

2022 RESEARCH PORTFOLIO



DRIVING TOWARD A CLEAN ENERGY FUTURE



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Everything is changing, and the mission is more important than ever. That is the fundamental challenge utilities face as the power system becomes more distributed, digitized, and cleaner. Customers want electricity anywhere, anytime. EPRI's 2022 research portfolio offers collaborative projects, customized research opportunities, thought leadership, and innovation to help energy companies simultaneously decarbonize the energy sector while maintaining the resilient, reliable, and affordable power system society has long depended on. From the research that improves energy efficiency and seamlessly integrates more renewable energy resources to projects that accelerate the shift toward electrified transportation, EPRI's portfolio provides the expertise that utilities and their stakeholders need to bring their clean energy vision to life.



BENEFITS OF PARTICIPATION

Energy organizations who engage in EPRI research, development, and demonstration programs have unique opportunities to:

- Identify and solve critical and emerging industry issues.
- Stay at the forefront of technology innovation.
- Gain access to a comprehensive, timely RD&D portfolio.
- Collaborate and network with industry peers through advisory councils and committees.
- Implement technology through the support of our researchers and technical advisors.
- Reduce future investment risks.
- Inform policies with objective, science-based findings and facts.

EPRI is the only collaborative science and technology organization serving global energy stakeholders.

EPRI offers independent, objective scientific research, expertise, and innovative technology to help you cut costs, satisfy customers, and build for the future. With ready access to our highly respected staff, quality products, and unique services, our members are better prepared to compete in today's marketplace.



TECHNOLOGY INNOVATION

Driving thought leadership and advanced R&D—including scouting and incubation—to inform strategic decision making and focus electricity-based innovation on societal objective

INTRODUCTION

Technology Innovation (TI) is a core benefit of EPRI membership, focusing strategic collaboration and early-stage R&D on a clean, reliable, affordable, and equitable energy future. TI investments, which total more than \$30 million annually, help lead the electric sector in beneficial directions and fill EPRI's R&D pipeline with new technologies and novel solutions.

EPRI TI objectives are to accelerate economy-wide decarbonization, build resilience across electricity and other critical infrastructures, and advance business models, markets, policies, and regulations to enable the transition to low-carbon energy systems. Experts manage early-stage R&D programs and projects throughout EPRI's Generation, Nuclear, and Power Delivery and Utilization sectors.

EPRI TI involves exploration, ideation, collaboration, and acceleration across three programmatic components:

- **Strategic Insights:** Synthesis and communication of key observations, learnings, challenges, and opportunities for the energy future, leveraging EPRI and other R&D, broad stakeholder input, and cutting-edge analyses.
- **Global Innovation Hub:** Platforms for direct engagement with world-leading clean energy incubators and startups and for active participation in interest groups and other forums that bring together utility, industry, and other stakeholders.
- **Early-Stage R&D:** Exploratory and applied R&D programs and projects focusing on strategic research gaps, crosscutting areas of science and technology, and innovations aligned with the roadmaps of EPRI's sectors.

The EPRI TI portfolio is highlighted in the following sections. EPRI members have access to all TI products, many of which are publicly available at no cost, to help inform the broadest possible audience. More information is available on the [EPRI TI homepage](#) and from the *2020-21 Technology Innovation Prospectus: Pathways to a Decarbonized Future* ([3002019513](#)).



STRATEGIC INSIGHTS

EPRI TI fosters visionary thinking, conducts integrated energy analysis and modeling studies to illuminate

recent developments and emerging issues, and aligns technology scouting and strategic R&D with high-impact gaps and opportunities. White papers, briefs, infographics, webcasts, and other delivery mechanisms communicate influential and timely information. Check thoughtleadership.epri.com for the latest insights.

