NARUC
National Association of Regulatory Utility Commissioners

MINI GUIDE

A Guide for Public Utility Commissions: Building Internal Technical Capacity and Recruiting Talent for Grid Resilience

Prepared for the National Association of Regulatory Utility Commissioners (NARUC) Center for Partnerships & Innovation supported by the U.S. Department of Energy, Grid Deployment Office

Prepared by Hyleah O'Quinn, NARUC

Acknowledgments

The authors wish to thank Matt Landi, U.S. Department of Energy, Office of Electricity, and Jeff Loiter, National Association of Regulatory Utility Commissioners for contributing their time and expertise to the development of this paper.

Table of Contents

Introduction

In recent years, there has been a sharp rise in grid resilience investment driven by increasingly severe weather events, emerging cybersecurity threats, and aging electric infrastructure. A 2024 U.S. Energy Information Administration (EIA) report shows that U.S. utilities increased their annual spending on electric infrastructure from $287 billion in 2003 to $320 billion in 2023,[1] inflation adjusted. These capital investments were largely fueled by the needs of grid hardening, upgrades of aging generation and delivery infrastructure, integrating renewable generation, and deploying smart-grid technologies. This acceleration is emphasized by historic levels of federal funding for the electric grid, through formula grants for states and Indian Tribes.[2] Significant funding authorized under Section 40101(d) of the Bipartisan Infrastructure Law has been disbursed nationwide, driving increased utility investment in grid resilience, transmission capacity, and system modernization.

This surge of funding represents not only an opportunity to strengthen the electric grid, but also a regulatory challenge: public utility commissions (PUCs) are tasked with evaluating proposals shaped by evolving grid priorities, including rising load growth, transmission expansion, and electrification. Alongside advanced forecasting models, severe weather risk assessments, distributed energy resources (DERs) integration, and long-term infrastructure planning. The DOE notes that the U.S. transmission system must evolve to "reliably service the nation's electricity customers as the power sector continues to transition to cleaner resources," reinforcing the heightened demands this places on regulatory decision-making. To continue providing effective oversight, PUCs must consider acquiring staff with specialized technical talent who can assess both the operational feasibility and economic prudence of resilience proposals.

This guide offers insight into how PUCs can strategically expand their technical workforce to meet evolving gird resilience demands. It outlines critical skill sets needed to support informed regulatory decision-making around resilience, such as modeling and weather forecasting, electric power systems analysis, and advanced data interpretation. In addition, it provides strategies for developing technical talent both internally and through additional recruitment efforts. Two appendices provide a list of grid resilience training resources and a compendium of sample job descriptions that reflect grid resilience technical expertise for PUC consideration.

Understanding Grid Resilience in a Regulatory Context

Grid resilience encompasses a broad set of concepts with varying definitions depending on jurisdiction or stakeholder perspective. Within the utility regulatory context, grid resilience is often referred to as the electric system's ability to withstand, adapt to, and recover from high-impact events. These events include extreme weather, wildfires, cybersecurity or physical infrastructure attacks, and fuel supply disruptions, among others. To improve grid resilience, PUCs evaluate utility proposals, set investment priorities, establish performance expectations, and attempt to align utility plans with state or regional policy goals.

Across the electric power and energy infrastructure sectors, resilience is often described through four core attributes or domains that, despite differing in terminology, collectively represent the resilience lifecycle. The DOE has framed resilience in distribution systems[3] using the following domains:

- **Preparedness**: Preparing for known and emerging threats by integrating resilience in resource planning, distribution, transmission upgrades, and hazards-specific infrastructure roadmaps.
- **Withstand**: Ensuring the grid can continue functioning during disruptions through real-time monitoring, DER integration, and smart technologies.
- **Response**: Tracking emergency response and outage restoration protocols.
- **Recovery**: Long-term strategies to incorporate lessons learned from past disruptions and to better reflect resilience goals.

  These domains or stages reflect a common understanding of resilience as a multi-phase process that is critical for grid resilience planning efforts. Each of these domains requires a level of technical expertise that can support informed regulatory decision-making. Here are some examples of each domain alongside the corresponding areas of expertise that could be essential for PUCs.

---

1 U.S. Energy Information Administration, "Grid infrastructure investments drive increase in utility spending over last two decades", November 18, 2024, https://www.eia.gov/todayinenergy/detail.php?id=63724

2 U.S. Department of Energy, Grid Resilience State/Tribal Formula Grants Program, https://www.energy.gov/gdo/grid-resilience-statetribal-formula-grants-program

3 U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, July 01, 2025, https://www.federalregister.gov/documents/2015/07/01/2015-16186/electric-grid-resilience-self-assessment-tool-for-distribution-system

Table 1. Four Pillars of Grid Resilience and Implications for PUC Staffing

Resilience Domain/Pillar	Description	Example Technical Roles Needed in PUCs
Preparedness	Planning, risk assessment, and hazard awareness	Environmental scientists, emergency planners, data scientists, severe weather modeling and forecasting professionals
Withstanding (also known as Mitigation)	Hardening infrastructure to resist or absorb shocks	Power systems engineers, cybersecurity experts, Distributed Energy Resources (DER) analysts
Response (also known as Adaptation)	Actions during events; adaptive operational strategies	data scientists, telecommunication experts, electrical engineers,
Recovery	Restoring services and operations after disruption	technology integration professionals, resilience planners, data modelers and forecasters

To illustrate how these resilience domains translate into concrete regulatory actions, the table below summarizes several commissions' stated resilience priorities and the types of expertise they employ or are likely to require to assess and implement grid resilience efforts.

