

Leading Global Energy R&D for a Post-Pandemic Future

For the first time since the inception of the electric grid, global energy companies are simultaneously facing a common challenge as they respond to immediate pandemic impacts and prepare for an uncertain future.

Presented with pandemic-driven uncertainty and disruptions to everyday life, the extraordinary men and women across the electric power industry have responded admirably, working around the clock to keep the lights on for customers. Charting a path forward to a safe, clean, reliable, and affordable energy future for all will require a similar commitment.

Overcoming Today's Energy Challenges and Preparing for Tomorrow

As the world's leading energy research and development organization, the independent, nonprofit Electric Power Research Institute (EPRI) has worked with thousands of utility staff with expertise in generation, transmission and distribution, the environment, and end-use customers to identify the need for and scope of key research areas to address near- and long-term pandemic challenges.

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It's up to all energy stakeholders to rise to the challenges at hand and unlock better ways to provide the energy that improves quality of life and fuels global economies. Together we will create a better energy future for all.

— **Michael W. Howard, Ph.D., P.E.**
CEO, Electric Power
Research Institute

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Building a more resilient and flexible grid

Respond to pandemic-related demand shifts and operational challenges while improving demand forecasting and building a more flexible, resilient electric system for the future.



Ensuring employee health and safety

Meet critical energy needs at critical times by identifying new and existing technologies and techniques to keep critical facilities staffed and employees and customers safe.



Meeting customers' changing energy needs

Adapt to serve customers' needs where and how they use electricity by devising effective strategies to safely, securely, and efficiently control the grid from multiple locations.



Creating a cleaner energy future

Cultivate healthy environments with source-specific air quality improvements and meet desires of socially conscious consumers by finding better ways to integrate renewables and other low-carbon resources, achieve net-zero emissions, and drive decarbonization across the economy.

Driving Change Through Unparalleled Collaboration

Virtually every energy company on the planet is wrestling with how to best meet customers' energy needs during the pandemic and prepare for an uncertain future. This uncommon level of industry alignment presents a unique opportunity to benefit from EPRI collaboration. As increased clarity around lasting impacts begins to influence long-term planning, our ability to harness industry, government, and academia knowledge will help inform strategies to prepare the industry for the future.

- Engaging with hundreds of energy companies
- Bringing together world energy experts
- Realizing local opportunities through global insights

Charting a New Path for Society

Throughout the pandemic, EPRI has served as the vehicle to drive global collaboration among energy stakeholders, adapting existing tools and designs to operate as never before. Thousands of stakeholders worldwide have actively engaged and participated in webcasts, research, and analyses immediately following the pandemic's outbreak and throughout its duration, taking aggressive action and applying innovative techniques to illuminate the path forward for society.



June 2020



Building a More Resilient and Flexible Grid

Real-time insights on pandemic-related demand shifts and the need for greater grid flexibility bring new opportunities to improve the electric system's ability to better meet customers' critical energy needs during high-impact events caused by a range of physical and cyber threats.

Finding Cost-Effective Solutions from the Generator to the Customer

Innovations spanning the entire electric system aim to help utilities and operators reduce costs, save time, realize new value streams, and achieve environmental goals. Related R&D includes:



Modernizing the grid to enable flexible operations for normal, pandemic, or other emergency conditions through the implementation of advanced technologies that enhance transmission and distribution operation, improve system communications, and make full use of grid-connected customer resources.



Improving forecasting and mitigating demand impacts to meet critical needs across customer classes by developing a comprehensive pandemic resiliency roadmap that will extrapolate load profiles across seasons and expand the pool of mitigation options, while enabling rapid deployment of cost-effective technologies that preserve reliability.



Adapting to changing needs and preserving future reliability through dynamic asset management strategies to help balance customer costs and mitigate risks of deferred capital investments and maintenance, strategically adjust generation fleet missions for changing needs, prioritize remote work and monitoring capabilities investment, and provide technical basis for other near-term operational decisions with potential long-term impacts.



Extracting more customer value from existing resources by applying insights from energy systems around the world to better enable integrated, long-term planning, and continuous improvement in operations when faced with unexpected risks and uncertainty.

Applying decades of expertise every day

Integrating practical expertise with scientific-based evidence uncovers actionable insights and reproducible solutions for improving grid flexibility and resilience. In collaboration with hundreds of organizations representing industry, government, and academia, the institute is driving the transfer and widespread adoption of promising technologies and approaches with applications around the world.

With world-renowned experts actively engaged in global energy R&D – from system planning and power generation to power delivery and end-use customer technology adoption – EPRI has the know-how to find and deliver effective solutions, when and where they're needed most.

June 2020



Ensuring Employee Health and Safety

The pandemic has drawn widespread attention to a central tenet of the electric sector – providing safe and healthy work environment – with emerging R&D helping industry and relevant authorities overcome evolving challenges and deliver on this fundamental principle for employees and the public.

