

Analysis of Household Electricity Consumption

User Guide

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Prerequisites

In order to run the program the following software needs to be installed:

- Python (version $\geq 3.6.x$)
- PDF-rendering program (Such as Adobe Acrobat or any webbrowser)

And the following modules for python:

- PyQt5 (version $\geq 5.9.1$)
- Pandas (version $\geq 0.20.3$)
- Matplotlib (version $\geq 2.1.0$)
- Numpy (version $\geq 1.13.3$)
- *Pygame (optional, version $\geq 1.9.3$)*

Which can be installed with `pip install [name]`.

See: <https://pip.pypa.io/en/stable/installing/> if in doubt

It is also important to add python to your PATH in order to run pip from console. This can be done when installing Anaconda (<https://www.anaconda.com/download/>) or manually (google it)

Opening the program

Method 1:

Double-click the file (Assuming .py files are opened with python.exe)

Method 2:

Windows:

Open cmd at file location (shift + right click) and type: python Main-GUI.py

```
E:\Dropbox\DTU\Programming\Repositories\Project-Electricity-GUI>python Main-GUI.py
```

Or

Open cmd and navigate to file location: cd (insert path) and type: python Main-GUI.py

```
E:\>cd \Dropbox\DTU\Programming\Repositories\Project-Electricity-GUI\
```

Mac OS:

Open terminal at file location (shift + right click on folder) and type: Main-GUI.py

```
Project-Electricity-GUI — -bash — 80x24
Last login: Wed Dec 6 00:09:51 on ttys000
[Simons-MacBook-2:Project-Electricity-GUI Simon$ python Main-GUI.py
```

Or

Open terminal and navigate to file location: cd (insert path) and type: python Main-GUI.py

```
Project-Electricity-GUI — -bash — 98x24
Last login: Tue Dec 5 23:31:09 on ttys000
[Simons-MacBook-2:~ Simon$ cd Dropbox/DTU/Programming/Repositories/Project-Electricity-GUI/
[Simons-MacBook-2:Project-Electricity-GUI Simon$ python Main-GUI.py
```

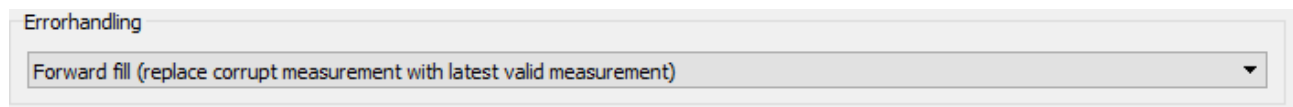
Loading data

It is assumed that the user has a valid .csv file containing data of a household's electricity consumption with the columns: [year,month,day,hour,minute,second,zone1,zone2,zone3,zone4]