Table 2. State Utility Commission Approaches to Grid Resilience

State PUC(s)	Resilience Priority	Regulatory Effort or Action	Technical Expertise
Oregon	Wildfire Mitigation	Rulemaking (AR-638)[4] on wildfire protection plans; facilitated the Wildfire & Electric Collaborative workshops for stakeholder input.	Wildfire science, Geographic Information Systems (GIS) analytics, severe weather modeling and data analysis
Texas	Winter Weatherization	Implementation and enforcement of 16 TAC §25.55[5] weatherization standards post-Winter Storm Uri, including compliance verification and grid readiness.	Power systems engineers, cybersecurity experts, Distributed Energy Resources (DER) analysts
Hawaii	Utility Natural Hazard Mitigation Reports Climate Adaptation and Distribution Resilience Program	Docket 2023- 04661,[6] directing public utilities to develop reports related to their ongoing efforts and future mitigation plans to address natural hazards. Docket 2022-0135,[7] a request to approve funds for a Climate Adaptation Transmission and Distribution Resilience Program.	Hazard-specific planning, extreme weather forecasting, investment risk modeling
New York	Climate Adaptation	Case 22-E-0222,[8] requiring gas and electric utilities to conduct Climate Change Vulnerability Studies and develop Climate Change Resilience Plans.	Environmental science and weather modeling, scenario planning and mitigation

Technical staff play a key role in translating complex hazard-specific data into actionable regulatory guidance, investment recommendations, and cost-recovery frameworks. In some states where resilience goals are already embedded in statute or regulatory planning processes, technical expertise supports the direction and execution of established grid resilience policies. In jurisdictions still in the early stages of defining what resilience means and prioritizing efforts in their specific geographic, policy contexts, the role of technical expertise becomes even more critical, as staff will help shape the very metrics and decision-making frameworks by which resilience investment will be evaluated in the future.

4 Oregon Public Utility Commission, Docket no. AR 638 (2020) https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=22341&Child=action&OrderBy=ActionDate&SortOrder=ASC

5 ERCOT, PUCT Rule 25.55 – Weather Emergency Preparedness Overview (2022) https://www.ercot.com/files/docs/2022/10/28/ERCOT-Generation-Entity-Winter-Weatherization-Workshop-Combined-2023-6-22.pdf

6 State of Hawaii Public Utilities Commission, PUC Case 2023- 04661 (2023) https://hpuc.my.site.com/cdms/s/puc-case/a2G8z000000G7xREAS/pc183087

7 State of Hawaii Public Utilities Commission, PUC Case 2022-0135 (2022) https://hpuc.my.site.com/cdms/s/puc-case/a2G8z0000007f18EAA/pc20323

8 New York State Department of Public Service, Case No: 22-E-0122 (2022) https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=22-E-0222

The Role of Grid Resilience Technical Talent within a PUC

Most PUCs maintain a multidisciplinary staff of engineers, financial analysts, attorneys, and other subject matter experts to advise commissioners on a range of regulatory issues, from traditional rate cases and applications for certificates of public convenience and necessity, (CPCNs) to programs that promote policy priorities such as energy efficiency or transportation electrification. PUCs may need to consider the need for additional technical expertise in areas such as data science, extreme weather forecasting and modeling, and grid resilience planning and evaluation. As the grid faces increasing challenges from extreme temperatures, increased use of DERs, and demand growth from advanced technologies, these skills are needed to advise commissioners on utilities' resilience plans, hazard-specific mitigation plans, or related grid resilience implementation programs and cost recovery mechanisms. This includes not only understanding the technical merits of proposed investments and evaluating their economic implications, but also their effects on long-term affordability for ratepayers. Resilience strategies should deliver both operational and financial value in accordance with the PUC's mission and ratepayers' interests.

To fully leverage this potential expansion of technical expertise, commissioners should depend on these professionals to synthesize complex scientific data and modeling into actionable regulatory strategies. With skilled technical support, Commissioners can be confident in challenging assumptions and holding regulated utilities accountable for delivering resilience improvements that meet both technical standards and jurisdictional goals and priorities. Moreover, technical staff can support the development of Commission orders and rules that anticipate emerging risks and technologies, ensuring regulatory frameworks remain adaptive and effective.

Frameworks for Identifying Grid Resilience Technical Expertise

Analysis, planning, and implementation of grid resilience strategies and investments covers a wide range of technical specializations that includes severe weather modeling, DER integration, and hazard-specific economic analysis. Furthermore, these fields are constantly evolving. Identifying and clearly defining the skills and knowledge that contribute to grid resilience expertise, specifically within a regulatory context, is a crucial first step in building the technical capacity for a skilled grid resilience workforce.

