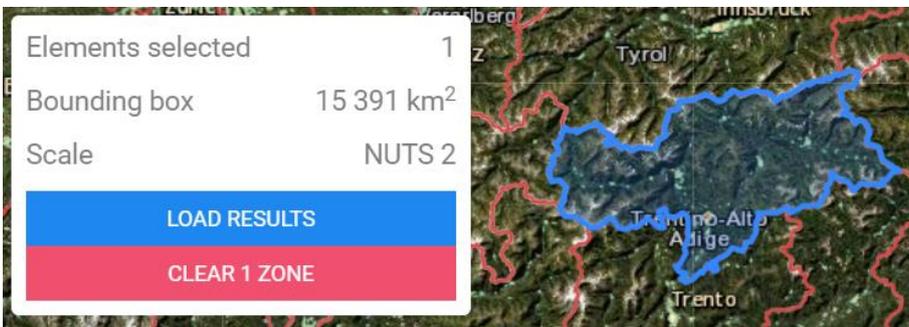


Figure 13. Information box for selected features for the HotMaps Toolbox.

INDICATORS		GRAPHICS
INFORMATION	VALUE	
HEAT DENSITY TOTAL		
Heat demand total	10 047.74 GWh/yr	
Counted Cells	45 966 cells	
Heat density min	0 MWh/(ha*yr)	
Heat density max	4 359.42 MWh/(ha*yr)	
Average heat density	218.59 MWh/(ha*yr)	
WIND SPEED		
Average wind speed	2.96 m/s	
Maximum wind speed	5.47 m/s	
Minimum wind speed	1.24 m/s	
Counted cells	67 cells	
<b>EXPORT INDICATOR</b>		

Figure 14. Example results menu display for the HotMaps Toolbox.

# 4. OTHER KEY FEATURES

## 4.1. Efficiency improvements

One of the main enhancements of the EDMT in the EnerMaps project versus the HotMaps Toolbox is the improvement of several processes that make the EDMT a much more efficiently application. Through simplifications of the data flow, software engineering practices, the application programming interface (API), the underlying code (including a reduction of the code of the data flow processes from over 22 thousand lines of code to around 2,500 lines of code, and a reduction of code of the frontend from over 189 thousand lines of code to around 3,000 lines of code), and the frontend GUI will result in a faster, leaner tool. This will provide numerous benefits to users looking to gain the most value from the tool without having to constantly experience extended loading times or crashes and is expected to result in an overall greater user experience while resulting in less issues that the EDMT support staff will need to fix.

## 4.2. Calculation Modules

Five analysis tools, called Calculation Modules (CMs), will be developed by Idiap, EURAC, and TU Wien using both data provided in the EDMT as well as user-defined inputs. Some of these CMs may also utilise user-provided data (provided through a user account creation and data upload features). In addition, several calculation modules will be imported from the HotMaps Toolbox (2)—though the specific CMs that will be transferred have not yet been defined.

The following user story from D1.1: User stories and prioritization (1) was provided by an interview on other online data software, and offers valuable feedback for how the EnerMaps consortium will approach developing CMs that will be included within the EDMT:

“It is also very complicated when you have to work on the data outside of the toolbox. You have the Excel sheet, which you have to fill yourself, and you have to upload again the results. I believe it is a bit clunky, it would be preferable doing these operations directly within the system and then getting the result.” (Interview 3)

The CMs provided within the EDMT will allow users to conduct customised analyses directly in the EDMT, without the need for downloading the data and using dedicated software on their own personal computer. Depending on the nature of the CM, users will be able to analyse data at varying spatial levels. In addition, multiple results (including graphical results) will be loaded and provided for users directly in the EDMT, with the option for the user to download the results in a comma-separated values (CSV) file or as a GEOTIFF raster file, if appropriate.



Full descriptions of the CMs will be presented in two future deliverables: D3.5a: Availability of new analysis tools in the platform and D3.5b: Analysis tools methodology.

### 4.3. Feedback submission

An easy and clear method for submitting user feedback will be developed in order to create a simple way for users to share their experiences with the EDMT developers, including reporting any bugs that they encounter or provide suggestions for new features. It is possible that this process will take advantage of the Kialo social network (3) integration and allow users to communicate their issues or thoughts directly with EnerMaps consortium members via this platform. The following user story from D1.1: User stories and prioritization (1) describes the importance of how a community-driven support system is advantageous to the EDMT and its users:

**“If there is a community around the software, people are correcting it, pointing out mistakes and working on how to improve it. Yes, feedbacks forms traffic lights for quality, indications of efficiency, all this kind of things.” (Interview 2)**

With this user story in mind, there is a clear reasoning for tying the user feedback solution with the Kialo social network in order to create a more community-driven feedback system.

