



Energy  
Transition Institute  
**UH ENERGY**

Shell  
FOUNDING  
PARTNER

# ANNUAL REPORT

JUNE 2023





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# INTRODUCTION

# Welcome to the UH ETI

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The Energy Transition Institute is an academic research institute focused on the advancement of reliable, affordable, environmentally responsible energy for all through a just and equity-driven pathway. We know that climate change impacts vulnerable communities in particular. These are the communities that the University of Houston serves, educates and engages, and we aim for our work and this institute to benefit those communities. The Institute focuses on three verticals: carbon management, hydrogen and circular plastics.

The gift by Shell USA, Inc. and Shell Global Solutions US, Inc. supports the Hydrogen work stream, which has strategic importance to Shell and creates an opportunity for University of Houston to build an industry alliance that is distinguished from its peers. Across those verticals we have built four work streams which define our University and our competitive advantage. We track and measure Institute progress along these work streams. The activities of the Center for Carbon Management in Energy and the Consortium for Energy CSR synergize with the activities of the UH Energy Transition Institute.

## **ENERGY TRANSITION IS THE FOUNDATION**

- Energy Growth
- Net Zero Emissions
- Circular Economy

Growing the Mission of the University of Houston and UH Energy in student development, top tier research, and thought leadership in Hydrogen, Circularity, and Carbon Management delivered via partnership with existing colleges, departments, centers, and institutes.

## Vision

To be the global academic leader for the energy transition.

## Mission

The University of Houston Energy Transition Institute empowers the next generation of energy leaders; develops and accelerates energy solutions, including hydrogen, carbon management and circular materials at scale; and informs policies to address our most pressing challenge to provide secure, reliable, affordable and sustainable energy for all.



## Why University of Houston?

**LOCATION:** We are located in the energy capital of the world, providing students with real-world experiences and numerous career opportunities in a thriving industry.

**RESEARCH AND INNOVATION:** We are a leader in energy research, particularly in the areas of hydrogen, carbon management and circular materials. Our faculty and students work on cutting-edge projects, contribute to important developments in the field and engage in the commercialization of these advancements.

**WORKFORCE DEVELOPMENT:** Our students are the future workforce of a broad energy ecosystem, including industry, academia and government.

**BROADENING PARTICIPATION:** We are one of the most diverse public research universities in the country. We provide a unique, inclusive and real-world centric learning environment that prepares students for success in the global economy.

**ENTREPRENEURSHIP:** Our focus on entrepreneurship and innovation encourages faculty and students to transform their ideas into viable solutions and new ventures.

# Energy Transition Inaugural Advisory Board



**SCOTT NYQUIST**  
Advisory Board Chairman  
Senior Advisor  
McKinsey & Company



**SCOTT ANDERSON**  
Senior Director  
Energy Transition Environmental  
Defense Fund



**WEI CAI, Ph.D.**  
Chief Technology Officer  
Technip Energies



**ANDREY SHUVALOV**  
Vice President of Energy Transition  
Shell USA Inc.  
(effective May 2023)



**AURA CUELLAR**  
Vice President of Energy Transition  
Shell USA Inc.



**HANNEKE FABER (MBA '92)**  
President  
Nutrition Business Group  
Unilever



**SELDA GUNSEL**  
President  
Shell Global Solutions



**PETER F. GREEN, Ph.D.**  
Deputy Laboratory Director  
for Science and Technology  
Chief Research Officer National  
Renewable Energy Laboratory



**DARRYL WILLIS**  
Corporate Vice President  
Energy & Sustainability  
Microsoft

# FACULTY & RESEARCH

# Joe Powell

ASPIRE INITIATIVE ENDOWED EXECUTIVE DIRECTOR  
SHELL ENDOWED CHAIR FOR ENERGY TRANSITION  
PROFESSOR, WILLIAM A. BROOKSHIRE DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING



The University of Houston has named Joseph Powell, former chief scientist for Shell and member of the National Academy of Engineering (NAE), as the founding director of the new UH Energy Transition Institute.

A nationally renowned chemical engineering expert with 36 years of industry experience, Powell has led research and development programs in new chemical processes, biofuels and enhanced oil recovery. Additionally, he chaired the U.S. Department of Energy Hydrogen and Fuel Cell Technical Advisory Committee (HTAC) and was elected to the NAE in 2021 after serving two terms on its board on chemical sciences and technology. He is UH's 18th member of the NAE.

Instead of enjoying a quiet retirement from industry, Powell chose to join UH to make a difference in the global shift to clean energy. In addition to leading the institute, Powell serves as a faculty member in the Department of Chemical & Biomolecular Engineering at the UH Cullen College of Engineering.

"What excites me about my new role is the opportunity to work with students, faculty and industry to make a difference on problems that truly matter. Who could pass that up? Imagine the difficulties that arise when you don't have access to energy," Powell said. "At this point in time, the global transformation to energy abundance is not complete, so we must grow the energy system while reducing its impact on climate and the environment, and also develop circular systems to recycle materials and reduce waste. That's a tall order, but a necessity to bring clean energy and sustainable chemicals into play globally and develop solutions that improve the quality of life for all."

Powell said the institute will allow him to leverage strengths across the University and in the energy sector to progress the energy transition and position Houston as a leading global energy transition hub.

