INTERNATIONAL ENERGY ANALYSIS
BERKELEY LAB

International Energy Analysis
News from Berkeley Lab

December 6, 2022

Greetings and welcome to the second edition of Berkeley Lab's International Energy Analysis newsletter.

Featured in this edition are Berkeley Lab's contributions to the recent international climate negotiations in Egypt (COP27), Net Zero World Energy Decarbonization Pathways report, economic and environmental benefits for India with freight truck electrification. We also describe a trio of studies that show the role of electrification in China's carbon neutrality transition, the implementation of energy efficiency standards in Uganda, and training to Indonesian scholars to scale up high-performance building technologies.

Please add us to your address book and forward this newsletter to any colleagues you believe might be interested.

Sincerely,

Mary Ann Piette
Interim Associate Lab Director, Energy Technologies Area
Lawrence Berkeley National Laboratory

Our Latest Research

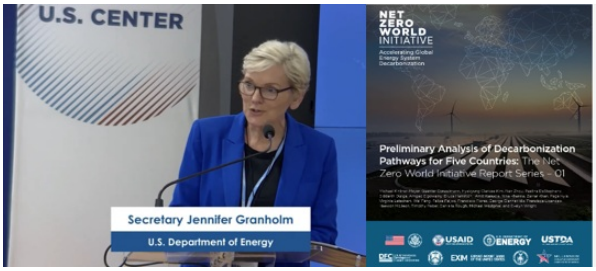
Berkeley Lab Scientists Provide Congressional Briefing on IPCC Report

Berkeley Lab Senior Scientist Nan Zhou and former Senior Scientist (retired) Lynn Price participated in a briefing on the implications of the Intergovernmental Panel on Climate Change's (IPCC's) most recent report—the Sixth Assessment Report—for the international climate negotiations in Egypt (COP27) and for work on Capitol Hill.

This briefing was part of a Congressional briefing series, *What Congress Needs to Know About COP27*. Nan and Lynn provided insights from the Working Group III Report of the IPCC's Sixth Assessment Report as a Lead Author and as a government designated reviewer, respectively. Berkeley Lab's Stephane de la Rue du Can and

Nina Khanna also served as authors on this report. Review the **briefing** for more information.

Release of Net Zero World Energy Decarbonization Pathways Report for Five Countries



In a joint-effort across Department of Energy National Labs, Berkeley Lab researchers completed the Net Zero World (NZW) Energy Decarbonization Pathways Report for five countries, which was released at a COP-27 event on November 15th as the first major NZW joint product.

Berkeley Lab's modeling and analysis, conducted by Virginie Letschert, Nina Khanna, Wei Feng, Hongyou Lu, Jing Ke, Stephane de la Rue du Can, Juan Pablo Carvallo, and Nan Zhou, highlights the essential role of energy efficiency and fuel switching to electricity and hydrogen in order to meet Indonesia and Chile's decarbonization goals. Chile's government commended the work of our researchers and plans to integrate the new insights in their future modeling and policy planning.

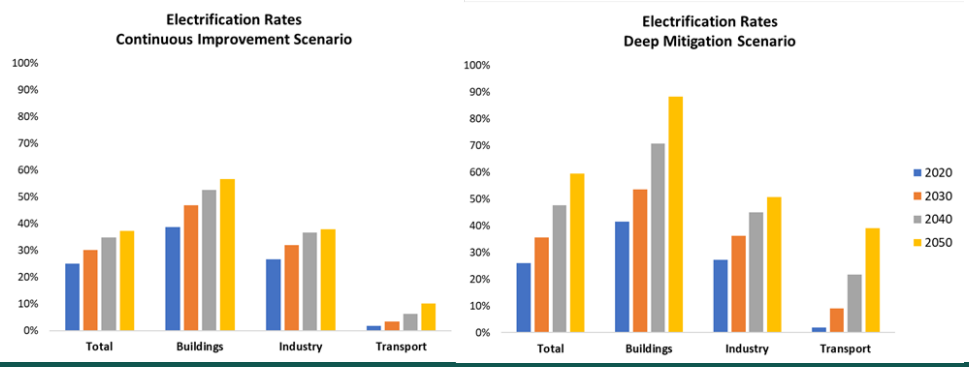
Watch the recording of Department of Energy (DOE) Secretary Granholm announcing this major milestone and **download the report.**

Benefits of Electrifying Freight Trucks in India

A new study from Berkeley Lab's Nikit Abhyankar, Nihan Karali and Amol Phadke and UCLA shows that advances in battery technology and dramatically decreased battery costs in recent years, combined with the right policies and incentives, could make electric truck operations more affordable, possibly making India a world leader in electric vehicles.

