



## Energy Consumption Analytics for a Product Resource Management Company

### Business Problem

Our client specializes in product resource management software to help manufacturers manage their energy and resource costs without installing smart meters or conducting regular energy audits. The client wanted to use historical machine level production outputs to accurately estimate energy resource required per machine and subsequently take corrective action to reduce energy inefficiencies within their production processes.

### Challenge

One of the challenges was to work with sparse facility output data to identify the right relationships and not over-parameterize or over-fit the model. Also, the energy consumption at production facilities depends not only on the operating machines, but also on several other undocumented sources of energy consumption such as HVAC. Additionally, we observed temporal relationships between the machines that are generally difficult to capture using sparse data.

### Solution

Tiger Analytics worked with the client to understand the available data in the context of the business problem. We explored the non-linear and temporal relationships of resource consumption with run times and production outputs of various machines.

Our initial analysis revealed that the relationship between electricity consumption and production for a given machine had a fixed and variable component, both of which needed to be successfully captured by

our model. Through systematic analyses using training and test datasets, we identified the right model forms, and computed the confidence around our estimates for various machines. We used bootstrapping to analyze sensitivity of end-results and assumptions, and refined the algorithms, thus ensuring their robustness.

We developed predictive models to help our client identify opportunity areas to reduce their energy resource consumption and carbon footprint across their production facilities.

### Impact

Our model predicted the overall energy consumption of the production facilities with up to 97% accuracy. In addition, we identified areas where energy efficiency could be gained by modifying the production schedule. This work led to significant impact to the bottom-line of our client's customers.

### About Tiger Analytics

We are a boutique analytical consulting firm. We use advanced analytical techniques, business insights and data engineering to make data-driven decisions and solve complex business problems.

Contact details: [info@tigeranalytics.com](mailto:info@tigeranalytics.com)

+1-408- 508-4430

For more information visit: [www.tigeranalytics.com](http://www.tigeranalytics.com)