Creating the "Energy Production Market Action" Dashboard

In this walkthrough, we will instruct step-by-step in the creation of a dashboard that showcases the results of a market action recommendations engine for an energy plant based on the predicted hourly production, internal demands, and predicted grid prices.

This guide is provided for the second part of the 2021 PyData Global “Bridging Data and Business: Power Plant Output Optimization Based on Electricity Market Price“ Workshop , and assumes that users have followed through with the first part of the workshop and have gathered the data from the machine learning model and outcomes from the market action recommendation engine. It is assumed that the following data tables are ingested into the database.

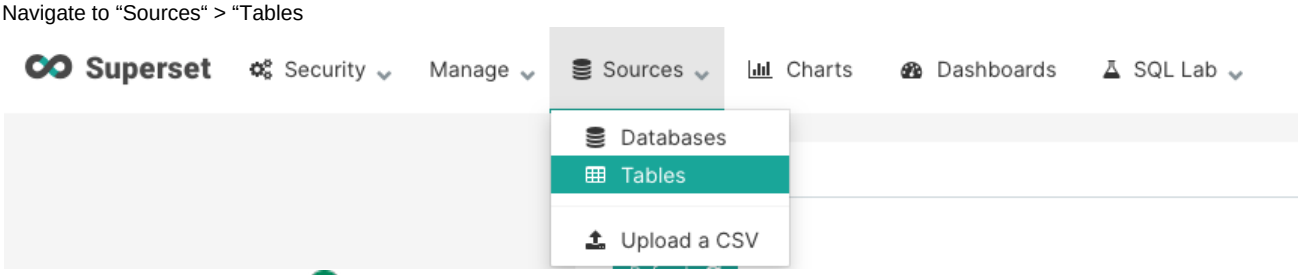
- “marketprediction” table containing the results from the market recommendation engine
- “energyprediction“ table containing the energy production predictions from the ML model

📖 Table of Contents

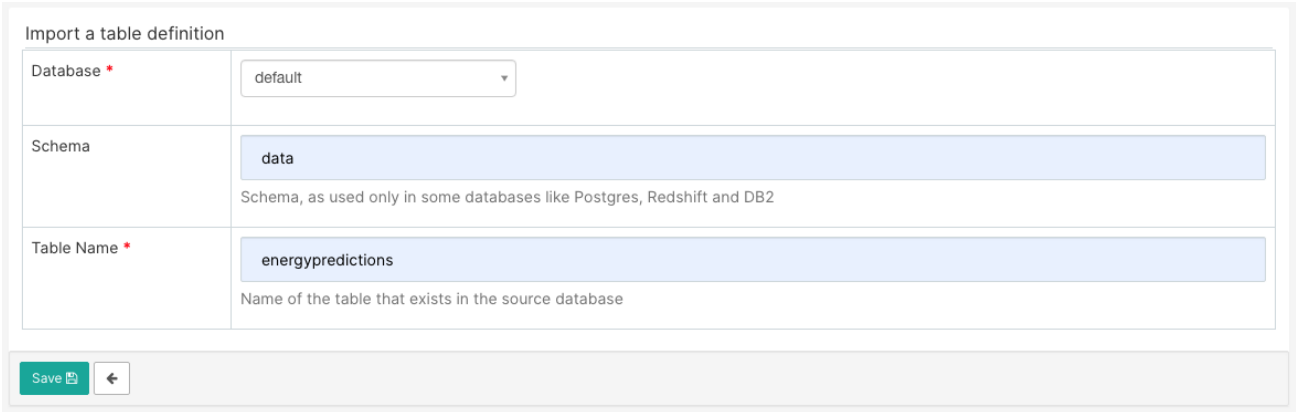
📘 Define Tables

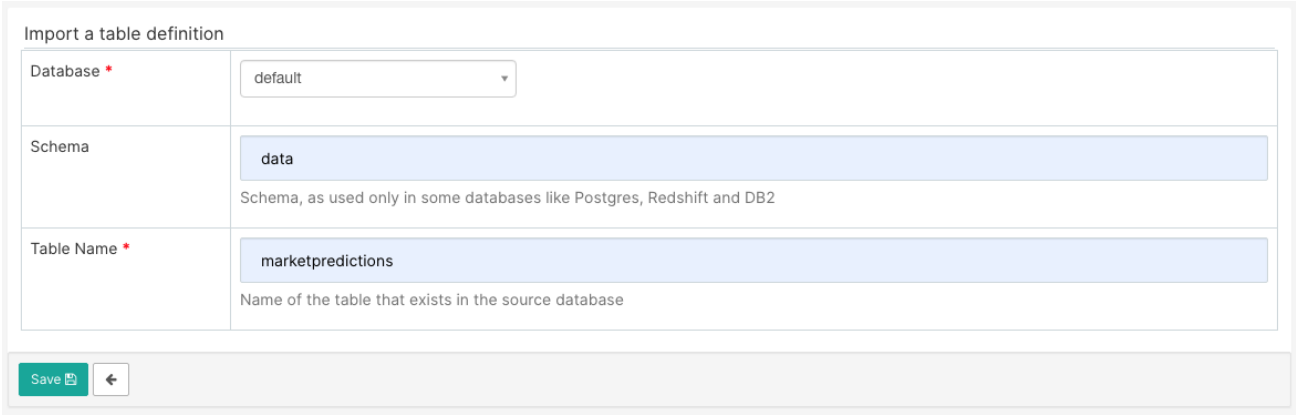
For Superset to access tables within the database, we need to first define these tables.

1. Navigate to “Sources“ > “Tables



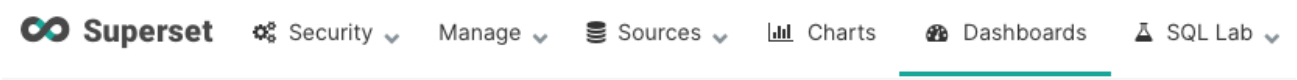
2. Add a new record by clicking on 
3. Import the table definitions for “energypredictions” and “market predictions”