PUCs can draw on established workforce frameworks that provide structured approaches to defining and organizing competencies. Originally part of the National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework, The National Institute of Standards and Technology Task-Knowledge-Skill Framework[9, 10] provides a modular approach to detailing the specific tasks, knowledge areas, and skill sets required to support an organization. In addition, the Center for Energy Workforce Development's (CEWD) Competency Model,[11] co-developed by the U.S. Department of Labor, offers tiered competencies ranging from foundational workplace skills to advanced technical capabilities in all sectors of the electric power system. PUCs can use these frameworks to determine the type of grid resilience expertise they may need. It is important to note that while these frameworks were not explicitly designed for regulatory agencies, their guidance on examining the expertise needed for particular needs may be helpful in the application of grid resilience.

In 2021, NARUC published "*A Guide for Public Utility Commissions: Recruiting and Retaining a Cybersecurity Workforce,*"[12] which served as a foundational reference for PUCs trying to develop and expand their cybersecurity proficiency. The guide introduced the NICE framework, describing seven cybersecurity work functions and operations. **Table 3**, below, lists each of the seven categories from the NICE framework, with suggested adaptations for a grid resilience context in **red**. This approach offers a starting point for PUCs to define, recruit, and develop the technical workforce needed to support grid resilience planning and oversight.

9 National Institute of Standards and Technology, "Task Knowledge Skill (TKS) Statements Authoring Guide for Workforce Frameworks" (2021) https://www.nist.gov/system/files/documents/2021/07/30/TKS_Authoring_Guide13apr2021-508Compliant.pdf

10 National Initiative for Cybersecurity Education, *Workforce Framework*, https://niccs.cisa.gov/tools/nice-framework

11 Center for Energy Workforce Development, *Energy Industry Competency Model* (2021) https://cewd.org/wp-content/uploads/2021/03/Competency-Model-GTD_electronic.pdf

12 Raffety, A & Costantini, L, *A Guide for Public Utility Commissions: Recruiting and Retaining a Cybersecurity Workforce* (2021), https://pubs.naruc.org/pub/E454F7A5-155D-0A36-314C-5A2E1E2A0FF9

Table 3. NICE Framework Categories with Application to Resilience

Work Function	Description
Analyze	Performs highly specialized review and evaluation of incoming cybersecurity information to determine its usefulness for intelligence.
	Analyzes resilience data, models extreme weather events, assesses outage impact, and evaluates risk in utility proposals and/or mitigation plans.
Collect and Operate	Provides specialized denial and deception operations and collections of cybersecurity information that may be used to develop intelligence.
	Gathers operational data (reliability metrics, AMI, outage reports, etc.) to inform regulatory decisions.
Investigate	Investigates cybersecurity events or crimes related to information technology (IT) systems, networks, and digital evidence.
	Investigates root causes of service disruptions and evaluates post-event reports for performance improvements.
Operate and Maintain	Provides the support, administration, and maintenance necessary to ensure effective and efficient IT system performance and security.
	Provides recommendations for strong resilience-related grid operations and maintenance such as DER integration and advance monitoring systems.
Oversee and Govern	Provides leadership, management, direction, or development and advocacy so the organization may effectively conduct cybersecurity work.
	Develops and recommends regulatory guidance, resilience planning standards, and customer-centric cost recovery frameworks.
Protect and Defend	Identifies, analyzes, and mitigates threats to internal IT systems and/or networks.
	Evaluates mitigation plans in utility filings and severe weather vulnerability assessments.
Securely Provision	Conceptualizes, designs, procures, and/or builds secure IT systems, with responsibility for aspects of systems and/or network development.
	Reviews grid resilience investments and programs in utility filings and/or proposals.

Although PUCs do not execute projects in the same way that a utility or an energy consulting firm would, they must still understand the technical rigor behind grid resilience-focused proposals to determine whether they are reasonable, cost-effective, and aligned with the public interest. Once the needed skill sets and competencies are defined, PUCs can explore strategies for building this technical capacity internally or recruiting external talent, as described in the following section.

Technical Roles Supporting Grid Resilience

Grid resilience professionals within PUCs perform tasks aligned with technical specialties such as hazard risk modeling, infrastructure vulnerability assessment, DER integration, and system planning. These professionals operate at various levels across a commission, from entry-level to highly experienced directors or department heads. While their roles may differ by experience, they all contribute to evaluating the technical and economic aspects of utility resilience proposals and/or hazard-specific mitigation plans.

Senior-level employees provide strategic direction for the commission's resilience oversights and planning priorities. They manage a team of technical staff responsible for reviewing utility grid resilience filings, multi-agency collaborations for mitigation efforts, and aligning regulatory recommendations or actions with broader state and federal resilience objectives. Ultimately ensuring grid resilience activities align with the commission's missions and jurisdictional goals.

Mid-level employees are typically subject-matter experts in disciplines such as power systems engineering, hazard mitigation and adaptation, data science and analytics, or environmental policy. These professionals lead technical reviews of filings like hazard-specific mitigation plans or extreme weather readiness. They advise Commission senior leadership, analyze modeling and forecasts, cost projections, lead targeted working groups or docket-specific technical inquiries.

