QuESt Performance Tutorial

U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

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QuESt Performance Tutorial

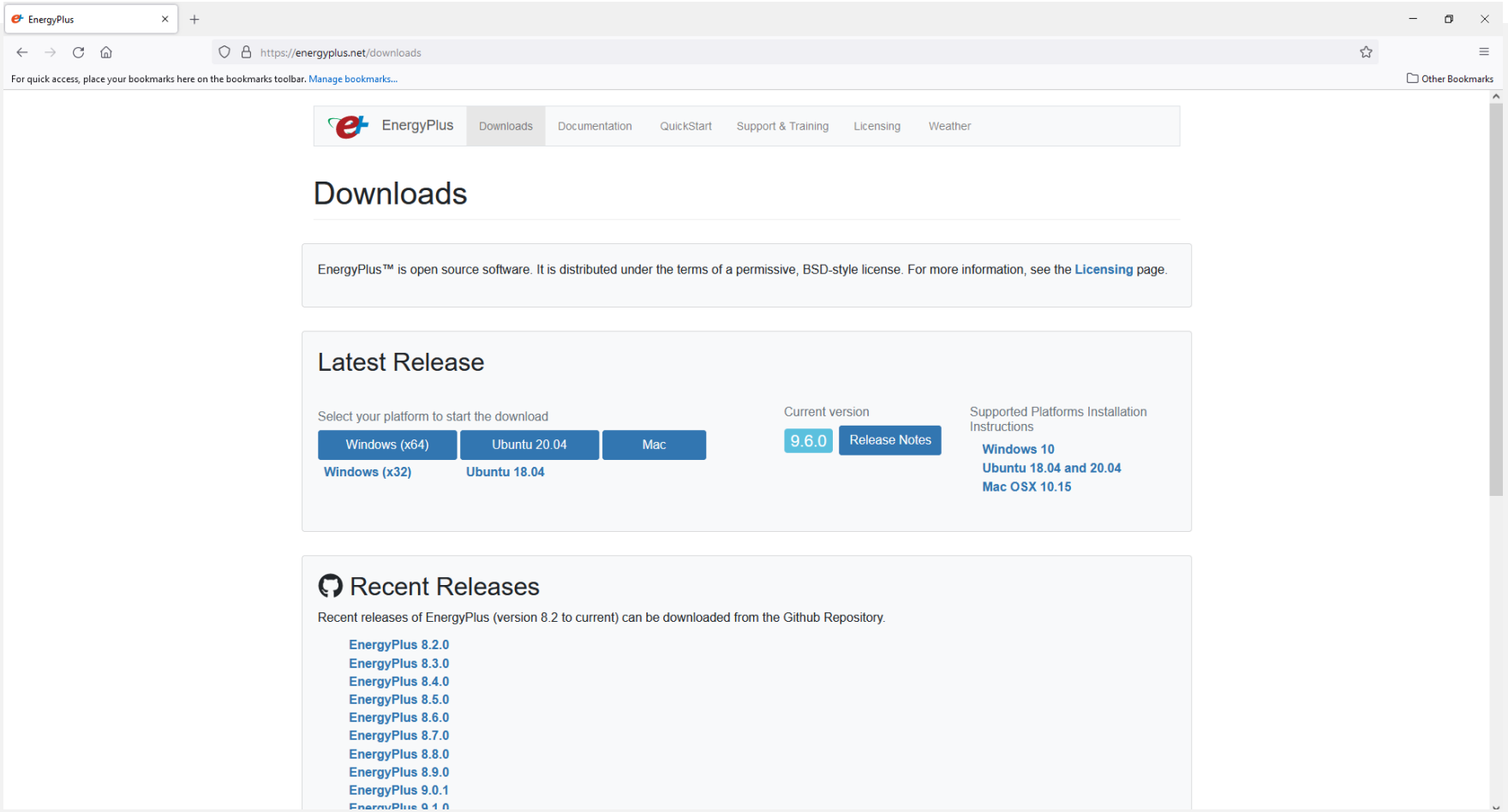
In this tutorial, a basic example will be introduced to enable the user to use the QuESt Performance Tool

The tutorial will cover the following:

- How to download EnergyPlus
- How to download the weather data using QuESt Data Manager
- How to run a QuESt Performance simulation after a QuESt valuation run

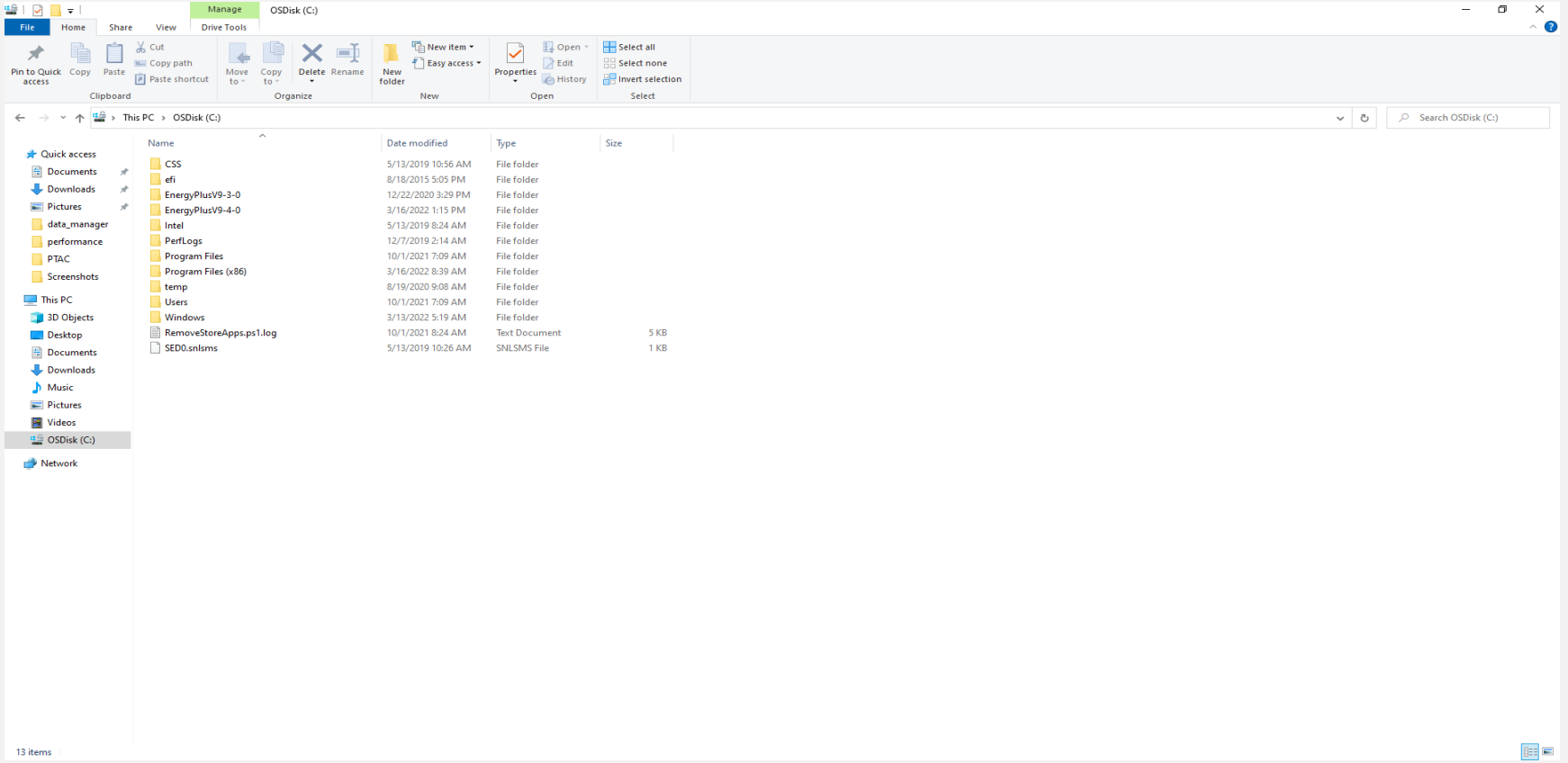
For this example, our location will be New York City.