Examples include:

- **The Integrated Grid** concept—introduced in 2014 for realizing the full value of distributed energy resources—is becoming a reality through interoperability demonstration projects worldwide.
- The future **Integrated Energy Network** (IEN), which will provide consumers with low- and zero-carbon energy services and a high level of resilience across electricity and other lifeline infrastructures.
- **Powering Decarbonization: Strategies for Net-Zero CO₂ Emissions** (3002020700) and **Global Energy Perspectives: Value of Resilience** (3002020795) outline key IEN opportunities and challenges facing diverse stakeholders.
- A new EPRI TI modeling study defines pathways for meeting increasingly ambitious emission reduction timelines set by energy service providers and governments worldwide while also achieving customer affordability and resiliency objectives.



GLOBAL INNOVATION HUB

EPRI TI coordinates the **Incubatenergy Network**, which brings together leading clean energy

incubator and accelerator programs and provides access to hundreds of vetted startups. Global connections are leveraged through the **Incubatenergy Labs Challenge**—an annual accelerator partnering selected startups with host utilities to demonstrate novel solutions based on real-world data and operating environments. EPRI's **TechPortal** integrates information on Incubatenergy programs, Integrated Grid and other demonstrations, and more than 1500 innovative technologies—from promising concepts to early commercial solutions.

EPRI's innovation hub offers growing engagement opportunities, including:

- **The Global Innovation Excellence Forum** convenes high-level utility executives to share leading practices and processes for fostering a culture of innovation.
- **The Disruptive Innovation Interest Group** supports technology and business managers in anticipating the future energy system.
- The **Value of Resilience Interest Group** engages diverse stakeholders to guide EPRI's thought leadership and help participants develop strategies for mitigating the impacts of extended outages on customers and society.
- Additional working groups address utility business models, blockchain, and nuclear fusion. New forums are planned to help drive insights in key areas.



EARLY-STAGE R&D

About 75% of the annual EPRI TI portfolio is devoted to identifying early-stage R&D. This includes multi-year, multi-

project programs and initiatives building foundational knowledge and nurturing innovations from validated concept to pilot demonstration, as well as individual studies exploring new ideas and novel applications.

EPRI TI programs, initiatives, and projects address one or more of the strategic gaps identified below. Many projects involve crosscutting R&D where success with one application could lead to others across the electricity value chain. Promising technologies and solutions transition to EPRI's sectors for further development and utility implementation.

Strategic Research Gaps

- Clean Energy
- Reliability, Resilience, and Flexibility
- Market Transformation

Crosscutting Areas

- Artificial Intelligence & Data Analytics
- Information, Communications & Cyber Security
- Materials, Manufacturing & Nondestructive Evaluation
- Environment, Health & Safety
- Equity & Social Justice

Low-Carbon Resources Initiative (LCRI)

Launched in 2020, the LCRI aims to accelerate the deployment of low- and zero-carbon technologies needed to enable deep, economy-wide decarbonization. Based on input from dozens of industry sponsors and hundreds of technical contributors across the global energy sector and R&D community, the LCRI builds knowledge and identifies and advances innovations in key technology areas. Results will guide demonstrations addressing production, delivery, storage, and utilization of renewable fuels and other clean energy carriers.

Efficient Electrification

Complementing early-stage R&D with market transformation activities, EPRI TI has helped highlight the value of electrification as an increasingly important element in efficiency programs and decarbonization strategies. Building heating, cooling, and control innovations are in early commercial deployment, and next-gen technologies are in the pipeline. Meanwhile, EPRI-led efforts to create interoperability standards and solutions for electric vehicle charging are expected to facilitate mass-market adoption.

Clean Energy, Equity & Justice

According to EPRI's analyses, decarbonization creates opportunities to deliver significant economic, social, and environmental benefits to communities historically subject to underinvestment, injustice, and high pollution levels. In 2021, EPRI began organizing stakeholder dialogue around a just and equitable clean energy transition and providing technical support for identifying promising policies, programs, and projects and helping build partnerships with trusted community organizations.



GENERATION

Providing nonnuclear and renewable generating fleets with safe, reliable, economical, and environmentally responsible electricity production technologies

Perhaps the most visible manifestation of the clean energy transformation underway is the solar panels and wind turbines that increasingly dot landscapes across the globe. Achieving a clean energy future and net-zero carbon emissions targets will depend in large part on the reliable and cost-effective operation of wind, solar, hydropower, and other clean energy assets.