Keeping Our People Safe

Finding new ways to improve power generation, delivery, and use, while ensuring employee and public health and safety is more important than ever. This core focus has intensified throughout the pandemic to help industry better manage occupational exposure risk in operational, office, and customer settings. Related R&D includes:



Maintaining safe control center and power plant operations by identifying effective disinfection technologies and protocols to minimize the spread of illness and seamlessly address its impacts on the power system.



Keeping crews serving customers healthy through new approaches contemplating all manner of field operations, from health monitoring and PPE to customer interactions and storm restoration.



Advancing employees' skills without exposure by developing and implementing next-generation virtual training for operators and field crews without proximity, transforming unique, in-person training to effective, remote learning courses.

Uncompromising in Our Approach

EPRI brings together global health and safety experts within and beyond the electric sector to advance this shared commitment. By fostering broad engagement, capturing location-specific requirements, and applying scientific rigor, we identify and deliver relevant health and safety insights at the speed of innovation that are comprehensive and suitable.



Meeting Customers' Changing Energy Needs

Consistently delivering value as customers' expectations evolve amid a growing range of high impact, low-frequency events – from pandemics to supply chain disruptions – demands a multi-pronged strategy with the flexibility to adapt to a variety of unforeseen conditions and emerging risks.

Driving Innovation in Serving Customers

Ongoing collaboration enables immediate access to global leading practices, helping grid operators find new ways to improve operations and minimize impacts as issues arise affecting plants and people. Related R&D includes:



Enabling uninterrupted control center operations by developing and deploying necessary technologies and processes to modify human-system interfaces and functions based on the challenge, from addressing contact procedures and enabling enhanced remote monitoring and control to transitioning between main and backup centers and advancing system automation.



Maintaining commitments to customers through continuous learning in field operations under various scenarios, including prioritizing investments to respond to events in which challenges compound, cascade, and strain resources over large areas, such as responding to a severe storm during a pandemic.



Changing plans without impacting costs through flexible maintenance strategies that contemplate the near- and long-term impacts of deferring outages and maintenance to address unexpected disturbances, as well as accelerated development of tools, technologies, and training to better leverage all resources on the grid and enhance pandemic resilience.

Delivering When it Matters Most

EPRI prioritizes safe, reliable power as part of our public purpose mission. We remain vigilant in looking ahead to help industry prepare and be ready for the next major event. With unmatched visibility into global energy system operations and the ability to separate facts from fiction, EPRI can help utilities navigate an increasingly complex environment to better serve their customers today and in the future.



Creating a Cleaner Energy Future

A heightened societal focus on cultivating a healthy environment is galvanizing industry's transition toward a cleaner energy system in a post-pandemic future. Decarbonization is a global challenge requiring global solutions.

Delivering on Environmental Commitments

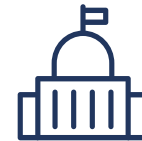
Affordable and reliable solutions seek to help energy companies achieve sustainable energy goals, while also enhancing prosperity and well-being of the communities they serve. Related R&D includes:



Driving deep, economy-wide decarbonization by examining and modeling air quality impacts during sequestration and other plausible scenarios and identifying cost-effective pathways to reduce near-term CO₂ emissions across sectors through electrification, telework, renewable energy integration, and low-carbon resources.



Advancing renewable energy adoption by continuing development of renewables and critical energy storage technologies, and incorporating new technologies to help operators maintain grid reliability through effective dispatch and strategic location of distributed energy resources, from utility-scale resources to behind-the-meter solar.



Removing barriers to cleantech advancement and adoption by gleaning insights from global industry, government, and academic experts on potential regulatory and policy constructs and comprising factors, such as public health benefits, technology trade offs, that enable sustainable energy investments.

Achieving Ambitious Decarbonization Goals Together

With a finger on the pulse of carbon reduction efforts around the world and economywide modeling capabilities, EPRI is poised to advance and scale low-carbon technologies and help inform discussions about varied approaches to realize future energy systems. As the pace of change accelerates, energy companies can adapt faster through EPRI's global ecosystem of talent, technology and knowledge that fosters peer-to-peer sharing of leading practices, emerging opportunities, and forward-focused ideas.

Engage in EPRI research in the following areas to help address a range of near- and long-term pandemic challenges.

Building a more resilient and flexible grid



[Near-Term Demand and Operational Impacts](#)

[Deferred Outages and Resource Adequacy](#)

[Asset Management Strategy](#)

[Long-Term Demand and Sustainability](#)

[Technology Deployment Support](#)

[Pandemic Resilience Roadmap](#)

Ensuring employee health and safety



[Health and Disinfection Methods and Technologies](#)

[Control Center Design and Processes](#)

[Field Crew Equipment and Processes](#)

[Pandemic-Resilient Operations and Maintenance](#)

Meeting customers' changing energy needs



[Control Center Design and Processes](#)

[Field Crew Equipment and Processes](#)

[Operator and Field Crew Training Methods](#)

Creating a cleaner energy future



[Long-Term Demand and Sustainability](#)

[Pandemic Resilience Roadmap](#)

[Pandemic Air Quality Assessment and Response](#)

[Air Quality Contributions from Different Sources](#)

[Potential Future Emissions Scenarios with Efficient Electrification](#)



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