Download EnergyPlus



Open a web browser and navigate to https://energyplus.net/downloads

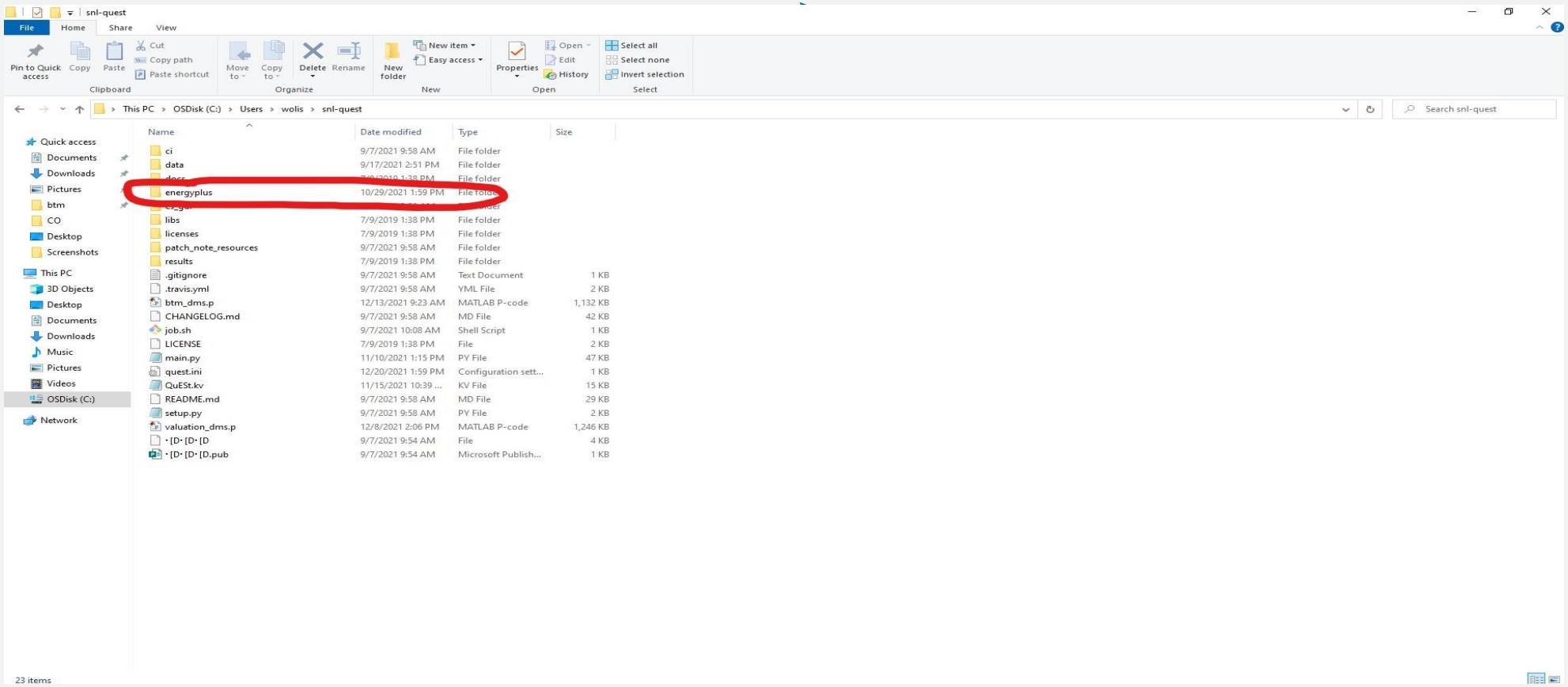
Download EnergyPlus



Download the latest version

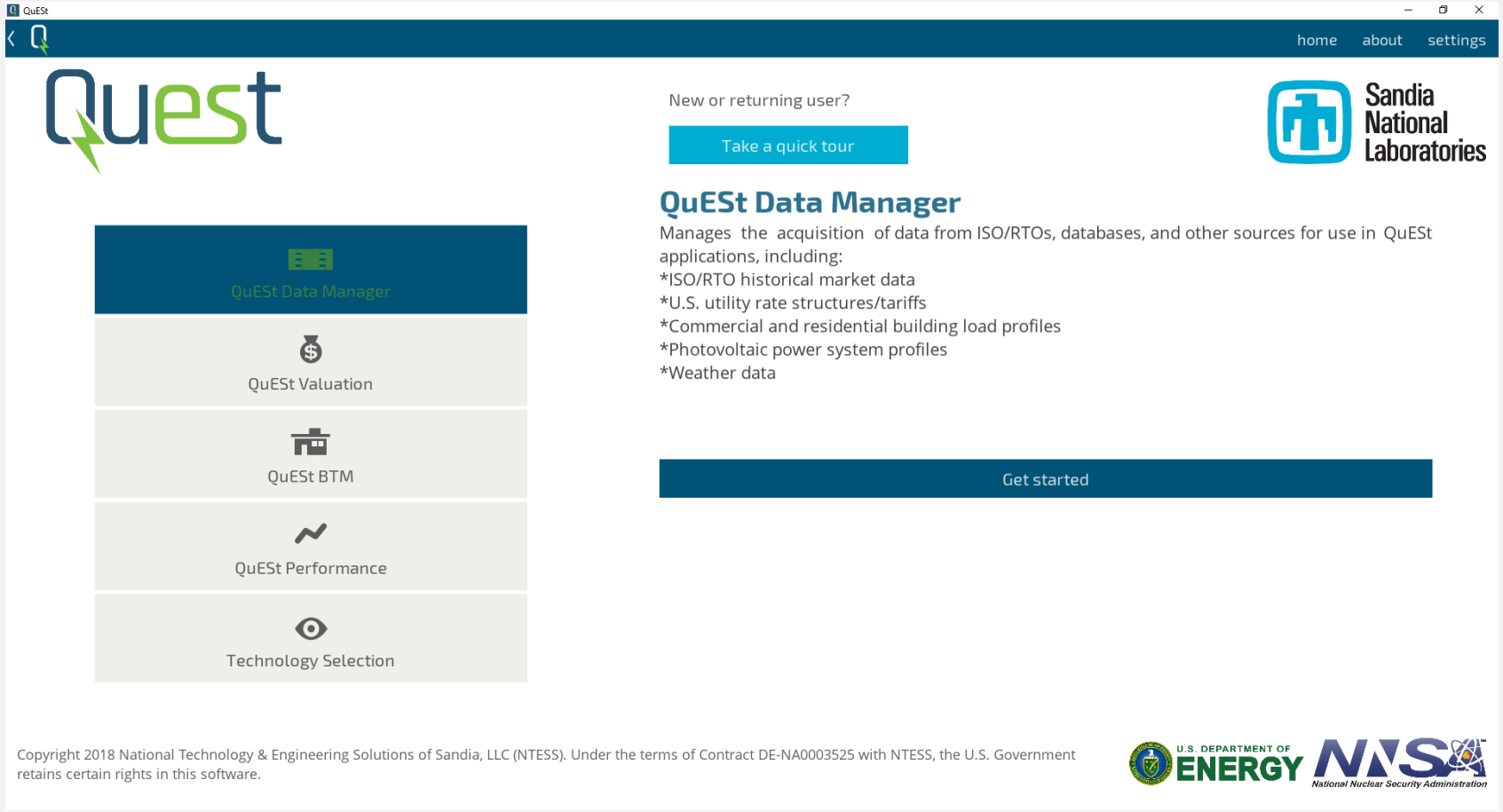
Find the EnergyPlusVx-y-z on your drive (x, y, and z represent the version number)

Download EnergyPlus



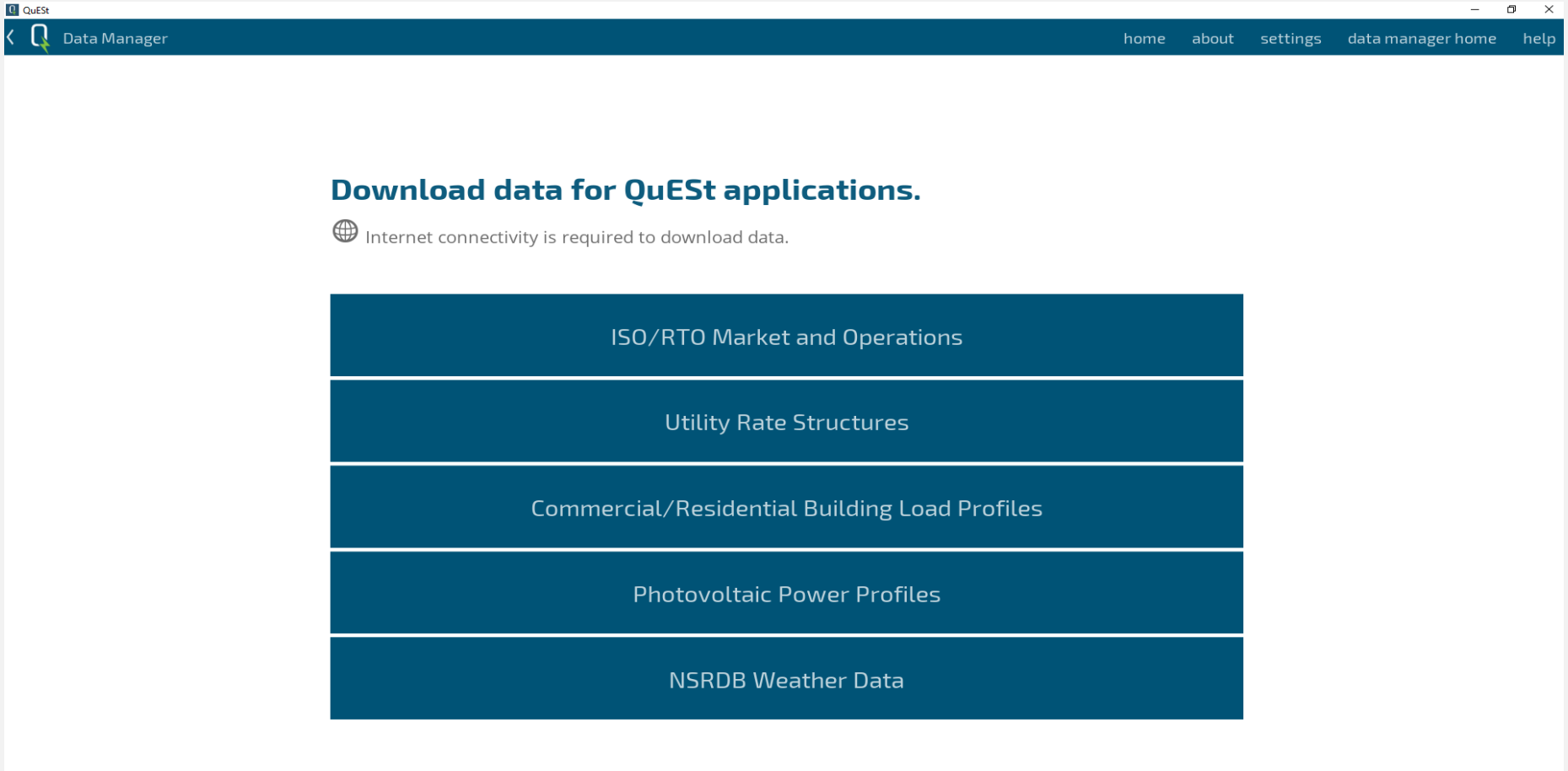
Copy and paste this file into the Quest directory (folder). Rename to “energyplus”

Download Weather Data



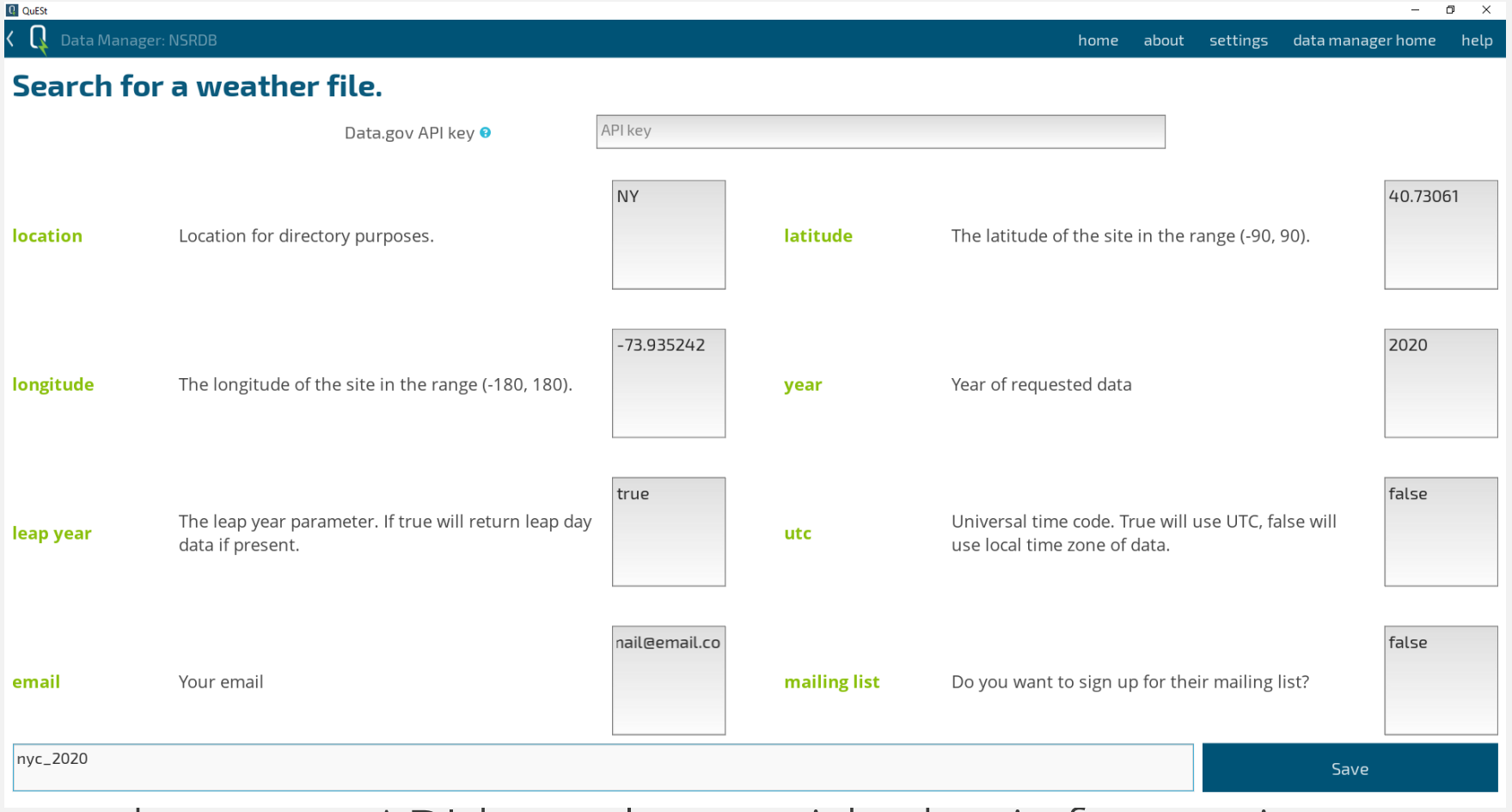
Open QuESt, head to the Data Manager Tool.