EPRI's generation sector pursues research initiatives that optimize the performance, evaluate the technologies, and improve the grid integration of renewable generation. For example, EPRI's solar research involves collecting and sharing best practices throughout the life cycle of solar plants already deployed and assessments of the capabilities and limitations of existing and cutting-edge technologies.

The generation sector's research initiatives extend beyond the reliable operation of renewable generation assets. For example, as more intermittent generation is connected to the power system, flexibility will become increasingly important—the wind doesn't always blow, and the sun doesn't always shine. EPRI's research into bulk energy storage aims to accelerate the large-scale deployment of dispatchable power assets that will be needed as installations of variable renewable energy continue to gain momentum.

Although there is a global push toward economy-wide decarbonization, a successful transformation to a clean energy future requires existing coal and gas power plants to perform reliably and often operate more flexibly than ever before. Heat rate and flexibility research provide technical guidance plant and fleet operators need to run their assets to meet new market and regulatory demands while maintaining reliability and safety. As more coal plant retirements are announced, EPRI's research also provides best practices to successfully navigate end-of-life issues and plant decommissioning.

The pursuit of a clean energy future is primarily driven by a desire to improve environmental conditions, particularly air and water quality; a transition to low- or no-emission energy sources can promote better public health and environmental equity and justice. The generation sector's research covers a range of environmental topics, including emissions controls at fossil fuel plants, water treatment technologies, and the protection of fish and other aquatic species.

In each of these areas, the ultimate objective is to provide a technical and scientific basis on the implications of technology options to enhance decision making. For example, EPRI's research includes a multi-disciplinary approach that combines epidemiology and toxicology expertise to better understand uncertainties about the health effects of air pollution. The work aims to support public health policies and standards with up-to-date scientific data and analyses.



MAJOR COMPONENT RELIABILITY

R&D for major components is an important aspect of the Generation portfolio in providing insights

around critical equipment, understanding of degradation mechanisms, and comprehensive life-management strategies.

- * Boiler Life and Availability Improvement – P214
- * Power Plant Piping – P215
- * Gas Turbine Life Cycle Management – P216
- * Gas Turbine Advanced Components and Technologies – P217
- * Heat Recovery Steam Generators – P218
- * Steam Turbines and Auxiliary Systems – P219
- * Generators and Auxiliary Systems – P220



ADVANCED GENERATION

Programs in the Advanced Generation research area are focused on accelerating the development and

commercial application of low-carbon fossil-based power generation and bulk energy storage technologies. The research includes CO₂ capture technologies and large-scale thermal energy storage. At the same time, new plant concepts and designs address technical risks, economic and environmental performance, and the challenges of deploying these new technologies.

- * Bulk Energy Storage – P221
- * Advanced Generation and Carbon Capture and Storage – P222



ASSET MANAGEMENT AND OPTIMIZATION

The generation fleet is operating with more emphasis on flexibility, efficiency, and asset and

plant management. The programs in this research area offer guidance, technology solutions, demonstrations, and training materials to support the evolving needs of the industry.

- * Heat Rate and Flexibility: Generation Fleet Optimization – P223
- * Integrated Asset Management – P224
- * Plant Management Essentials – P225
- * Boiler and Turbine Steam and Cycle Chemistry – P226



ENABLING TECHNOLOGIES

The Enabling Technology programs provide integrated research solutions to ensure

reliable and efficient equipment and plant performance while also meeting safety and security standards in a changing industry. The programs provide research to support fleets with cyber security concerns, flexible operations, data collection and analysis, and material repair and mitigation strategies.

- * Process Control and Automation – P227
- * Monitoring and Advanced Data Analytics – P228
- * Materials and Repair – P229
- * Cyber Security for Generation Assets – P209



ENVIRONMENTAL CONTROLS FOR CURRENT AND FUTURE FUELS

The Environmental Controls program area

seeks to minimize all current or anticipated controlled emissions for fuels, including gas, coal, and biofuels. Emissions include NO_x, CO, ammonia, formaldehyde, SO_x, mercury, and particulates.