*"We must be the trusted voice for stakeholders and the community that is objective and knowledgeable, where industry comes to present ideas and challenges, where faculty come with their research interests and expertise to partner and achieve more together, and where students are transformed into the energy workforce and leaders of tomorrow."*

Powell is co-inventor for over 125 patent applications, with more than 60 granted, and is a Fellow and former director of the American Institute of Chemical Engineers (AIChE). He has received numerous industry awards including the A. D. Little Award for Chemical Engineering Innovation (AIChE 1998), R&D100 Award (R&D Magazine) and American Chemical Society Team Innovation Award (2000). He is co-editor and author of the book "Sustainable Development in the Process Industries: Cases and Impact, John Wiley & Sons, New York (2010)," and serves on the editorial board of Annual Review of Chemical and Biological Engineering, and on a current National Academy study on carbon utilization.

# Faculty Appointments to the Energy Transition Institute

The UH Energy Transition Institution was created through the foundational gift from Shell and gifts from several other private donors to establish endowed faculty chairs and professorships, part of the University's **Aspire Fund program**.

In 2019, the University of Houston launched a transformational initiative to propel our academic enterprise to unprecedented levels of distinction. Founded by an anonymous donor, the Aspire Fund matches contributions to the University's research and scholarship initiatives. Gifts, combined with a one-to-one match from the anonymous donor and potential matching funds from the state of Texas, will enable the University to recruit and retain the highest-quality faculty, fueling our learning environment through heightened knowledge, innovation and discovery in areas with world-wide impact.

## ASPIRE FUND FACULTY

Shell Endowed Chair for Energy Transition	<b>Professor Joseph Powell</b>
2nd Shell Endowed Chair for Energy Transition	<i>Search underway</i>
Panos Family Endowed Chair in Mechanical Engineering	<i>Search underway</i>
Anuradha Rani Agrawal Industrial Engineering Endowed Professorship	<i>Search underway</i>
Durga D. Sushila Agrawal Industrial Engineering Endowed Professorship	<i>Search underway</i>
[Hari and Anjali] Agrawal Endowed Professorship in Engineering	<i>Search underway</i>

The University is also investing in the **Presidential Frontier Faculty program**, a university-wide integrated interdisciplinary faculty hiring campaign supported by President Renu Khator. The program encompasses hiring a large cohort of convergence research faculty to respond to federal priorities and societal challenges.

The University has successfully recruited two additional Presidential Frontier Faculty members to the ETI who will start in fall of 2023. The faculty members will be multi-disciplinary, and some will balance their work between a primary and secondary college appointment.

## PRESIDENTIAL FRONTIER FACULTY

Assistant Professor, Energy Security and Transition	<b>Professor Ben Xu</b>
Assistant Professor, Energy Security and Transition	<b>Professor Steffan Hitzemann</b>
Assistant Professor, Energy Security and Transition	<i>Search underway</i>
Assistant Professor, Energy Security and Transition	<i>Search underway</i>



**PROFESSOR STEFFAN HITZEMANN**

C.T. BAUER COLLEGE OF BUSINESS / CULLEN COLLEGE OF ENGINEERING

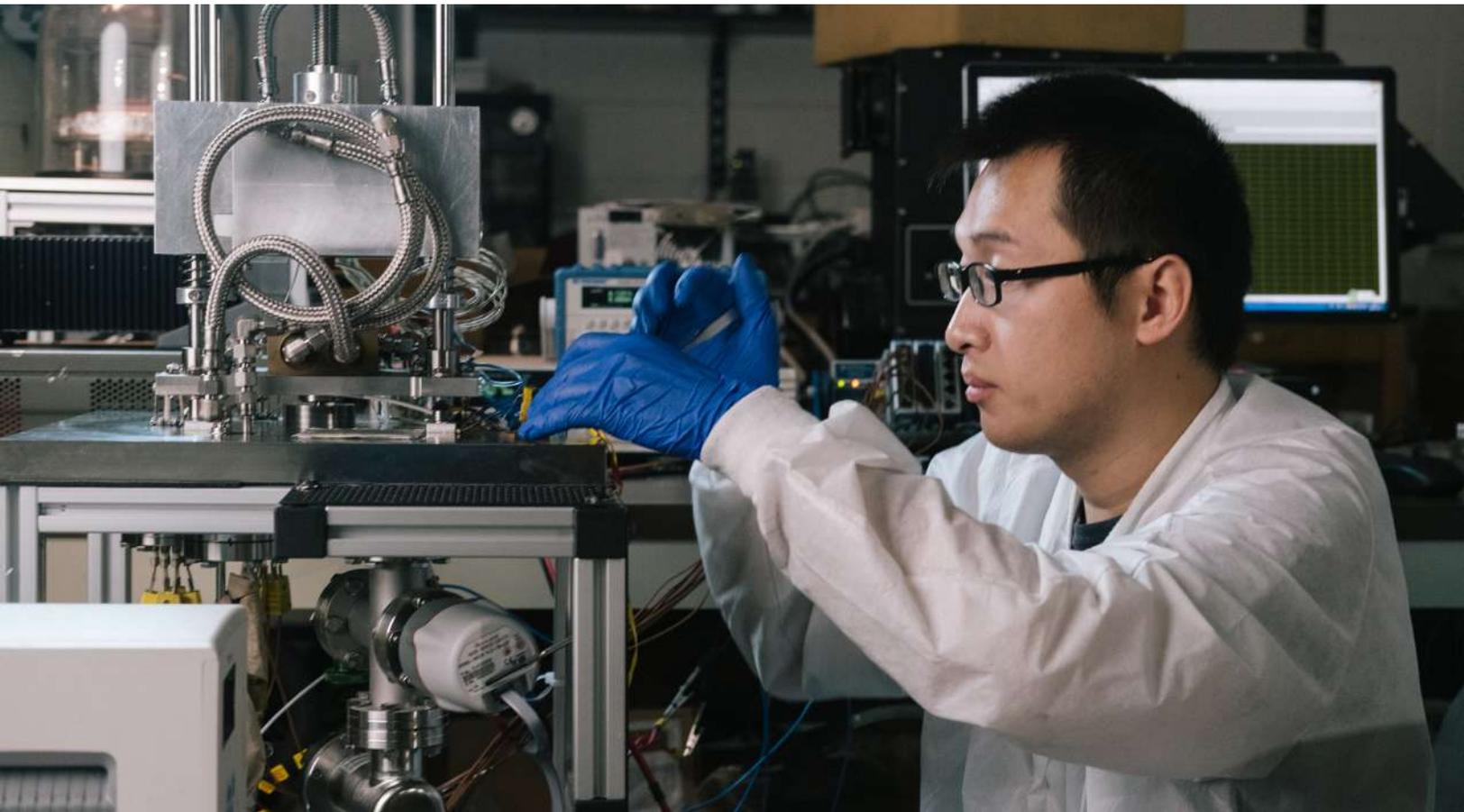
Professor Hitzemann's research is in the area of macro-finance, asset pricing, and derivatives markets. A central part of his work especially focuses on the financial economics of energy and climate change.