Three New Studies Show the Role of Electrification in China's Carbon Neutrality Transition

Electrification of the end-use sectors, along with the decarbonization of the power systems, can be a powerful strategy to achieve net-zero CO_2 emissions. **The newest edition of Berkeley Lab's *China Energy Outlook* assessed China's electrification potential in buildings, transport, and industry sectors** by using our China 2050 Demand Resources Energy Analysis Model (DREAM). The analysis showed that China's overall electrification penetration level can be increased from 22% in 2015 to 37% by 2050 in the Continuous Improvement Scenario, and can be significantly increased to 60% by 2050 in the Deep Mitigation Scenario. Report co-authors, Hongyou Lu, Nina Khanna, Wei Feng, Jing Ke, David Fridley and Nan Zhou point out that policies are needed to support research and development, demonstration, and the scale-up of emerging electric technologies to overcome barriers to electrification. The full report is available **here**.



In November 2022, a report led by Energy Foundation China with contributions from 21 experts from nine research organizations analyzed China's carbon neutrality transition. Berkeley Lab's Nan Zhou, Nina Khanna, and Hongyou Lu are contributing authors.

The report highlighted the role of electrification and associated electricity system transformation in achieving China's "30/60" goals and identified a set of near-term sectoral actions and long-term sectoral strategies that can be taken to accelerate electrification and power sector decarbonization to put China on a successful, low-emissions growth pathway.

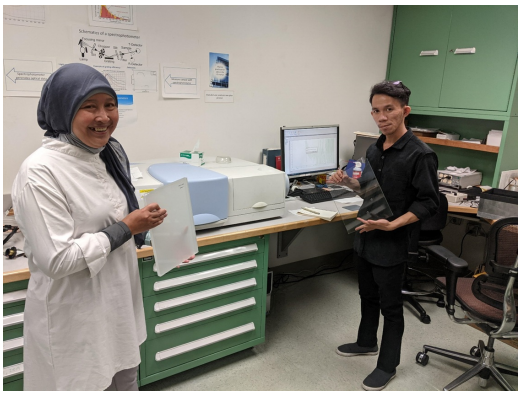
Falling costs for both renewable energy and battery storage create an opportunity for China to exceed its current policy goals for decarbonizing power while cutting energy costs and increasing energy security. **A new study led by researchers at Berkeley Lab finds China could reach 80% carbon-free electricity by 2035 while reducing consumer costs**. It could do so by leveraging its abundant domestic renewable resources and unparalleled capability to build infrastructure. The recently published study looked at various effects from increasing carbon-free sources on the country's electric grid, including cost, reliability, emissions, public health, and employment. Berkeley Lab co-authors include: Jiang Lin, Nikit Abhyankar, Frederich (Fritz) Kahrl, Shengfei Yin, Umed Paliwal, Xu (Angela) Liu, Nina Khanna, Qian Luo, and Amol Phadke.

Berkeley Lab is providing energy efficiency support to Uganda

Berkeley lab is working closely with Uganda's Ministry of Energy and Mineral Development (MEMD) on the implementation of an energy efficiency standards and labeling program with support from USAID. This close collaboration led to a recent **journal article** about how energy efficiency improves energy access affordability. Berkeley Lab co-authors are Stephane de la Rue du Can, Virginie Letschert, Shreya Agarwal, and Won Young Park.

The analysis found that the most cost-effective products have an efficiency level 35% higher than baseline products sold on the market. By choosing these products, consumers save, on average, US$76 over the lifetime of the product. These savings translate into additional purchasing power for households and investments for small businesses, leading to increased living standards and economic development.
Read the **Implementation Strategy report** and visit the **Uganda standards and labeling website** for more information.

Berkeley Lab Scientists Provide Training to Indonesian Scholars to Scale Up High-Performance Building Technologies and Standards



Two researchers from Universitas Pendidikan Indonesia (UPI) visited Berkeley Lab to learn about state-of-the-art infrastructure to aid the development of a testing and certification program for building components in Indonesia. The new testing lab in Indonesia aims to support the adoption of building energy codes and standards to facilitate the widespread implementation of high-performance buildings in the archipelago. During their two-week visit in Fall 2022, the researchers engaged with representatives from the Net Zero World Initiative and U.S. DOE national laboratory researchers on topics including building envelope technology testing, radiative measurement, and ratings and standards. Berkeley Lab staff contributing to the effort included Charlie Curcija (host), Ronnen Levinson, Sharon Chen, Hugo Destaillats, Virginie Letschert, and Wei Feng. For more information about the Net Zero World Initiative, visit the **website** and **fact sheet.**

Learn More at international.lbl.gov

Lawrence Berkeley National Laboratory
Energy Technologies Area

Mary Ann Piette, Interim Associate Laboratory Director, Energy Technologies Area

Tom Kirchstetter, Division Director, **Energy Analysis & Environmental Impacts**
Jessica Granderson, Interim Division Director, **Building Technology & Urban Systems**
Robert Kostecki, Division Director, **Energy Storage & Distributed Resources**