- * SCR Performance for Gas and Other Fuels – P232
- * Emissions Measurements and Monitoring for Gas and Other Fuels – P233
- * Combustion and Carbon Control Issues for All Fuels Supplemental Program
- * Emissions Controls for Coal and Other Fuels Supplemental Program



AIR QUALITY, METHANE, AND MULTIMEDIA SCIENCES

Programs focus on the characterization of methane emissions, the

development/evaluation of air quality models and ambient measurement technologies, and the characterization of multimedia releases. Research in this area also includes assessments that inform the implementation and development of air quality standards, including evaluation of health effects of key pollutants from electricity generation and other health issues in the energy transition.

- * Air Quality Models and Measurements – P234
- * Air Quality Assessments and Multimedia Characterization – P235
- * Air Quality and Health in the Energy Transition – P236
- * Methane Characterization in Electric Utility Natural Gas Systems – P243
- * Toxic Substances and Health: Air, Land, and Water Supplemental Program



WATER MANAGEMENT

Providing a diverse area of research, these Generation programs help improve water management both in the cooling systems and

wastewater streams of power plants. The programs provide technology development and operational guidance to ensure efficiency, water treatment and quality management, and the management of the environmental effects of source discharges.

- * Cooling System Technologies and Equipment – P237
- * Water Treatment Technologies – P238
- * Aquatic Resource Protection – P239
- * Water Quality and Effluent Guidelines – P240



COAL COMBUSTION PRODUCTS MANAGEMENT AND LAND USE

Providing the electric power industry with R&D

around the challenges and opportunities for managing coal combustion products (CCPs) is central to this research area. The programs offer cost-effective CPP management and recycling practices to enhance environmental protection. Research is conducted using scientific data, engineering knowledge, restoration methods, models, and other advanced tools and guidance associated with CCP storage, disposal, and use.

- * Coal Combustion Products Management – P241
- * CCP Land and Groundwater Management – P242



RENEWABLE ENERGY

The renewable energy programs support the transition to a clean energy future by helping quantify the cost, technical

performance, and reliability characteristics of utility-scale renewable generation technologies to inform planning and generation fleet management decisions. The renewable energy programs support operations and maintenance, technology development, and assessments on wind, solar, and hydropower assets.

- * Wind Power Generation – P206
- * Solar Generation – P207
- * Hydropower Generation – P208
- * Renewable Economics Supplemental Program
- * Environmental Aspects of Wind Supplemental Program
- * Environmental Aspects of Solar Supplemental Program
- * Environmental Aspects for Hydropower Supplemental Program



NUCLEAR

Connecting the global nuclear community to timely, cost-effective R&D solutions

By definition, discussions about a clean energy future are forward-looking. Yet any realistic blueprint of the technologies, regulations, policies, and business models needed to achieve deep decarbonization goals will need to include a significant role for today's largest source of carbon emissions-free electricity: nuclear power.

According to the U.S. Department of Energy (DOE), nuclear energy provided over 50% of the nation's carbon-free electricity in 2020. It's a similar story worldwide, with 440 reactors delivering about 10% of the world's electricity and around 30% of all low-carbon power. Keeping these existing sources of zero-carbon electricity operating for extended time horizons is a vital element of a clean energy strategy. Equally important for the longer term will be the successful deployment of advanced nuclear energy technologies that offer additional flexibility and adaptability to meet the needs of evolving energy markets.

While the average age of nuclear power plants worldwide is over 30 years, these facilities can be safely operated for 80 years or more through proven monitoring and aging management practices. Ongoing EPRI research programs devoted to materials management, plant performance, and fuels and chemistry help plant operators establish the technical basis for life extension. EPRI|U offers courses addressing topics of interest to those operating these plants.

While safety and reliability are essential, the viability of existing nuclear power plants is also about economics. Changing market conditions—including the growing penetration of renewable generation—have highlighted the importance of cost reduction at nuclear plants to maintain competitiveness. EPRI research provides numerous tools and insights for plant operators to lower their costs, including inspection optimization, automation, and artificial intelligence, to increase the efficiency and effectiveness of decision making and maintenance.

