

Greetings,

We are pleased to offer the newest installment of the Energy Systems and Climate Analysis (ESCA) newsletter.

This newsletter contains the launch of the LCRI Net Zero 2050 Report. This quarter also features ESCA publications on the role of natural gas in future power systems, renewable cost projections, and metrics for robust planning decisions. We also highlight new insights on GHG accounting, a public webcast on the Social Cost of Carbon, and forthcoming work on extreme heat events. Read on to learn more.

All of ESCA's publicly available work, and past announcements, can be found on the ESCA <u>website</u>.

ESCA Research Highlights

LCRI Net-Zero 2050: U.S. Economy-Wide Deep Decarbonization Scenario Analysis



EPRI is pleased to announce the public release of a new study, **Net-Zero 2050: U.S. Economy-Wide Deep Decarbonization Scenario Analysis**. This study has been conducted under the Low Carbon Resources Initiative (LCRI), a collaboration between EPRI and GTI Energy to accelerate the development and demonstration of low- and zero-carbon energy technologies. The Net-Zero 2050 study explores technology pathways to achieve economy-wide net-zero CO2 emissions in the U.S. by 2050. This comprehensive analysis uses a new and expanded version of <u>US-REGEN</u>, a detailed, integrated energy system model that represents economic trade-offs and technology interactions across sectors and regions of the U.S. Our findings illustrate multiple pathways to a 2050 net-zero target and reinforce the need for a broad portfolio of clean energy technologies to support the transition to a sustainable, reliable, and affordable energy economy. The report is fully online and available at <u>lowcarbonLCRI.com/netzero</u>.

For more information, please contact Geoff Blanford, gblanford@epri.com.

READ REPORT

The Role of Natural Gas in Reaching Net-Zero Emissions in the Electric Sector

A new study from EPRI, published in **Nature Communications**, assesses the potential role for natural gas and carbon removal in deeply decarbonized electricity systems in the U.S. and evaluate the robustness of these insights to key technology and policy assumptions.

Key Insights:

- Natural-gas-fired generation can lower the cost of electric sector decarbonization, a result that is robust to a range of sensitivities, when carbon removal is allowed under policy.
- Net-zero by 2035 entails greater contributions from natural gas than in 2050.
- Wind and solar have higher generation shares than natural gas for most regions and scenarios (52-66% variable renewables for net-zero scenarios versus 0-19% for gas)
- This suggests that natural gas generation can be substituted more easily than its capacity.

For more information please contact John Bistline jbistline@epri.com or David Young dyoung@epri.com



READ ARTICLE



New Resources on GHG Emissions Accounting

The ESCA Group has released two new Back Pocket Insights on Greenhouse Gas Accounting. Both Insights are part of a series of to help electric companies and other entities **conduct comprehensive GHG emissions accounting**. This work is based on 2021 research completed by EPRI's Program 201.

- The Insight on <u>Scope 2 GHG Emissions Accounting</u> discusses direct and indirect emissions from transmission and distribution system line losses, the use of emissions factors in GHG accounting, as well as location & market methods to estimate scope 2 emissions.
- The Insight on <u>RECs and GHG Accounting</u> offers an introduction to corporate renewable energy procurement, Renewable Portfolio Standards (RPS) and Renewable Energy Credits (RECs). It discusses the role of RECs in GHG accounting as well as the impact and evolving disagreement surrounding locational vs market-based Scope 2 GHG accounting.

For more information please contact Adam Diamant adiamant@epri.com

Implications of Variations in Renewable Cost Projections for Electric Sector Decarbonization in the United States



Two Page Summary

A recent EPRI study **compared projections of U.S. wind and solar costs** across published studies and **modelled how these reductions could alter electric sector planning** decisions and costs under deep decarbonization. Results:

- Wind and solar are the largest generation resources for many scenarios and regions, but shares depend on assumptions about costs, policy targets, and policy timeframes (spanning 14% to 67% of national generation by 2035).
- Renewables cost reductions lower decarbonization costs and reduce projections for nuclear and carbon-captured-equipped generation,
- Policy decisions have a larger influence on future trajectories.
- Lower wind and solar costs have more limited impacts on deployment of carbon removal technologies and the capacity of clean firm technologies in reaching net-zero emissions in the electric sector.

For more information please contact John Bistline jbistline@epri.com

Capacity at Risk: A Metric for Robust Planning Decisions under Uncertainty in the Electric Sector



A recent EPRI publication in Environmental Research Communications **introduces a screening metric** called 'capacity at risk' and two complementary metrics—robust capacity and risk ratio—for **identifying the most decision-relevant uncertainties** and for understanding which investments could be robust and which are more uncertain across a range of different futures. The use of deterministic model runs in calculating capacity at risk metrics **can lower barriers to entry for modelers and communications with stakeholders**.

For more information please contact John Bistline jbistline@epri.com and Srujana Goteti NGoteti@epri.com

READ ARTICLE

Public Education Webcast: Discounting and the Social Cost of Carbon



The ESCA group recently hosted the third installment of EPRI's Public Webcast Series on the Social Cost of Carbon. This session focused on the **fundamental discounting issues and technical considerations in calculating and using SC-GHGs**; and, helping define the technical dimensions that need to be considered for developing a scientifically defensible SC-GHG discounting approach.

Moderated by **John Weyant** (Professor, Management Science and Engineering, Stanford University) the panel featured **William Pize**r (Vice President for Research and Policy Engagement, Resources for the Future), **Steven Rose** (Senior Research Economist, Energy Systems & Climate Analysis, EPRI) and **Deborah Lucas** (Professor, Sloan School of Management, MIT).

Learn More and View Recording



Forthcoming: Extreme Heat Events Quick Insights

Several heatwaves in the last few years have tested reliability and resilience of power systems. The world continues to set new extreme heat records with increased frequency and intensity and, as global temperatures rise, these trends are projected to continue and worsen over the coming decades. In this Quick Insight, Climate READi evaluates the severity of recent extreme heat events in the context of historical records and climate change and potential future implications of extreme heat for the power system For more information please contact Delavane Diaz <u>ddiaz@epri.com</u> and Laura Fischer <u>lfischer@epri.com</u>

Member Center

The ESCA Group conducts its research as part of EPRI Programs 178 (<u>Resource</u> <u>Planning for Electric Power Systems</u>) and 201 (<u>Energy, Environmental, and Climate</u> <u>Policy Analysis</u>). Examples of recent program-specific research includes:

- Exploring Power System Reliability under Zero-CO2 Policy: A US-REGEN and PLEXOS Modeling Case Study (<u>3002025269</u>) - Program 201
- Impacts of 111(d) Design Decisions and Tax Credit Interactions: Near-Term Electric Sector Decarbonization Policy Sensitivities (<u>3002025234</u>) - Program 201
- Evaluation of Future Firm Capacity Peaker Options: Technologies and Fuels (<u>3002025394</u>) - Program 178
- 2022 Energy System Technology Cost and Performance Summary: Market Trends & Technology Insights (<u>3002024231</u>) - Program 178

For more information about these programs, please contact <u>Nidhi Santen</u> (P178) or <u>David</u> <u>Young</u> (P201).

Thank you for your continued interest in our work. If you have any questions please email <u>eea@epri.com</u>.

Best,

EPRI Energy Systems and Climate Analysis Group



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