



TAUBER INSTITUTE
FOR GLOBAL OPERATIONS
UNIVERSITY OF MICHIGAN

Creating a Lasting Impact Through Careful Planning and Strategic Thinking



Midland, Michigan-based Dow Chemical Company is the second-largest chemical manufacturer in the world by revenue and chemical production, and third-largest by market capitalization. Placing a focus on sustainability plans in recent years, Dow brought in a student team from the Tauber Institute for Global Operations to help develop a green transportation strategy to align with their 2025 sustainability goals.

Founded in 1897, Dow operates in approximately 160 countries, has about 54,000 employees, and reported sales of approximately \$57 billion. The company manufactures plastics, chemicals, and agricultural products. Most of its sales are to other industries, with direct sales to end-users primarily in the human and animal health and consumer products markets.

Beginning in 2006, Dow began developing sustainability goals for each upcoming decade, with the most recent iteration taking the form of 2025 Dow sustainability goals. This approach has resulted in the company leading the chemical industry globally in sustainability improvements throughout its operations.

Given the increasing importance of calculating, monitoring, and reducing greenhouse gas emissions, primarily carbon dioxide (CO₂), Dow seeks to evaluate opportunities for further reductions in transportation CO₂ within its supply chain.

In order to develop a green transportation strategy for its global supply chain, Dow brought in a student team from the Tauber Institute for Global Operations at the University of Michigan, consisting of Chhavi Chaudhry, a member of the Engineering Global Leadership Honors (EGL) Program, which leads to BSE and MSE in Industrial and Operations Engineering degrees; and Alison Levy, working on a Master of Business Administration (MBA) degree.

“The purpose was to develop a green transportation strategy for Dow’s global supply chain and make recommendations on a three to five year implementation plan consistent with Dow’s 2025 sustainability goals,” said Chaudhry.

The Tauber team’s approach was to conduct a comprehensive analysis broken down into three phases: establishing the current state of Dow’s global transportation carbon footprint; benchmarking and defining goals for Dow based on industry trends

and leading research; and finally, using that knowledge base to develop a green transportation strategy. Since transportation emissions are outside of Dow’s direct control, the Tauber team had to develop a deep understanding of what actions Dow could take that could influence emissions reductions.

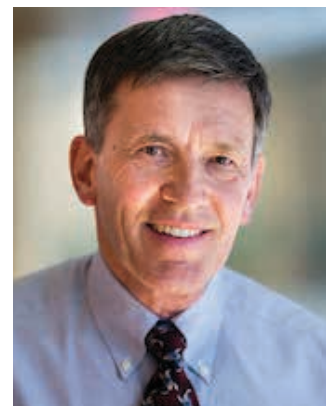
“Because the nature of the project was focused on sustainability, we had to define green transportation,” said Chaudhry. “This meant coming up with a way to frame it as a cost project vs. sustainable project, determining both a solution and cost, which don’t always go hand and hand.”

Defining green transportation was the first step,
but possibly the most challenging.

“We had the description, but not what they meant by ‘green’ or ‘transportation,’ making for a broad scope,” said Chaudhry. “We had to justify how we were narrowing it down. We had to use and analyze the data to figure out the hot spots. It took us



Jill Schloff
Ross School of Business



Dennis Blumenfeld
College of Engineering

Above, L to R: Chhavi Chaudhry – EGL (BSE/MSE Industrial and Operations Engineering) and Alison Levy – Master of Business Administration.

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awhile to say what our proposed scope was and what path we wanted to take. We focused on carbon dioxide and trucking, where Dow's CO² footprint was heaviest, particularly in North America.

"Neither of us had a background in transportation or supply chain, so we had to educate ourselves. Sustainability is a difficult topic to define, measure, or scope. Some people have a hard time defining sustainability and putting it in terms of transportation. Dow's sustainability department understood it. I think that is why they had us there.

"Defining sustainability and the policy research was interesting. There was a lot of benchmarking to see what other companies were doing and what is happening in other regions."

The final deliverable was a three-tiered actionable strategy for Dow, consisting of outward-facing activities to present a united front on transportation emissions to external stakeholders, promoting awareness to incentivize change and driving demand for technology and fuel efficiency upgrades; internal activities to measure and actively manage the CO² emissions footprint, reacting to internal metrics to focus on hotspots; and external activities that Dow could leverage to drive and promote emissions reduction initiatives, taking advantage of long-term regulation and technology improvements to promote short-term initiatives.

All three tiers, each of which Dow has varying degrees of control over, help Dow take actions that ultimately drive improvements in the company's global CO² footprint.

"We had some data mining involved, but the project was mostly strategy," said Chaudhry. "We had to do a lot of policy research to see how Dow could leverage upcoming regulations to drive change. We used the data to figure out where Dow is today and benchmark where it could be in the future.



L to R: Jacqueline Faseler, Alison Levy, Jill Schloff, Chhavi Chaudhry, and Dennis Blumenfeld.

We developed a tool that Dow can use to test out different strategies. That was all based on the data, and this project was data heavy."

By actively implementing the green transportation strategy developed by the Tauber team, Dow can influence fuel economy improvements in the trucking industry, resulting in a reduction of 180,000 tons in Dow's transportation CO² emissions, and a fuel cost savings of \$27 million shared between Dow and its carriers over the next 10 years.

"These results are conservative," said Chaudhry. "We think that the results will get better. That is because the 15 percent efficiency improvement over the next 10 years was the EPA regulation for the 2017 proposal. But when we left the project, the EPA increased its efficiency regulation, requiring heavy duty trucks to reduce CO² emissions by 25 percent over the next 10 years, which will improve our results dramatically.

"It's a trickle-down effect, with engine and tractor/trailer manufacturers affecting truck operators, who in turn would affect the carriers and thus affect Dow. So, Dow's role is that of a customer of the carriers demanding change.

"We provided a strategy for the next three to five years on what they should do. Now it is up to Dow to implement those recommendations."

Dow Project Team

Students

Chhavi Chaudhry – EGL (BSE/MSE Industrial and Operations Engineering)

Alison Levy – Master of Business Administration

Project Sponsor

Jacqueline Faseler – Global Director of Supply Chain Sustainability, EHS & Public Policy Advocacy

Faculty Advisors

Dennis Blumenfeld – College of Engineering
Jill Schloff – Ross School of Business

About Tauber Team Projects

The 2016 Tauber Team Projects resulted in \$460 million in savings according to sponsoring company calculations, an average of \$14.4 million per project over 3 years.

Each two to three person Tauber Team consists of graduate engineering, MBA, and/or MSCM students. Along with receiving high-level corporate support from the sponsoring company, each team is advised by a College of Engineering and a Ross School of Business faculty member and overseen by a Tauber Institute Co-Director. The projects begin on-site in May and continue for 14 weeks. Students present the results of their projects and compete for over \$40,000 in scholarships at the U-M Tauber Institute's annual Spotlight! event, held each September in Ann Arbor, Michigan. Spotlight! provides outstanding opportunities for students and corporate partners to establish relationships while exploring innovations in operations and manufacturing.

To learn more about the Tauber Institute for Global Operations, visit tauber.umich.edu or contact us at 734-647-1333.