The role of nuclear power in achieving a clean energy future is by no means limited to the continued operation of existing reactors—and EPRI's research is also aimed at developing new technologies that aid and accelerate the shift to carbon-free electricity. Research initiatives include a focus on advanced reactor designs, materials, and advanced manufacturing processes and techniques. EPRI research also seeks to analyze the business case for various nuclear power uses beyond providing baseload electricity, including hydrogen production, industrial heating, and multi-product energy parks.



MATERIALS MANAGEMENT

Research increases the understanding of materials aging mechanisms in nuclear reactors and develops

technologies to identify, characterize, mitigate, monitor, and repair degradation.

Programs include:

- International Materials Research
- Pressurized Water Reactor Steam Generator Management Program
- Boiling Water Reactor Vessel and Internals Program
- Pressurized Water Reactor Materials Reliability Program
- Welding & Repair Technology Center
- Nondestructive Evaluation and Material Characterization



FUELS AND CHEMISTRY

Research provides technical bases for preventing fuel failures and investigates improved fuel options

for enhancing plant safety and economics while maintaining high reliability. Provides guidance and technologies to improve water chemistry practices, enhance high-level and low-level waste management, and reduce radiation exposure.

Programs include:

- Fuel Reliability
- Used Fuel and High-Level Waste Management
- Nuclear Fuel Industry Research Program (NFIR)
- Radiation Safety Program
- Remediation and Decommissioning Technology
- Water Chemistry Program



PLANT PERFORMANCE

Research provides tools, techniques, and practices that enable nuclear plant owners to make technically sound design,

maintenance, and operational decisions, contributing to high equipment reliability and enhanced plant safety.

Programs include:

- Nuclear Maintenance Applications Center
- Plant Engineering
- Instrumentation and Control
- Risk and Safety Management



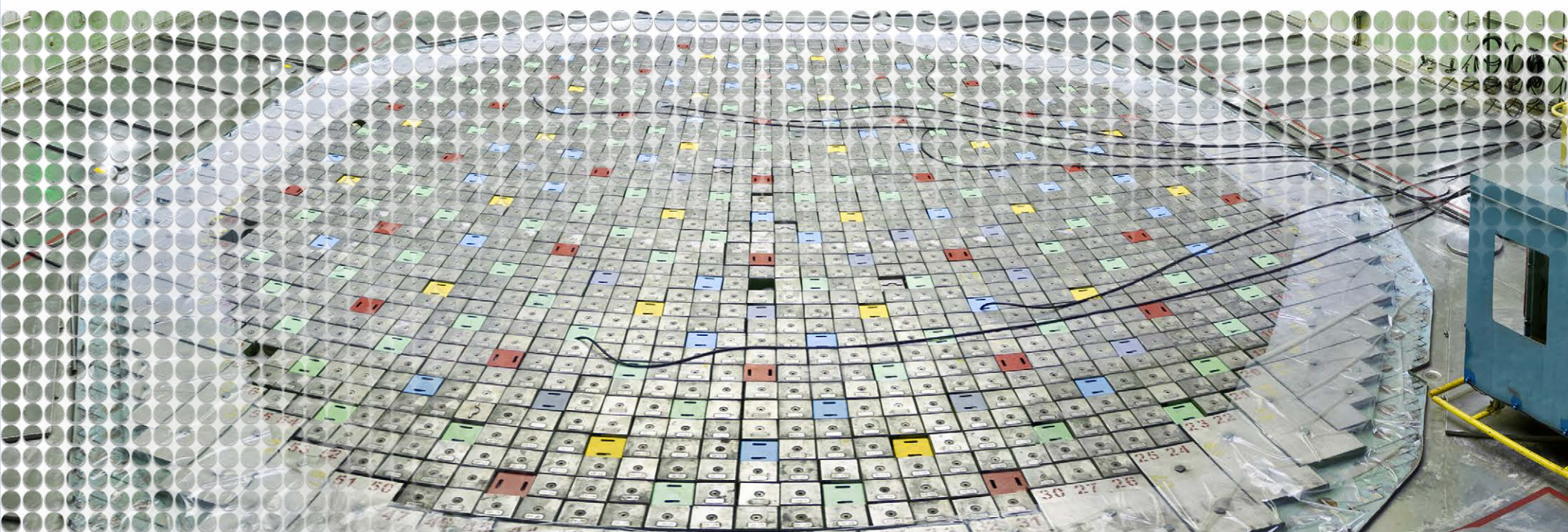
STRATEGIC INITIATIVES

The research incorporates plant operating experience and research results into tools and guidance that reduce risks associated

