



## REopt Lite Tutorial: Load Profile Inputs

This tutorial gives an overview of the load profile inputs in the REopt Lite™ web tool. Find additional REopt Lite [tutorials](#).

There are two options for entering your site’s typical electric load profile, a required field in REopt Lite. You can simulate it based on 16 genericized load profiles developed by the U.S. Department of Energy (DOE), or you can upload actual interval data for your site (Figure 1). Uploading custom data is the more accurate of the two options.

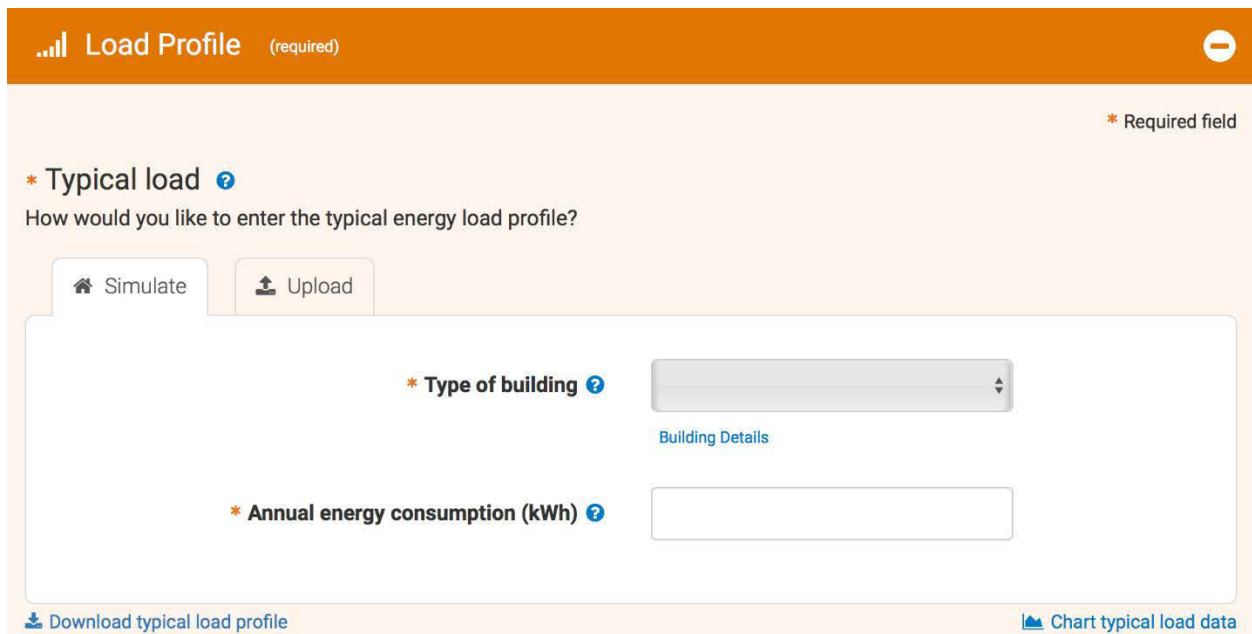


Figure 1. REopt Lite allows you to simulate your typical load profile or upload interval data

Choosing a simulation assumes you do not have actual interval data readily available. Use the dropdown to select a common building type that most closely matches the use of your own site. Each building has a different load shape that reflects the expected times of the day, week, and year when load would be low or high for that building type.

In addition to the 16 DOE building types (Table 1), there is also an option for a “flat load,” which is the relatively unusual situation where the electric load is constant at all hours, every day. This would usually correspond to a business like a data center or factory with constant round-the-clock operation.



Table 1. 16 DOE Commercial Reference Building Types

BUILDING TYPE NAME	FLOOR AREA (FT <sup>2</sup> )	NUMBER OF FLOORS
Large Office	498,588	12
Medium Office	53,628	3
Small Office	5,500	1
Warehouse	52,045	1
Stand-Alone Retail	24,962	1
Strip Mall	22,500	1
Primary School	73,960	1
Secondary School	210,887	2
Supermarket	45,000	1
Quick Service Restaurant	2,500	1
Full Service Restaurant	5,500	1
Hospital	241,351	5
Outpatient Health Care	40,946	3
Small Hotel	43,200	4
Large Hotel	122,120	6
Midrise Apartment	33,740	4

Based on the building type selected and the climate zone (Table 2) that corresponds to the location you entered in the Site and Utility section, a representative hourly load profile will be generated. This simulated load profile will correspond to the square footage and other constraints for the Commercial Reference Building that you have chosen.