Where zone1 .. zone4 represents how many watt-hours are consumed at the time

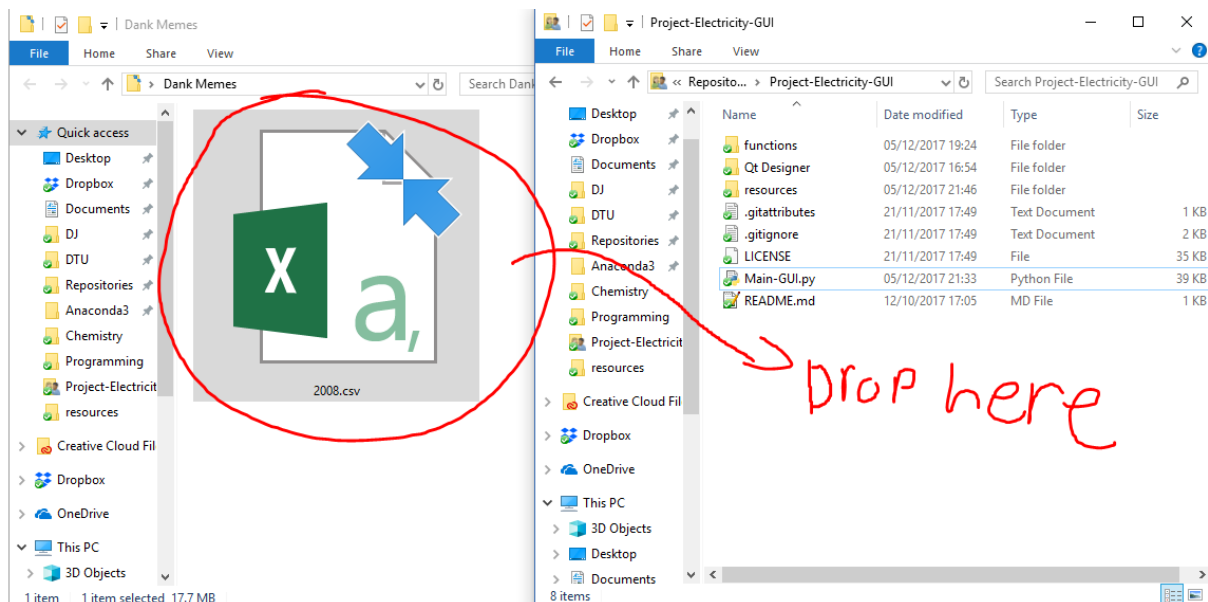
Define error handling type

Choose one of the 3 modes to handle errors in the data (Forward fill, backwards fill, drop)

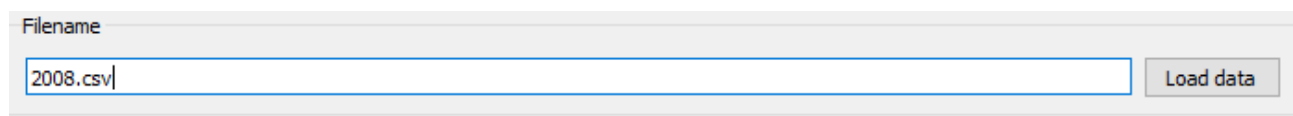


By filename

First drop the datafile into the SAME folder as Main-GUI.py

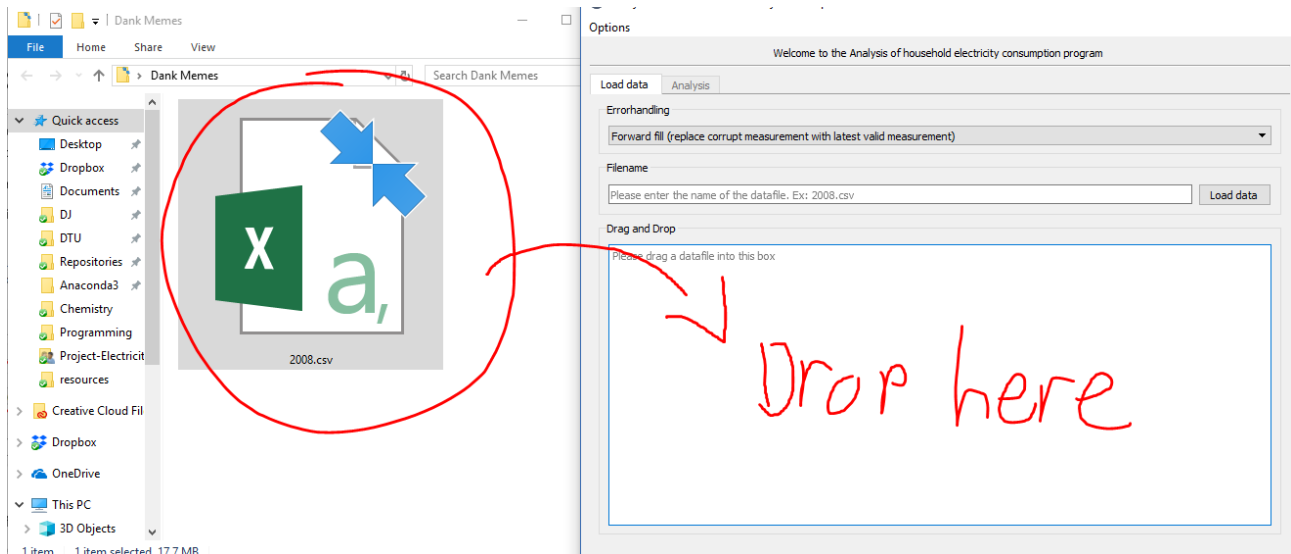


Then enter the filename, with its extension and hit ENTER or click "Load data"