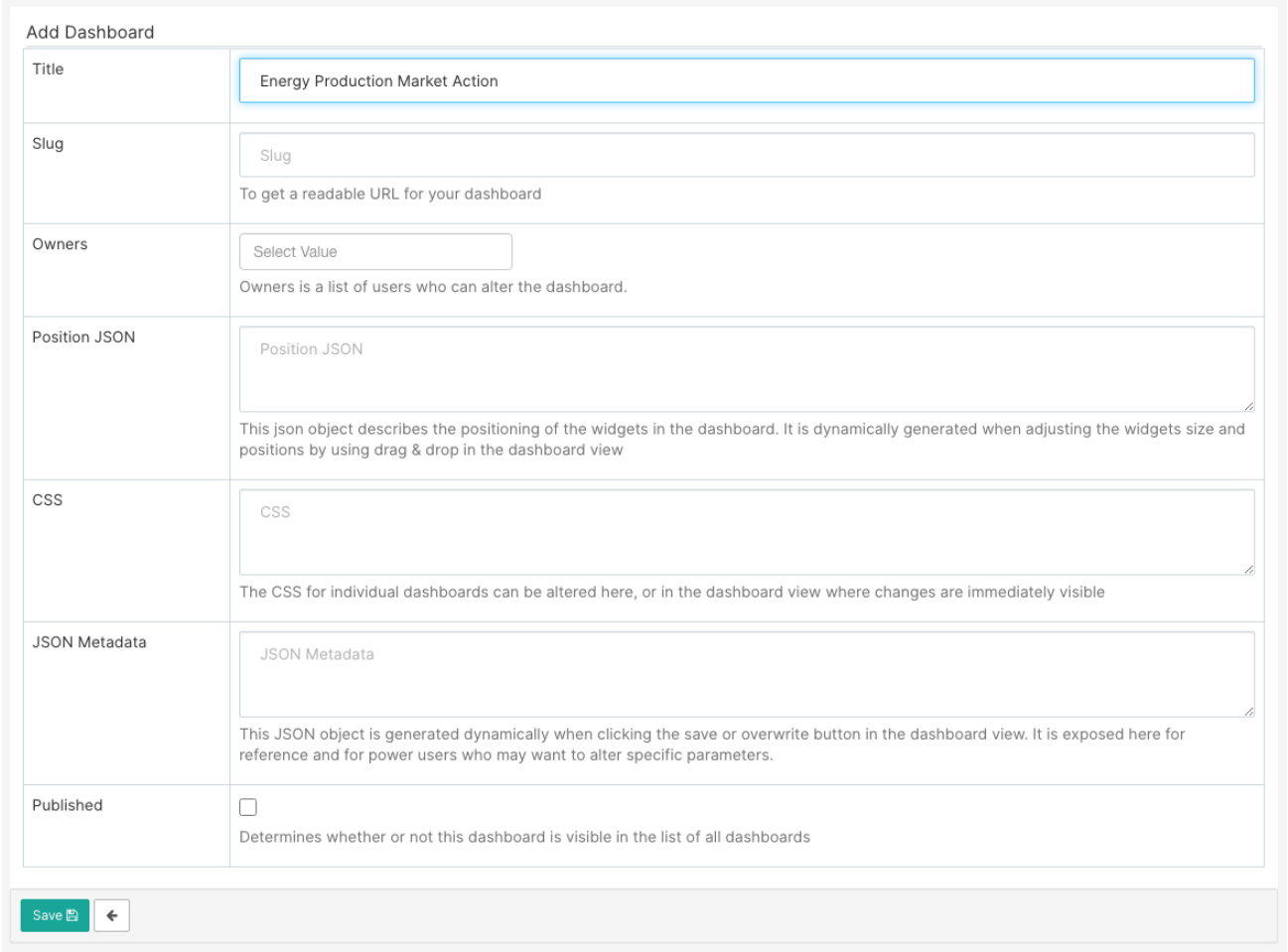


Create the Dashboard

1. Navigate to the “Dashboard” tab and click on to create a new dashboard

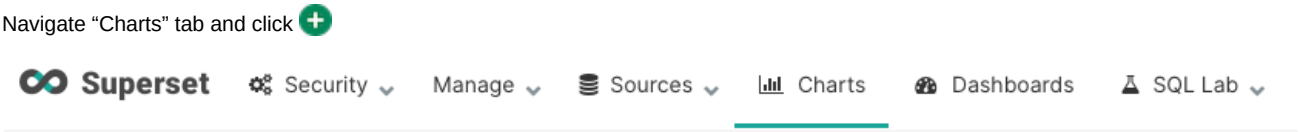


2. Name the dashboard “Energy Production Market Action” and save.

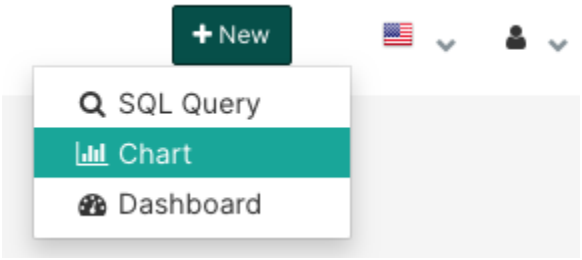


Creating Charts

There are 2 methods to create a new chart

1. Navigate “Charts” tab and click 

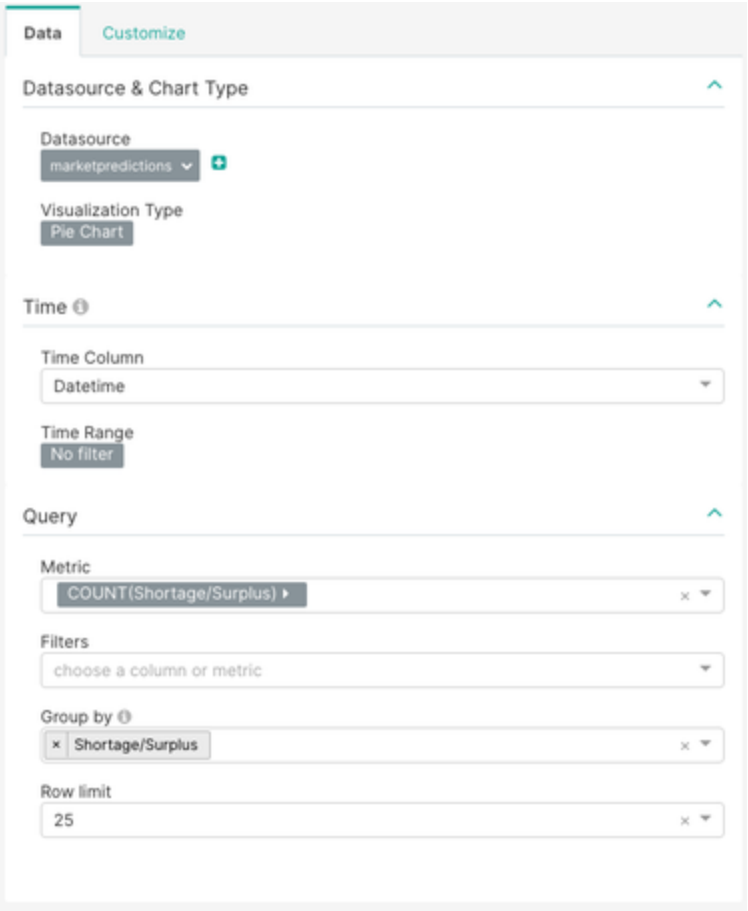
2. Navigate to “+New“ > “Charts”



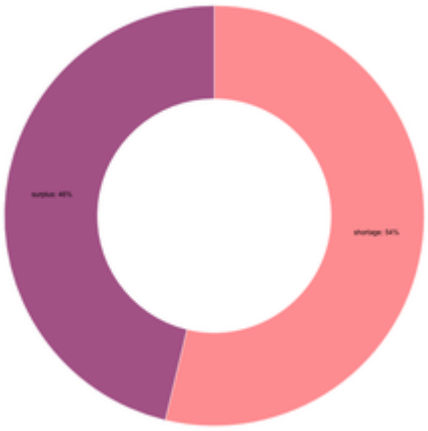
Shortage vs. Surplus

1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Pie Chart” as the chart type.