Table 2. 16 Climate Zones Used to Simulate the Hourly Load Profile

CLIMATE ZONE	REPRESENTATIVE CITY
1A	Miami, Florida
2A	Houston, Texas
2B	Phoenix, Arizona
3A	Atlanta, Georgia
3B-Coast	Los Angeles, California
3B	Las Vegas, Nevada
3C	San Francisco, California
4A	Baltimore, Maryland
4B	Albuquerque, New Mexico
4C	Seattle, Washington
5A	Chicago, Illinois
5B	Boulder, Colorado
6A	Minneapolis, Minnesota
6B	Helena, Montana
7	Duluth, Minnesota
8	Fairbanks, Alaska



The expected total annual electricity consumption for the building and climate zone will be calculated and automatically populated in the annual energy consumption field.

If you know your own site's annual electricity consumption, overwrite the calculated default in the annual energy consumption field with your building's consumption. The load profile will then be scaled to your actual energy consumption and it will provide a better load approximation. If you do not have an annual energy consumption value but know that your building is significantly larger or smaller than the reference building sizes, you can scale the calculated default annual consumption value accordingly.

You can download or chart the resulting simulated typical load profile (Figure 2). Note that the simulated load profile chart displays 2017 dates, but this display year has no relevance except to show that the simulated data starts with January 1<sup>st</sup> on a Sunday (as in 2017) to show how weekday/weekend differences in utility rates are applied.

### Typical Load Profile Based on Your Inputs

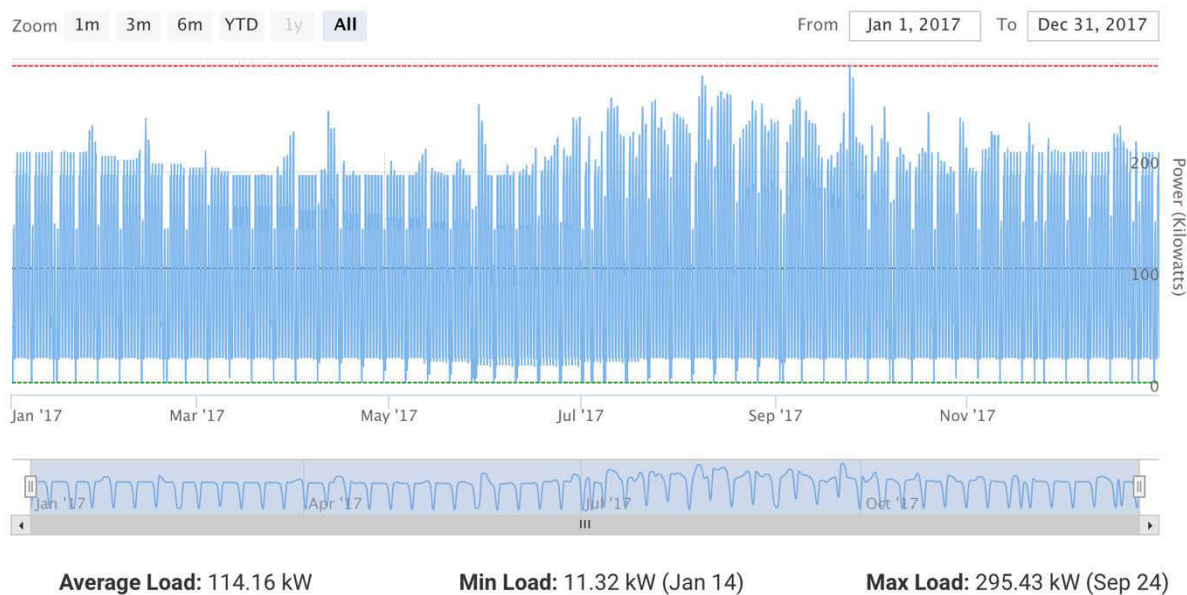


Figure 2. Simulated typical load profile chart generated by REopt Lite

A simulated residential load profile is not currently available. The most accurate way to model a residence is by uploading a custom load profile and checking that all financial, tax, and incentive inputs are relevant. A rough approximation can be made using the apartment building option, which most closely matches the timing of a residential electric load. The annual consumption would need to be scaled down to a relevant residential annual energy consumption total.



If you have actual interval data (in 15-minute, 30-minute, or hourly intervals), select the Upload tab (Figure 3). This will allow the model to most accurately represent your site’s electricity requirements.

