



CLIENT CASE STUDY: DEMONSTRATING VALUE OF RECENT CAPITAL INVESTMENTS



Client

Mid-Size Canadian Distributor



METSCO's Task:
Demonstrate Value to Customers
of Recent Capital Investments



Value of Assets
\$200 Million+



Customers
25,000+

A distributor carrying out an active asset renewal program approached METSCO with a request to help it validate whether and how renewal investments to date have benefitted its customers.

As it was heading into its next rate application cycle, the client sought METSCO's help in demonstrating that the asset renewal to date was already producing tangible improvements for its customers. The client saw an empirical demonstration of the customer value of recent investments as a compelling tool in justifying requests for incremental capital funds to continue the program.

Due to the frequency and severity weather events typical of its service territory, the client hypothesized that its recent overhead infrastructure renewal work would have translated into improved reliability for its customers. While anecdotal data supported this hypothesis, there was little empirical evidence to confirm it. Beyond the typical reliability statistics (down to CEA Cause Code levels) and investment volumes, there was no dedicated data to confirm the client's hypothesis.

METSCO's Engagement Objectives:

In approaching the engagement, METSCO set out to accomplish the following three

objectives:

- Prioritize data-driven insights;
- Focus on managerially significant factors;
- Empower the client with tools to manage future performance.

METSCO's Methodology

In the course of the project work we performed the following tasks:

Enhance & Refine the Data: adding to the client's reliability datasets, METSCO obtained public weather station data for its service area.

Recognizing that extreme weather events can skew the results of statistical relationships we hoped to explore, we adjusted the historical reliability data by removing Customer Hour Interruption (CHI) event days that met the IEEE-1366 definition of a Major Event Day. Having obtained a more even CHI distribution across the years, we further narrowed our scope of inquiry by focussing on reliability data from only select outage cause codes that could be reasonably attributed to capital assets' performance (and could thus be expected to improve as capital renewal proceeded).

Explore Statistical Validity of Hypothesized

Relationships: by way of statistical analysis, METSCO explored relationships between

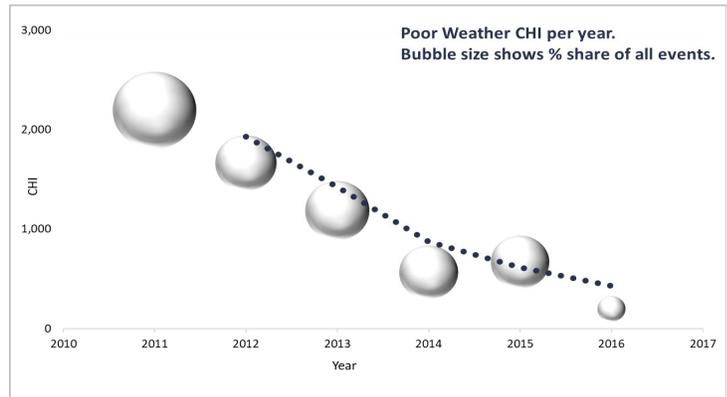
optimized outage data and various weather phenomena such as precipitation, snowfall, wind gusts, etc. Using both multivariate regression and data visualization techniques, we established statistically significant correlation factors across the data categories explored, along with a number of weather severity thresholds beyond which the reliability impacts worsen. However, these insights were only the foundation of work that would provide value to the client.

Confirm Managerial Significance: noting that our client sought to find out precisely whether its system performed better during poor weather days following the investments (to help it plan its operational and capital investments going forward), METSCO needed to establish that (a) particularly poor weather— not just mild weather events — was a meaningful driver of outages, and that (b) the number of particularly poor weather events was consistent throughout the timeline in our dataset.

Using the numerical thresholds derived in the previous phase, we confirmed that the severity of outages in days designated as “poor weather” was as much as 90 times higher than during the days where less severe poor weather events occurred. Similarly, we established that the number of “poor weather” days stayed consistent, and actually increased over the timeframe studied. This meant that any subsequent reliability data insights could be reliably attributed to poor weather days, allowing the client to leverage them in future planning.

Evaluate the Reliability Trends: having established that especially poor weather does impact the client’s reliability performance in a meaningful way, we set out to explore the trends in performance over the timeline of recent capital renewal. Using standard data smoothing techniques to reveal the trends behind the short-term volatility expected of weather events, METSCO established clear and statistically significant declining trends in reliability, for both Customer Hour Interrupted (CHI) and Customers Interrupted (CI) metrics. In a number of cases, statistical tests run on the trends exhibited robust predictive power (R-squared), giving us and the client even more confidence in the data insights, and confirming that performance had indeed improved.

Set Up the Client for Future Success: METSCO developed an easy-to-use model grounded in our study’s insights to forecast and track its reliability performance during poor



weather events going forward. We also recommended a number of poor weather threshold definitions that the client can implement as objective and transparent Key Performance Indicators (KPIs) to evaluate and report on its performance in the future.

Our Next Frontier: using deep learning algorithms, we are exploring the efficiency and cost effectiveness of various modes of intervention for underground assets, and using visual data and machine learning tools to recognize the signs of deterioration and predict the condition and failure probability of overhead line assets.

METSCO's Strategy and Operations consulting practice helps our clients identify and resolve complex pressure points that straddle departmental authority lines, extend across time horizons and incorporate a significant degree of uncertainty.

It is our conviction that utilities possess major incumbent advantage they can unlock and leverage to remain technology leaders and progress conduits for years to come.

We help our clients devise comprehensive asset management and Smart Grid strategies, optimize planning and operations processes in support of M&A activities, and develop forward-looking productivity plans that leverage leading management science tools and economic optimization approaches.

We approach every project with a unique blend of engineering, economics and management science tools appropriate in each context, delivering new age insights grounded in old school expertise.

We challenge ourselves to deliver value that exceeds the immediate objectives set by the client.

Contact us today and see why utilities and industrial customers across the continent trust METSCO to make things possible.

Toronto Area

#215; 2550 Matheson Blvd. E,
Mississauga, ON, L4W 4Z1
Phone: 905-232-7300

Calgary Area

1206, 20 Ave SE,
Calgary, AB, T2G 1M8
Phone: (403) 878-2505

Worldwide

Website: metsco.ca
Email: info@metsco.ca