Entry-level employees can be recent graduates with academic degrees in environmental engineering, data science, energy systems, or energy policy. However, they can be professionals transitioning into the energy/grid resilience space. Entry-level employees support mid-level experts through research, data analysis, and program coordination, while building institutional knowledge through direct involvement in grid resilience-related proceedings and stakeholder engagement.

In some cases, ***interns or fellows*** contribute by conducting short-term research projects related to incorporating grid resilience into integrated resource planning or a project that a Commission has scoped out. While this guide does not focus specifically on intern recruitment strategies, having interns or fellows can build a talent pipeline and introduce emerging professionals into the rewarding, critical Commission work.

Strategies for Building Technical Talent for Resilience

As PUCs build out their technical divisions to support grid resilience, the structure may mirror that of other divisions (e.g. rates, legal). However, the increasingly specialized nature of grid resilience planning, especially at the intersection of severe weather, reliability, and economic risk, may prompt PUCs to strengthen their technical expertise. Two primary approaches include recruiting dedicated technical staff and building technical capacity in-house. These strategies are not mutually exclusive and can be pursued in tandem to support robust, informed regulatory decision-making. **Table 4** outlines these two approaches along with considerations of how they can be implemented as PUCs begin to structure their technical capacity.

Table 4. PUC Technical Staffing Strategies for Supporting Grid Resilience.

Model	Leadership	Analytical Support	Programmatic Support
Recruiting Grid Resilience Technical Talent	Director-level technical expert or resilience lead	Mid-level engineers or analysts specializing in resilience	Entry-level specialist or technical coordinators.
	Key Characteristics: Deep technical talent across levels. Fostering continuity, mentorship, and career pathways with technical specialties .		
Building Technical Capacity Internally	Existing leadership with new training	Targeted cross-training and applied work on utility filings and cases.	In-house mentorship and task-specific training (e.g. GIS)
	Key Characteristics: Emphasizes internal workforce development and knowledge retention. Useful for budget constraints and retention of high institutional knowledge.		

Recruiting Grid Resilience Technical Talent

Recruiting technical talent for grid resilience should take a balanced approach, one that values traditional experience in energy and utility sectors as well as transferable skills gained in adjacent fields. PUCs are in the position to benefit from flexible recruitment frameworks that recognize competencies alongside credentials. **Table 5** outlines considerations for senior -, mid -, and entry – level roles through both traditional experience-based criteria and skill-based criteria. This showcases both conventional and non-traditional pathways for identifying and developing recruitment plans for highly capable candidates.

Table 5. Staff Level Criteria Considerations for Grid Resilience Technical Talent

Experience Level	Traditional Experience-based Criteria	Skill-based Criteria
Senior-Level	• 10+ years of leadership in energy systems, infrastructure resilience, or utility regulation • Advanced degree preferred, e.g., Master of Public Policy (MPP), Public Administration (MPA), Business Administration (MBA) Juris Doctor (J.D) Master of Science in Engineering, Environmental Science, Energy Policy or Doctorate subject matter equivalent • Supervisory or regulatory decision-making experience	• Strategic thinking across technical, regulatory, and policy domains • Leadership in multidisciplinary environments with ability to mentor junior staff • Expertise in applying resilience framework to infrastructure planning or regulation • Ability to assess complex technical filings and make defensible regulatory recommendations • Strong communication skills to interface with commissioners, stakeholders, and the public on resilience priorities
Mid-career	• 3-6 years in energy, utilities, planning or resilience work • Master's degree preferred, e.g., MS in Electrical Engineering, Environmental Science, Project Management, Public Policy (MPP) Public Administration (MPA), Business Administration (MBA), Data Analytics, Geographic Information Systems (GIS) • Experience with utility filings, stakeholder engagement, or modeling	• Ability to interpret utility filings, resilience plans, or technical modeling outputs • Experience facilitating cross-sector collaboration or stakeholder engagement • Skills in scenario analysis, risk assessment, and evaluating system vulnerabilities • Capacity to translate technical insights into policy recommendations • Project management or case tracking skills
Entry	• Bachelor's degree in engineering, public policy, environmental science or policy, or data science/ analytics • 0-2 years of related work/internship experience • Exposure to utility or government systems **OR** • Mid-level professional who has transitioned into the energy resilience/energy systems field	• Ability to collect, clean, and analyze datasets • Familiarity with infrastructure systems • Clear, concise technical and policy communication skills (written and verbal) • Willingness to learn regulatory processes and utility operations • Collaboration in team=based environments with openness to feedback and interdisciplinary learning

Once the necessary qualifications and skills are defined, the next step is identifying where to find candidates. Effective recruitment for grid resilience roles will likely require drawing from a diverse range of talent pipelines, both traditional sources such as graduate programs and energy sector firms and less-conventional pathways such as adjacent technical fields or mission-aligned professionals seeking career transitions. **Table 6** outlines potential recruitment pipelines for grid resilience talent.

Table 6: Potential Recruitment Pipelines

Note: This is not an exhaustive list of relevant job boards or pipelines to find grid resilience technical talent.