By drag and drop

Drag the datafile into the Drag and Drop box

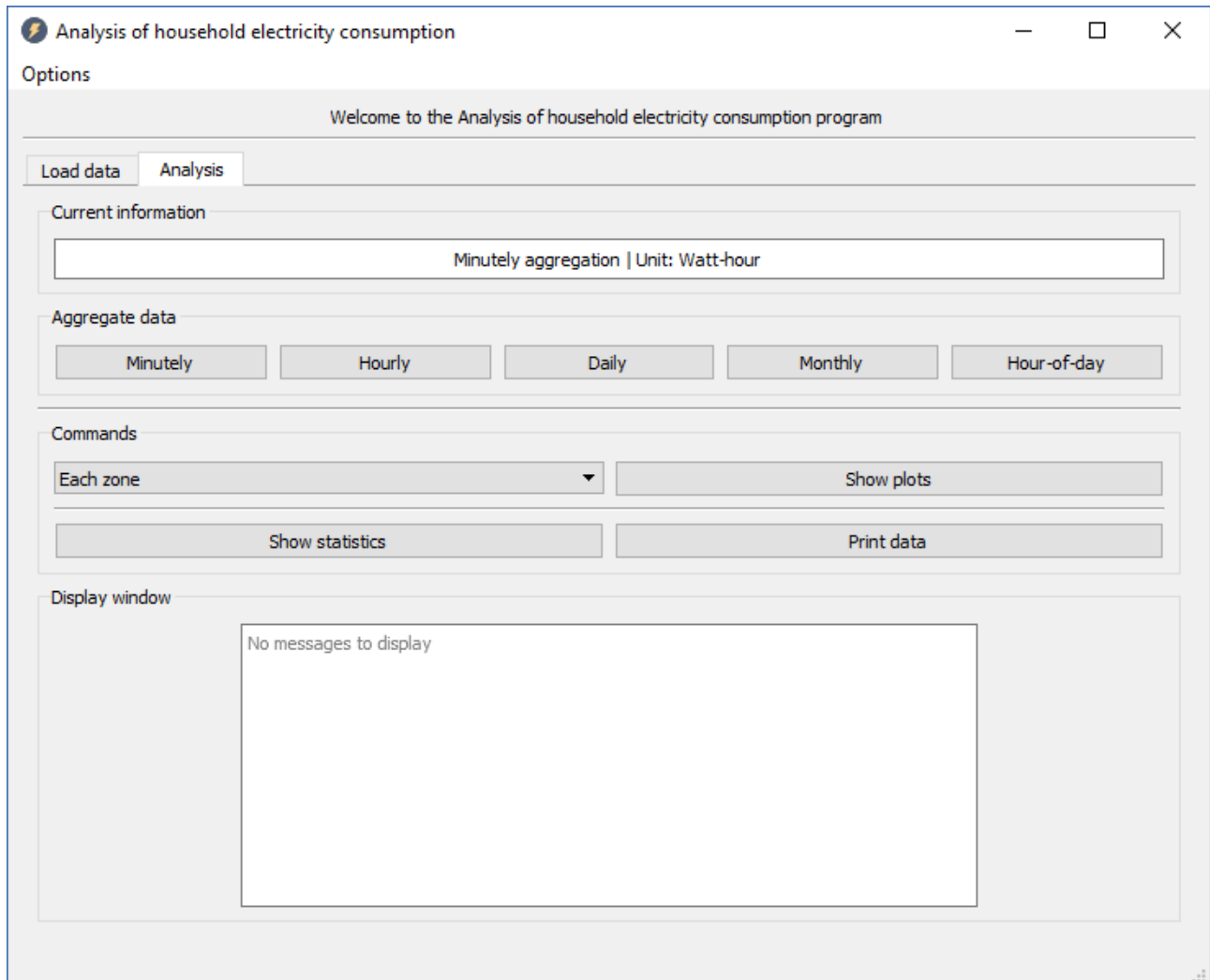


Important!

The program runs best when it is maximized or in full screen mode (press F11 on windows)

Analyze data

You will now see the following screen



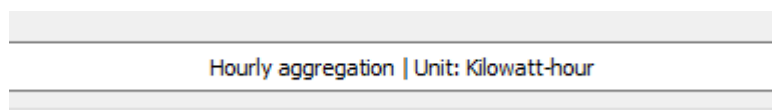
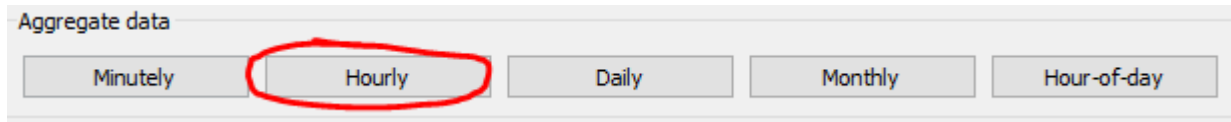
Each element will be explained in the following section

Current information

Displays the current aggregation and unit of power

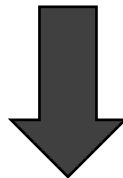
Aggregate data

Will aggregate the data according to the button clicked. Hour-of-day represents the hourly average in the intervals [00:00-01:00],[01:00-02:00],..., [23:00-00:00[.



