



## NEWSLETTER AND RESEARCH HIGHLIGHTS

Greetings,

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

This newsletter highlights the release of a [new modeling framework, demonstration study results, and key insights](#) from EPRI's Integrated Strategic System Planning (ISSP) initiative.

ESCA researchers have also led a [new model intercomparison study](#) on the power sector impacts of the Inflation Reduction Act, contributed to the [5th National Climate Assessment](#), and released a [quick insight on greenhouse gas accounting](#) for corporate and industrial electricity consumers. Read on to learn more.

All of ESCA's publicly available work, and past announcements, can be found on the ESCA [website](#).

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## Research Highlights

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### **New Research Advances Long-term Resource Planning and Modeling for Low-Carbon Electric Power Systems**



EPRI's Integrated Strategic System Planning (ISSP) researchers have developed a new framework and case study for more comprehensively planning across generation, transmission, distribution, and end-use systems and realizing cost-effective and reliable low-carbon electric power systems. This research developed a first-of-a-kind, generalizable framework and analytical toolbox for integrated strategic planning with a series of soft-linked, existing power system modeling tools.

## The framework consists of:

- an economic energy-systems planning model to develop regional technology pathways;
- a detailed nodal generation and transmission capacity expansion planning model to develop system-level resource portfolios;
- a series of grid operations simulation models to evaluate resource adequacy and system risk;
- and distribution planning tools to assess potential network upgrades and non-wires alternatives.

## Key Findings

- **Regional technology planning provides an informed "starting point"** and minimizes prematurely screening out technology solutions that may be beneficial for a specific system.
- **Nodal capacity expansion planning (vs. zonal) is important** for integrated system planning to ensure consistent follow-on system cost and reliability evaluations.
- A multi-step approach to testing cost & reliability of candidate resource portfolios can find more robust solutions.
- **Linking production cost modeling scenarios with feasible power flow solutions is critical** for integrated planning. This supports identifying potential network reliability issues when planning future resource portfolios.
- Improving **power system reliability does not de facto come at a higher cost**. For example, the ISSP demonstration study shows that economic transmission upgrades can offset higher fixed and other costs.

The modeling framework is generalizable and is intended to be applied using a range of power system modeling tools already in use by electric companies and other industry stakeholders. Individuals or organizations interested in applying the framework are encouraged to speak with their software vendors to assess their model's capabilities to support the links presented in this study, or follow-up with Nidhi Santen for a customized model road-mapping assessment.

For more information, please contact Nidhi Santen [NSanten@epri.com](mailto:NSanten@epri.com)

## READ REPORT

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## Power sector impacts of the Inflation Reduction Act



EPRI researchers, using the [US-REGEN](#) model, led a new 11-model intercomparison study published in Environmental Research Letters. This study assesses the impacts of the

Inflation Reduction Act on the power sector.

## Key Insights

- **Power sector CO2 emissions could drop 66-87% by 2035 with IRA from 2005** (compared with 39-68% without IRA).
- IRA could accelerate clean electricity deployment, including **1.4-6.2 times current installed wind and solar capacity by 2035**.
- **Low-emitting generation shares**—including renewables, nuclear, and carbon capture—in 2035 **range from 59-89%** with IRA, compared with 46-74% without IRA
- Total fiscal **costs of IRA's power sector provisions could range from \$240-960 billion through 2035**. Energy costs could be \$73-370 per household per year lower by 2035 with IRA.

These results show higher clean electricity deployment and **lower emissions under IRA, compared with earlier U.S. modeling**, and change future baselines for policymaking and analysis. Although IRA helps to bring projected U.S. power sector and economy-wide emissions closer to near-term climate targets, no models indicate that these targets will be met with IRA alone, which suggests that additional policies, incentives, and private sector actions are needed.

