



Karen Paczkowski (ME'06) and Senator Edward Markey (D-MA) (Hon.'04).

# THE STEM ADVOCATE

## ENG ALUMNA GOES TO WASHINGTON

BY SARA CODY

**W**hen the automaker Volkswagen was caught cheating on emissions testing recently, the company had to pay \$14.7 billion in restitution to irate customers, the largest consumer class-action settlement in US history. So, Senator Edward Markey (D-MA) (Hon.'04) put Karen Paczkowski (ME '06) into action, where, behind the scenes on Capitol Hill, she drafted legislation aimed at preventing a repeat of this behavior.

The “Compensating Losses to the Environment from Automobiles with Noxious Undisclosed Pollution,” or CLEAN-UP Act, would establish federal penalties for automakers who fraudulently evade emissions laws. The act, now working its way through the legislative process, would not only penalize offenders, but would use the fines to fund clean-air initiatives like electric vehicle fueling stations, retrofitting school buses

to reduce emissions and improving air quality in low-income communities.

“This was exciting for me because it was reactive and I had the opportunity to experience the legislative process from start to finish,” Paczkowski says. “We were responding to a timely event and I worked with a variety of stakeholders to draft up the bill and I even got to drop it on the floor of the Senate the day we introduced it. My technical background allowed me to understand how the defeat devices worked and that knowledge was extremely useful when I worked on the bill with my fellow staffers.”

Paczowski’s experience came via a fellowship—sponsored by the American Academy for the Advancement of Science, the Geological Society of America and the United States Geological Survey—that puts scientists and engineers on staff in congressional offices to serve as a resource for science, technology, engineering and math



(STEM)-focused policy making. Paczkowski's portfolio during the fellowship, which concluded in September, included energy, the environment, climate and STEM research and education in Massachusetts. She helped Markey prepare for congressional hearings and Capitol Hill events. She also met with constituents who represent these areas, from renewable energy companies to scientists, to listen to their concerns and suggestions and to learn about their work. Her strong connection to Massachusetts through her time at BU made her feel at home in Markey's office.

"Karen's engineering and science background and passion to make the world a better place have helped her make valuable contributions to my work in the Senate," Markey says. "She has gained hands-on experience in the legislative process by helping me fight for a clean energy future, hold high-emitting automobile makers accountable and defend the value of basic science research and STEM education."

## **THE FELLOWSHIP PUTS SCIENTISTS ON STAFF IN CONGRESSIONAL OFFICES TO SERVE AS A RESOURCE FOR SCIENCE, TECHNOLOGY, ENGINEERING AND MATH (STEM)-FOCUSED POLICY MAKING.**

Technical proclivity runs in Paczkowski's family. She grew up outside of Albany, New York with her father and older brother, both engineers, and her mother, a financial analyst. Some of her earliest memories include practicing simple differential equations with her brother when she was in elementary school. In high school, she took every math and science class she could. Drawn to BU's urban campus, she settled on pursuing her undergraduate degree in mechanical engineering with a concentration on energy and fluids.

"The thing that led me to government policy is the same thing that led me to engineering in the first place: the desire to use my skills to help society," she explains. "I've always been very technical and I wanted to find a way to apply those skills to make people's lives better."

According to Paczkowski, one of the most important skills she learned as an undergraduate was the ability to work well in groups, which she used frequently in her fellowship, particularly when forming coalitions to leverage collective action to address a variety of policy concerns. She also worked closely with the Career Development office to gain real-life work experience in an internship with a computational fluid mechanics company, an experience that made her realize the importance of STEM workforce development, particularly among women and minorities. "When I look back, everything I loved about BU stemmed from how connected the College is to industries in the area, which is a testament to how wonderful the Career Development office is as a resource for students," she says. "I had the opportunity to run my own project from start to finish, which was invaluable real-world experience."

While working toward a PhD in geophysics at Yale University, Paczkowski participated in her first Science, Engineering and Technology Congressional Visits Day, which brings scientists, engineers, researchers, educators and technology executives to Washington to raise visibility and support for STEM. This experience opened her eyes to the important role that federal funding plays in supporting STEM-based research, education and industry, and made her realize that she could serve as a bridge to connect policy makers to the field. It also led her to pursue the fellowship.

"I discovered that my STEM background could be used to help tackle national challenges by using science to develop better policy," she says. "Breaking down complex problems into solvable pieces is a concept that is so engrained in the engineering field and is a skill that I have appreciated being able to apply to make a difference working in government policy."

Scientific advisors play a vital role in developing informed government policy. Patti Curtis, director of the Boston Museum of Science's Washington office, worked extensively with Paczkowski to develop an amendment for the American Innovation and Competitiveness Act, which sets national policy and goals for STEM research and education. Their amendment seeks to direct support from the National Science Foundation toward large-scale, informal science education programs, which are often responsible for inspiring many young children to pursue career paths in STEM. According to Curtis, Paczkowski played an instrumental role in drafting the amendment.

"Most of the people who work on the Hill don't have a technical background, so the expertise Karen brings is very valuable to have," says Curtis. "It's wonderful when congressional offices bring in STEM experts to work on policy in the field because they know what it takes from firsthand experience. They understand the challenges and they know how important informal education is because it's often a crucial first step to attracting people to the STEM workforce."

Working for the government can be challenging. In addition to the strong technical skills needed to understand complex issues, strong communication skills are necessary. Whether it's consulting with other experts on drafting bills or garnering support from other congressional staffers, communication—such as encouraging colleagues to look at the big picture—plays a vital part in the legislative process.

"It can be challenging to convince people to take the longer view on these topics and to keep in mind that change tends to happen incrementally," Paczkowski notes. "It's important to remember that small movements still move the dial and those smaller efforts add up to large improvements."

Having wrapped up her work in Markey's office, Paczkowski has begun the AAAS Executive Branch Science and Technology Policy Fellowship, serving at the NSF. She is going back to her scientific roots to study cyber-physical systems, working with smart devices connected through the Internet of Things. Connecting devices to each other via the Internet can be applied to developing smarter cars, smarter electric grids, smarter medical devices and more.

"The driving force motivating my career choices has always been leveraging my skills to help people and exploring how I can best serve society," she says. "Government policy was a natural fit for me because it allows me to combine my technical background with interacting with people in a way that lets me feel connected and that I am truly making a difference." ■