**PROFESSOR BEN XU**

CULLEN COLLEGE OF ENGINEERING

Professor Xu's research focuses on developing novel numerical and experimental techniques to investigate the multiphase transport phenomenon in advanced energy systems and advanced manufacturing processes. Current research focuses on the multiphase flow and heat transfer in porous structures, modeling and experiments of laser additive manufacturing process, and bubble/jet generation in laser-assisted 3D bioprinting.



# Energy Transition Research Priorities



	CARBON MANAGEMENT	HYDROGEN	CIRCULARITY
Science, Engineering & Technology	→		
Public Policy, Legal Regulations & Commercialization	→		
Advancing Environmental Justice & Energy Equity	→		
Education, Workforce & Talent	→		

## Research Feature: Seawater Electrolysis



**ZHIFENG REN, Ph.D.**

M.D. Anderson  
Chair professor

Department of Physics  
and Texas Center for  
Superconductivity  
at the University of  
Houston

Seawater makes up about 96% of all water on earth, making it a tempting resource to meet the world’s growing need for clean drinking water and carbon-free energy. Scientists already have the technical ability to both desalinate seawater and split it to produce hydrogen, which is in demand as a source of clean energy.

But existing methods require multiple steps performed at high temperatures over a lengthy period of time in order to produce a catalyst with the needed efficiency. That requires substantial amounts of energy and drives up the cost.

Researchers from the University of Houston have reported an oxygen evolving catalyst that takes just minutes to grow at room temperature on commercially available nickel foam. Paired with a previously reported hydrogen evolution reaction catalyst, it can achieve industrially required current density for overall seawater splitting at low voltage.

Zhifeng Ren, director of the Texas Center for Superconductivity at UH (TcSUH) and corresponding author for the paper, said speedy, low-cost production is critical to commercialization.

*“Any discovery, any technology development, no matter how good it is, the end cost is going to play the most important role,” he said. “If the cost is prohibitive, it will not make it to market. In this work, we found a way to reduce the cost so commercialization will be easier and more acceptable to customers.”*

# Research Projects in Progress



## HYDROGEN AND ENERGY STORAGE

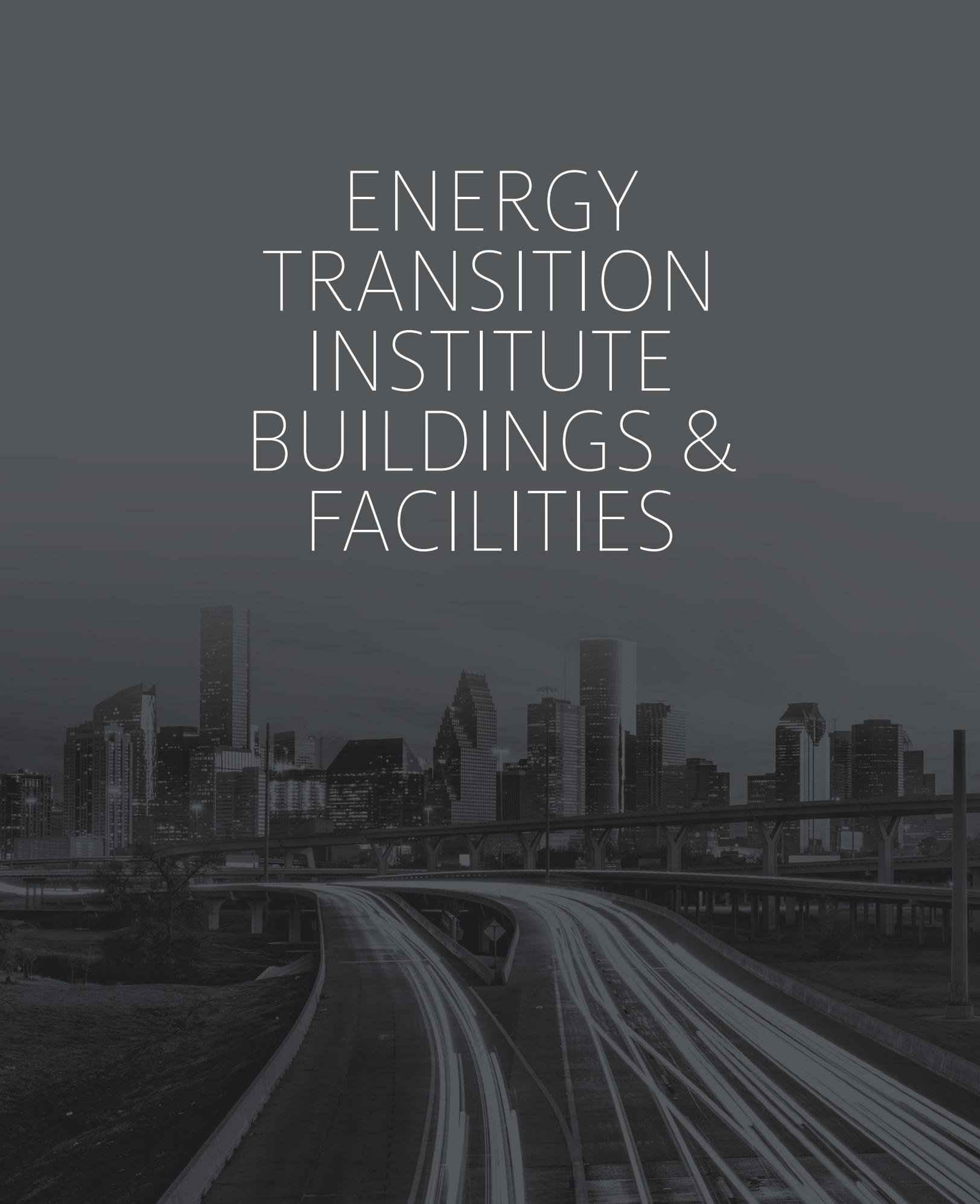
- Towards an Effective Energy Transition by the Development of a Solid State Battery using PetCoke as Carbon Source; Zheng Fan and Francisco Robles Hernandez, Division of Technology (CCE).
- Seawater Electrolysis for Hydrogen Production; Zhifeng Ren; Department of Physics (NSM), Texas Center for Superconductivity.
- New Liner and Liner Application Technology for Repurposing Existing NG Pipelines for Hydrogen Transport; Stanko R. Brankovic; Electrical and Computer Engineering (CCE).