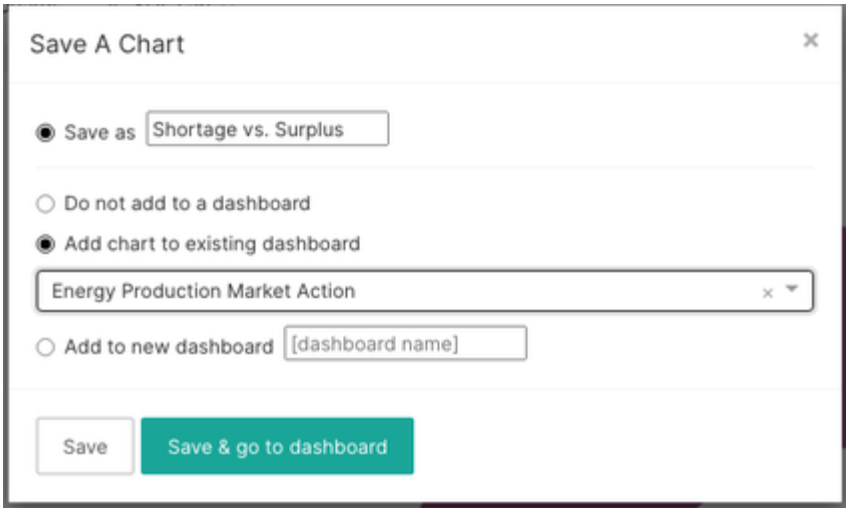
2. Create the query and customize the chart.



