



ADVISORY SERVICES CASE STUDY

How a Leading Natural Gas Infrastructure Developer Integrated a Machine Learning Model to Improve Project Cost Estimates and Capital Allocation

Overview

A leading midstream infrastructure operator delivering natural gas reliably and safely across North America needed to more precisely forecast costs for large capital projects. As an existing customer of Arbo's gas asset analytics software, this operator understood the depth and breadth of data and expertise ArboIQ could bring to their modeling.

They engaged our team to develop a data-driven model that could be integrated into their internal decision making workflow for project cost and schedule planning. Our data scientists leveraged machine learning techniques and data visualization capabilities to deliver a forecasting model that accelerated and enhanced the customer's decision process and simplified the presentation of key variables, scenarios, and risks to executive leaders and other stakeholders.

The Problem

With over 49 billion dollars in assets and billions more committed to upcoming projects, return on invested capital and stewardship of resources was of the highest priority to the project and executive team.

They historically only used internal project data for estimating project costs—in this case, pipeline compressor stations. This constrained the model to only a handful of projects for



comparison. The small data set was also confined to a specific region which made business leaders hesitant to rely on resulting estimates as true comparables. They needed additional data and insights for assets and projects in their targeted region.

Previous cost estimates also lacked precision due to outliers in the data. The team believed utilizing more advanced statistical techniques could reduce the variability in their models, so they engaged ArboIQ as part of their existing enterprise relationship.

The Solution

We leveraged the Arbo data acquisition engine to extract the project data sets most like the customer's planned project across a wide range of attributes spanning over ten years. After assembling an initial analysis of the data, the team identified cost per horsepower as the desired value metric for comparison. We then utilized various machine learning techniques, most notably a decision tree regression model,

to predict the value of cost per horsepower for compressor stations. After delivery, this model was further integrated into the client's internal system of record with a direct and continuously updated API feed from Arbo's cloud-based system. The customer's estimation and project teams are now able to interface with the model, manipulate all the key input variables, and perform scenario analyses in real time.

The Impact

The enhanced compressor station cost forecasting model implemented by ArboIQ increased this operator's accuracy and understanding of the variables driving costs and their associated sensitivities. Using the model to forecast costs to their exact specifications, the client gained increased confidence in their planned capital allocations. In addition, the customer team was able to more clearly and visually present the business case to their C-Suite, who in turn could better inform investors.