## CIRCULARITY

- Developing Reverse Logistics Networks for Shell Plastic Circularity; Sasha Dong and Zheyong Bian (Supply Chain and Logistics Technology, Division of Technology (CCE)).
- Designing a Circular Supply Chain Model for Flexible Packaging and Films; Meng Li (1), Norman Johnson (2), Qiang Li (3); (1) Supply Chain and Logistics Technology, Division of Technology (CCE); (2) Bauer College of Business; (3) Wilfrid Laurier University.
- Feasibility research of structural repurposing of decommissioned wind turbine blades (DWTBs) as highway overhead sign structures (OSSs): testing, modeling, monitoring, demonstration, and environmental benefit analysis; Gangbing Song (1,2) and Yi-Lung Mo (2); (1) Mechanical Engineering (CCE), (2) Civil and Environmental Engineering (CCE).

## CARBON MANAGEMENT

- The Political Economy of Creating Decarbonization Coalitions: A State-Level Approach; Boris Shor & Jennifer Clark; Political Science, College of Liberal Arts and Social Sciences.
- Producing Long-chain Hydrocarbons and Hydrogen from CO<sub>2</sub> and Water using Photoelectrochemical Catalysis; Jiming Bao; Electrical and Computer Engineering (CCE).
- Towards Development of Electrochemical Systems for Carbon Capture; Mim Rahimi; Civil and Environmental Engineering (CCE).
- Swarming of Bio-inspired Robotic Fish for Underwater CO<sub>2</sub> Leakage Monitoring; Zheng Chen; Mechanical Engineering (CCE).
- Composite Aminopolymer-Enabled Low-Cost Direct Air Capture: From Lab to Pilot Scale Studies; Praveen Bollini; Chemical and Biomolecular Engineering (CCE).
- Processing of algae to biodiesel and organic acid using re-usable whole cell immobilized catalyst to enable microalgae-based carbon capture; Venkatesh Balan; Engineering Technology, Division of Technology (CCE).
- Seismic Baseline Survey Along the Northern Gulf of Mexico for Energy Transition; Yingcai Zheng; Earth and Atmospheric Sciences College of Natural Sciences and Mathematics.



# ENERGY TRANSITION INSTITUTE BUILDINGS & FACILITIES

# Innovation Hub

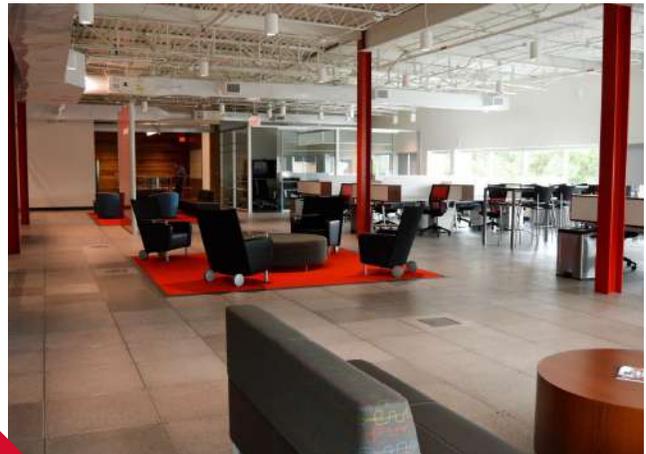
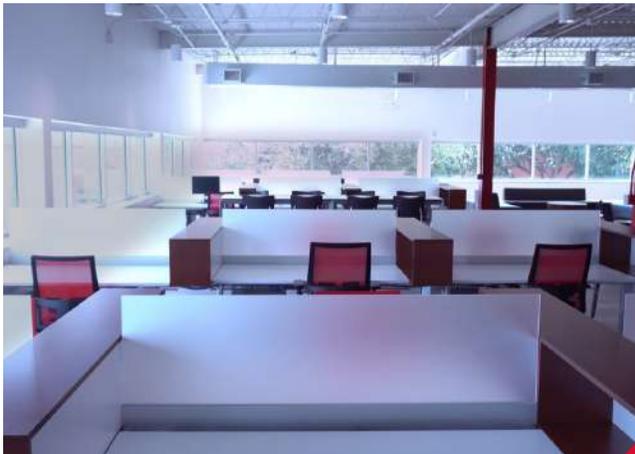
The UH Energy Transition Institute will operate out of the Innovation Hub building, which will open in academic year 2025-2026. This 75,000 square foot building will be located in the center of campus and will house innovation and entrepreneurship programs, including a maker's space for students.