with deploying technologies, processes, and new plants. Informs decisions on extended and flexible operations of nuclear plants and provides improvement approaches to plant decommissioning activities.

Programs and initiatives include:

- Advanced Nuclear Technology
- Data-Driven Decision Making (3DM)
- Flexible Operations Program
- Nuclear Plant Modernization
- Nuclear Beyond Electricity





POWER DELIVERY & UTILIZATION

Providing transmission, distribution, end-use, sustainability, and analytics R&D to enable utilities and stakeholders to achieve safe, resilient, affordable, reliable, and environmentally responsible energy systems

A defining feature of a clean energy future is an economy with net-zero carbon emissions. Achieving the deep decarbonization required to reach that objective will require unprecedented innovation, collaboration both within the electric power industry and across society, and science-based research to solve challenges and uncover new opportunities.

EPRI's Power Delivery and Utilization sector takes a holistic approach to accelerate progress toward a decarbonized clean energy future. EPRI's research builds on and accelerates the decarbonization potential that efficient electrification can deliver to societies. In some cases, the research provides technical guidance to facilitate and increase the deployment of technologies, like heat pumps and distributed energy resources (DER).

Efficient electrification research extends beyond single technologies to the systems and connections that need to be forged to drive decarbonization in buildings, entire communities, and across newly electrifying industries like transportation and agriculture.

As electrification expands as a tool to decarbonize a growing number of industries, society's dependence on electricity will only increase. Our research further seeks to develop or enhance the tools, technologies, and approaches

needed to guide utilities and stakeholders toward safe, reliable, resilient, and environmentally responsible operation of the bulk power transmission and distribution systems. One important track of this work is developing and evaluating the tools and models necessary to ensure that existing and emerging resources are adequate to maintain reliability and resiliency as the overall mix of resources changes.

Cyber security is a core and increasingly important component of grid reliability and resiliency. Whether it's the emergence of new grid-connected resources like electric vehicles (EVs) and smart thermostats or the deployment of digital instrumentation on existing assets, the grid is increasingly dependent on secure information technology and telecommunications infrastructures. EPRI's cyber security research works to develop the tools and methods necessary to identify and assess security gaps and the ability to effectively and cost-efficiently address them.

As societies move toward clean energy goals, everyone must share the economic and environmental benefits of a clean energy future. EPRI's research seeks to help all communities achieve the full potential of that future while helping mitigate the ecosystem and worker safety impacts of decarbonization.



TRANSMISSION AND SUBSTATIONS

Transmission asset owners face many issues—among them, aging infrastructure, stringent operating requirements, financial constraints, and retiring expertise—that make maintaining and managing

assets challenging. They seek safe, reliable, resilient, and cost-effective operations from their transmission lines and substations. EPRI's research provides the technical basis to support critical decisions in all phases of asset management, including guidelines for new component specifications, engineering software tools, advanced asset health algorithms, new sensing technologies, and inspection and assessment tools. Reference and field guides support personnel ranging from early career to expert.

- ✦ Transmission Asset Management Analytics – P34
- ✦ Overhead Transmission – P35
- ✦ Underground Transmission – P36
- ✦ Substations – P37



TRANSMISSION AND DISTRIBUTION ENVIRONMENTAL IMPACTS

Transmission systems have challenges in right-of-way land management and permitting. Distribution systems must now support a smarter grid with integrated

distributed energy resources and electrified end-use products like EVs. EPRI's research works to minimize species interactions with transmission and distribution systems focusing on the mitigation of species interactions, vegetation management methods, and technologies aimed at increasing the resiliency of T&D infrastructure. It also examines potential human health risks from electric and magnetic fields and radiofrequency exposure to benefit the surrounding ecosystems and communities.

