

Tulane team a national semifinalist in energy technology competition

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This team of students from the Tulane Department of Earth and Environmental Sciences were named national semifinalists in a U.S. Department of Energy competition. Team members are, front row from left, Kevin Reece and Martin Musila. Back row from left are Samantha Hilburn, Sophie Aber and Carolina Hurtado-Pulido. (Photo by Professor Cynthia Ebinger)

When Samantha Hilburn learned of the [U.S. Department of Energy's inaugural EnergyTech University Prize competition](#), which challenges multidisciplinary teams to identify an emerging energy technology, there was no question that she wanted to sign up.

A Tulane University senior studying geology, environmental studies and economics, Hilburn is all about coming up with affordable energy alternatives to fossil fuels as a way of reducing carbon emissions and combatting global climate change.

She recruited a team of like-minded students in the Department of Earth and Environmental Sciences, including PhD students Carolina Hurtado-Pulido, James Lopez, Martin Musila, Kevin Reece and Sophie Aber, to enter the geothermal subdivision of the contest.

“This was truly a team effort. Each team member brought unique experience and insight to the project, which required impressive collaboration across disciplines, from engineering geosciences to economics.”

Tulane senior Samantha Hilburn

Together they came up with the idea of technology for hydrocarbon-to-geothermal well conversion and carbon capture and storage. The objective is to harness the geothermal energy potential of abandoned hydrocarbon wells across the Gulf Coast to power carbon capture and sequestration (CCS) systems in adjacent, depleted oil and gas reservoirs.

Each team member played a specific yet synergistic role. Reece brought technology implementation objectives into focus and prepared a detailed schematic diagram visualizing the technology in action. Lopez helped draft the section of the business plan assessing Louisiana's geothermal potential. Hurtado-Pulido mapped abandoned wells eligible for conversion, while Musila ensured that these wells satisfied criteria of viable geothermal resources. Aber and Hilburn assessed the market and economic feasibility of the technology. Hilburn served as captain, refined the final project proposal, and pitched the team's idea to the judges.

“This was truly a team effort,” Hilburn said. “Each team member brought unique experience and insight to the project, which required impressive collaboration across

disciplines, from engineering geosciences to economics.”

Hilburn said the team’s proposed use of existing well infrastructure will drastically reduce CCS startup and operation costs. “It will also mobilize industry workforces already primed to pivot toward a new era of clean energy and climate action, maximizing both economic feasibility and lasting social impact.”

The team was named a national semifinalist, winning the Geothermal Technologies Office Bonus Prize at the Appalachia and South Regional Competition co-hosted by the University of Arkansas and the University of Kentucky. Although they didn’t achieve their goal of winning the top prize, their standing as a semifinalist has opened doors. They plan to meet with Entergy representatives about the possibility of implementing their technology locally and regionally.

As part of the competition, the team had to submit a business plan that includes an assessment of its market potential and a strategy for commercialization. Reece said the team hopes to create a new industry that can minimize global climate change while putting displaced Louisiana workers on a new career path in the field of clean energy.

Hilburn said the technology has the potential to create hundreds of thousands of new jobs, secure academic and industry partnership and supply the growing carbon offset market with durable geologic carbon storage options.

“Ultimately,” she said, “our coupled hydrocarbon-to-geothermal well conversion and carbon storage technology will impact local, regional, national, and international efforts in the global fight against climate change.”