Download Weather Data



Open NSRDB Weather Data tab.

Download Weather Data

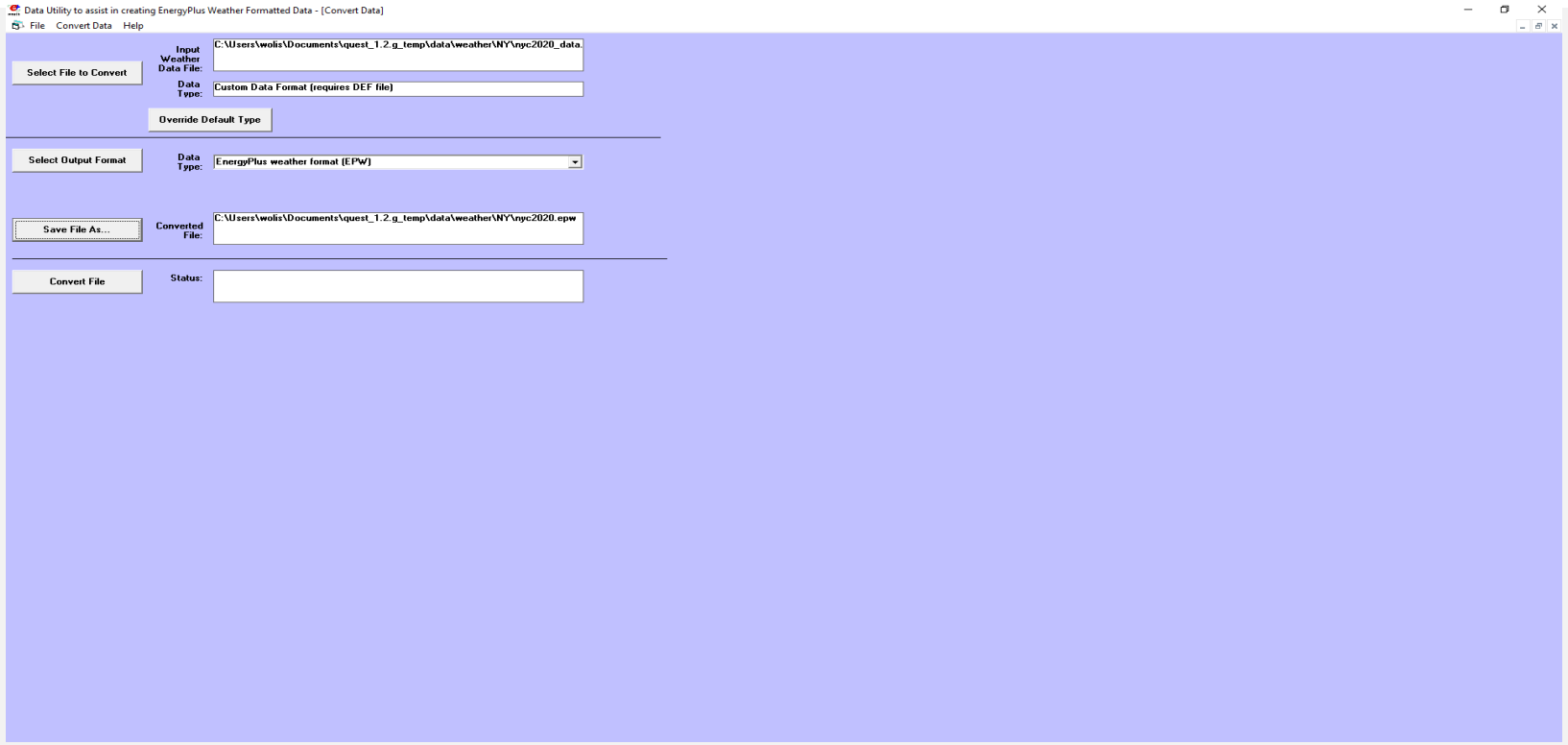


Enter your data.gov API key along with the information requested for the download. All fields are required. Once ready click save.

Download Weather Data

After clicking the save button, the EnergyPlus weather converter will open.

Download Weather Data

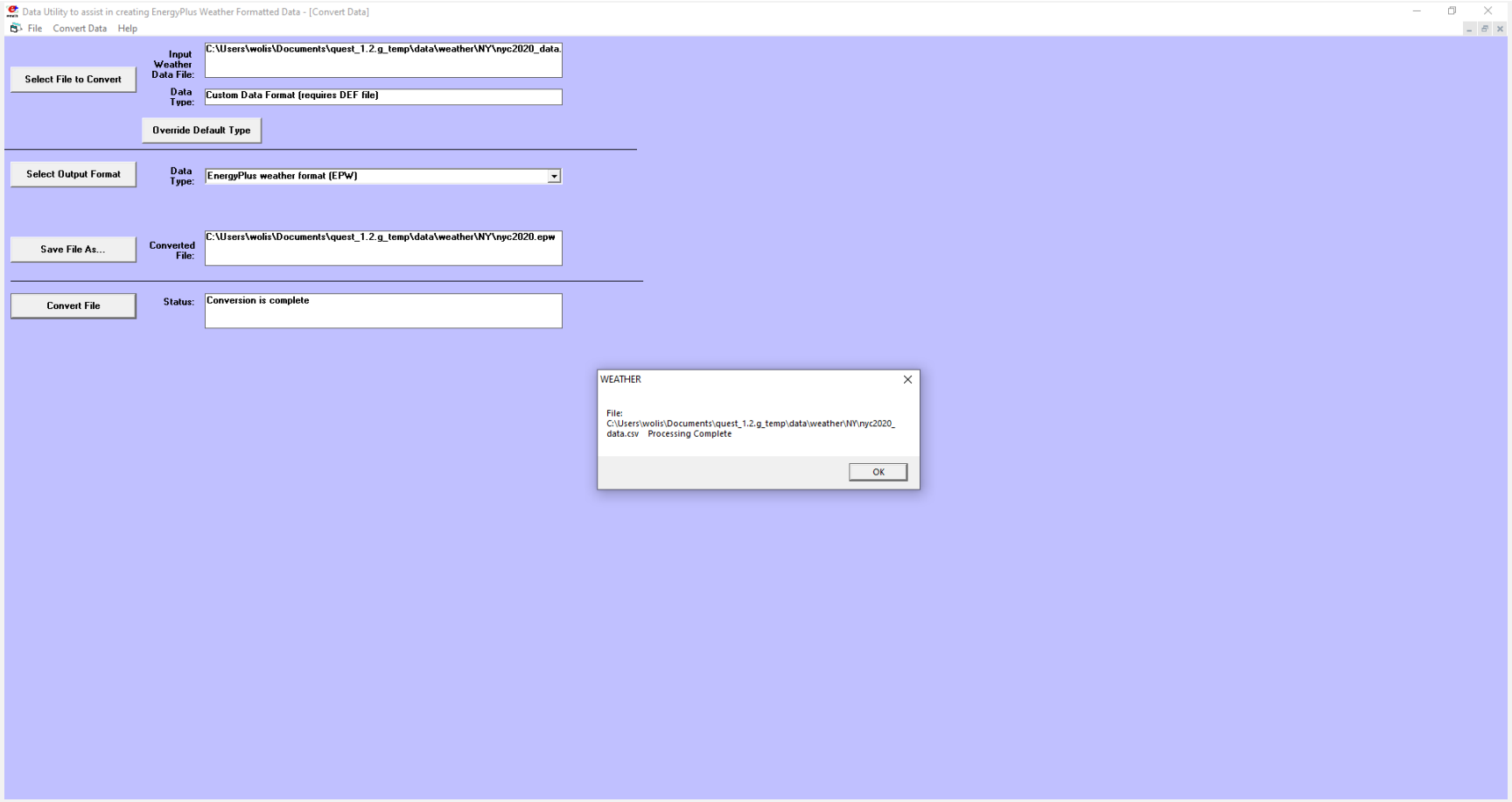


To convert the weather data, click “Select File to Convert” and navigate to QuESt/data/weather/NY/. Select the “nyc_2020_data.csv”.

Click select ouput format which will default to EnergyPlus weather format (EPW).