3. If the chart does not automatically appear on the right window, click “Run Query” to generate the chart.

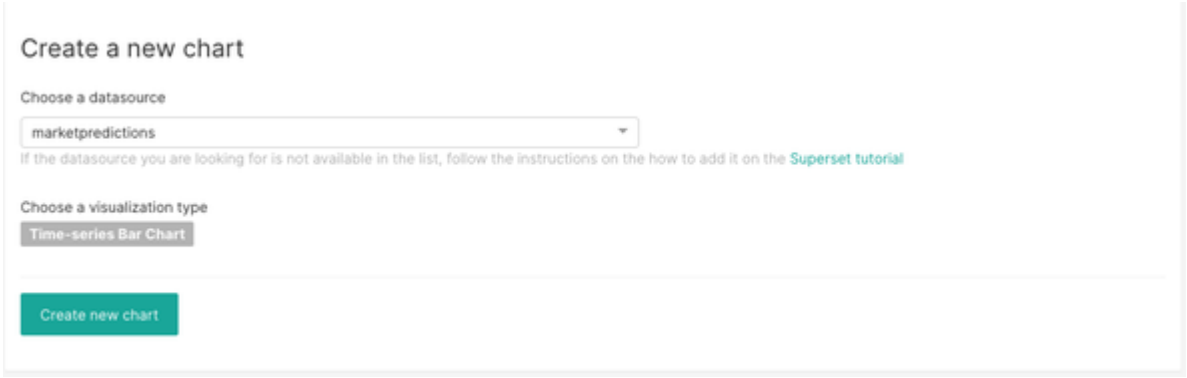


4. Save chart as “Shortage vs. Surplus” and add it to the “Energy Prediction Market Action” dashboard.

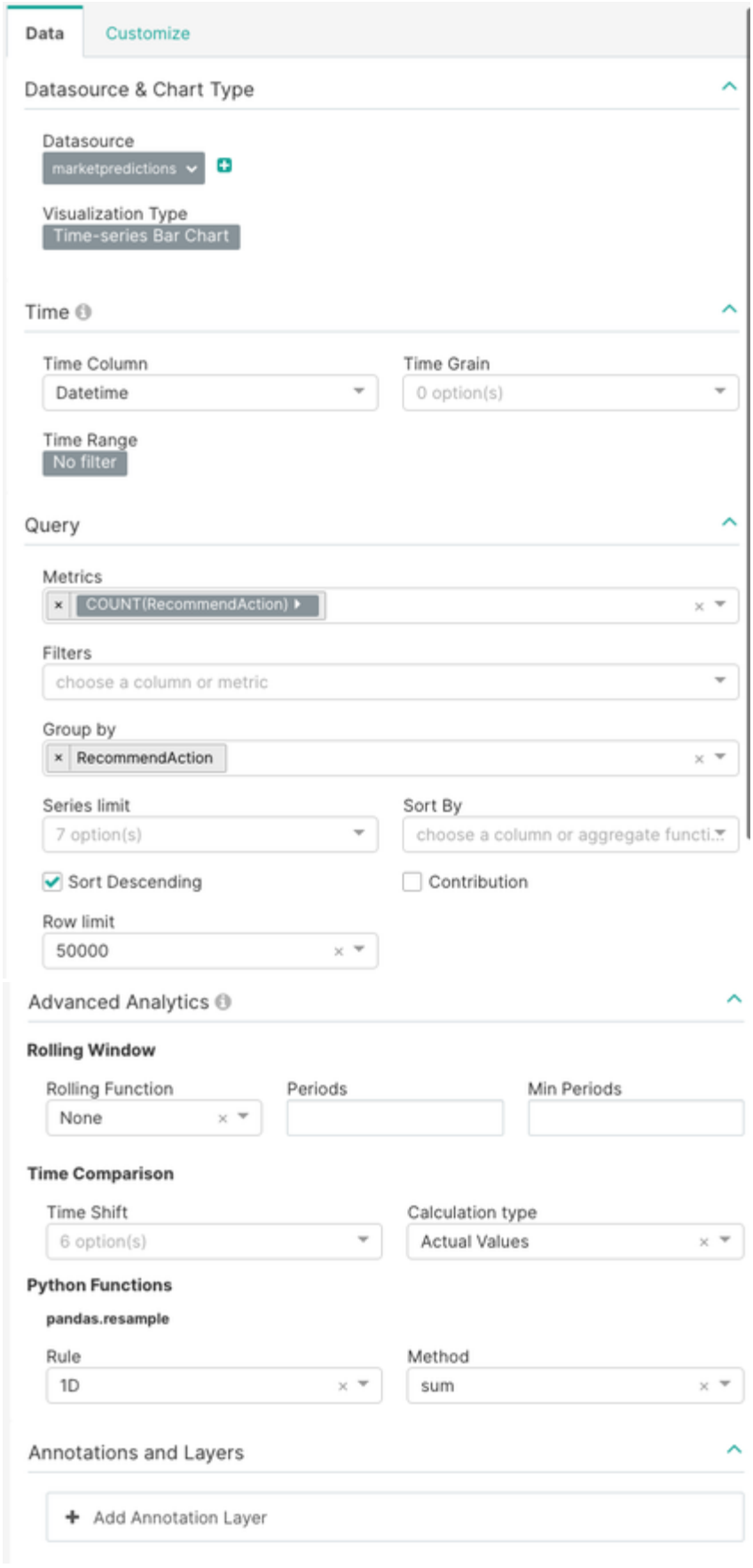


Actions By Day

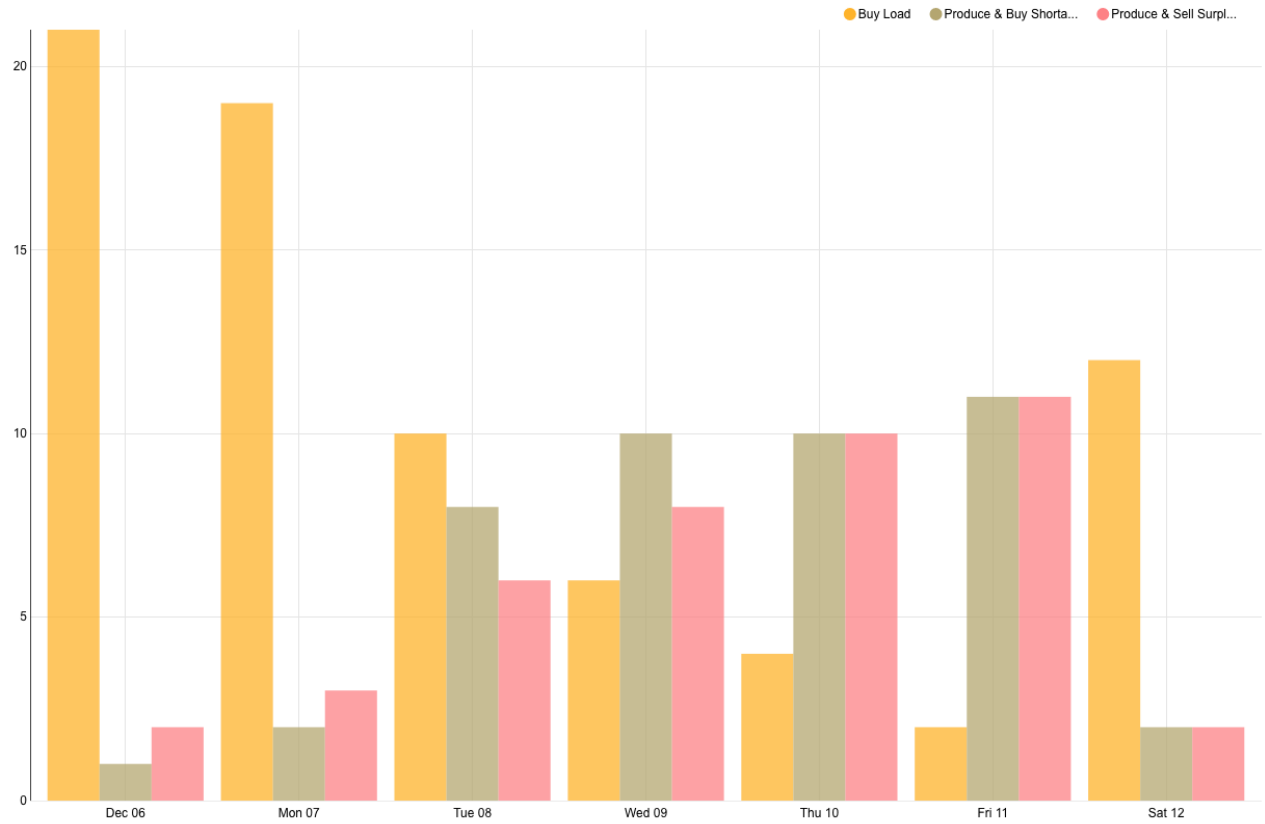
1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Time-series Bar Chart” as the chart type.



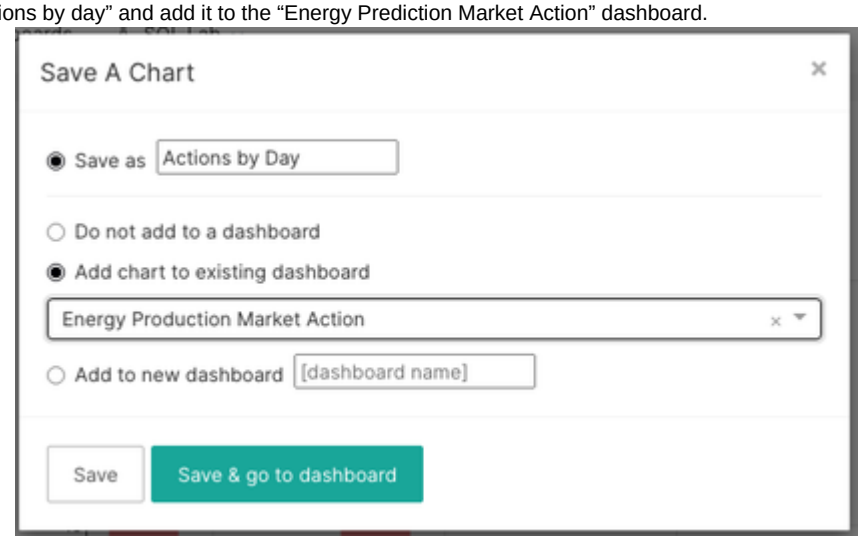
2. Create the following query and customize the chart.