Statistics

Click "Show statistics" to show the statistics of the current aggregate data. Adjust window size to see all statistics at once



Commands

Each zone

Show plots

Hide statistics

Print data

Display window

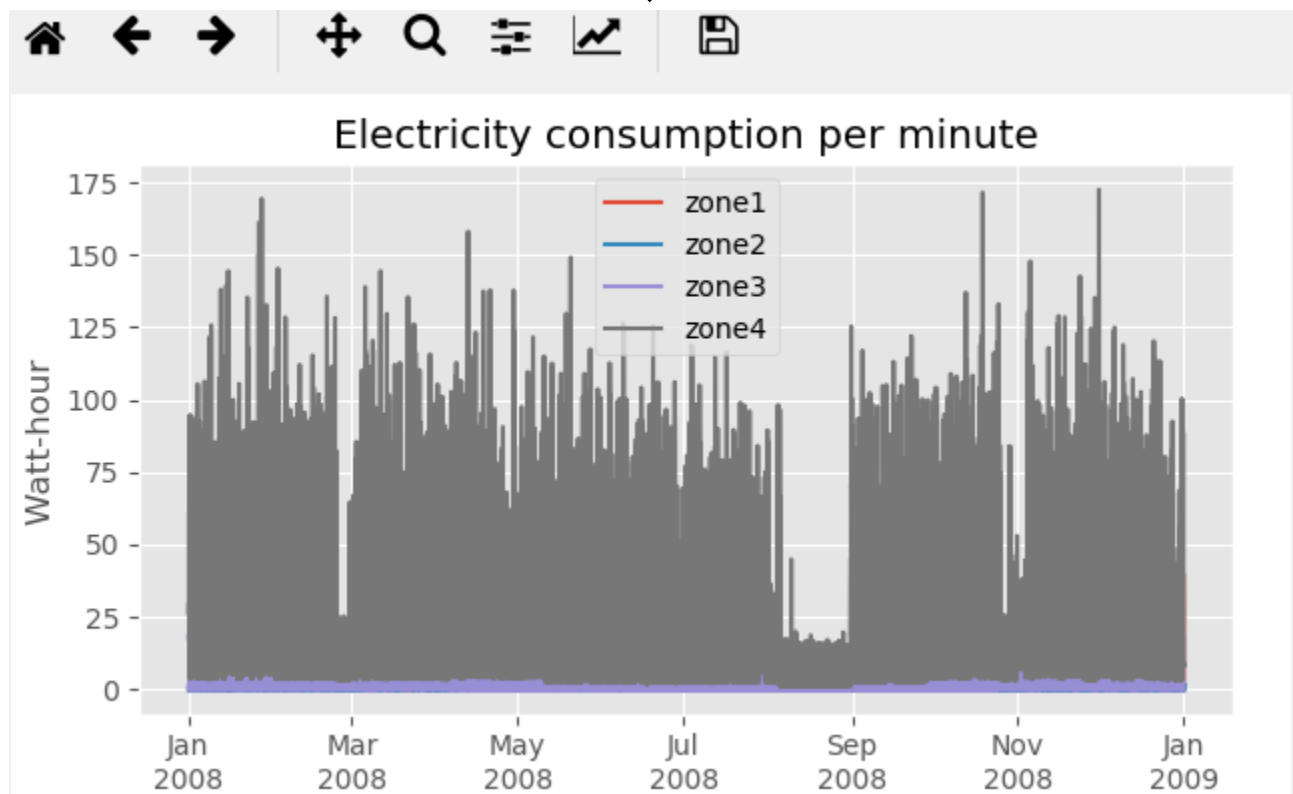
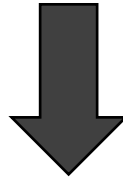
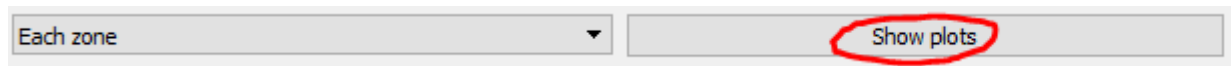
	Min	25%	50%	75%	Max
Zone 1	0.0	0.0	0.0	0.0	80.0
Zone 2	0.0	0.0	0.0	1.0	76.0
Zone 3	0.0	0.0	1.0	17.0	31.0
Zone 4	1.3	5.0	9.4	25.3	172.5
All	1.3	5.0	10.4	43.3	359.5