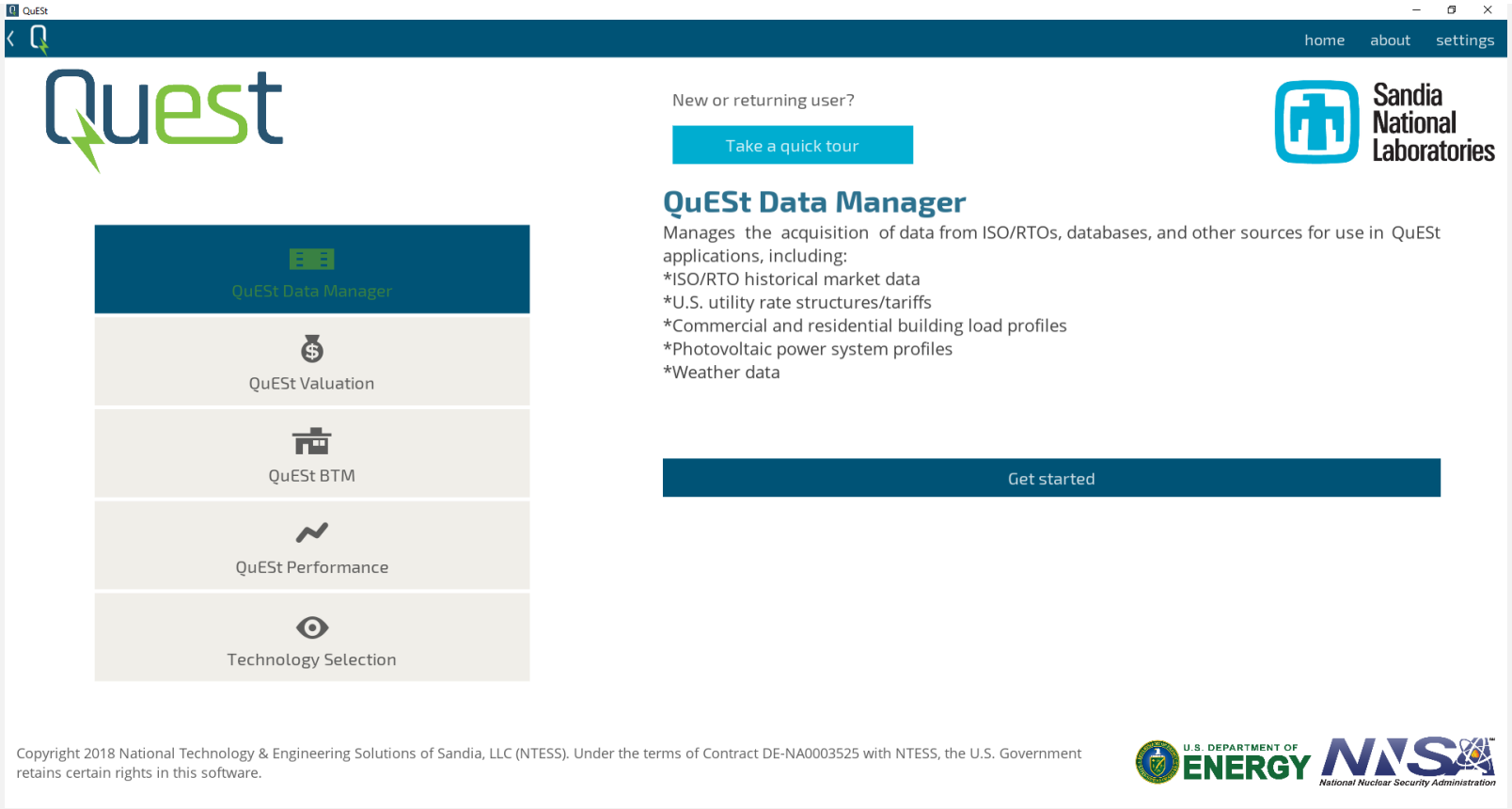
Click save file as and enter your desired file name.

Download Weather Data



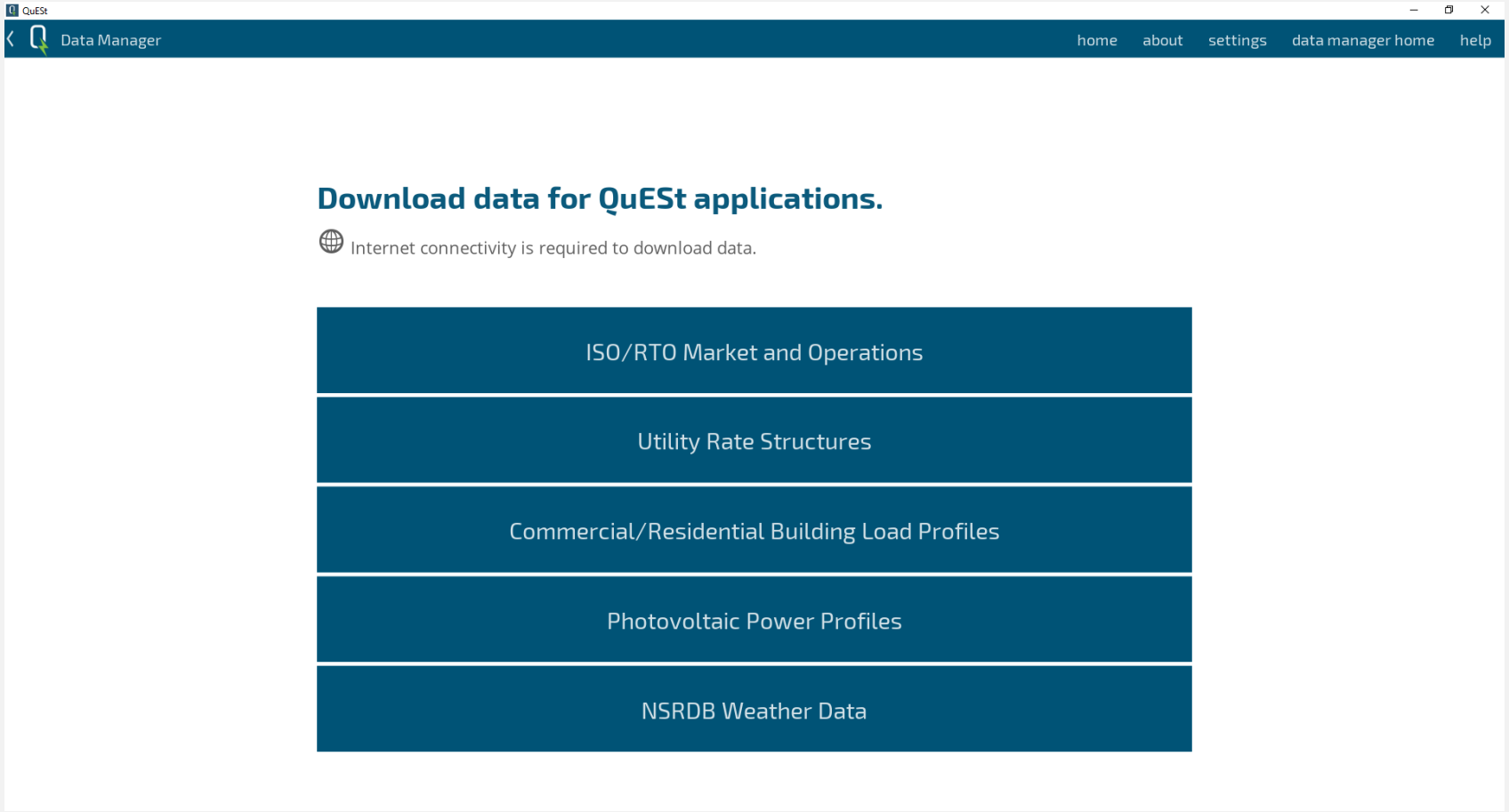
Click convert file. When finished click ok and close out the weather converter. Done!

Run QuESt Valuation



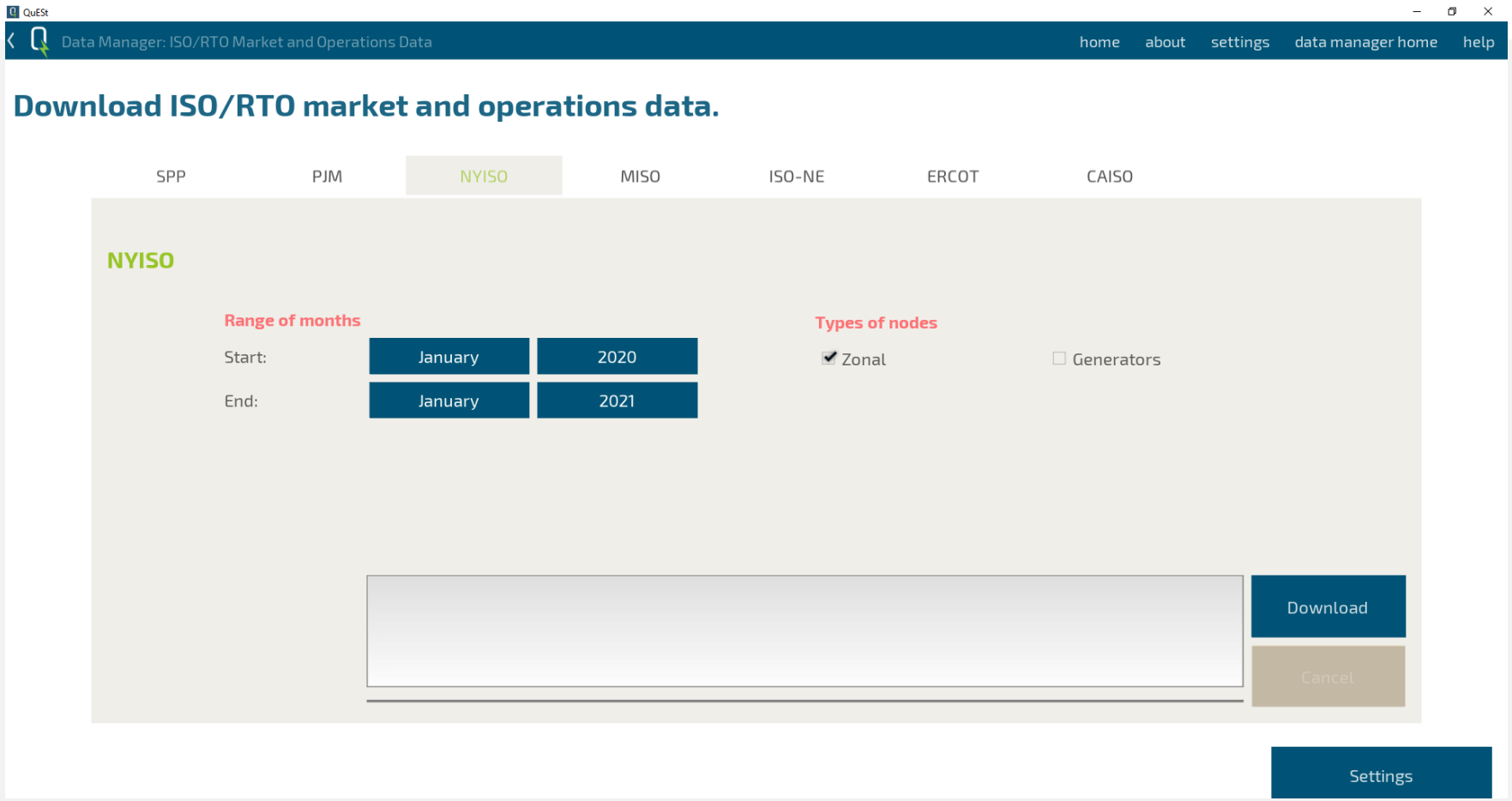
- First we need to download NYISO data. If you are familiar with this, feel free to skip ahead.
- Open QuESt, head to the Data Manager Tool.

