

## **From art to engineering, Tulane researchers tackle energy challenges together**

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news@tulane.edu



Numerous panels at the Future of Energy Forum featured Tulane researchers, including Cynthia Ebinger (left), the Marshall-Heape Chair in Geology, and Cristóbal Molina Baeza (center), the Favrot Visiting Assistant Professor of Architecture, who spoke on “Challenges and Misconceptions Around Critical Minerals.” (Photo by Kenny Lass)

From developing wind-turbine bearings inspired by the human knee, to encouraging social infrastructure in cities that support energy development, Tulane University’s Future of Energy Forum highlighted that the fastest route to a cleaner, more resilient energy future runs straight through interdisciplinary research.

“From the world-renowned Tulane Energy Institute to the Center for Energy Law and Policy to the ByWater Institute, our faculty and alumni find new solutions by crossing disciplinary boundaries — whether they're finding new approaches to global energy governance or developing new solutions for energy storage and infrastructure,” Tulane President Michael A. Fitts told a packed crowd Sept. 10 as he opened the second annual forum.

During his remarks, Fitts previewed more disciplinary crossings to come, announcing plans to launch the Tulane Institute of Advanced Energy Studies, a university-wide hub connecting research and education across science, engineering, law, business and beyond.

More than 1,700 people registered for the free forum, which lasted through Sept. 12. Speakers and panelists, who appeared across three stages during the event, included Colette Hirstius, president of Shell USA; Drew Marsh, chair and CEO of Entergy; and Walter Isaacson, Leonard Lauder Professor of American History and Values at Tulane.

Conversations during the forum paired scientists with policymakers, engineers with social scientists and researchers with industry leaders to discuss this year's theme: “Powering the Future: Innovation, Competition and Collaboration.”

One panel, “Challenges and Misconceptions Around Critical Minerals,” underscored how the rush for materials to build batteries, including lithium, nickel, copper and cobalt, isn't just an engineering problem. Cristóbal Molina Baeza, Favrot Visiting Assistant Professor of Architecture, studies extraction landscapes in Chile's Lithium Triangle and warned that speed without stewardship won't work.

“The real challenge is not just extracting faster but doing so in a sustainable, fair and respectful way for the territory, its ecosystems and its people,” Molina Baeza said.

Tulane political scientist Lucas González, a postdoctoral fellow at the Center for Inter-American Policy and Research in the Roger Thayer Stone Center for Latin American Studies, said the social license to operate hinges on whether companies work with, not around, local governments and communities. He said the best outcomes for both companies and locals occur when everyone works together.

Cynthia Ebinger, the Marshall-Heape Chair in Geology in Tulane's School of Science

and Engineering, discussed solutions that reduce the need for new mines altogether. Remining waste at abandoned sites can supply critical minerals using technologies matured at universities and national laboratories, she said. “Now, more than ever, we need these partnerships between the companies, academics and the federal laboratories to implement these strategies,” Ebinger said.

During the panel “The Materials Behind the Mission: Infrastructure Solutions for a Changing Energy Landscape,” Noshir Pesika, associate professor of chemical and biomolecular engineering at Tulane, described research that borrows from biology to cut energy losses. One lab-developed coating, inspired by cartilage, aims to reduce friction without oil — a potential efficiency boost for turbines and other rotating equipment. “Rather than trying to reinvent the wheel, let’s see where we can be inspired by nature,” Pesika said.

Tulane’s interdisciplinary lens extends beyond minerals and machines to the places where energy and commerce meet the coast. One panel, “Global Port Cities: Common Challenges, Creative Approaches,” was led by Brian T. Edwards, dean of the School of Liberal Arts. He and fellow panelist John Sabo, professor of river-coastal science and engineering and director of the ByWater Institute, have traveled to port cities around the globe to learn how they survive and thrive despite the risks of being surrounded by water.

“We really want to think about these types of questions — sustainability, climate adaptation — in ways that creative cities such as New Orleans and other port cities yield different kinds of approaches to our common future,” Edwards said.

Sabo said that social infrastructure in these cities is more important than physical infrastructure. The creative disciplines matter, too, panelists said. Tulane’s Studio in the Woods and other artist-scientist collaborations, for instance, help translate abstract projections into human stories. Further exploration of port cities will be the biennial focus for the Global Humanities Center in the School of Liberal Arts, which launched this month.

The forum’s interdisciplinary approach “feels very authentic to Tulane,” said Cole Ashman, a Tulane alum and founder and CEO of Pila Energy. He spoke on a forum panel, “Power and Energy Storage on the Edge.” Ashman and his company are pioneering a battery mesh network that can help manage a home’s energy use and provide battery backup during outages. “I think a lot about the human element of the technology. And I think I can draw a through line back to Tulane.”