Showing statistics

Click "Hide statistics" to hide the statistics window again

Plotting

Choose how to plot data (each or all zones) and click “Show plot”. It is suggested to make the window larger when plotting. The dropdown menu to the left of “Show plot” decides how to plot the data



Click “Hide plot” to hide the plot. Larger plot, such as consumption per minute will make the program slower.

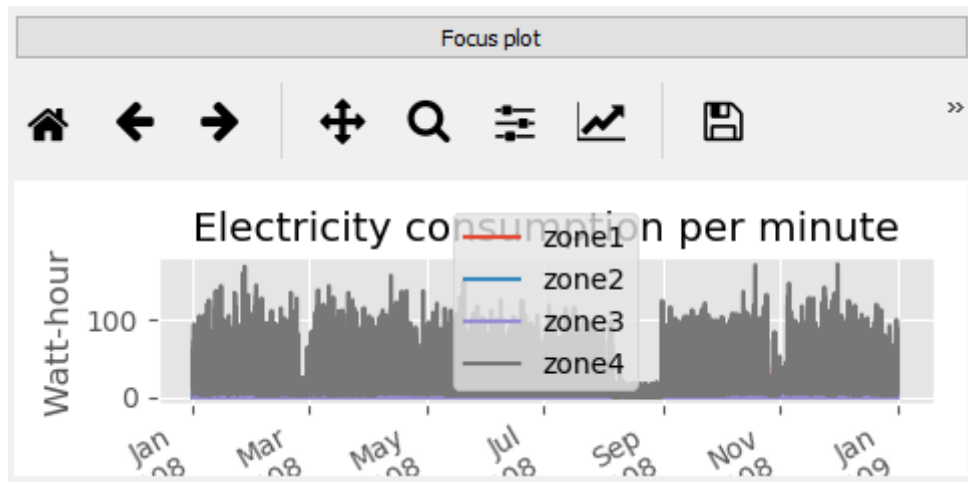
Focus plot

If you want to examine the plot on a larger scale, then press “Focus plot”



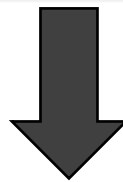
Please note that the plot now fills all of the UI

The focus plot option is especially good for cases like this:



Print data

Press "Print data" to print the current data in its raw format



The 'Display window' shows a table of raw data. The table has 10 columns and 527040 rows. The data is printed in its raw format, showing the current unit as Watt-hour.

Index	Year	Month	Day	Hour	Zone1	Zone2	Zone3	Zone4	Value
527025	2008	12	31	23	45	0	0.0	0.0	9.2
527026	2008	12	31	23	46	0	0.0	0.0	9.2
527027	2008	12	31	23	47	0	0.0	0.0	9.2
527028	2008	12	31	23	48	0	0.0	0.0	9.2
527029	2008	12	31	23	49	0	0.0	0.0	9.2
527030	2008	12	31	23	50	0	0.0	0.0	9.2
527031	2008	12	31	23	51	0	0.0	0.0	8.6
527032	2008	12	31	23	52	0	0.0	0.0	8.1
527033	2008	12	31	23	53	0	0.0	0.0	8.1
527034	2008	12	31	23	54	0	0.0	0.0	8.1
527035	2008	12	31	23	55	0	0.0	0.0	8.1
527036	2008	12	31	23	56	0	0.0	0.0	8.0
527037	2008	12	31	23	57	0	0.0	0.0	8.0
527038	2008	12	31	23	58	0	0.0	0.0	8.0
527039	2008	12	31	23	59	0	0.0	0.0	8.0

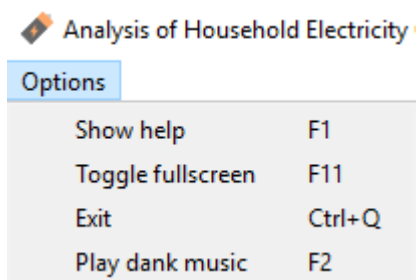
[527040 rows x 10 columns]
Data printed
Current unit: Watt-hour

Additional information

Tips!

