Welcome & Introduction

ENGLISH

TRANSITION:
AGENTS OF
CHANGE,
CHANGING
AGENTS

April 13 – 10:15 a.m.-3:00 p.m.
April 14 – 9:30 a.m.-2:00 p.m.
Central Time

DR. VARUN RAI
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Asst. Secretary, U.S. DOE (EERE)

Student Research Poster Competition

Energy Tradeoffs Panel

ExxonMobil Fellows Lunch

Sustainability Leadership Panel

Women in Energy Networking Breakfast
Deep decarbonization is not an option, it’s a necessity

Limiting climate change to substantially less than 2 degrees Celsius requires global emissions to reach net-zero by mid-century (IPCC 2018)

• Scale, scope, and rapidity of the necessary changes are unprecedented, all-encompassing, and truly daunting

• Success in addressing this global challenge requires coordination and alignment across markets, governments, and cultures
Large-scale energy transition: Shifts in patterns of energy use in the society

“Energy transitions have been, and will continue to be, inherently prolonged affairs, particularly so in large nations whose high levels of per capita energy use and whose massive and expensive infrastructures make it impossible to greatly accelerate their progress even if we were to resort to some highly effective interventions ...” (V. Smil, 2012)
Larger the scope of change, longer it takes…

...partly because:

- **Diverse set of actors and institutions**: many competing ideas and stronger inertia
- **Need for integration with other parts of the system**


Diffusion durations scale with market size. Notes: X-axis shows duration of diffusion (t) measured in time to grow from 10% to 90% of cumulative total capacity; y-axis shows extent of diffusion normalized for growth in system size. All data are for “core” innovator markets. Round symbols denote end-use
With increasing unit size, cost reductions may not automatically hold for capital intensive technologies.

Cost increases due to: uncertainties and complexity in value chains; unanticipated technological and regulatory bottlenecks; market structure effects; and possible appraisal optimism or “low balling”.

Source: “Carbon capture and storage at scale: Lessons from the growth of analogous energy technologies”, Rai, Victor, & Thurber. Energy policy 38 (8), 4089-4098
Agents of Change, Changing Agents

• Large-scale energy transitions are expected to be long affairs. To speed things up abnormally, need carefully designed & coordinated technology-push and demand-pull, coupled with transformed social norms

• Policy, regulatory, business, and public experience with actual deployment across markets critical
Accelerating Decarbonization of the U.S. Energy System

Download the report and report resources at nap.edu/decarbonization
Decarbonization policies must ensure a fair and equitable transition with public participation in decision making

“...clean energy transitions should help to create future U.S. energy systems that are more just, equitable, and inclusive. This requires careful attention to ensure that both the *processes* through which decisions about energy transitions are made and the *outcomes* of clean energy transitions are more inclusive of the full array of voices of workers and communities with stakes in the future of U.S. energy and that these *diverse communities are treated fairly and equitably.*”
Committee Roster

- **Stephen W. Pacala**, Chair, Princeton University
- **Colin Cunliff**, ITIF
- **Danielle Deane-Ryan**, Consultant
- **Kelly Sims Gallagher**, Tufts University
- **Julia H. Haggerty**, Montana State University
- **Chris T. Hendrickson**, Carnegie Mellon University
- **Jesse Jenkins**, Princeton University
- **Roxanne Johnson**, BlueGreen Alliance
- **Timothy C. Lieuwen**, Georgia Institute of Technology
- **Vivian E. Loftness**, Carnegie Mellon University
- **Clark A. Miller**, Arizona State University
- **Billy Pizer**, Duke University
- **Varun Rai**, University of Texas at Austin
- **Ed Rightor**, American Council for an Energy-Efficient Economy
- **Esther S. Takeuchi**, Stony Brook University
- **Susan F. Tierney**, Analysis Group
- **Jennifer Wilcox**, University of Pennsylvania

Speaking at UT Energy Week 2021
Energy@UT
Taking a multi-faceted, integrated approach to Fueling a Sustainable Energy Transition

The depth and breadth of the research and innovation of our faculty and researchers enables UT to take a balanced view of the global energy system.

The Energy Institute (EI) serves as a gateway to UT’s world-class researchers dedicated to solving the grand energy challenges facing society.
Longhorn Energy Club brings you a showcase of student energy research here at the University of Texas at Austin. This year’s competition features 27 students from 10 academic departments.
ENERGY TRANSITION:
PAST, PRESENT, AND FUTURE

Panelists: Benjamin Sovacool,
Sanya Carley, & Aldo Flores-Quiroga

Moderator: Carey King

Tuesday, April 13, 2021