Candidate Profile	Relevant Sectors or Institutions	Pathway to Public Service	Best-Suited Roles
Recent Graduates (Undergrad or Grad)	Universities, Historically Black Colleges and Universities, Tribal Colleges, Public Policy Schools	Internships, fellowship programs, state/local rotational programs	Entry-level
Private Sector Technical Expertise	Energy companies, utilities, grid technology start-ups, policy consulting	Targeting hiring, mission-driven recruitment campaigns	Mid- or senior-level
Government or NGO Professionals	DOE labs, Federal Emergency Management Agency (FEMA), NEMA, NGOs, Military	Interagency rotations, direct hires, project-based contracts, skill bridge programs	Mid-level
Cross-Sector Professionals	GIS firms, public health, environmental orgs, tech sector	Skill-based hiring, certifications (e.g. PMP, GIS)	Entry-to mid-level
Academic or Think Tank Researchers	Research institutions, energy policy think tanks	Public testimony experience, advisory boards, stakeholder working groups	Senior-level or technical advisor roles

Building Technical Capacity Internally

Investing in their existing workforce through structured training and skill development is an efficient pathway for PUCs to acquire the technical expertise needed to address new challenges such as resilience. This approach leverages both the institutional knowledge and regulatory experience embedded within the Commission and the importance of long-term succession planning and employee retention. Equipping all levels of staff with specialized grid resilience knowledge and competencies can be an efficient avenue to develop capable teams that further grid resilience implementation in their jurisdiction. Some specific strategies related to capacity-building follow.

Mentorship and Peer Learning

Mentorship and structured learning opportunities can be a powerful and effective tool to cultivate talent from within and transfer institutional knowledge across teams. A useful model for internal technical development based on mentoring comes from the federal government. A 2024 RAND study[13] explored FEMA's Incident Workforce Mentorship Efforts, where FEMA uses informal and formal mentoring to develop, support and sustain a well-skilled incident workforce to mitigate disaster situation. The study noted "favorable experiences" from both mentors and mentees.

Application to PUCs:

- Invite senior engineers and data analysts to mentor mid-level regulatory staff on topics like data interpretation and vulnerability assessments.
- Pair staff across experience levels (senior-mid, mid-entry, senior-mid-entry) when assigning dockets.
- Facilitate internal peer learning sessions to review resilience-related utility filings and proposals or to debrief hearings.

Microlearning

Microlearning is a strategy for making education and skill-building easier and quicker by offering new and unique ways to gain knowledge.[14] By delivering "bite-sized," highly focused learning experiences, employees can acquire and retain critical skills and accelerate learning without stepping away from their primary responsibilities for extended training sessions. These modules support continuous learning, allowing staff to quickly reference, learn, or refresh key skills related to resilience filings, cases, and technical meetings.

13 RAND, "Mentorship Efforts Within the Federal Emergency Management Agency's Incident Workforce" (2024) https://www.rand.org/pubs/research_reports/RRA2964-1.html

14 eLearning Industry, "How Microlearning is Changing The Way We Learn in 2025" (2025) https://elearningindustry.com/how-microlearning-is-changing-the-way-we-learn-all-you-need-to-know

Application to PUCs:

- Create and establish internal portals that include brief videos and tutorials on specific grid resilience topics.
- Archive staff presentations, memos, and tools on grid resilience-related subject matter.

Role-Based Skill Mapping

The National Governor's Association reports that expanding skill-based hiring strategies can help bridge workforce gaps, improve job fit, and enhance talent matches to public sector needs.[15] Skill mapping offers a structured way to strengthen technical capacity by identifying the skills required to perform specific tasks or fill key roles. This process usually involves: 1) documenting the skills needed to complete certain tasks or fill certain roles in an organization, 2) assessing the skills of current staff, and 3) identifying resilience-relevant skills by role. Competency frameworks, like the NICE Cybersecurity Workforce Framework, have enabled government agencies such as the Department of Homeland Security to align work roles with the required tasks, knowledge, and skills they demand. PUCs can use this approach to define precise requirements for grid resilience roles.

Application to PUCs:

- Map existing commission staff roles to grid resilience-related functions.
- Use that mapping to build individualized development plans or recommend targeted training.

All of these approaches to building technical capacity internally strengthen institutional knowledge, support long-term workforce resilience, and help commissions remain competitive in retaining talent, particularly as private-sector opportunities for grid resilience professionals increase.

Professional Development Opportunities

Professional development opportunities such as conferences, workshops, and regulator-focused training programs are a critical complement to internal upskilling efforts. These forums allow commission staff to deepen technical understanding of emerging grid resilience issues, stay current on regulatory best practices, and learn from peer commissions facing similar challenges. Programs designed specifically for regulators, such as NARUC's Rate School, are particularly valuable as resilience-related filings involve large capital investments, new cost recovery mechanisms, and long-term affordability considerations. PUCs can use this approach to support continuous professional growth and adaptability as technical demands evolve.

Application to PUCs:

- Encouraging staff participation in resilience-focused conferences, grid modernization forums, and technical trainings.
- Integrating conference takeaways into internal briefings or knowledge-sharing sessions.