Run QuESt Valuation



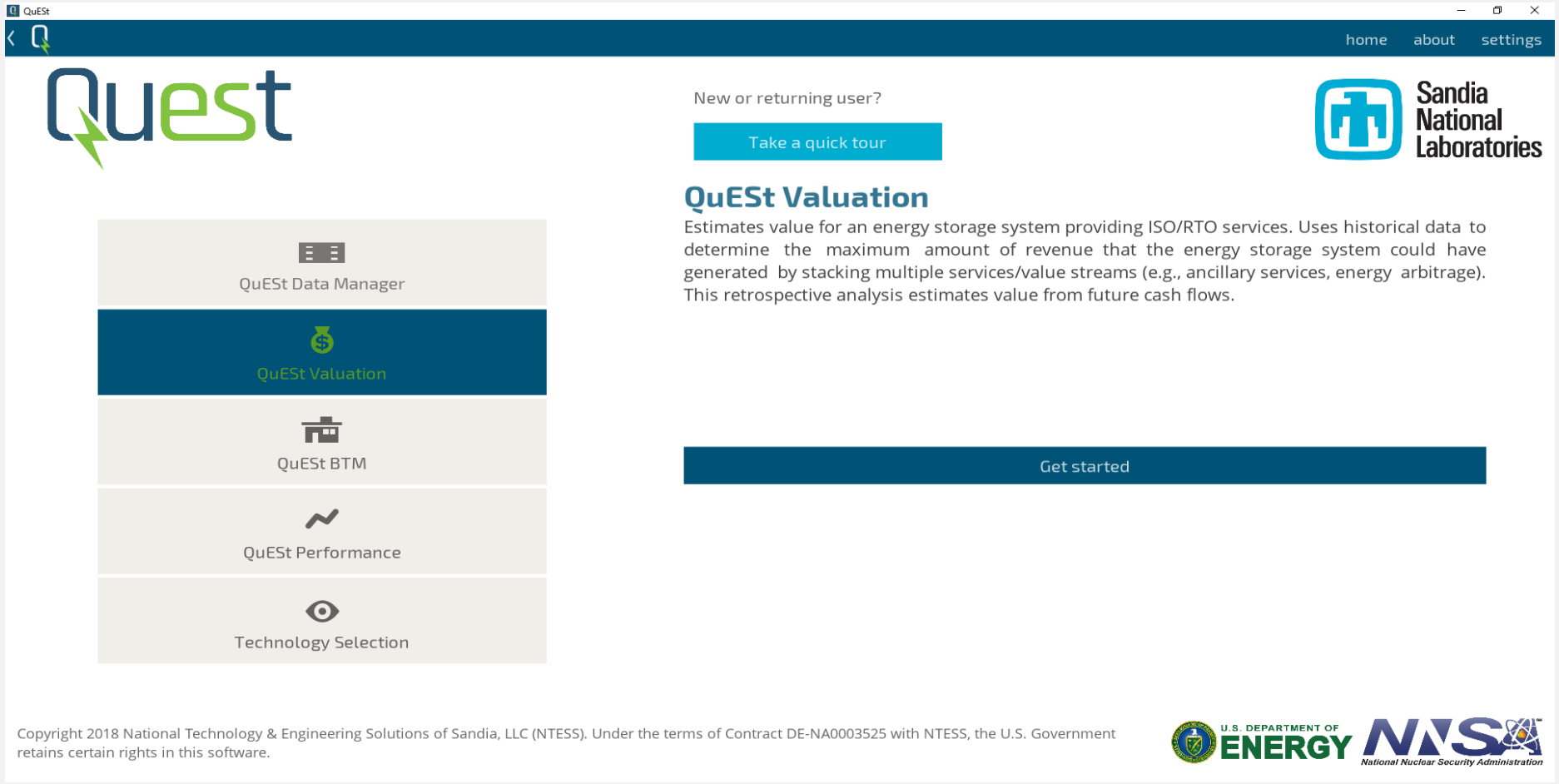
- Select ISO/RTO Market and Operations from the options.

Run QuESt Valuation



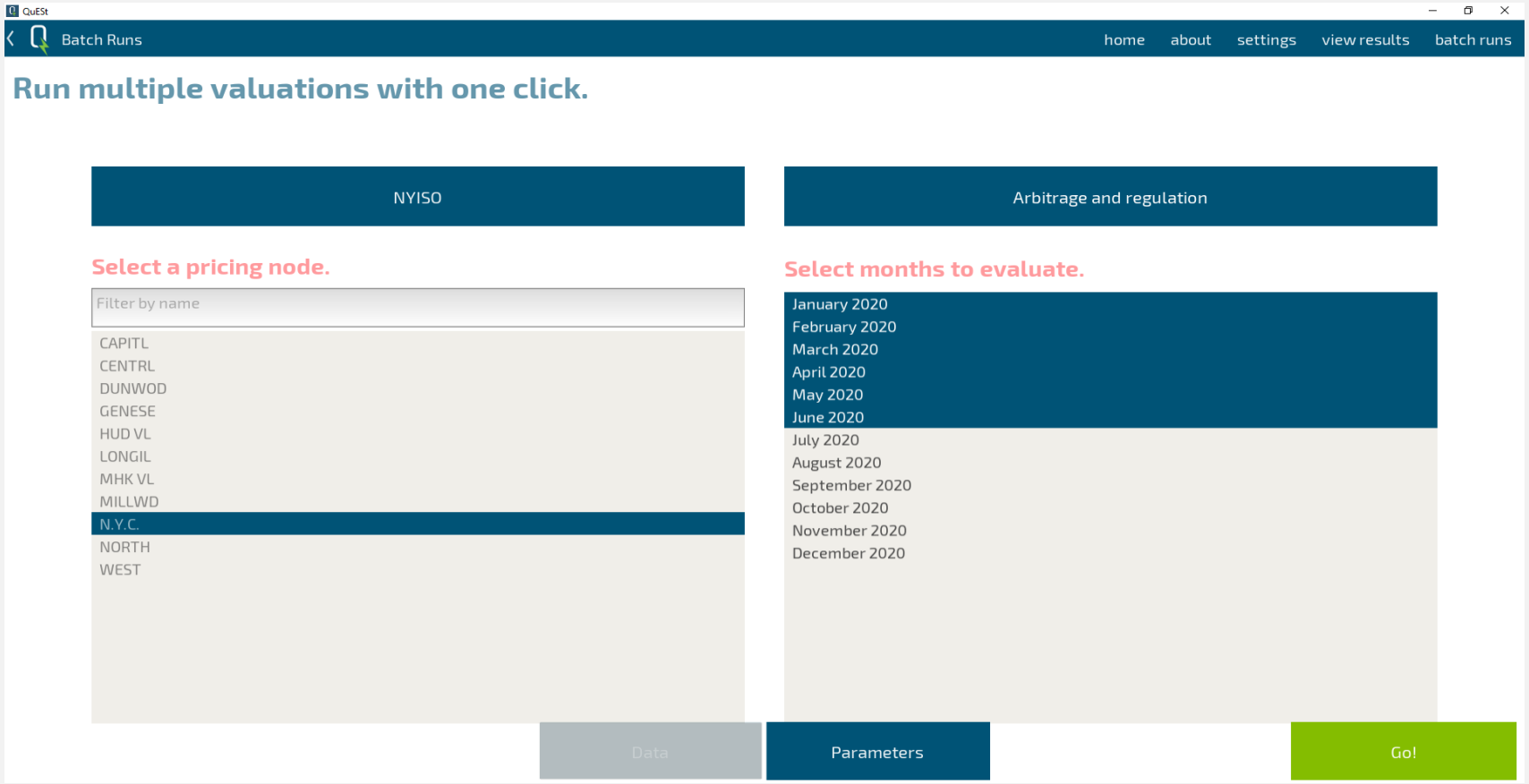
- Select the NYISO tab. Set the range of months from January 2020 to December 2020. Check the Zonal nodes box. Make sure your settings are correctly configured, click download.

Run QuESt Valuation



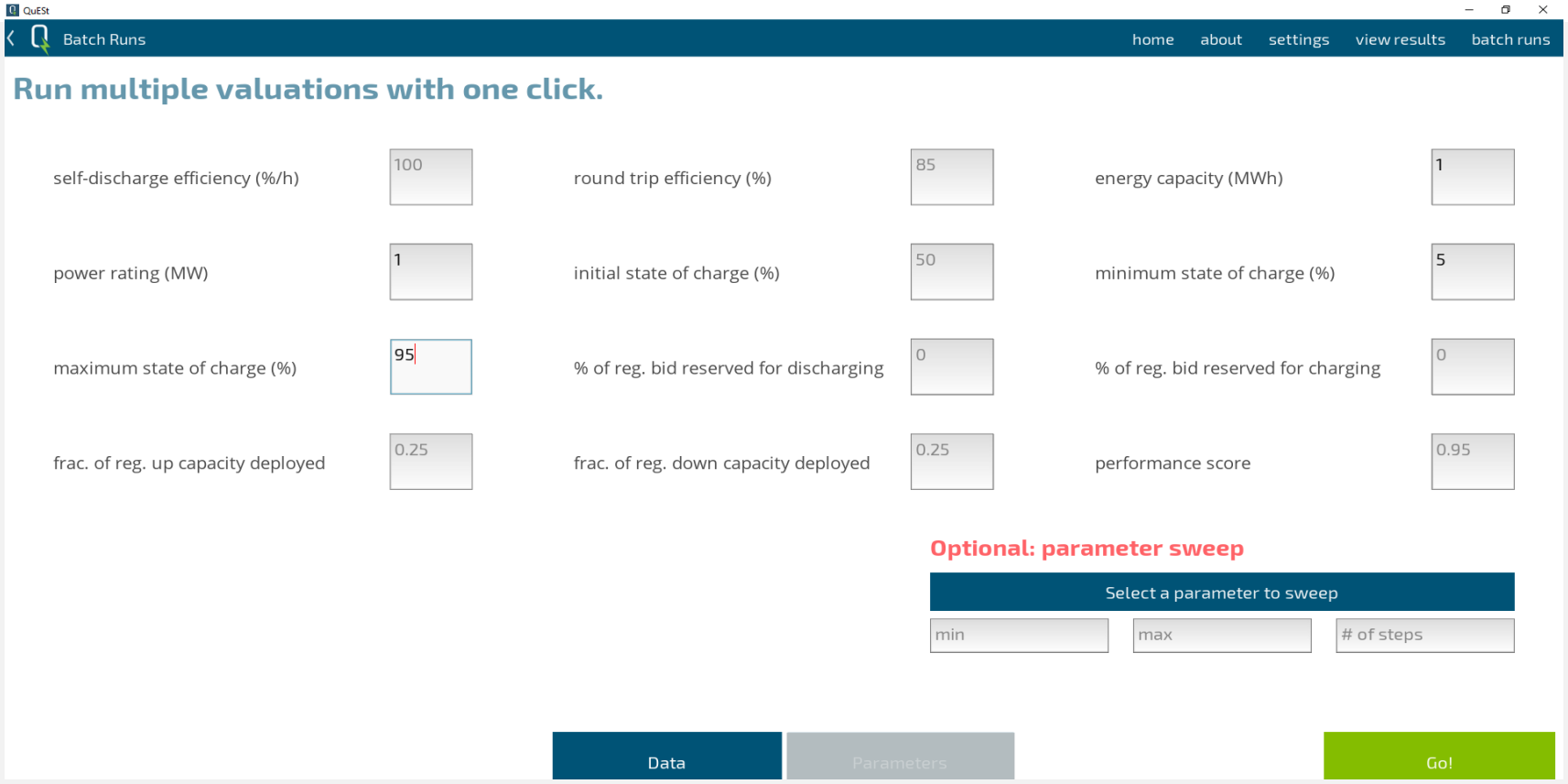
- Navigate to the QuESt Valuation tool.