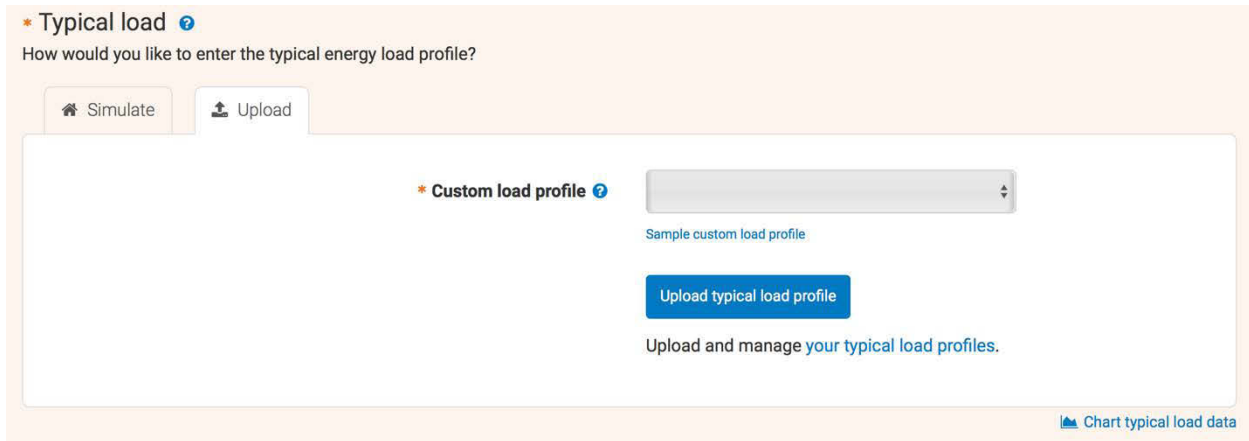


Figure 3. Upload actual interval data for your site

You don’t need to be registered or logged in to a REopt Lite account to upload a custom load profile. But if you are, you can save and manage any load profiles that you upload in the page that opens from the “Load Profiles” link in the top right corner of the input page.

If you’re logged into your REopt Lite account and have previously uploaded your typical load profile, you can select it from the dropdown list (Figure 4).

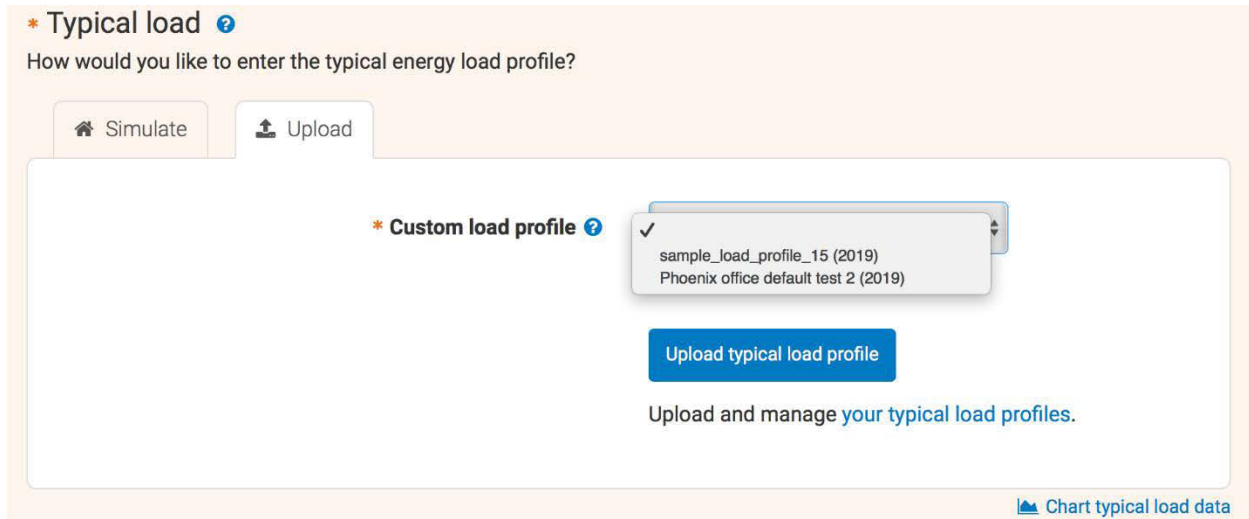


Figure 4. Access saved load profiles by logging into your REopt Lite account



If you haven't already uploaded your typical load profile, download the "Sample custom load profile" to see the .csv file format required. Save your site's load profile in this format and upload it to REopt Lite (Figure 5). Do not include any commas, blank entries, or text in the data. Be sure that the file has the correct number of rows (8,760, 17,520, or 35,040). If the available load data is for a leap year, please delete the data for December 31 to shorten the file length to 8,760, 17,520, or 35,040 rows.

The load profile should start at the first hour of January 1. Be sure to include the year—this will help preserve the day of the week for accurate application of the site's utility rate.

Upload a **Typical** Load Profile ×

\* Custom typical load profile ? Choose File no file selected

Year of load profile ? 2019

Description

Upload Typical Load Profile

Figure 5. Upload a typical load profile to REopt Lite

## Learn More

For more information on tool inputs and default values, please see the [REopt Lite Web Tool User Manual](#).

Find additional REopt Lite tutorial documents and videos on [reopt.nrel.gov/user-guides.html](http://reopt.nrel.gov/user-guides.html).



NREL's REopt Lite web tool helps users evaluate the economic viability of grid-connected PV, wind, and battery storage systems at a site. It identifies system sizes and battery dispatch strategies to minimize energy costs, and estimates how long a system can sustain the site's critical load during a grid outage.

Learn more about REopt Lite at [reopt.nrel.gov/tool](http://reopt.nrel.gov/tool).

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