NARUC Winter Policy Summit

Electricity Committee

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Electric System Resiliency
-What's Our Mission?

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Electric System Resiliency – What is our Mission?

- **Alison Silverstein**
- **NARUC Electricity Committee**
- **February 12, 2018**

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Definitions

Reliability has short- and long-term dimensions

- Short-term = operational security – withstand a sudden disturbance and still meet load without an uncontrolled cascading blackout or equipment damage. "Work the grid you've got"
- Long-term = resource adequacy -- ability to keep supply and demand in balance. Regulatory and compliance dimensions

Resiliency = "the ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to and/or rapidly recover from an event." (162 FERC ¶61,012)

Resiliency ≠ reliability

But resiliency measures enhance reliability

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What's the goal?

What's the problem we're trying to solve?

- Resiliency and reliability for generation is different from the grid is different from resiliency and reliability from customers' perspective.
- 95+% of customer outages come from T&D failures, not from generation shortages or fuel shortages,* so generation "resilience" does little to improve customer resilience.

We should prioritize reliability and resilience for customers, not just for generation

* Rhodium Group used DOE-EIA data to find that 0.00007% of recent customer outages are due to generation failure or loss of fuel…

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Long-term resiliency and reliability

- Short-term – since most customer outages occur from T&D problems, not generation, we should spend more on T&D – starting with design, asset management and vegetation management relative to generation resources
- Long-term – in a threat-rich environment, the best way to protect customers is to improve the way buildings and appliances protect people from energy system failures.
- Diverse cost-effective technologies and fuels – including supply- and demand-side resources – offer most value and risk reduction for customer-measured resiliency.
- Long-lived T&D assets need to be designed to meet 40 year forward climate change threats (extreme heat, drought, violent precipitation, wildfires, etc.).

Physical Systems

https://www.researchgate.net/figure/Integration-of-generation-transmission-distribution-and-consumer-in-a-smart-grid_300048936

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Electric System Resiliency

Innovation in Technology & Analytics

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Dr. Arshad Mansoor
Senior Vice President
EPRI

Benefit Cost Assessment Method for Storm Hardening and Recovery

How do we it today?

Distribution Grid Resiliency: Prioritization of Options. EPRI, Palo Alto, CA: 2015. 3002006668.

Determine historical damage and impact on recovery performance

Project the impact of applying options

Translate change in anticipated damage and in storm recovery performance

Need industry wide credible data to correlate historical experience of damage of particular asset types with overall storm recovery duration or frequency