## 5. CONCLUSIONS

The EnerMaps Data Management Tool offers users a variety of powerful features to optimise their research needs by providing an intuitive research experience. By utilising links with other tools as well as the development of a user-friendly GUI, the EDMT will be a powerful tool for energy researchers.

The EDMT is, in many ways, the next iteration of the HotMaps Toolbox. The GUI used for the HotMaps Toolbox will be used to develop the EDMT, which allows EnerMaps to take advantage of a user tested and mature GUI. However, the EDMT aims to enhance many of the existing features of the HotMaps Toolbox, including offering more links to related resources, including the EnerMaps Scientific Community Dashboard and the Kialo social network, in addition to offering a greater variety of analysis tools and dataset layers. In addition, the EDMT will be much more efficient than the HotMaps Toolbox, allowing for faster processing times, smoother operation, and an overall superior user experience when compared to the HotMaps Toolbox.

The features of the EDMT will be developed with close considerations of various user needs so that it will be a valuable tool for a variety of users, including industrial users, researchers, and social innovation experts. This report and its findings will be used as a reference for all EnerMaps consortium members who are responsible for the development, implementation, and dissemination of training and communication of the EDMT for future tasks and deliverables.

## 6. REFERENCES

1. **Balest, Jessica, et al.** *EnerMaps Deliverable 1.1: User Stories and Prioritization*. 2020.
2. **HotMaps Project.** HotMaps Toolbox. [Online] 2020. <https://www.hotmaps-project.eu/hotmaps-project/>.
3. **Kialo.** Kialo. [Online] 2020. <https://www.kialo.com/social-network-26786>.
4. **European Commission.** Guidelines on FAIR Data Management in Horizon 2020. [Online] 2016. [https://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-datamgt\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-datamgt_en.pdf).
5. **Bardi, Alessia.** EnerMaps Deliverable 4.2: OpenAIRE Scientific Gateway. [Online] 2021. <https://enermaps.openaire.eu/>.
6. **HotMaps project.** HotMaps Wiki. [Online] 2021. <https://wiki.hotmaps.eu/Home>.
7. **Clémence Contant, Giulia Conforto, Marcus Hummel, Mostafa Fallahnejad.** *EnerMaps Deliverable 6.3: Capacity building strategy*.
8. **QGIS.** QGIS. [Online] 2021. <https://www.qgis.org/en/site/>.
9. **ArcGIS.** ArcGIS Desktop. [Online] 2021. <https://desktop.arcgis.com/en/>.
10. **Thierry Bernhard, Lesly Houndole, Albain Dufils, David Wannier, Daniel Hunacek, Matthieu Dayer, Jérémie Vianin, Lucien Zuber, Mostafa Fallahnejad.** *Hotmaps Graphical User Interface (Deliverable D4.5 Dedicated GUI, GIS based)*. 2019.
11. **Jérémie Vianin, Lesly Houndole.** *D4.7 Release of versions after testing with the target group*. 2020.
12. **Contant, Clémence.** *EnerMaps Deliverable 6.2: Visual identity and website*. 2020.
13. **OpenStreetMap.** OpenStreetMap. [Online] 2021. <https://www.openstreetmap.org/#map=5/42.088/12.564>.
14. **EnerMaps project.** EnerMaps GitHub. [Online] 2021. <https://github.com/enermaps>.





The Open Data Tool empowering  
your energy transition.

## WHAT IS ENERMAPS?

EnerMaps Open Data Management Tool aims to improve data management and accessibility in the field of energy research for the renewable industry.

EnerMaps tool accelerates and facilitates the energy transition offering a qualitative and user-friendly digital platform to the energy professionals.

The project is based on the FAIR principle defining that data have to be Findable, Accessible, Interoperable and Reusable.

EnerMaps project coordinates and enriches existing energy databases to promote a trans-disciplinary research and to develop partnerships between researchers and the energy professionals.

### **Project Coordinator**

Jakob Rager, CREM  
[jakob.rager@crem.ch](mailto:jakob.rager@crem.ch)

### **Communication Coordinator**

Clémence Contant, REVOLVE  
[clemence@revolve.media](mailto:clemence@revolve.media)



The EnerMaps project has received funding from the European Union's Horizon 2020 research and innovation programme under [grant agreement N°884161](#)