Summary

Grid resilience has become an increasingly critical component of regulatory oversight, and PUCs recognize the need to strengthen their internal capacity in relevant technical areas. This guide outlines strategies for building and recruiting grid resilience technical talent across all staff levels, emphasizing the importance of role clarity, workforce frameworks, internal development, and suggested targeted recruitment. To support implementation, Appendix A provides sample job descriptions for director, mid-career, entry-level, and internship positions. Together, these tools and approaches can aid PUCs in taking concrete steps towards developing the technical workforce needed to meet their jurisdictional goals and continue serving the public interest.

15 National Governors Association, "Empowering Progress: Harnessing Skills-Based Strategies to Drive Public Sector Excellence" (2025) https://www.nga.org/publications/empowering-progress-harnessing-skills-based-strategies-to-drive-public-sector-excellence/

Appendix A: Sample Job Description Toolkit for Grid Resilience Talent

Here are example job descriptions for PUC technical grid resilience roles across all levels of experience. They represent foundational roles that build on traditional regulatory, engineering, and analytical functions, incorporating both experience-based and skill-based criteria.

Grid Resilience Intern

Inspired by entry and associate-level positions within government regulatory agencies and public sector energy offices, this internship focuses on developing foundational skills in data analysis, reporting, and regulatory framework comprehension.

Position Overview:

The Grid Resilience Intern will assist technical and regulatory staff in projects related to electric grid reliability, DERs integration, and infrastructure resilience. This internship offers hands-on experience supporting the evaluation of utility filings, data analysis, and stakeholder coordination as the Commission works to enhance grid resilience and adaptability.

Primary Duties:

- Support data collection, organization, and preliminary analysis related to grid performance and resilience metrics.
- Review public utility documents and filings under supervision of more experienced staff.
- Prepare summaries, presentations, and briefing materials for internal teams.
- Participate in meetings, workshops, and stakeholder engagement activities.
- Conduct research on emerging grid technologies and resilience best practices.
- Provide general administrative and technical support to the resilience division.

Experience-Based Criteria (Preferred but Not Required):

- Coursework or projects related to energy systems, environmental science, engineering, public policy, or data analysis.
- Any prior internship, research, or volunteer experiences involving utilities, infrastructure, or technical analysis.

Skill-Based Criteria:

- Strong analytical and critical thinking abilities.
- Basic proficiency with data tools such as Excel or Google Sheets.
- Good written and verbal communication skills.
- Ability to learn technical concepts quickly and work collaboratively.
- Attention to detail and organizational skills.

Entry-Level: Grid Resilience Analyst

Inspired by analyst and associate-level positions commonly found in energy firms, regulatory agencies, and engineering consulting companies, this role emphasizes foundational skills in data analysis, reporting, and regulatory comprehension.

Position Overview:

The Grid Resilience Analyst supports the Commission's efforts to evaluate and improve grid reliability and severe weather adaptation strategies. This role involves technical data analysis, policy research, and coordination with internal teams and external stakeholders.

Primary Duties:

- Analyze outage data, utility filings, and resilience-related metrics.
- Support risk assessments related to extreme weather and infrastructure vulnerabilities.
- Assist in drafting memoranda, reports, and technical summaries.
- Track federal and state resilience funding opportunities.
- Contribute to stakeholder engagement and interagency coordination.

Experience-Based Criteria:

- Bachelor's degree in engineering, environmental science, public policy, or related field.
- 0–2 years of experience in energy, utility regulation, or infrastructure planning.
- Familiarity with utility grid operations and resilience frameworks.

Skill-Based Criteria:

- Quantitative analysis and data visualization (e.g., Excel, R, or Python).
- Ability to translate technical information into policy recommendations.
- Project coordination and attention to detail.
- Interest in severe weather adaptation, emergency management, or public service.

Mid-Level: Resilience Program Manager

Adapted from project manager, regulatory advisor, or technical specialist roles in utilities, state agencies, and grid modernization programs, this position is designed for professionals with applied experience in grid operations, resilience planning, or interdisciplinary coordination.

Position Overview:

The Resilience Program Manager leads cross-cutting initiatives that enhance the reliability and adaptability of the energy grid in the face of severe weather and cybersecurity risks. The role involves oversight of regulatory filings, stakeholder engagement, and coordination with utilities and government agencies.

Primary Duties:

- Review and assess utility resilience plans and filings.
- Manage projects related to microgrids, severe weather adaptation, or grid modernization.
- Collaborate with emergency management and environmental agencies.
- Support rulemaking and regulatory proceedings on resilience investments.
- Supervise or mentor junior analysts and coordinate cross-agency working groups.

Experience-Based Criteria:

- Master's degree or equivalent experience in engineering, energy systems, or public administration.
- 3–7 years of experience in utility regulation, planning, or resilience.
- Knowledge of energy policy, grid operations, and regulatory frameworks.

Skill-Based Criteria:

- Systems thinking and policy development.
- Strong communication and facilitation skills.
- Ability to lead multi-disciplinary teams.
- Experience managing data- or stakeholder-intensive projects.
- Familiarity with resilience metrics and risk assessment tools.