# Core Facilities

Because ETI researchers will be multidisciplinary, their labs will be spread throughout University of Houston campus. In addition to the equipment and resources that will be dedicated to individual faculty labs, UH has committed \$20 million to purchase equipment for new core facilities in five national priority research areas: Advanced Manufacturing, Advanced Materials, Imaging and Scanning, Data and Sensing, and Automation and Autonomy.

The investment will provide equipment for our research community to compete effectively for research awards and excel at delivering the goals and objectives of their research projects. Core facilities optimize investments in equipment and make them available to the UH research community at competitive rates.



# Technology Bridge

The UH Technology Bridge is a rising innovation park suited for large research laboratories, pilot scale facilities and light manufacturing. Its location near downtown Houston, the energy corridor and the midtown innovation district, makes it the ideal location for startups and industrial partners looking to join a university ecosystem to boost local economic development. UH offers competitive lease rates, real estate development, lab facilities and incubator space. The Technology Bridge also offers connectivity to the UH research and innovation enterprise, its top-rated entrepreneurship program and its talented faculty and students.

Ongoing programs include educational resources to support entrepreneurship and innovation for the community. Specifically, we collaborate with serial entrepreneurs, other local startup development organizations, investors and experts from within the university hosting workshops and talks for our faculty. Some of the programs are series called “UH Technology Bridge Partner Spotlights”, “Basics of Building your Business”, “Panel Discussions with Corporate Ventures Experts” and “UH Technology Bridge Startup Spotlights.” Lastly, UH has launched the UH Technology Bridge Engagement program for strategically recruiting startup companies at the UH Technology Bridge that are looking to work with UH faculty and staff on various research programs to develop their technologies. They will build engagement with UH by hiring UH talent, writing SBIR/STTR grants with UH faculty, sponsoring research at UH laboratories and License and co-developing UH Intellectual property. As they engage more with UH, they will receive discounts on lease pricing to encourage working with UH's research enterprise.

UH Technology Bridge start up incubator is currently home for 27 startup companies employing 81 employees. .



# WORKFORCE DEVELOPMENT

# Energy Education

## ENERGY & SUSTAINABILITY MINOR

Undergraduate students from across the campus participate in the Energy & Sustainability Minor, offered through the Honors College but open to all majors. The Energy and Sustainability minor is designed to provide an interdisciplinary approach to broad issues in energy and sustainability. The Minor will educate students on the basics of energy sources, fossil fuels, and the future of energy. In addition to a common introductory and capstone course, the minor offers a blend of courses in technology, business, engineering, architecture, social science, and natural science.

Coursework will focus on topics such as existing, transitional, and alternative energy sources, as well as energy and sustainability from the perspectives of economics and business, engineering and technology, architecture and design, and public policy and education.

## DATA SCIENCE FOR ENERGY TRANSITION

ETI will contribute to training via a summer course in Data Science for the Energy Transition: <https://dsc.nsm.uh.edu/>

The 2023 program will run from May 15 through June 15, 2023. This is an NSF-funded multidisciplinary program based at UH in partnership with four other universities. Participants are undergraduate and masters students from fields ranging from computer science, environmental science, geoscience and social sciences.

An “Energy Equity” microcredential or for-credit course is being developed for Fall 2023 or Spring 2024. The course will address issues in Diversity, Equity, Inclusion, and Accessibility (DEIA), equitable global access to energy (including supply resilience), and workforce development. These topics comprise work required for a Community Benefits Plan to receive US DOE funding of projects, where UH will play a lead role in many proposed industry – academia – national lab consortium projects.

## MICRO-CREDENTIALS FOR ENERGY PROFESSIONALS

UH Energy has been proactive in fulfilling workforce reskilling and upskilling needs by delivering micro-credential programs since 2020. Using a combination of real-time and pre-recorded materials, the University’s micro-credential programs provide the insights, information and skills needed to thrive in the energy transition.

Our structured series of micro-credentials cover a variety of energy-related fields such as sustainable energy development; environment, social and governance (ESG) in energy; energy value chain; downstream energy data analytics; and carbon capture, utilization and storage (CCUS), as well as the hydrogen economy.

These programs are taught by world class instructors, including leaders from industry and the marketplace and accomplished faculty from the University of Houston. Course participants include university students (seniors and beyond), as well as industry professionals seeking to expand their career horizons in the dynamic world of the energy transition.