Run QuESt Valuation



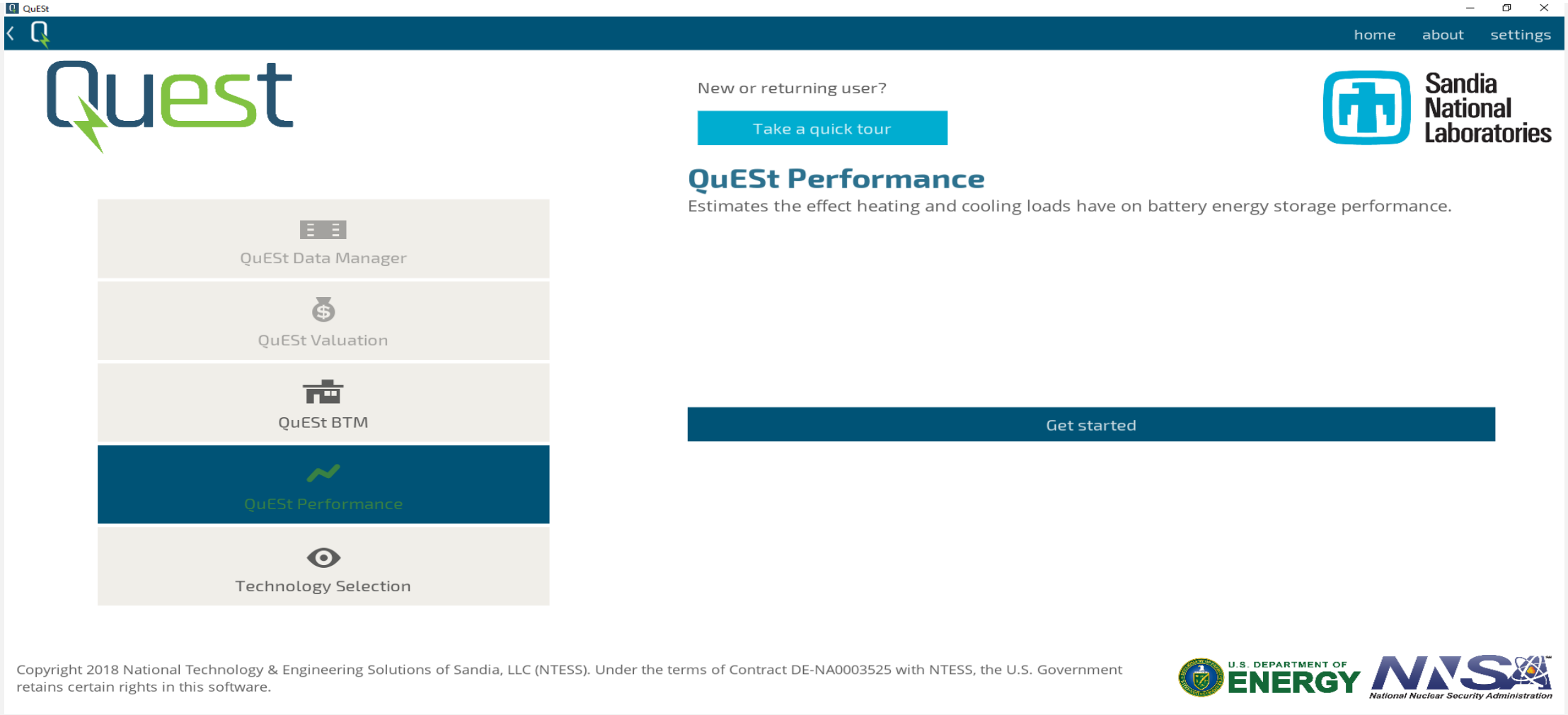
- Click on the Batch Runs Button -> select NYISO from the pull down options -> select N.Y.C. from the node options -> select arbitrage and regulation from the pull down options -> select the first six months of the year.

Run QuESt Valuation



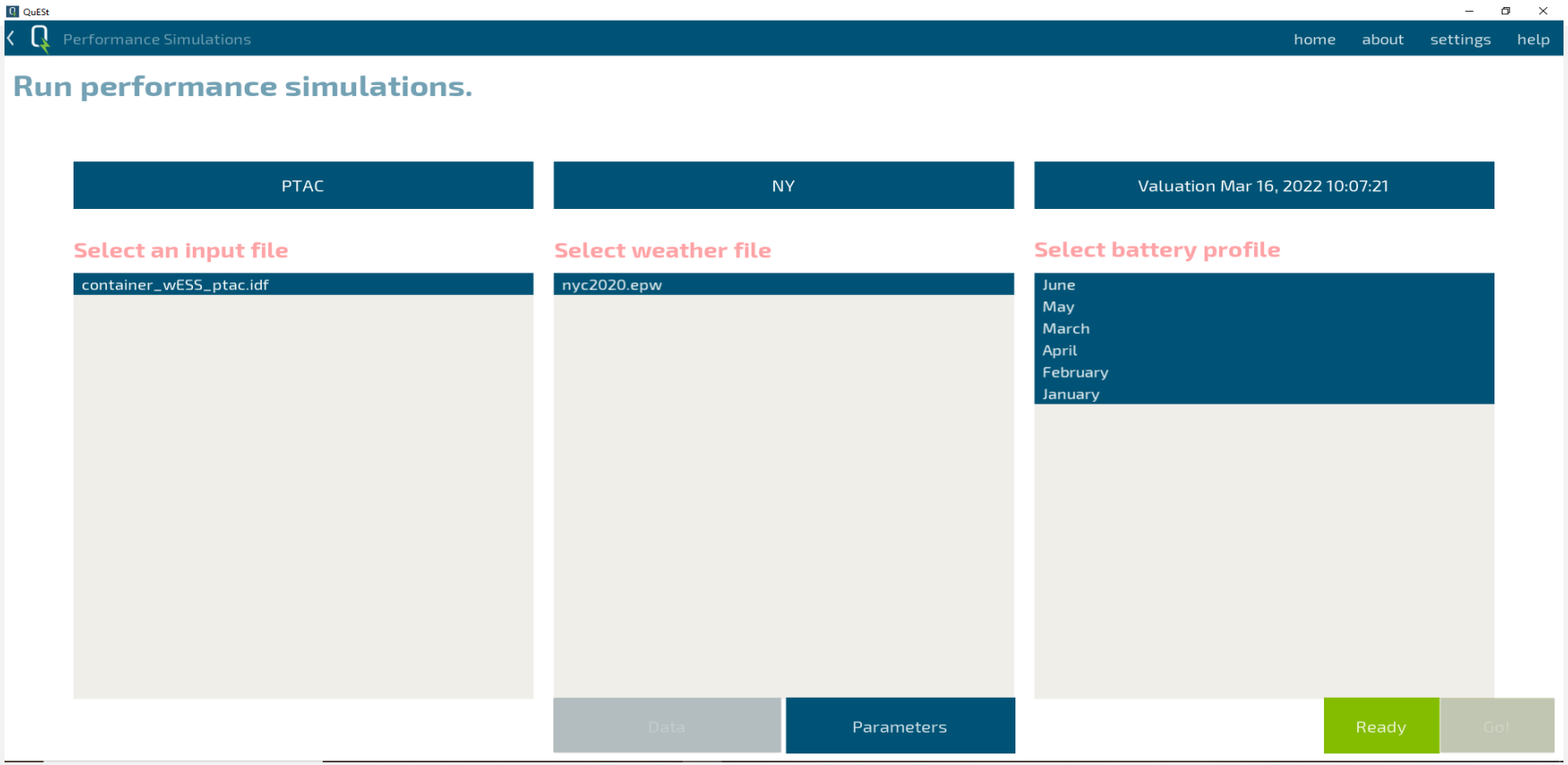
- Click the Parameters tab. Change the energy capacity to 1 MWh and the power rating to 1 MW. Change the minimum state of charge to 5% and the maximum state of charge to 95%.
- Once everything looks correct, click Go! Once the simulations are finished, navigate back to the home page.

Run QuESt Performance



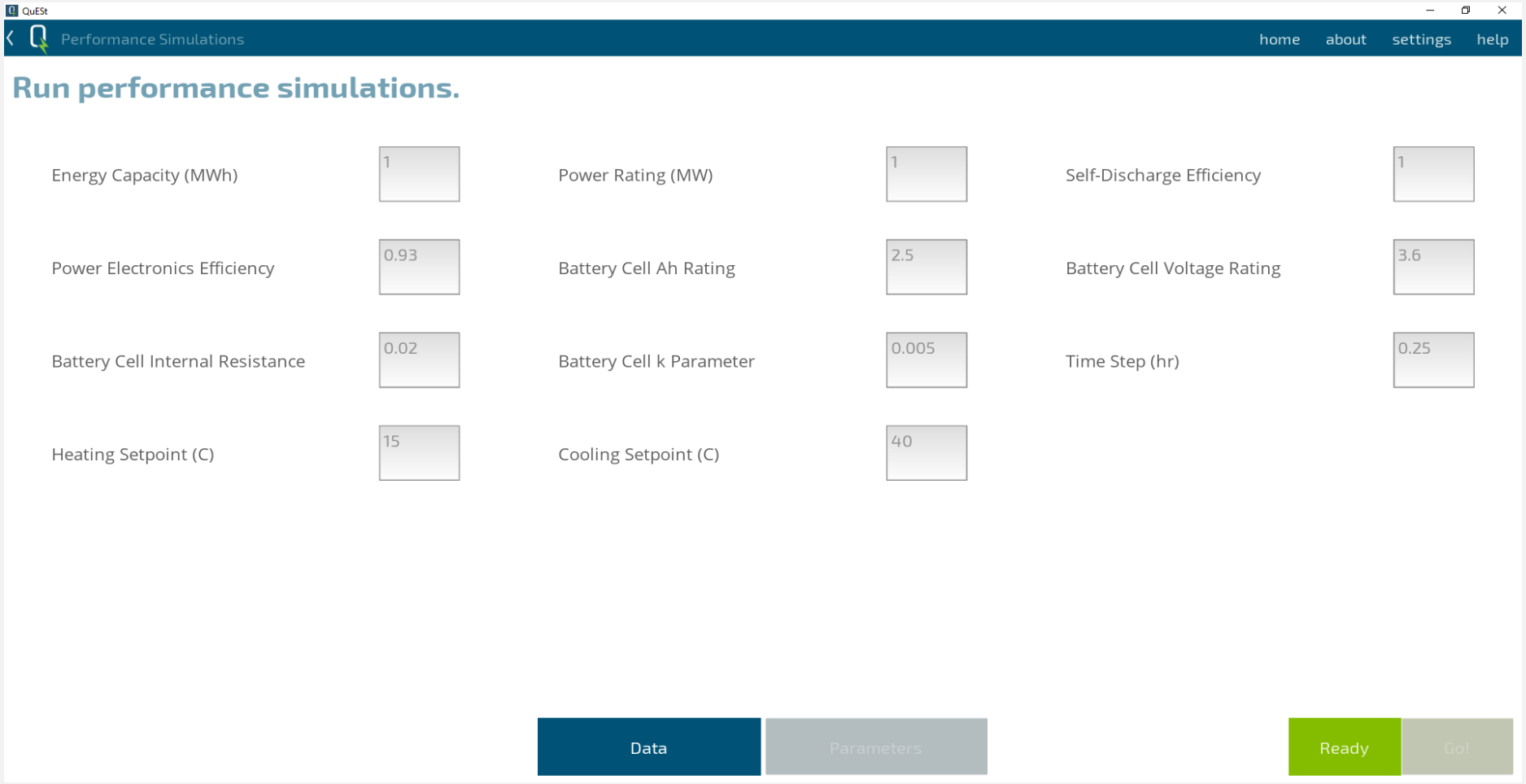
- Navigate to the QuESt Performance tool.