Senior-Level: Director of Grid Resilience and Reliability

Modeled after director-level, senior advisor, or systems engineer roles in complex regulatory or utility environments, this role requires deep subject-matter expertise, strategic leadership capabilities, and the ability to manage cross-functional resilience initiatives.

Position Overview:

The Director of Grid Resilience and Reliability provides strategic leadership on all matters related to grid resilience, including regulatory oversight, emergency preparedness, and severe weather readiness. This executive-level position advises Commissioners, represents the PUC in high-level forums, and drives interagency coordination.

Primary Duties:

- Develop and implement long-term resilience strategies and regulatory policies.
- Oversee evaluations of critical infrastructure risks and mitigation investments.
- Represent the Commission in federal and regional energy resilience discussions.
- Coordinate with utilities, emergency response agencies, and federal partners (e.g., DOE, FEMA).
- Provide thought leadership and shape external com munications on resilience priorities.

Experience-Based Criteria:

- 10+ years in utility regulation, infrastructure planning, or energy policy.
- Proven leadership in cross-sector energy, emergency management, or severe weather initiatives.
- Advanced degree in engineering, law, policy, or environmental management preferred.

Skill-Based Criteria:

- Executive decision-making and leadership under uncertainty.
- Deep understanding of infrastructure interdependencies.
- Strong strategic communication and stakeholder diplomacy.
- Ability to navigate evolving resilience threats and technologies.

Familiarity with federal funding streams and regulatory levers.

The following are additional job descriptions for more in-depth roles that incorporate technical, hazard focused, and adaptation-centered positions. These positions reflect realistic responsibilities based on publicly available postings. The example descriptions can be adapted for any level of experience.

Grid Resilience Engineer

Example Inspiration: *Utah Public Service Commission, Utility Technical Consultant (Risk Analyst)*

Position Overview:

Advises commissioners and regulatory staff on physical and severe weather-related infrastructure risks, with a focus on wildfire, storm, and cyber threats impacting utility systems.

Primary Duties:

- Evaluate utility infrastructure filings and risk mitigation plans.
- Analyze vulnerability to physical and cyber threats.
- Summarize technical findings for regulatory dockets and executive decision-making.

Experience-Based Criteria:

- Bachelor's degree in engineering or related field.
- 3+ years of risk assessment or infrastructure planning experience.

Skill-Based Criteria:

- Ability to assess grid resilience metrics and data.
- Proficiency in translating technical resilience information into actionable policy guidance.

Critical Infrastructure Risk Analyst

Example Inspiration: *Utah Public Service Commission, Utility Technical Consultant (Risk Analyst)*

Position Overview:

The Critical Infrastructure Risk Analyst plays a vital role in supporting the Commission's regulatory decisions by assessing risks that utilities face across multiple domains, including physical infrastructure, cybersecurity, and financial vulnerabilities. This position focuses on understanding how interconnected utility systems (electricity, natural gas, telecommunications, and water) interact with broader critical infrastructure networks and how cascading failures may impact overall resilience. The Analyst provides clear, data-driven insights and actionable recommendations to inform regulatory oversight and risk mitigation strategies.

Primary Duties:

- Conduct comprehensive risk assessments of utilities across electric, gas, telecommunications, and water sectors, emphasizing interdependencies and potential cascading impacts on critical infrastructure.
- Analyze utility filings, technical evidence, and risk models submitted in regulatory proceedings to evaluate potential threats and vulnerabilities.
- Collaborate with internal technical teams, external experts, and stakeholders to gather data and validate risk scenarios.
- Prepare concise, accessible testimony summaries, briefing materials, and formal risk mitigation recommendations for Commissioners and staff.
- Monitor emerging risks, including cybersecurity threats and severe weather-related hazards, and advise on proactive mitigation measures.
- Participate in cross-agency initiatives and working groups focused on enhancing infrastructure resilience and emergency preparedness.

Experience-Based Criteria:

- Prior experience in risk management, insurance underwriting, infrastructure planning, audit, or regulatory analysis preferred.
- Familiarity with utility operations and critical infrastructure sectors is a plus.
- Experience working in or alongside government agencies, regulatory bodies, or infrastructure-related organizations.

Skill-Based Criteria:

- Strong analytical skills with the ability to interpret complex technical filings, risk models, and quantitative data.
- Excellent written and verbal communication skills, capable of translating technical risk assessments into clear, actionable recommendations for diverse audiences.
- Adaptability to work across multiple infrastructure sectors and collaborate with interdisciplinary teams.
- Critical thinking and problem-solving abilities, particularly in evaluating interdependent system risks and mitigation strategies.
- Proficiency with data analysis tools and software.

Grid Hazard Analyst

***Example Inspiration**: California Public Utilities Commission, Climate Adaptation Utility Risk Policy Analyst*

Position Overview:

The Grid Hazard Analyst is responsible for identifying, assessing, and tracking natural and operational hazards that pose a risk to electric grid infrastructure and performance. The role supports proactive planning and regulatory review processes by evaluating utility filings, hazard models, and mitigation proposals to ensure energy systems are resilient, reliable, and aligned with state goals.