### Micro-Credential Offerings as of May 2023

- Robotics in Energy
- Rubbers in Extreme Environments
- Upstream Energy Data Analytics Program
- CCUS Executive Education Program
- Data Analytics for the Process Industries Program
- Sustainable Energy Development Program
- The Hydrogen Economy Program
- ESG in Energy Program

# Testimonials

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*"I'm so happy to have completed the Hydrogen Economy Silver Belt Program at the University of Houston. The instructors, speakers, and material were world-class. It was a fantastic introduction to energy transition and the important role that hydrogen can play. If anyone is interested in hydrogen, I highly recommend the program!"*

– **Daniela Ismail**, Zero Emissions Business Development Manager at Trillium Energy Solutions

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*"Thank you to UH Energy for presenting the Hydrogen Economy program for those of us wanting more than a superficial view of the potential role of hydrogen in the energy transition. Kudos to all involved for providing 45 hours of terrific content about this important subject."*

– **Kay McCall**, Board of Directors Chair at Renewable Energy Alliance and The Flexitallic Group and Board Member of Clean Energy Services and EDP Renewables

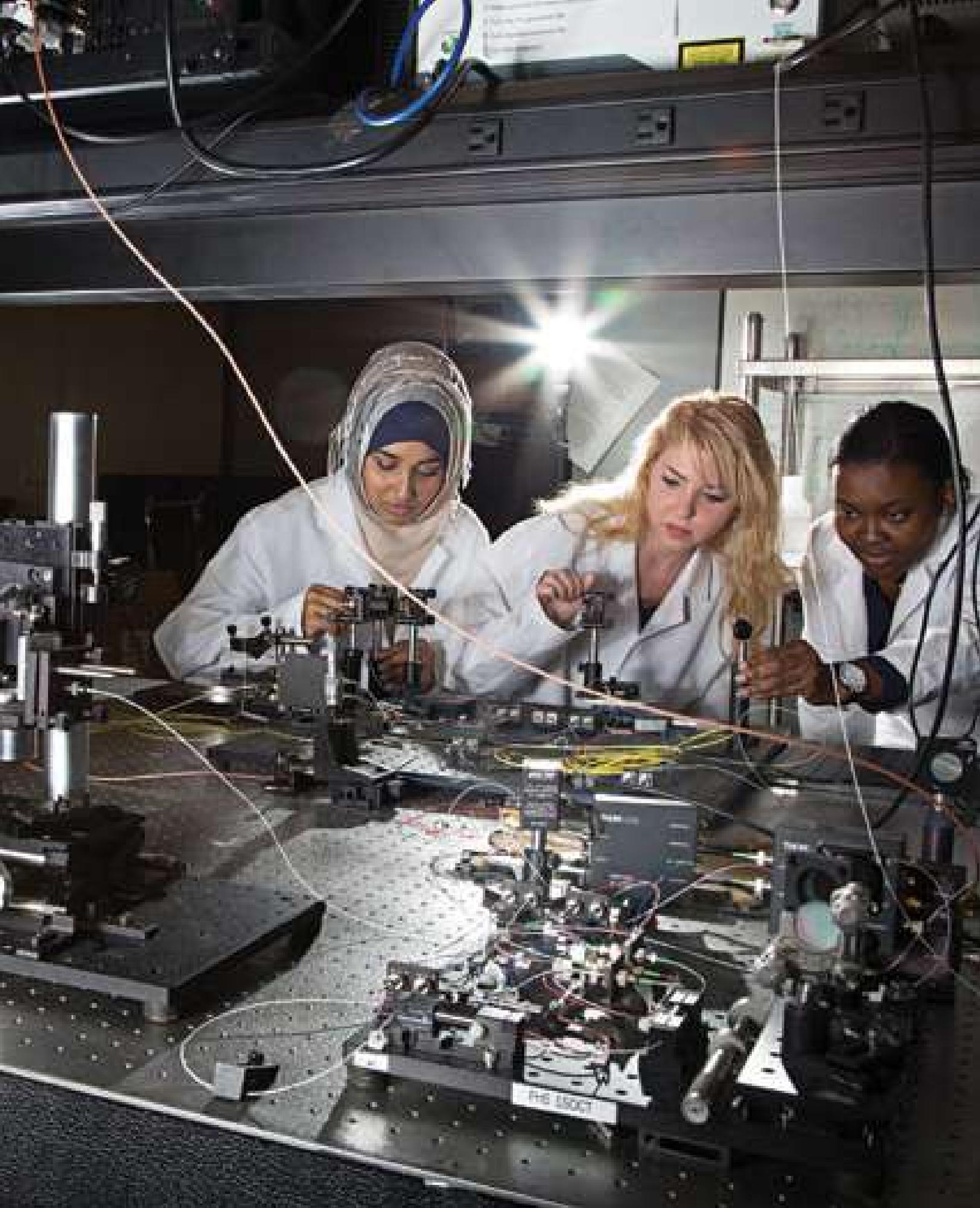
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*"I highly recommend this micro-credential course at UH Energy. In my new role at UH Energy, I am excited to be involved in the hydrogen economy and collaborate with a great team of researchers and companies to define a realistic, cost-effective and holistically planned role for hydrogen in the energy transition space."*

– **Ram Seetharam**, Energy Center Officer at UH Energy

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# Student Competitions

## NETZERO BY 2050 WRITING AND POSTER CONTEST

The writing competition, co-sponsored by ConocoPhillips and the UH Energy Transition Institute, addressed the question: "Net Zero By 2050 – What will the world be like in 2050?" Many governments, corporations, and industry associations have announced roadmaps to achieve a net zero of greenhouse gas emissions by 2050. UH received 40 essay submissions and identified five finalists. \$7000 in prizes was awarded at the annual Energy Banquet held April 19, 2023.