3. If the chart does not automatically appear on the right window, click “Run Query” to generate the chart.

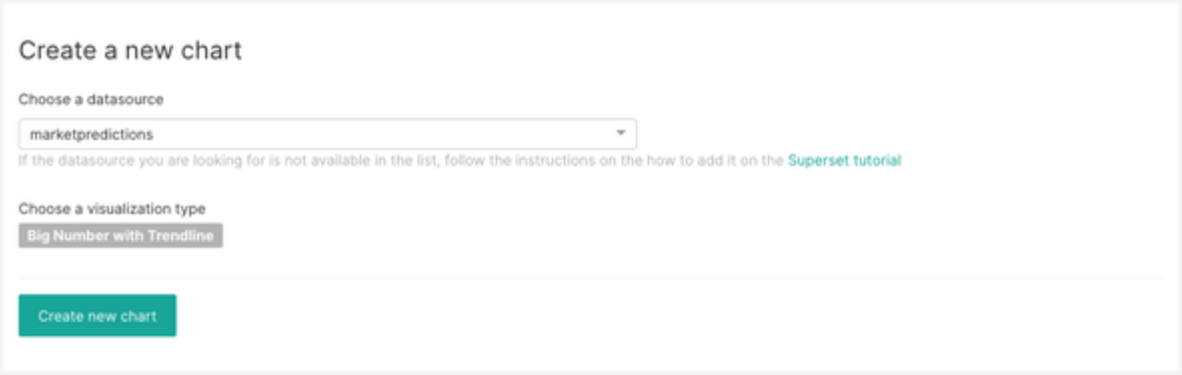


4. Save the chart as “Actions by day” and add it to the “Energy Prediction Market Action” dashboard.

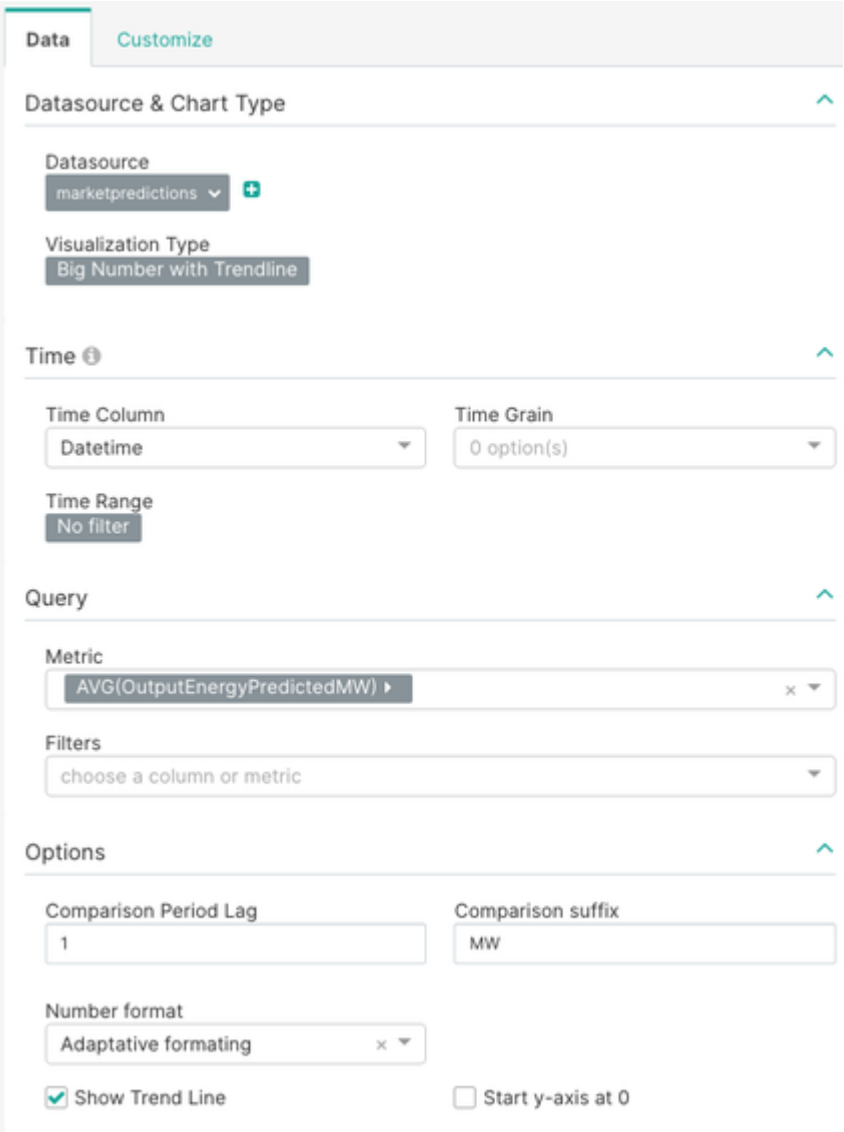


Estimated Hourly Energy Production

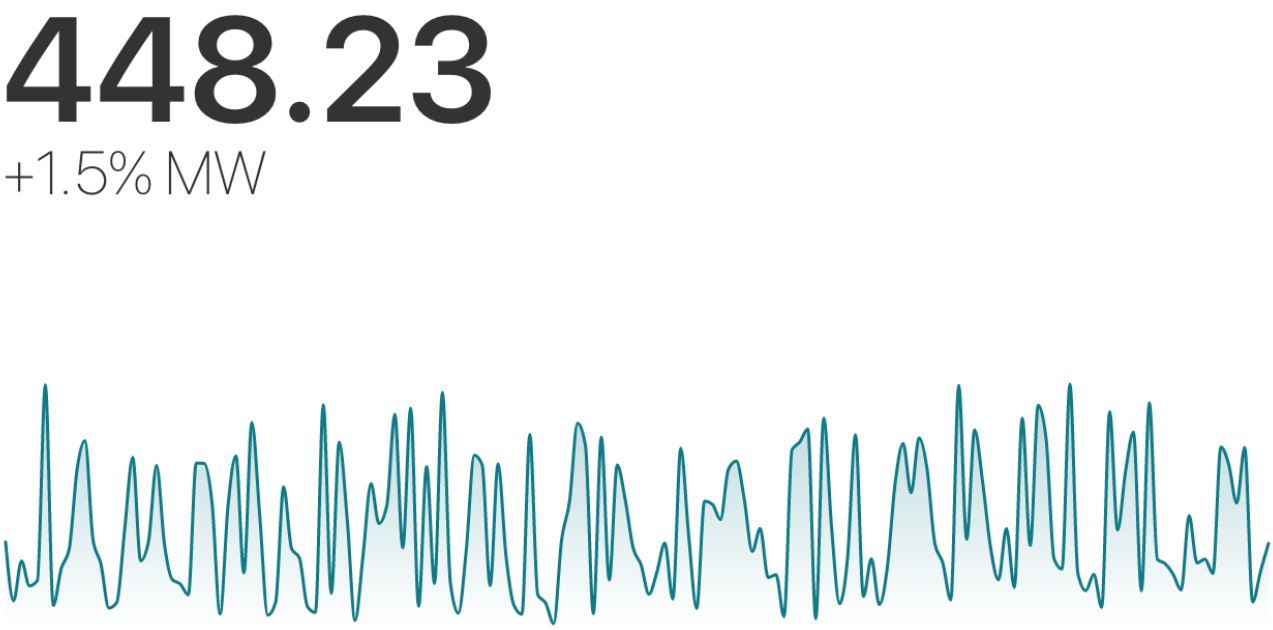
1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Big Number with Trendline” as the chart type.



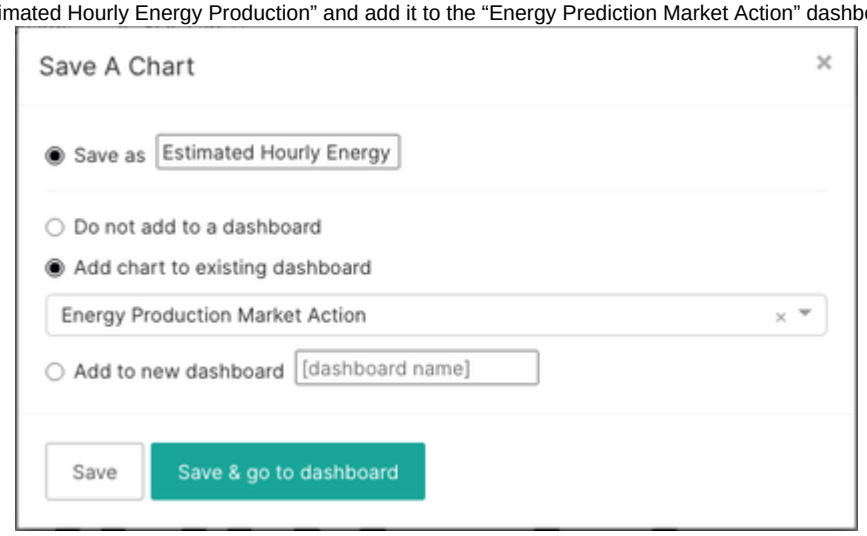
2. Create the following query and customize the chart.



