Quantum Grid Utility Assurance and Resilient Defense Act of 2026 (Quantum-GUARD Act)

U.S. Senators Chris Coons (D-Delaware) and Mike Rounds (R-South Dakota)

The *Quantum-GUARD Act* strengthens electric grid resilience by proactively addressing growing cybersecurity threats posed by advances in quantum computing. The bill directs relevant federal agencies to evaluate quantum-related cybersecurity risks, help electric utilities transition to post-quantum cryptography (PQC), and improve coordination between grid operators, cybersecurity experts, and government partners.

The Problem

Quantum computing technology is rapidly advancing, and these advances could undermine the security of existing encryption systems. While the National Institute of Standards and Technology (NIST) finalized PQC standards in 2024, critical infrastructure sectors face unique challenges in adopting these new technologies.

- **Critical Infrastructure Vulnerabilities:** The electric grid relies on complex information technology (IT) and operational technology (OT) systems that control physical assets, including power generation and transmission. Many OT systems are long-lived, difficult to upgrade, and require careful testing before cybersecurity changes can be implemented.

- **Growing Cybersecurity Threats**: As quantum computing capabilities advance, adversaries may be able to decrypt sensitive information or access sensitive systems, exacerbating threats to grid operations and national security.

The *Quantum-GUARD Act*

- **Requires FERC to Consider Quantum Cybersecurity Risks**: Directs the Federal Energy Regulatory Commission (FERC) to consider cybersecurity risks posed by quantum computers and potential uses of PQC when reviewing electric reliability standards.

- **Creates a DOE PQC Sandbox**: Establishes a collaborative testing environment through the Department of Energy's Office of Cybersecurity, Energy Security, and Emergency Response (DOE CESER) where grid operators, technology providers, federal agencies, and other stakeholders can evaluate PQC solutions for grid applications.

- **Requires a Federal Assessment of Quantum Risks**: Directs DOE CESER to conduct a study on quantum cybersecurity risks to the bulk electric power system, including vulnerabilities in IT and OT systems and barriers to transitioning high-value systems to PQC.

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