Electromagnetic Pulse Special Interest Group
(EMP SIG)

Summit

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CRITICAL INFRASTRUCTURE RESILIENCE

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POTENTIAL FINANCIAL INCENTIVES FOR CRITICAL INFRASTRUCTURE RESILIENCE

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Why financial incentives impact the resilience of critical infrastructures

- **Cost-based utilities have challenges to justify investments in resilience**
  - Most federal and state utility-related statutes support "reliability" but do not identify "resilience" as an investment justification.
  - High consequence, low or unknown probability events are difficult to mitigate pre-crisis.
- **Deregulated sector entities that invest in resilience risk unrecovered costs, bankruptcy or depressed returns on capital**
  - With "reliable operations" but not "resilience" as a regulatory goal, FERC has deferred and not yet adopted meaningful "resilient capacity pricing" for California (CAISO), PJM Interconnection (Mid-Atlantic states), and ISO-New England.
  - EMP protection is now cost-recoverable for control housings in high voltage (bulk power) transmission systems, but not yet cost-recoverable for large generation stations and associated transformers.
- **Production or investment tax credits for renewable energy systems do not generally include costs of resilience as a tax credit-qualifying component**
  - The Office of Tax Policy (Treasury) & IRS might jointly enable resiliency costs as qualifying elements of tax credits (e.g., IRC Sec. 48) for renewables, but
  - Congressional legislation would be required to create higher (resilient) and lower (non-resilient) tax credit rates to strengthen incentives for critical infrastructure or include storage components for time-shifting dispatch
- **Wind production credits plus "must take" output undermines dispatchable baseload**
  - Read Angela C. Erickson, *The Production Tax Credit: Corporate Subsidies & Renewable Energy,* Texas Public Policy Foundation, November 2018.

Alternative financial incentives to strengthen resilience of critical infrastructures - I

- Utility ratepayer funding
  - Enables EMP-protected control housings for bulk power substations
- Ratepayer funding + lifeline rates
  - Can alleviate financial hardship with "lifeline rates" for distribution customers
- Include resilience costs as qualifying components of investment tax credits (ITCs)
  - Should batteries or hydro storage qualify for tax credits?
- Reduce or phase out tax credits for non-resilient systems
- Qualify "resilience" for different hazards, enabling a marketplace for tax-credit enabled resilience,
  - Accept risk differentials and risk-tolerance differences among customers
- Develop "resilient capacity" pricing in market-clearing auctions
- Expand Regional Greenhouse Gas Initiative (RGGI) and California emission credits and compensation to support nuclear power system viability and potential "black start" by future small modular nuclear reactors
- Exchange gov't-owned communications bandwidth for resilient telecom services
- In emergencies, using FAST Act powers (FPA Sec. 215A), the Secretary of Energy issues Emergency Orders with allowable cost-recovery
- Direct federal procurement at federal taxpayer expense
- Federal matching grants requiring equal or greater investments by recipients
  - DOE co-payments for "smart grid" and synchrophasor investments, 2010 - 2015
- Federal grants to states and local governments

Alternative financial incentives to strengthen resilience of critical infrastructures - II

- Direct federal power authorities to offer resilient electric services to Tier 1 defense & other customers
- Allow other electric service providers to serve Tier 1 customers at resilient system premiums
  - Co-location or proximity to Tier 1 customers averts "free riders" or "3rd party surcharges – microgrids?
- Utilize Gov't Owned Contractor Operated (GOCO) resilient facilities
  - For secure telecom services consider time-shares plus demand charges
- Utilize contractor-owned plus leaseback of essential facilities and services
- Lease federal and state lands & offshore federal and state resources for energy services with in-kind resilient energy services to lessor(s)
- Provide "safe harbor" legislative provisions to meet resilience standards but limit liability
- Use Stafford Act funding for pre-disaster mitigation – up to 6% of FEMA baseline budget
  - By legislation, expand Stafford Act funding for pre-disaster mitigation above current 6% limit
- Utilize DOE, utility-funded & energy lab pilot & demonstration programs to validate benefits of resilient architectures and technologies
- Expand utility (ratepayer) funding for "black start" assets within the bulk electric and load serving entity systems
- Enable tariffs for resilient "microgrids" that can operate during grid outages to receive (higher) "value of lost load" prices, justifying both larger capacity and resilient features
- Utilize "economic opportunity and "disaster recovery" zones for "resiliency projects"

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