- **1st Place – Rawand Hwayyiz**  
"A Tale of Three Humans"
- **2nd Place/Viewer's Choice – Jacobs Steen**  
"Critical Minerals & the Future of Geopolitics"
- **3rd Place – Thuan Tran**  
"Net Zero and Resistance to Change"
- **Finalist – Steve Williams**  
"Global Race to Net Zero Emissions by 2050"
- **Finalist – Ibrahim Islam**  
"The Sunset of 2050"



# Undergraduate Research

## ENERGY SCHOLARS

Ten students have been matched to faculty mentors for the Summer / Fall program 2023. A speaker event will be held in Fall 2023 and expanded to a larger group of students for education on Energy Transition issues and opportunities. The program will be expanded the following year (2024) with help from ETI in promotion and funding in conjunction with Phillips 66. Ultimately, a program size of about 75 students can be accommodated for a funding level of \$450,000. This opportunity comprises one of the uses for future ETI member funding.

## FUTURE ELECTRIC VEHICLE CONCEPTS

University of Houston students are competing to design the next generation of luxury electric vehicles as part of their coursework at the Gerald D. Hines College of Architecture and Design. Mark Kimbrough and Jeff Feng, co-directors of the industrial design program, offered students enrolled in junior- and senior-level classes the opportunity to participate in the design competition while still gaining class credit. Seniors, who designed the vehicle exteriors, paired up with juniors, who created the interiors, to form eight teams.



## RESEARCH DAY

Held April 14, 2023, 200 UH students presented their research during an afternoon showcase at the M.D. Anderson Library's Rockwell Pavilion and The Honors College Commons. Through the process of investigation and discovery, students hone their critical thinking skills. Likewise, they learn to collaborate and communicate effectively with peers and professors. Ultimately, these researchers on the rise gain confidence as scholars who can effect positive change in their communities.



## ENERGY COALITION

Founded in 2015, the Energy Coalition serves as a pipeline between UH students and the energy industry. Focusing its efforts on building multidisciplinary collaborations across campus and introducing energy career-minded peers from all backgrounds to various educational and professional development opportunities, the Coalition has grown into the largest energy-centric student organization of its kind with over 5,000 members. The organization aims to connect the next generation of industry with the best and brightest leaders in the marketplace and through its efforts, strengthens the University of Houston's strategic partnerships within the Energy Capital of the World and beyond, ultimately reinforcing UH's place as The Energy University.



## CERAWEEK

Hosted in Houston each year, CERAWeek brings together thousands of innovators and industry leaders from around the world to discuss what's ahead for global energy markets, geopolitics, and technology. The 2023 theme was the energy "trilemma" – sustainability, affordability and security. The UH Energy Coalition was able to attend CERAWeek and gained valuable insights from the esteemed conference.

## ENERGYTECH UP COMPETITION (U.S. DEPT. OF ENERGY)

Five UH students across three teams participated in the U.S. Department of Energy's EnergyTech University Prize competition. Aiming to empower future energy innovators, the EnergyTech UP competition encourages multidisciplinary student teams to develop and present business plans for high-potential energy applications for use in various spaces. Between all of the teams that included University of Houston students, the university took home an East Regional win, Southwest Regional win, and a National Lab Technology IP Licensing Bonus Prize.



**Pictured:** Erin Picton, Parisan Taheri, and Pranjali Sheth

# SPEAKERS & EVENTS

# ENERGY 101 WITH SHELL

## October 2022

Energy 101, an annual event organized by the Energy Coalition student group, reveals plans and opportunities in store for University of Houston students to connect, learn, and innovate alongside industry professionals through the year. This year, the event included Shell Energy Transition team members and the Houston Mayor's Office of Sustainability and Resiliency.

Representing the Energy Transition Institute, chemical engineer Joe Powell spoke on the key focuses of the institute – hydrogen circularity and carbon management – and the deliverables. The goal of the institute, Powell said, is to provide students with needed hands-on education, top tier research, and industry engagement to solve tomorrow's problems.



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# MARITIME SECTOR ANALYSIS

## January 2023

The Shipping Deputy Ministry (SDM) of Cyprus, in association with the University of Houston, organized the interactive hybrid event, "SWOT-ing the potential of low- and zero-emission fuels in the maritime sector." Held on January 19, 2023, the event was hosted by PwC's Experience Centre in Nicosia, Cyprus, a cutting-edge facility for modern and innovative solutions and experiences. The three-hour event brought together more than 400 participants from around the world, in an interactive and participatory way for a live hybrid SWOT analysis of four alternative fuels; hydrogen, ammonia, biofuel and methanol.

Panelists from the industry and academia, moderated by the Shipping Deputy Minister Mr. Vassilios Demetriades, examined the safety, costs, maturity, and availability of new bunker fuels, drawing conclusions that provide a useful summary of the current alternative fuel landscape.



## ETI SPEAKER: INDUSTRY AND THE ENERGY TRANSITION February 2023

The UH Energy Transition Institute hosted Shell representatives to speak with energy-focused students, along with faculty and professionals that offered an all-encompassing look at where oil and gas fit in the energy transition. With a keynote address from Shell’s Corporate Chief Scientist Dirk Smit, the evening centered on how the industry – as well as present and future workforce – needs to adapt to global energy demand to provide economically-feasible and sustainable solutions long term. Additionally, a Q&A panel was held where attendees were able to learn more about how Shell is honing its research toward nuclear research, which has notable potential for future energy use.



## CERA WEEK INNOVATION AGORA SESSION: PROJECT SHOWPLACE March 2023

Project SHOWPLACE Texas Gulf Coast is an Industry-Government-Public-Academia collaborative demonstration project that aims to establish the commercial feasibility of synergies between offshore wind power & hydrogen generation & storage. Key concept elements include re-purposing existing offshore Gulf of Mexico oil and gas platforms and pipelines into green hydrogen hubs.