3. If the chart does not automatically appear on the right window, click “Run Query” to generate the chart.

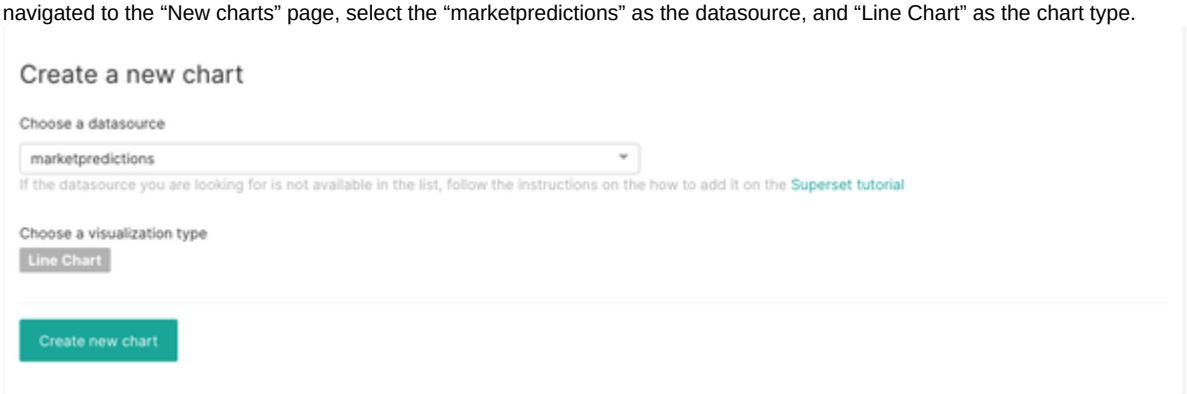


4. Save the chart as “Estimated Hourly Energy Production” and add it to the “Energy Prediction Market Action” dashboard.

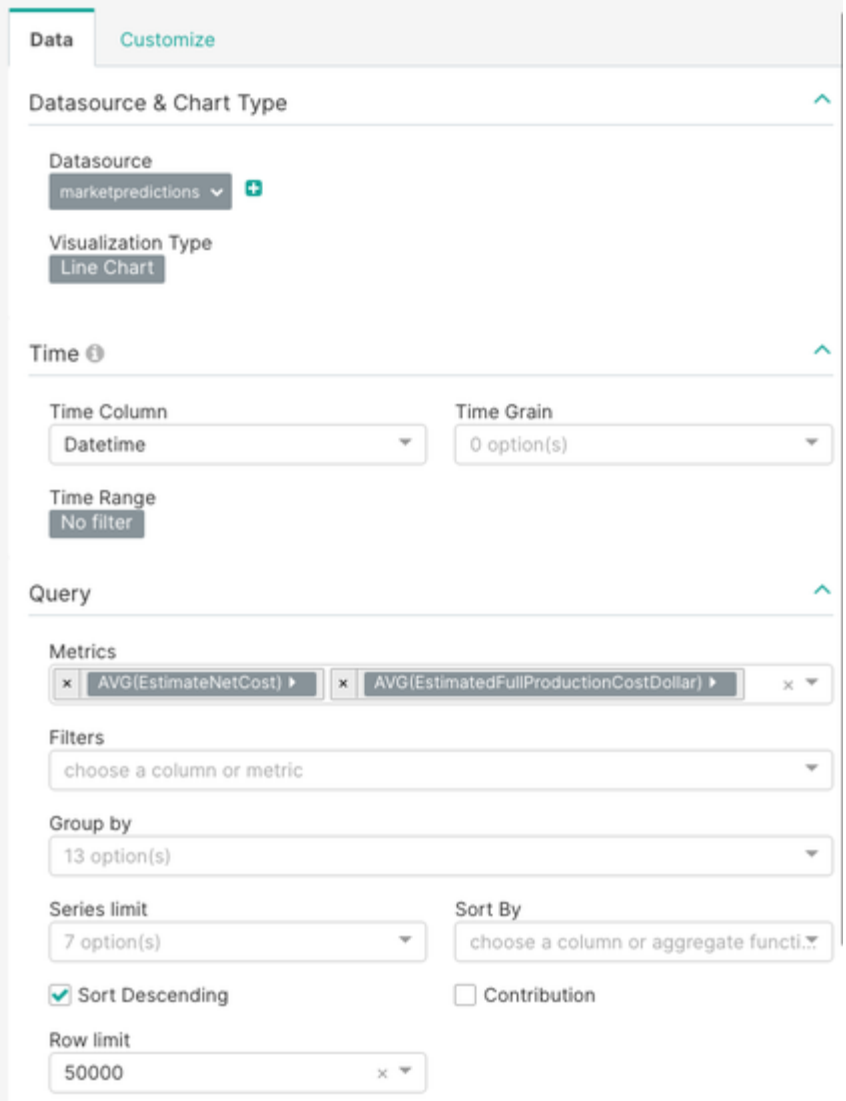


Full Production Vs Recommended Production Cost

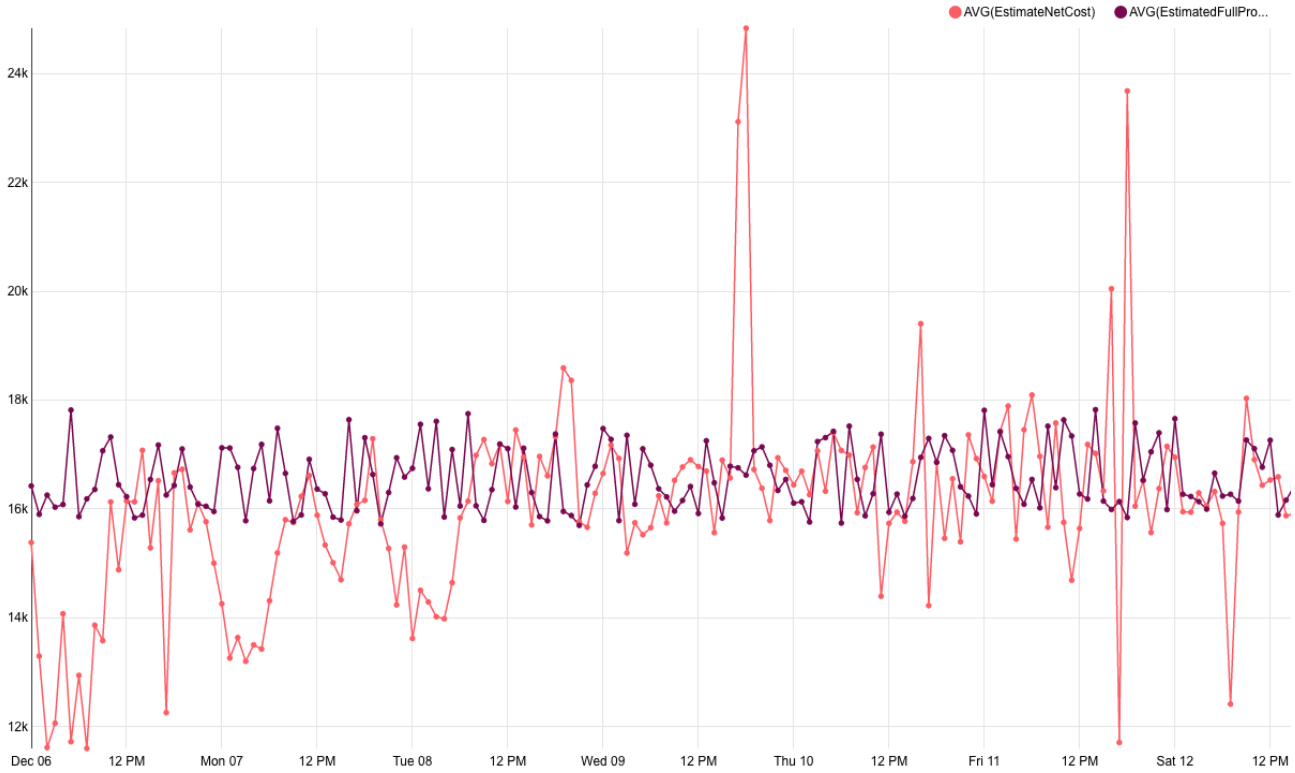
1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Line Chart” as the chart type.