Run QuESt Performance



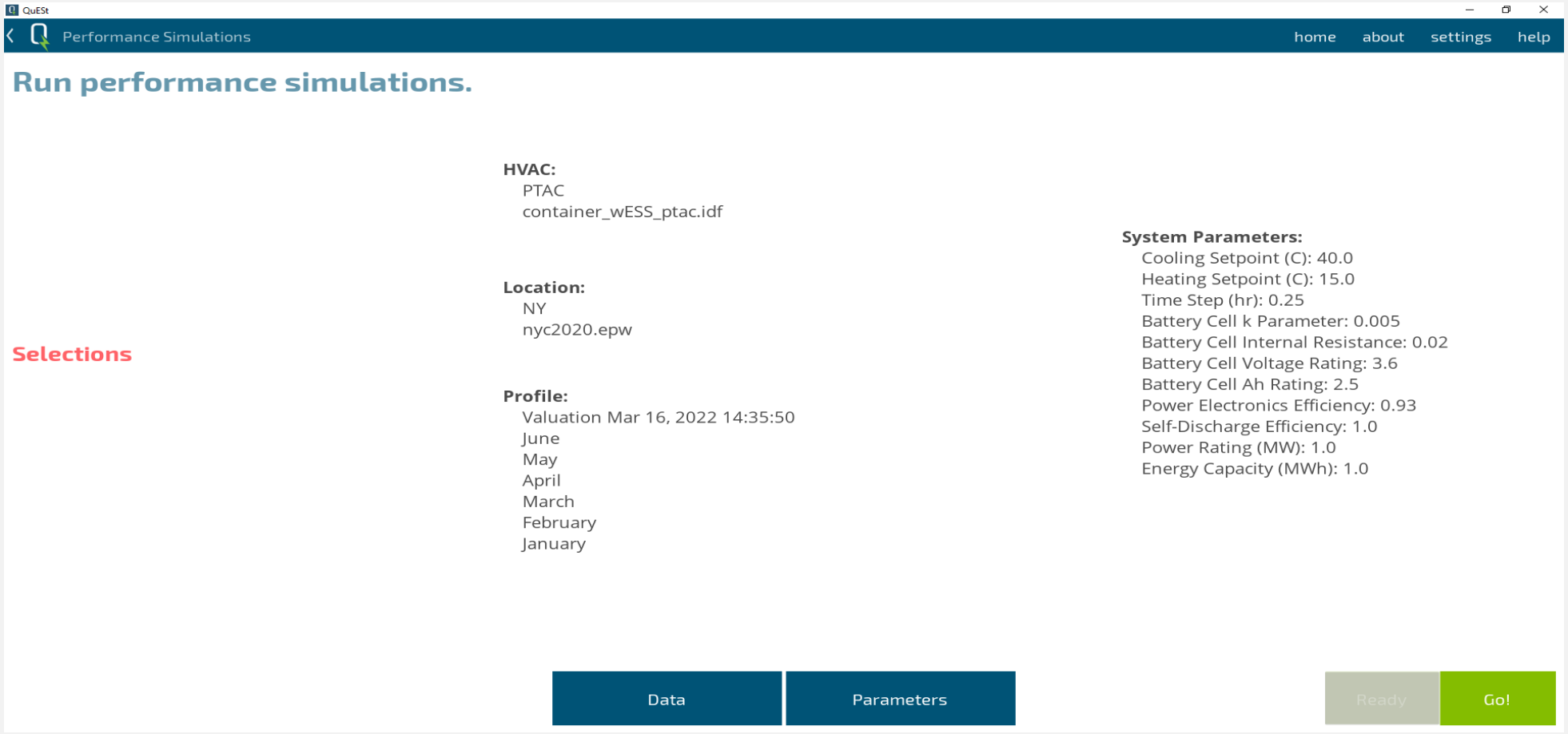
- Enter the Performance Simulations option. Select PTAC from the HVAC options. Select the provided input file describing a BESS in a shipping container. Select NY from the location dropdown. Select the weather file downloaded previously. Select the Valuation run from the Profile dropdown. Select the six months available.

Run QuESt Performance



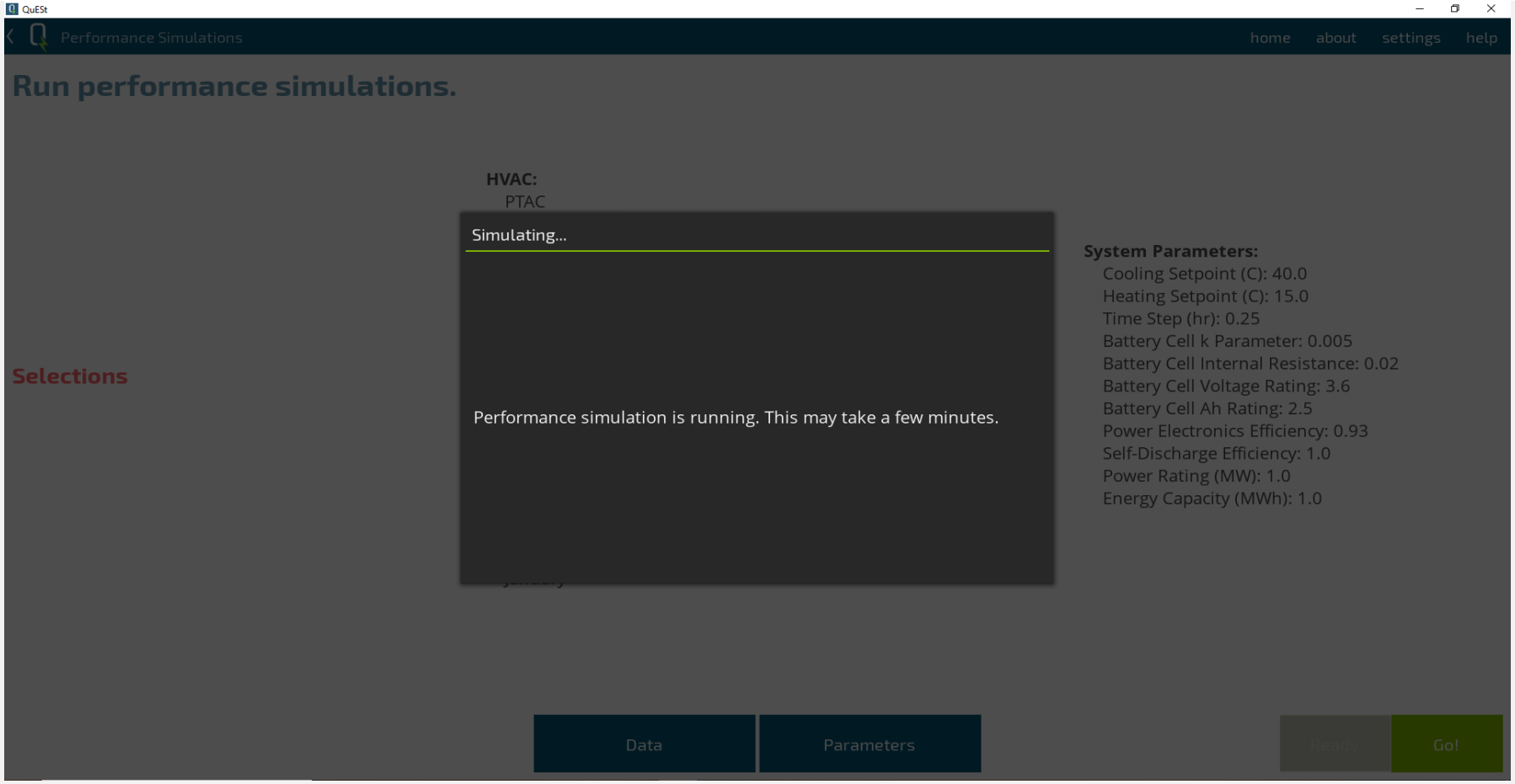
- Click the Parameters tab. Leave the default parameters as is, click the Ready Button.

