

## DTE ENERGY

### REDUCING ENERGY COSTS FOR RESIDENTS OF MICHIGAN

---

**Student Team:**

Anil Godavarthy – Master of Supply Chain Management

Jacob Villarreal Pollenz – EGL (BSE Chemical Engineering/MSE Industrial and Operations Engineering)

**Project Sponsors:**

Inderpal Deol – Plant Manager, Monroe Power Plant, DTE Energy

Andrew Dobrzanski – Performance Manager, Monroe Power Plant, DTE Energy

Brian Rice – Director of Monroe power plant, DTE Energy

Jason Wong – Senior Engineer, ESO, DTE Energy

**Faculty Advisors:**

Oleg Gusikhin – UM College of Engineering

Owen Wu – Kelley School of Business

DTE Energy Co. is a fortune 300 diversified energy company involved in the development and management of energy-related businesses and services nationwide. The Monroe power plant was built in the 1970s and is DTE's largest power generation facility. Monroe has 4 generating units each capable of producing 850 megawatts of electricity, enough to light a city of 625,000 homes. When all 4 units are operating, Monroe is the third largest coal fired plant in North America.

Monroe power plant has one of the most advanced coal blending technologies in the United States and has been experimenting with new fuel blends to reduce energy costs for the residents of Michigan, comply with environmental regulations and to adapt to changes in resource availability. DTE Energy tasked the Tauber team with designing a methodology to analyze operational and financial costs, and calculating estimated savings for customers resulting from different fuel portfolios. The Tauber team then put the methodology to work to find the optimal petroleum coke blending that would maximize customer savings in the long term. The team also evaluated the feasibility of using natural gas at the Monroe power plant.

In the first phase, the Tauber team worked with Engineering, Capital projects, Controllers and Corporate strategy groups in DTE to identify and quantify in great detail the cost components that make up total power generation costs. The team reviewed the operating budgets from 2011-2014 and defined base operating costs and escalation rates until 2030. In the second phase, the team developed methodology and a tool chain that enabled rapid scenario analysis under varied settings and volatilities. The team also worked with the fuel supply group to define strategies for supplier relations and intermodal transportation options for future fuel supplies. And worked with environmental groups to understand permits regulating fuel combustion, reviewed DTE contracts, and incorporated these in to financial risk analysis.

In the final phase, the team ran market simulations for more than 35 key business scenarios using PROMOD™ and provided a detailed comparison of the customer's savings across these scenarios. The scenarios encompassed current business contracts, regulations, and volatilities to reflect present and future uncertainties. The Tauber team also calculated the rate savings of using natural gas over fuel oil by using energy futures and simulating the market with PROMOD™.

Using the results from the models created, the team proposed a petroleum coke consumption strategy in the short term and long term that would yield customer savings and also proposed future work in the addition of natural gas to Monroe.