New Approach Requires New Thinking for Benefit/Cost Assessment

Advanced Energy Communities

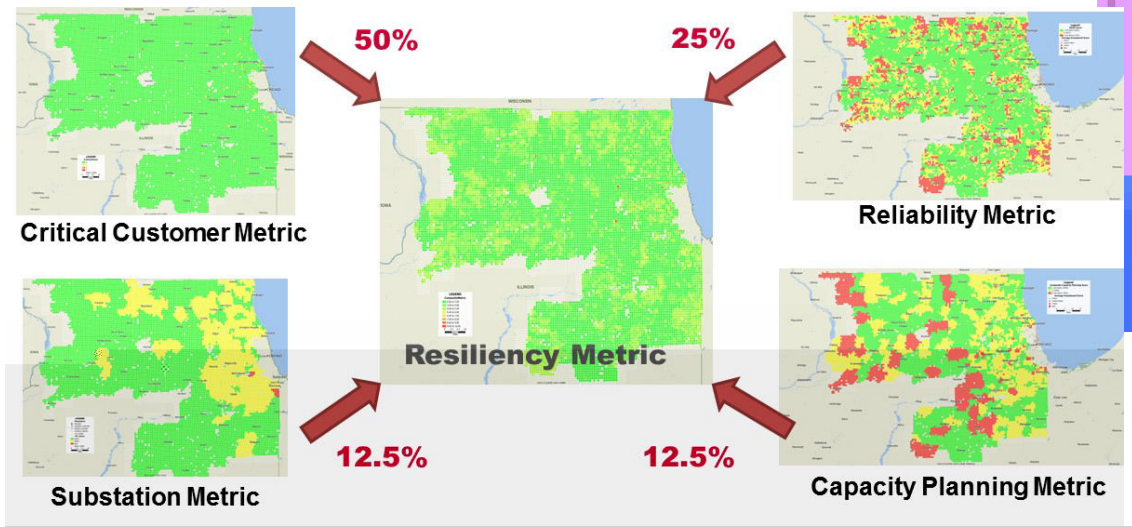
Improved Reliability AND Resiliency

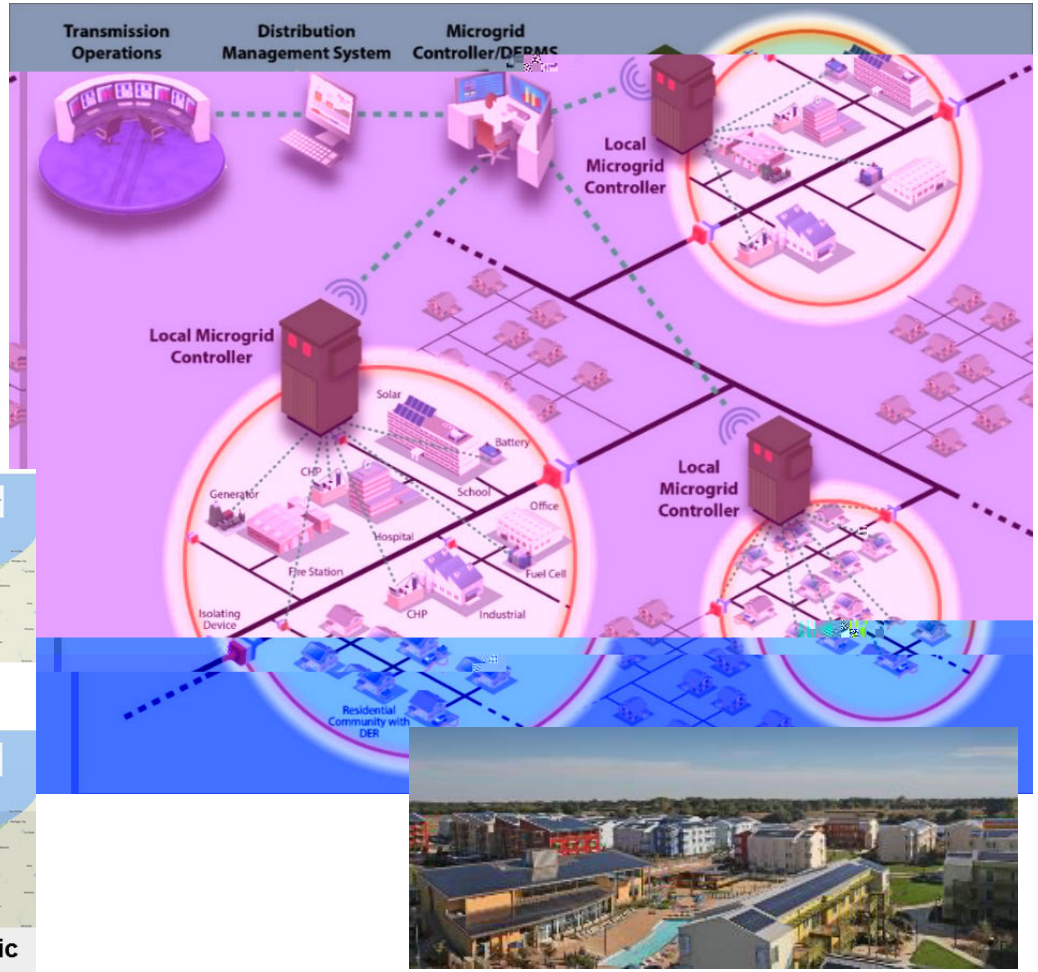
Improve Safety

Support Critical Facilities

Increase Hosting Capacity

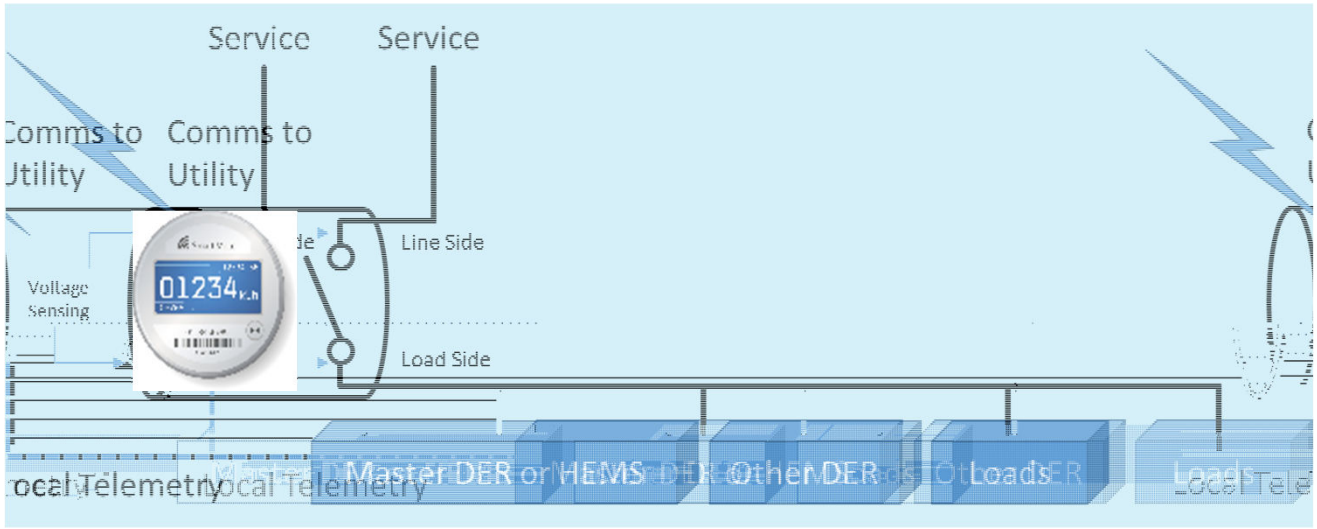
Reduce Losses





New Approach Requires New Thinking for Benefit/Cost Assessment