Run QuESt Performance



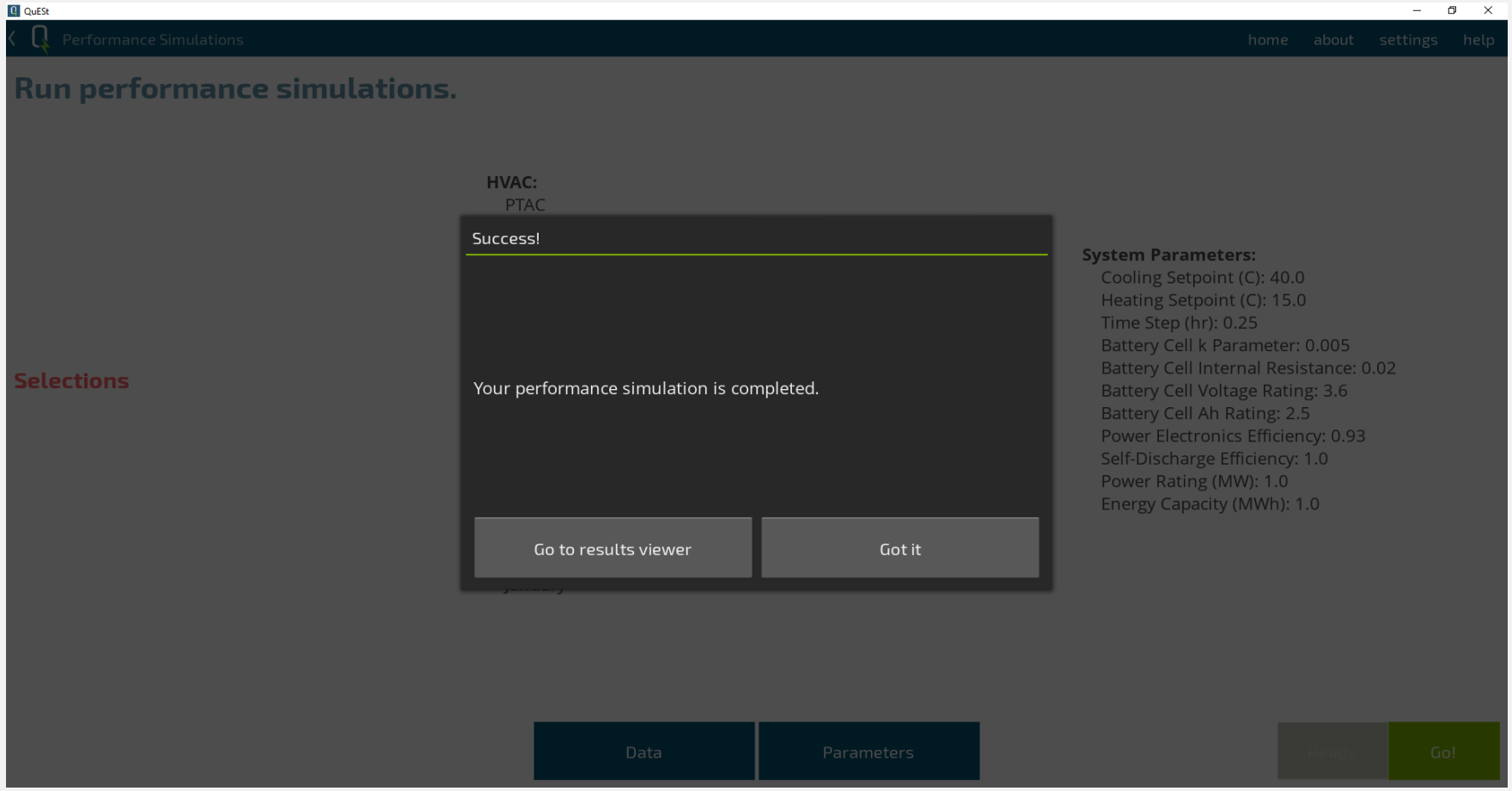
- The selections made will be displayed. If everything looks correct, press Go!

Run QuESt Performance



- A popup will appear reassuring that the performance simulation is running, which may take a few minutes.

Run QuESt Performance



- Once the simulation is completed, a new popup will appear saying the simulation is completed. Click “Go to results viewer”.

Run QuESt Performance

- Select as many runs as you want, the pictures displayed here show all six.
- Options to plot are the monthly energy consumption of battery and HVAC, Hourly HVAC or Battery power throughout each month, and the month efficiency of the battery.

Run QuESt Performance

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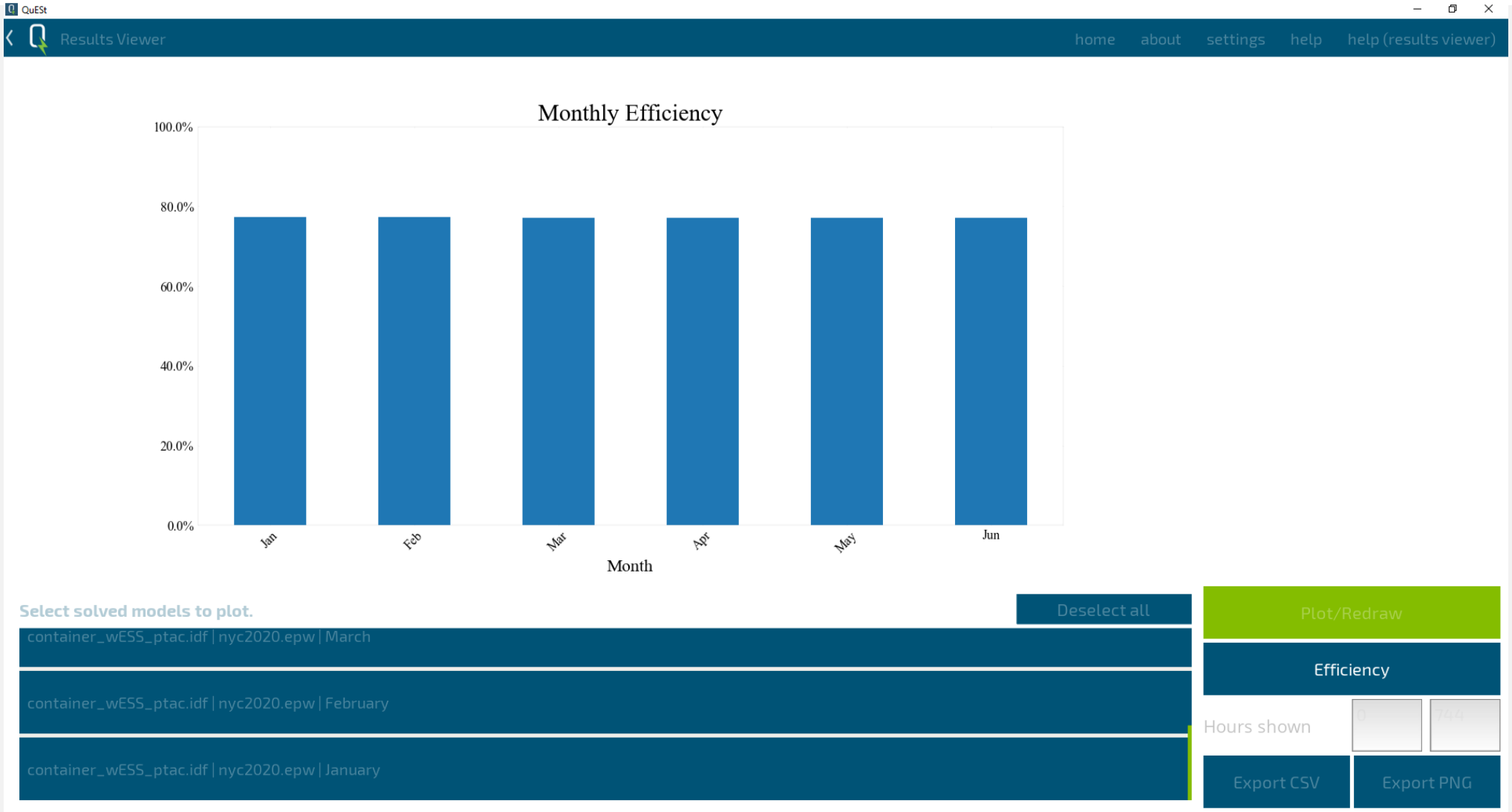
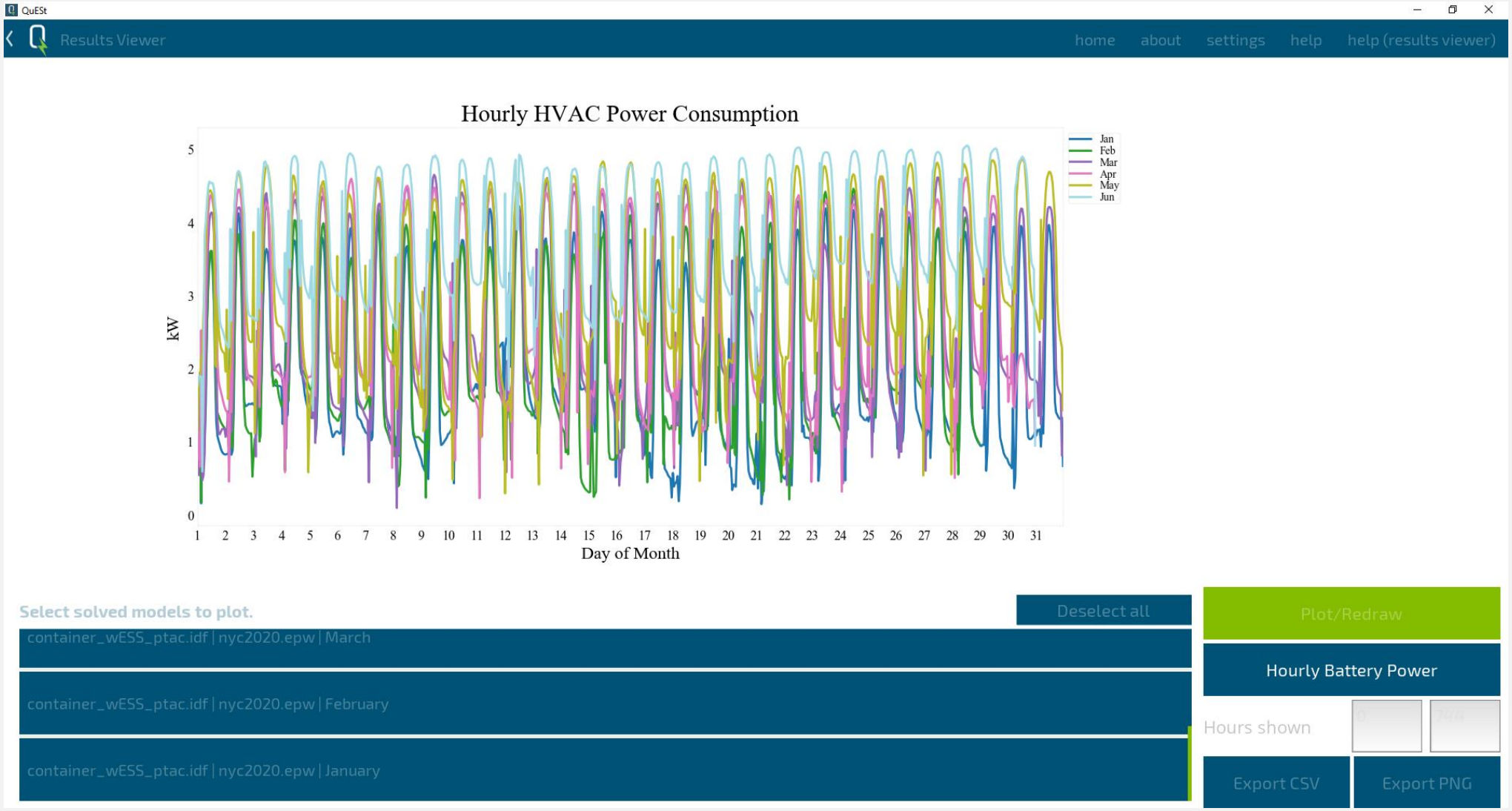


Run QuESt Performance



Run QuESt Performance