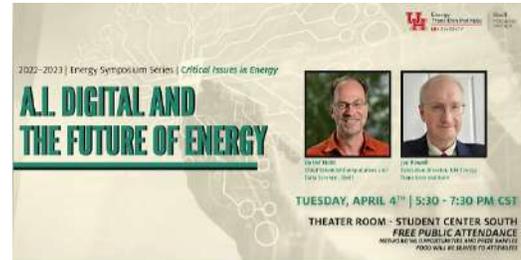


**Project SHOWPLACE**  
is hosted and run by Dr. Ram Seetheram,  
Energy Center Officer at UH Energy

# ENERGY SYMPOSIUM SERIES: AI DIGITAL AND THE FUTURE OF ENERGY

## April 2023

Representatives from Shell and the University of Houston Energy Transition Institute co-hosted the latest installment of UH Energy's Critical Issues in Energy Symposium Series, "AI, Digital and the Future of Energy." The symposium, with a keynote from Detlef Hohl, Chief Scientist over computation and data science at Shell, provided an in-depth look into AI's capabilities within the energy marketplace as demonstrated through Shell's latest developments. Hohl noted that AI offers limitless potential as a conduit for the energy transition, as digital-based solutions can be applied to a myriad of energy challenges – such as carbon capture, wind energy, batteries and more, thus offering strong opportunities within industry to tackle energy poverty across the world. Seizing those openings, Hohl said, will be paramount, as energy needs have necessitated the continued development of multiple solutions and sources. Attendees were also able to engage with members of Shell's digital team to learn more about what it will take to transform perceptions of energy.



# SHELL SCENARIOS SEMINAR

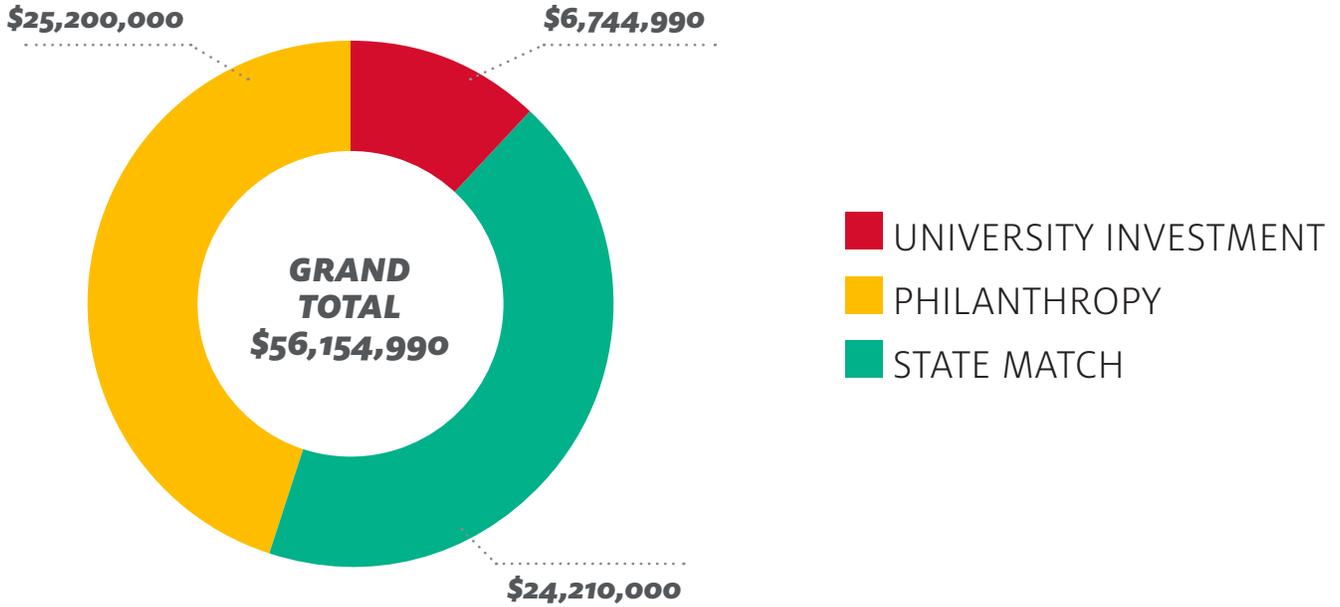
## May 2023

The Energy Transition Institute partnered with Shell to offer UH students and faculty a front-row seat for a highly interactive forum that took a deep dive into the current pace of the Energy Transition. Shell VP for Global Business Environment Laszlo Varro presented highlights from a pair of newly released energy scenarios from Shell: Sky 2050 and Archipelagos. Both forecasts provided critical insight as to the future of energy as it relates to reaching the Paris Agreement's most ambitious goals — limiting the increase in global average temperatures to 1.5°C above pre-industrial levels — as well as examining current policy to predict outcomes. The seminar discussed global needs for energy security and sought to answer the question as to whether society and industry are moving fast enough to address climate change.



# ETI FUNDING MODEL

The ETI is seeking to attract \$150 MM over the next 10 years as it scales to become a robust engine for energy transition research and workforce in the Gulf Coast region.



**FACULTY**

- Endowed Faculty
- Visiting Faculty
- Professors of Practice

**STUDENTS**

- Graduate Fellowships
- Post Docs
- Undergraduate Research

**RESEARCH**

- Faculty Seed Grants
- Sponsored Research Programs

**PROGRAMMING**

- Student Programming
- Innovation Competitions
- Mentorship Programs

**FACILITIES**

- Lab Enhancements
- Research Equipment

**OPERATIONS**

- Staff Support
- Events and Communications





# THANK YOU

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**FOR MORE INFORMATION:**

**Laura Babka**

Executive Director of Corporate Relations

Division of Advancement & Alumni

University of Houston

713-743-7479

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