Primary Duties:

- Review utility risk assessments and hazard exposure models (e.g., wildfire, flood, extreme heat).
- Analyze geographic, infrastructure, and performance data to evaluate vulnerability and response capacity.
- Track evolving hazard trends and assess their implications for long-term grid reliability.
- Support development of resilience metrics and adaptation strategies for utility oversight.
- Collaborate with emergency response, environmental, and engineering staff to integrate technical insight into regulatory decision-making.
- Participate in interagency or public technical workshops, stakeholder meetings, and utility site visits.

Experience-Based Criteria:

- 3–6 years of experience in grid operations, environmental risk assessment, utility regulation, or resilience planning.
- Experience analyzing infrastructure risk in the context of utility filings, resilience plans, or vulnerability studies.
- Prior experience working with geospatial or severe weather-exposure datasets preferred.

Skill-Based Criteria:

- Strong quantitative analysis skills using geospatial, technical, or environmental data.
- Ability to synthesize technical inputs into clear regulatory language.
- Familiarity with electric utility systems, risk-based planning frameworks, or infrastructure performance metrics.
- Knowledge of tools such as ArcGIS, hazard modeling platforms, or power system planning software.

Grid Adaptation and Energy Systems Planner

***Example Inspiration**: California Public Utilities Commission, Climate Adaptation Utility Risk Policy Analyst*

Position Overview:

The Grid Adaptation and Energy Systems Planner evaluates utility proposals and infrastructure plans through the lens of long-term risk adaptation and operational flexibility. The role helps ensure the grid can withstand and recover from emerging hazards through data-informed regulatory review, stakeholder coordination, and forward-leaning policy development.

Primary Duties:

- Assess grid adaptation strategies in utility rate cases, hazard mitigation plans, and long-term planning proceedings.
- Analyze how utilities plan for uncertainty across planning horizons, including through the use of scenario modeling or asset prioritization.
- Support development of standards, metrics, or reporting frameworks for evaluating adaptation effectiveness.
- Contribute to internal reports and Commission decision documents related to grid modernization and hazard response.
- Engage with academic, technical, and community stakeholders on adaptation and equity-informed resilience**.**

Experience-Based Criteria:

- 4–7 years of experience in infrastructure adaptation, regulatory policy, environmental systems, or utility operations.
- Track record of contributing to long-term infrastructure planning, regulatory proceedings, or applied risk assessments.

Skill-Based Criteria:

Expertise in evaluating system flexibility, critical infrastructure dependencies, and emerging technology use cases.

- • Skilled in cross-disciplinary collaboration, with the ability to translate technical work into regulatory and policy insights.
- Working knowledge of energy infrastructure adaptation, utility investment planning, or resilience benchmarks.
- Proficient in analytical tools such as R, Python, GIS, or systems modeling software.

Grid Technology Integration Analyst

***Example Inspiration**: Public Service Commission of the District of Columbia, Distributed Energy Resource Specialist*

Position Overview

The Grid Technology Integration Analyst supports the strategic evaluation, adoption, and regulation of emerging grid technologies that enhance resilience, reliability, and equitable energy access. This role bridges traditional regulatory work with modern grid modernization efforts, assessing how technologies such as DERs, advanced metering infrastructure, energy storage, and AI/ML-based tools can be effectively integrated into utility operations and state-level oversight. The analyst collaborates across departments and with external stakeholders (utilities, technology providers, research labs) to inform policy, evaluate pilot programs, and support data-driven regulatory decision-making.

Primary Duties:

- Monitor, evaluate, and summarize trends in emerging grid technologies relevant to resilience, reliability, and operational efficiency.
- Analyze integration pathways for technologies such as DERs, microgrids, grid-edge devices, and AI-based analytics into utility systems and regulatory frameworks.
- Collaborate with utilities and developers to assess the impact and results of pilots, sandboxes, and innovation zones.
- Draft policy memos, technical briefs, and decision support materials for Commissioners and senior leadership.
- Translate technical findings into regulatory considerations, including rate structures, grid planning requirements, and resilience standards.
- Develop recommendations to support equitable technology deployment and inclusive community outcomes.

Experience-Based Criteria:

- 3–7 years of relevant professional experience in electric grid operations, energy policy, engineering, utility planning, or technology integration.
- Familiarity with utility regulatory environments, state energy offices, RTO/ISO operations, or research institutions.
- Previous involvement in pilot projects, innovation initiatives, or grid modernization efforts.
- Experience with stakeholder engagement or technical translation for non-technical audiences.

Skill-Based Criteria:

- Strong analytical skills, with the ability to synthesize technical data, interpret modeling outputs, or evaluate pilot outcomes.
- Understanding of power systems, distributed energy resources, and related grid modernization technologies.
- Ability to work independently while coordinating with interdisciplinary teams.
- Excellent written and verbal communication skills tailored for public sector and regulatory audiences.
- Comfortable navigating uncertainty and working on cross-cutting issues where regulation, innovation, and affordability intersect.

These sample job descriptions are intended as flexible templates that PUCs can adapt to their specific organizational structure and regulatory contexts. Tailoring these job descriptions to align with individual PUC workforce development efforts can help attract, retain, and develop the necessary technical talent to support grid resilience goals.