- ✦ Transmission and Distribution: Environmental Issues – P51
- ✦ Electric and Magnetic Fields and Radio-Frequency Health Assessment and Safety – P60



TRANSMISSION OPERATIONS AND PLANNING

Transmission system owners are increasingly challenged to operate today's power system while also planning for the electric system of tomorrow.

Decarbonization drives fundamental change in electricity supply with significantly higher levels of variable and energy-limited resources and decreasing levels of dispatchable synchronous generation. EPRI's research provides analytics for understanding the changing operating environment and methods and tools to guide planning and operating decisions. It develops new models and associated tools for validating models, assessing reliability and economic parameters, and providing visualization and decision support for planners, operators, and system protection engineers.

- ✦ Transmission Operations – P39
- ✦ Transmission Planning – P40
- ✦ Bulk System Integration of Renewables and Distributed Energy Resources – P173





DISTRIBUTION

Changing customer expectations, regulatory and policy initiatives, extreme weather, and the need to integrate DER and advanced technologies are driving changes to the way distribution utilities

plan and operate the grid. In response, utilities are making investments in people, processes, and technology to modernize the grid and meet the future needs of the utility and its customers. EPRI's research informs all aspects of distribution grid modernization, including the technical basis for key decisions in all phases of the asset life cycle, new tools and enhanced methods to plan and operate an integrated distribution system, advanced grid technology, DER technology and its integration with the grid, safety, and leading workforce practices.

- ✦ Energy Storage and Distributed Generation – P94
- ✦ Distributed Energy Resources Integration – P174
- ✦ Distribution Systems – P180
- ✦ Environmental Aspects of Fueled Distributed Generation and Energy Storage – P197
- ✦ Distribution Operations and Planning – P200



INFORMATION, COMMUNICATION, AND CYBER SECURITY

From informing the latest communication standards and devices that enable connectivity to navigate cyber security risks, guidance, and protocols, these

programs touch on many areas of research across EPRI's sectors. A common thread is to create a fully integrated, controllable, and communicating grid to enhance security and resiliency and optimize the value of distributed and central energy resources. Communication and cyber security requirements for transmission, distribution, electric transportation, and demand response provide input into developing and assessing standards and communication protocols. Also emerging from this research are technologies such as smart meters, augmented reality, the digital worker, outage management detection, and communication tools.

- ✦ Information and Communication Technology – P161
- ✦ Cyber Security for Power Delivery and Utilization – P183



ENERGY SYSTEMS AND CLIMATE ANALYSIS

Global power sector transformation drives changes in company operational decisions, investment strategies, environmental management, resource planning, business strategies, policy creation, and industry structure. EPRI's research provides technical data and information, analytic tools, and insights to support resource and strategic planning through this evolution. Research focuses on economic, policy, and planning aspects of change, including decarbonization, emerging and advanced technologies, electrification, and climate impacts.

- ✦ Resource Planning for Electric Power Systems – P178
- ✦ Energy, Environmental, and Climate Policy Analysis – P201





ELECTRIFICATION AND CUSTOMER SOLUTIONS

Achieving economy-wide clean energy goals will depend in part on end-customers and their choices. New customer technologies and services can reshape how electricity

is produced and consumed, bringing the potential for new customer value and impacts to usage patterns, power quality, and service reliability. Such technologies and services include energy-efficient and flexible equipment and appliances, electric vehicles and other electrified end-uses, and advanced buildings with generation and storage capabilities. EPRI's research and applications provide insight on performance and customer expectations to help utilities lower costs and manage risk by designing more effective programs and services. By understanding customer trends and impacts, utilities can find opportunities to optimize system performance while maintaining a customer-centric focus.

- ✦ Power Quality – P1
- ✦ Electric Transportation – P18
- ✦ Customer Technologies – P170
- ✦ Customer Insights – P182
- ✦ Electrification – P199
- ✦ Advanced Buildings – P204



SUSTAINABILITY AND ECOSYSTEM STEWARDSHIP

Corporate strategies increasingly emphasize sustainability, moving to a comprehensive focus on economic, environmental, and social responsibility.