Options

If you click the “Options” button you can see different actions which can be clicked or called by the corresponding shortcut



Show help: Shows this file

Toggle fullscreen: Opens in fullscreen

Exit: Exits the program

Play dank music: Plays dank music

Tool- and status tips

These are tips that show up when hovering you mouse above a button, widget or almost anything relevant in the program. The status tip is seen in the bottom of the program and the tooltip is seen after 2 seconds of hovering your mouse over the object.

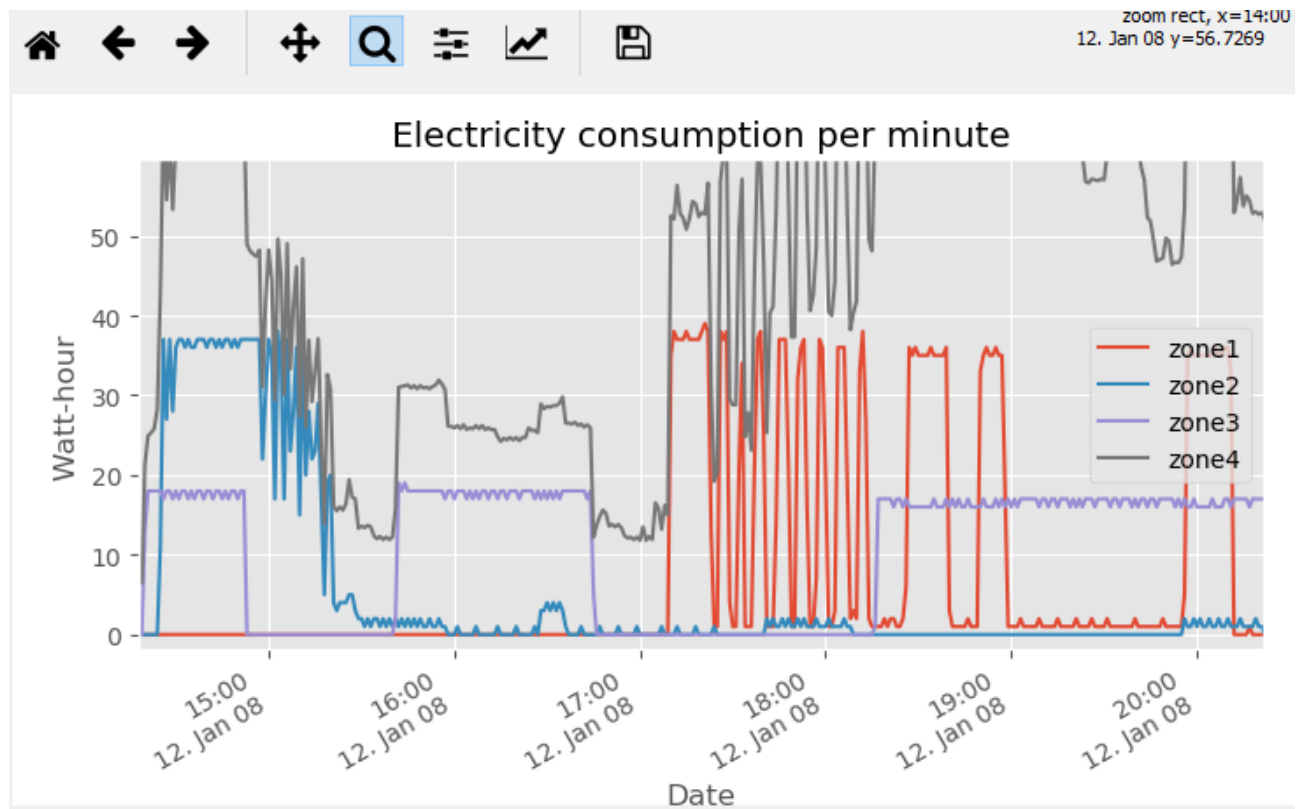
Focus plot and statistics

If you focus plot while having statistics displayed, the statistics gets focused along side the plot to efficiently compare them.

Plotting

You can navigate through the plot by using the toolbar above the plot (Strongly recommended being in maximized mode when doing this)

For example you can zoom in to get



Credits (Copyright)

Creator of icon: [Squid.ink](https://www.squid.ink/)