Smart Meters and Smart Inverters

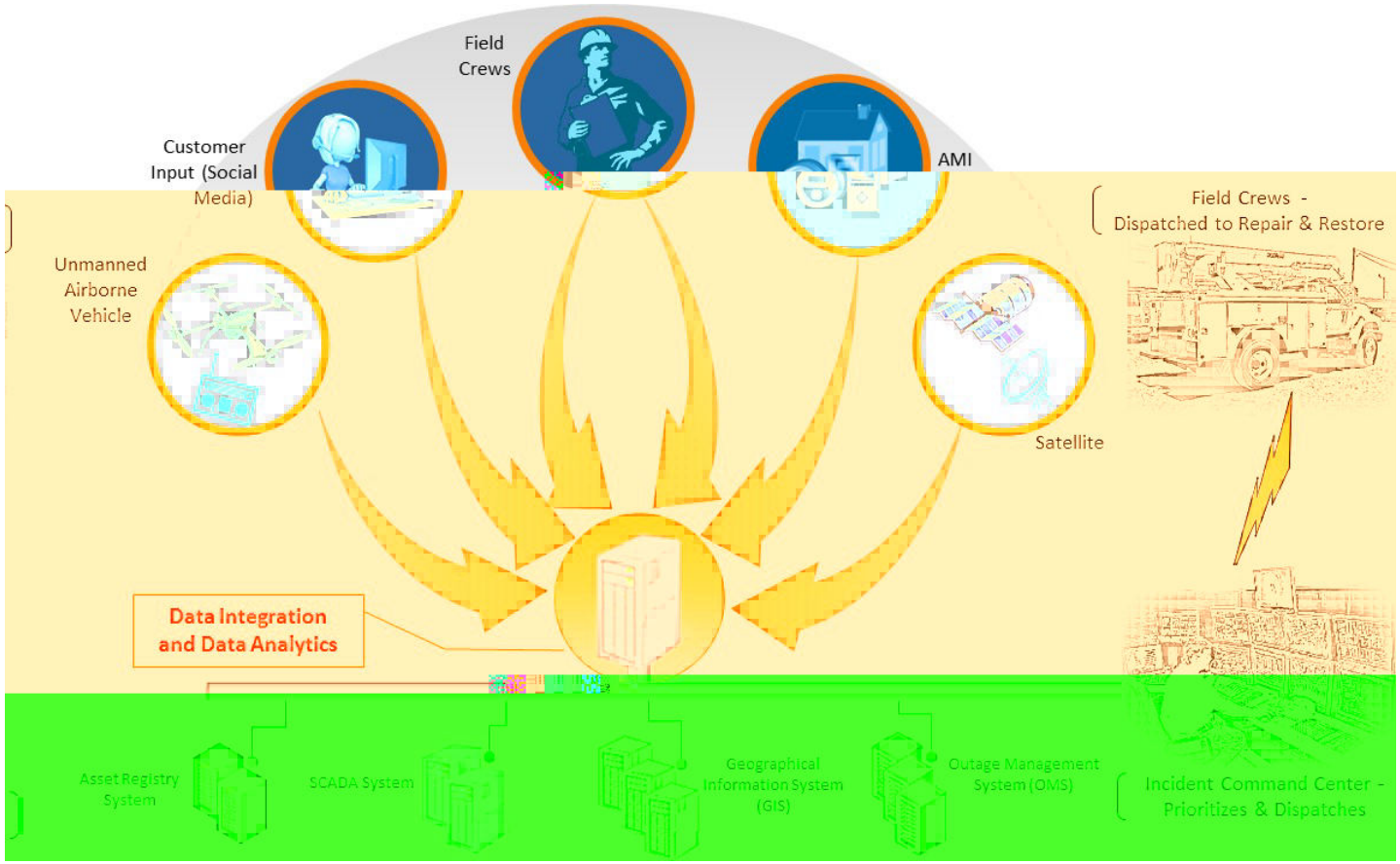


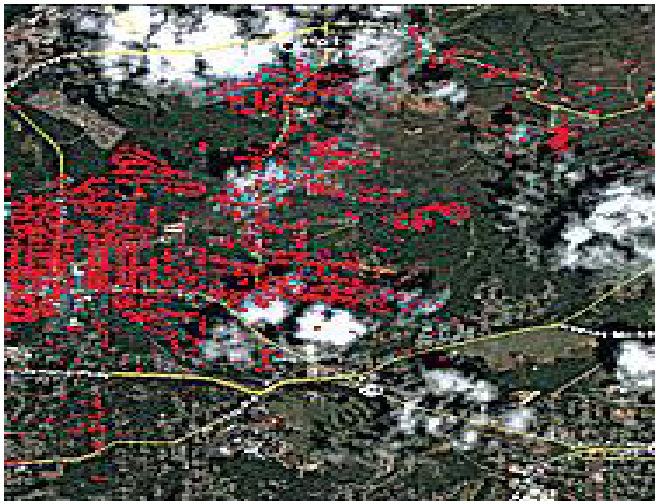
Why Florida Residents Couldn't Use Solar Power After Irma Knocked Out the Electricity, NBC News

Shared Resources – Enhanced Customer Resiliency and Grid Support

New Approach Requires New Thinking for Benefit/Cost Assessment

Communication Overlay for Grid Modernization





EPRI ELECTRIC POWER RESEARCH INSTITUTE

Key Elements for the New Thinking – Top 5

1. **Shared Resources**
2. **Multiple Value Streams Beyond Resiliency**
3. **Probabilistic Risk Assessment**
4. **Adequacy of Value of Lost Load (VoLL)**
5. **Standard/Metrics Based Criteria**

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