For more information, please contact John Bistline [JBistline@epri.com](mailto:JBistline@epri.com)

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## ESCA Authors on the Fifth National Climate Assessment





Three members of EPRI's Energy Systems and Climate Analysis team were contributing authors on the Fifth National Climate Assessment (NCA5). This is the US Government's preeminent report on climate change impacts, risks, and responses that provides the scientific foundation to support informed decision-making across the United States. Across the U.S., mitigation and adaptation efforts are underway to combat the effects of climate change, but additional actions are needed to both plan for the changing climate and reach economy-wide net-zero by 2050.

Dr. John Bistline was a contributing author on the Mitigation Chapter, Dr. Delavane Diaz was a contributing author on the economics chapter, and Laura Fischer was a contributing author on the adaptation chapter. Coinciding with the release NCA5, they contributed to an op-ed on ['a glimpse of optimism on climate change'](#), published in The Hill. Delavane also [spoke with the Wall Street Journal](#) about the release, including the new economics chapter. The decarbonization scenario database for NCA5 was published in a [public scenario explorer](#) (including results from EPRI's US-REGEN model).

For more information, please contact John Bistline [JBistline@epri.com](mailto:JBistline@epri.com), Delavane Diaz [DDiaz@epri.com](mailto:DDiaz@epri.com), and Laura Fischer [LFischer@epri.com](mailto:LFischer@epri.com)

## Explore the Fifth National Climate Assessment

Mitigation Chapter

Economics Chapter

Adaptation Chapter

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**Quick Insight: How Large Electricity Customers Reduce their Indirect Scope 2 Greenhouse Gas Emissions**



This Technology Innovation (TI) program Quick Insight (QI) explores how large commercial and industrial (C&I) electricity consumers account for and report the greenhouse gas (GHG) emissions embedded in the electricity they buy to operate their businesses, and existing and emerging approaches companies can use to reduce these emissions.<sup>1</sup> It is intended to provide a quick overview and point to additional technical resources for senior executives and managers responsible for GHG emissions accounting, sustainability reporting, and corporate decarbonization strategy.

**KEY POINTS**

- A GHG emissions inventory accounts for the GHG emissions and removals attributable to a company's operations over a calendar year. A GHG emissions inventory typically includes a company's direct scope 1 emissions (e.g., emissions from combusting fossil fuels to generate electricity) and indirect scope 2 emissions (e.g., emissions associated with company purchases of electricity, heat, steam, and cooling for its own use). GHG inventories include emissions of carbon-dioxide (CO<sub>2</sub>) and other GHGs (e.g., methane).
- Scope 3 emissions are indirect and include 15 categories of "upstream" and "downstream" emissions. For example, scope 3 emissions for a natural gas supplier include emissions from combustion of the natural gas by their customers. Scope 3 emissions typically are considered optional for voluntary reporting, but stakeholders increasingly are requesting this information.

## READ HERE

This Quick Insight (QI) explores how large commercial and industrial (C&I) electricity consumers account for and report the greenhouse gas (GHG) emissions embedded in the electricity they buy to operate their businesses, and existing and emerging approaches companies can use to reduce these emissions. It is intended to provide a quick overview and point to additional technical resources for senior executives and managers responsible for GHG emissions accounting, sustainability reporting, and corporate decarbonization strategy.

For more information, please contact Adam Diamant [ADiamant@epri.com](mailto:ADiamant@epri.com)

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## Member Center

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

- Inflation Reduction Act Power Sector Tax Credit Selection and Technology Strategy ([3002027792](#)) - Program 178 and Program 201
- Harmonized Carbon Capture Costs for Integrated Modeling ([3002026706](#)) - Program 178
- Emissions and Energy Impacts of the Inflation Reduction Act ([3002026641](#)) - Program 201

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For more information about these programs, please contact [Nidhi Santen](#) (P178) or [John Bistline](#) (P201).

Thank you for your continued interest in our work. If you have any questions, please email [eea@epri.com](mailto:eea@epri.com).

Best,  
EPRI Energy Systems and Climate Analysis Group

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