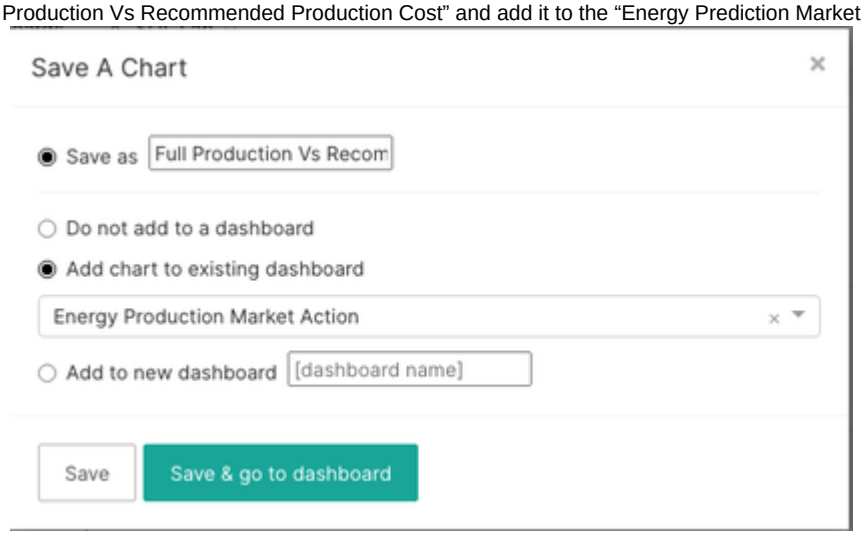
2. Create the following query and customize the chart.



3. If the chart does not automatically appear on the right window, click “Run Query” to generate the chart.

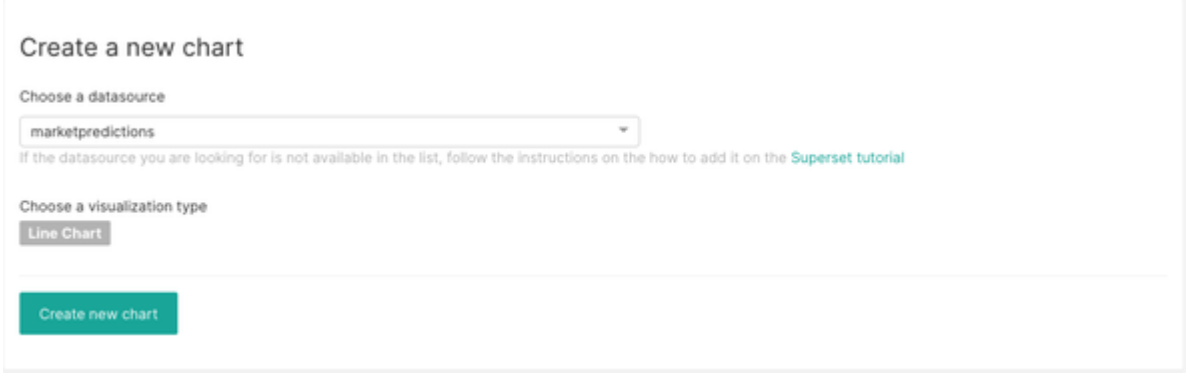


4. Save the chart as “Full Production Vs Recommended Production Cost” and add it to the “Energy Prediction Market Action” dashboard.

