Formula 1

Content placeholder

Formula 2

Content placeholder

Detailed Explanation

The Grid Resilience Rating Framework v2.1 builds upon earlier NIST efforts to formalize how buildings equipped with smart controls, distributed generation, storage, and flexible loads can actively support grid stability and recovery. Central to the framework is a tiered rating structure (Levels 1–4) that evaluates capabilities across three core dimensions: situational awareness (e.g., real-time monitoring and communication), adaptive response (e.g., automated load shedding or islanding), and coordinated recovery (e.g., synchronized reconnection and resource dispatch with grid operators). Each level corresponds to increasingly sophisticated integration with utility systems—including adherence to IEEE 1547, UL 1741 SA, and OpenADR 2.0b—and requires verification through standardized test procedures and documentation. The framework emphasizes outcome-based metrics rather than prescriptive technologies, enabling fair comparison across diverse building types (commercial, industrial, residential) and DER configurations. It also incorporates cybersecurity readiness, interoperability assurance, and equity considerations—such as equitable access to resilience benefits—reflecting NIST's broader mission to advance trustworthy, inclusive, and secure infrastructure.

Key Components

#	Component
1	Resilience Capability Levels (1–4)
2	Grid Interaction Metrics (e.g., response time, duration, dispatch accuracy)
3	Verification & Certification Protocol

Applications

#	Application
1	Utility-scale demand response program design and validation
2	Building code and incentive program alignment (e.g., for resilience grants or tax credits)
3	Third-party certification of grid-interactive building systems (e.g., by laboratories or rating bodies)

Related Concepts

#	Concept
1	Grid-Interactive Efficient Buildings (GEB)
2	Distributed Energy Resource (DER) Aggregation
3	Cybersecurity for Energy Delivery Systems (CEDS)

Tags

> grid resilience, building energy systems, NIST, smart grid, DER integration