EPRI's research explores and develops the science, tools, and resources companies can use to mitigate compliance risk and embed a stewardship mindset into day-to-day activities, long-range planning, and corporate culture. This expanding view of sustainability includes multifaceted scientific research, value analysis, and innovative solutions to help power companies achieve business objectives, deliver value to communities served, and support the vitality of local ecosystems.

- ✦ Ecosystem Risk and Resiliency – P55
- ✦ Endangered and Protected Species – P195
- ✦ Strategic Sustainability Science – P198



WORKER AND COMMUNITY HEALTH AND SAFETY

Workplace exposures and injuries affect employee health, quality of life, productivity, and job satisfaction while increasing business costs. EPRI's research

focuses on innovation and developing new knowledge to reduce serious injuries and fatalities (SIFs). Program products, data analyses, and tools help utilities maintain safer, healthier work and community environments, identify injury and illness trends, develop cost-effective ergonomic interventions, and address occupational exposures. Research results also help advance awareness of how a company's safety performance is influenced by its culture, safety management systems, and business operations.

- ✦ Occupational Health and Safety – P62



WORKER HEALTH AND SAFETY RESEARCH

Health and safety considerations are a top priority for all aspects of the utility industry and will continue to be of critical importance during the energy transition. EPRI worker health and safety research is embedded in various programs. Some of the work is crosscutting in nature, while other research aligns more closely with specific assets. Some examples of programs and topical areas are illustrated below.

CROSS-CUTTING



Occupational Health and Safety
– P62

- Ergonomics
- Fatigue Management
- Heat Stress
- Job-Site Hazard IDing
- Vehicle/Driving Safety
- Human Performance
- Data Analytics

POWER DELIVERY & UTILIZATION



Overhead Transmission
– P35

- Equipment, Field Inspection, Guides
- Digital Worker
- Drones/UAS
- Lifting & Rigging
- Robotic Inspection
- Safety by Design
- Live Working



Substations
– P37

- Safe Substation Grounding
- Fire-Resistant Transformer Fluids
- Equipment, Field Inspection Guides
- Digital Worker
- SF6 Handling & Safety
- Switching & Safety
- Robotic Inspection



Distribution Systems
– P180

- Arc Flash Testing/Analysis
- Drones/UAS
- Downed Conductors
- Grounding
- Manhole Safety



Electric & Magnetic Fields, Radio-Frequency Health Assessment & Safety
– P60

- Occupational EMF & RF Exposures



Underground Transmission
– P36

- Confined Spaces
- Robotic Inspection
- Safety by Design
- Digital Worker

POWER DELIVERY & UTILIZATION



Energy Storage
– P94

- Battery Energy Storage Fire Safety



Environmental Aspects of Fueled DG and Energy Storage
– P197

- Battery Energy Storage Fire Safety
- DG Operations

GENERATION



Integrated Asset Management
– P224

- Equipment, Field Inspection Guides



Plant Management Essentials
– P225

- Emergency Management
- Lockout/Tagout
- Human Performance
- Digital Worker



Boiler and Turbine Steam & Cycle Chemistry
– P226

- Flow Accelerated Corrosion



Nuclear Power
– P41

- Radiation Safety
- Flow Accelerated Corrosion
- Digital Worker
- Robotic Inspections and Surveys
- Lifting and Rigging

GETTING THE MOST FROM YOUR PARTICIPATION

To realize the greatest value from EPRI's programs, we encourage you to:

- Participate in advisory meetings to help shape the direction of our research.
- Access and apply leading-edge results within your company.
- Discuss your emerging or ongoing needs with your EPRI Technical Advisor or International Regional Manager.
- Obtain an epri.com login ID to gain access to EPRI's ongoing research collaboratives and products.

Contact EPRI

To discuss options and solutions for your needs:

- Call EPRI at 800.313.3774, and press 4 to connect with EPRI's Customer Assistance Center.
- Send an e-mail to askepri@epri.com, and ask for an EPRI representative to contact you.



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