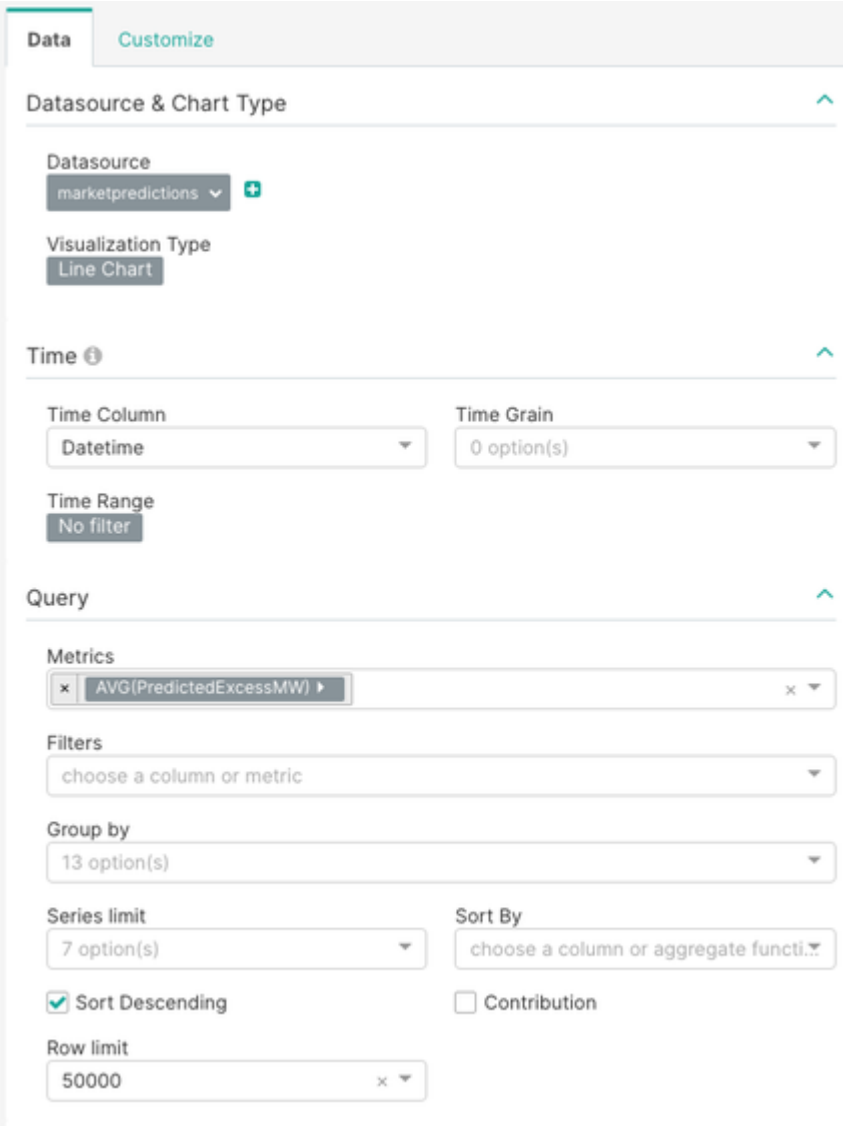


Predicted Surplus/Shortage

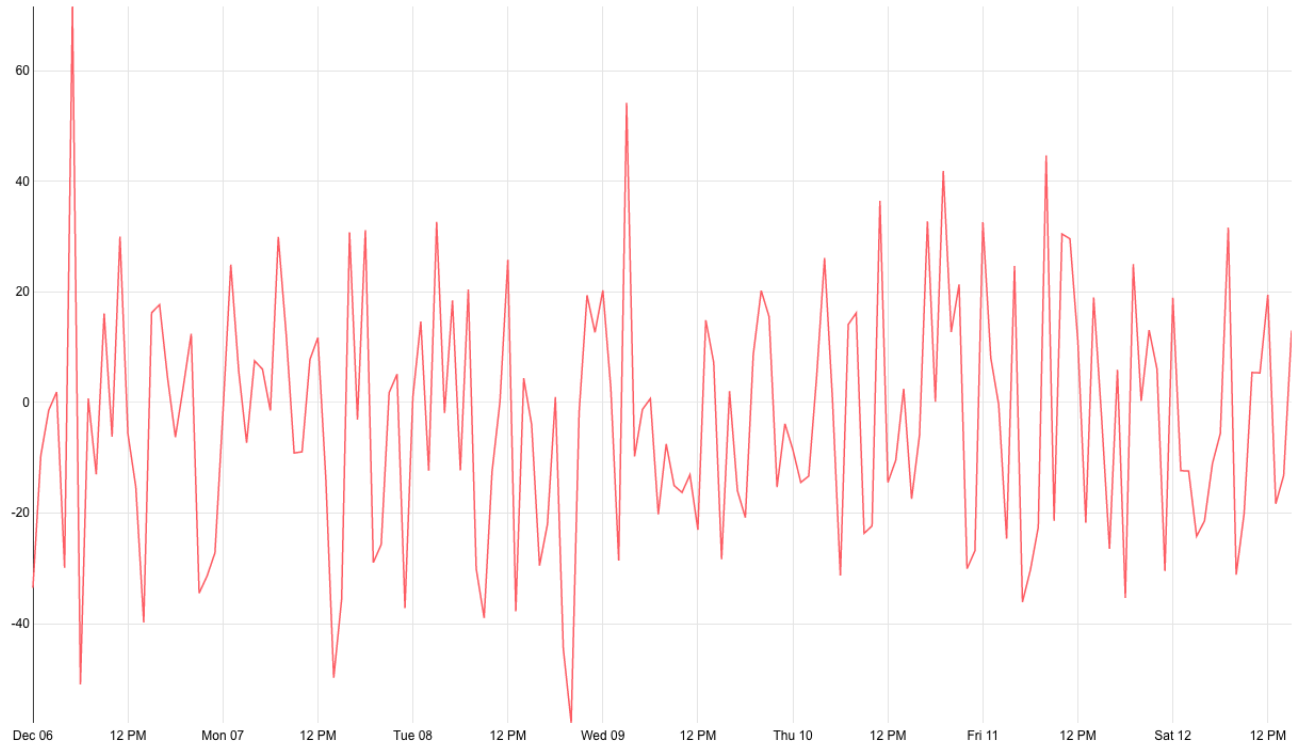
1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Line Chart” as the chart type.



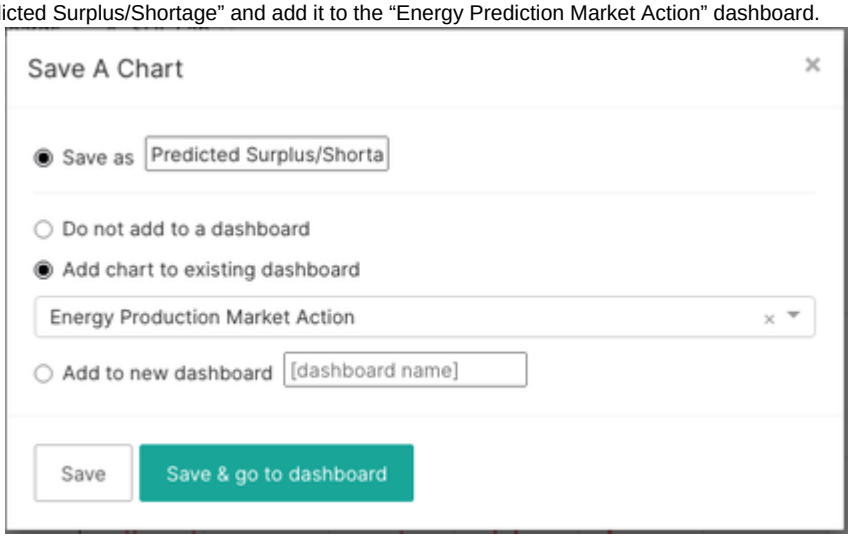
2. Create the following query and customize the chart.



3. If the chart does not automatically appear on the right window, click “Run Query” to generate the chart.

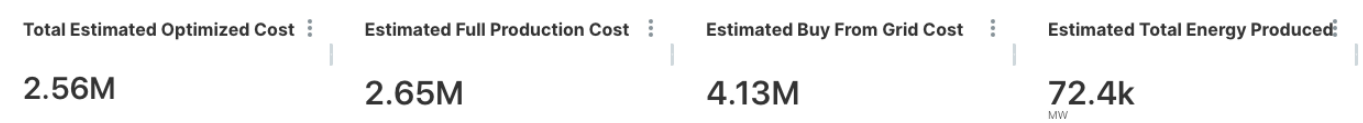


4. Save the chart as “Predicted Surplus/Shortage” and add it to the “Energy Prediction Market Action” dashboard.



🔢 Create “Big Numbers”

“Big Numbers” Are created in the same way as a chart



Total Estimated Optimized Cost

1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Big Number” as the chart type.
2. In the option “Query“ > “Metric”, select “SUM(EstimatedNetCost)” .
3. Save the chart as “Total Estimated Optimized Cost” and add it to the “Energy Prediction Market Action” dashboard.

Estimated Full Production Cost

1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Big Number” as the chart type.
2. In the option “Query“ > “Metric”, select “SUM(EstimatedFullProductionCostDollar)” .
3. Save the chart as “Estimated Full Production Cost” and add it to the “Energy Prediction Market Action” dashboard.

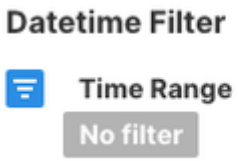
Estimated Buy From Grid Cost

1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Big Number” as the chart type.
2. In the option “Query“ > “Metric”, select “SUM(BuyDemandFromGridDollar)” .
3. Save the chart as “Estimated Buy From Grid Cost” and add it to the “Energy Prediction Market Action” dashboard.

Estimated Total Energy Produced

1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Big Number” as the chart type.
2. In the option “Query“ > “Metric”, select “SUM(OutputEnergyPredictedMW)” .
3. In the option “Options” > “Subheader”, enter “MW”.
4. Save the chart as “Estimated Total Energy Produced” and add it to the “Energy Prediction Market Action” dashboard.

Create Filter Box



1. Once navigated to the “New charts” page, select the “marketpredictions” as the datasource, and “Filter Box” as the chart type.
2. Use default settings for datetime filter
3. Save the filter as “Datetime Filter” and add it to the “Energy Prediction Market Action” dashboard.

Edit Dashboard

1. Navigate to “Dashboard” tab and select “Energy Production Market Action”.
2. Click on “Edit Dashboard” on the top right corner of the window.
3. Drag and drop the charts into a layout of your choice.