

ELECTRICITY AND DIGITIZATION: THE FEDERAL ROLE

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Clean Energy Project
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Critical Infrastructure Interdependencies

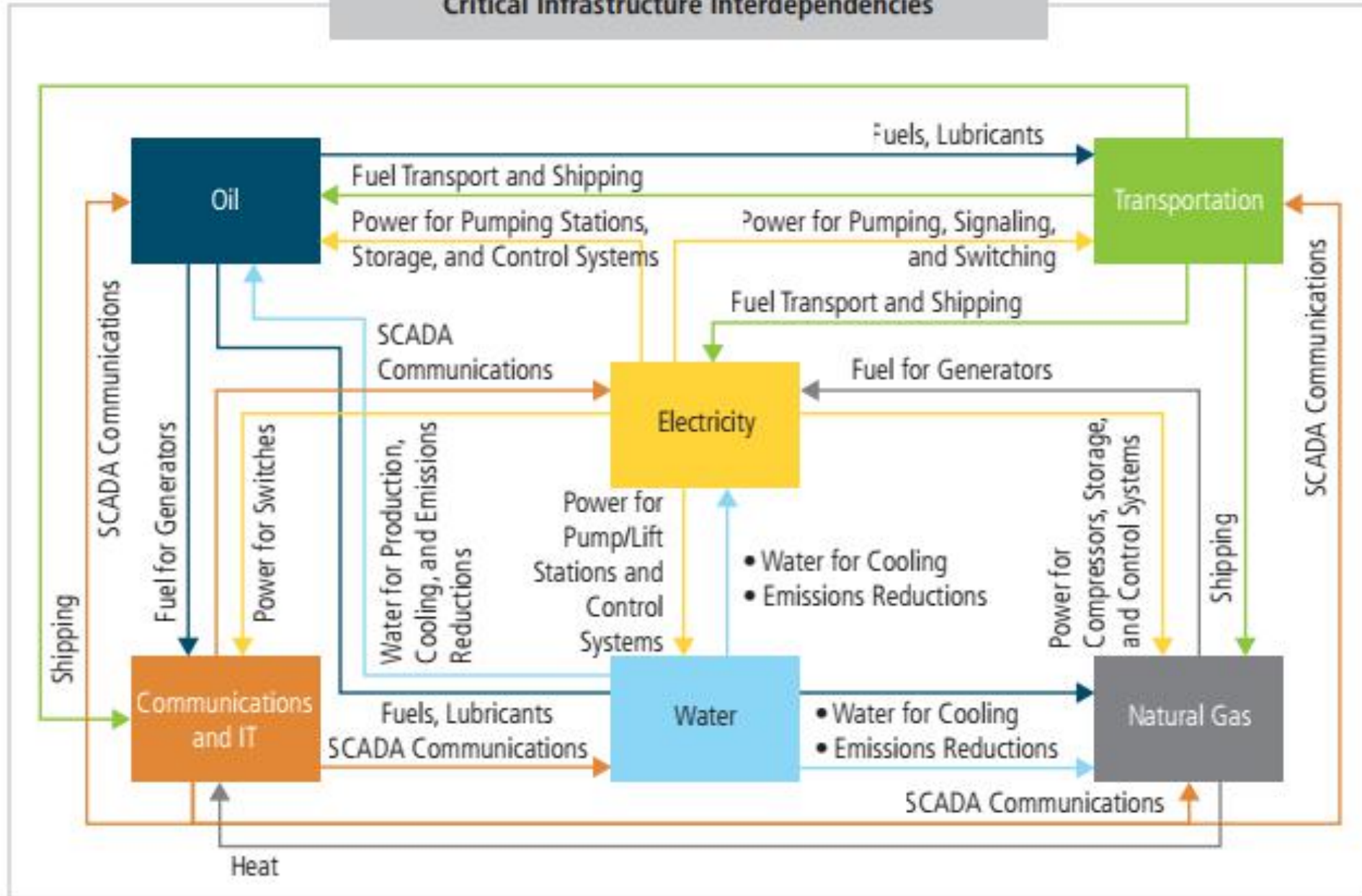
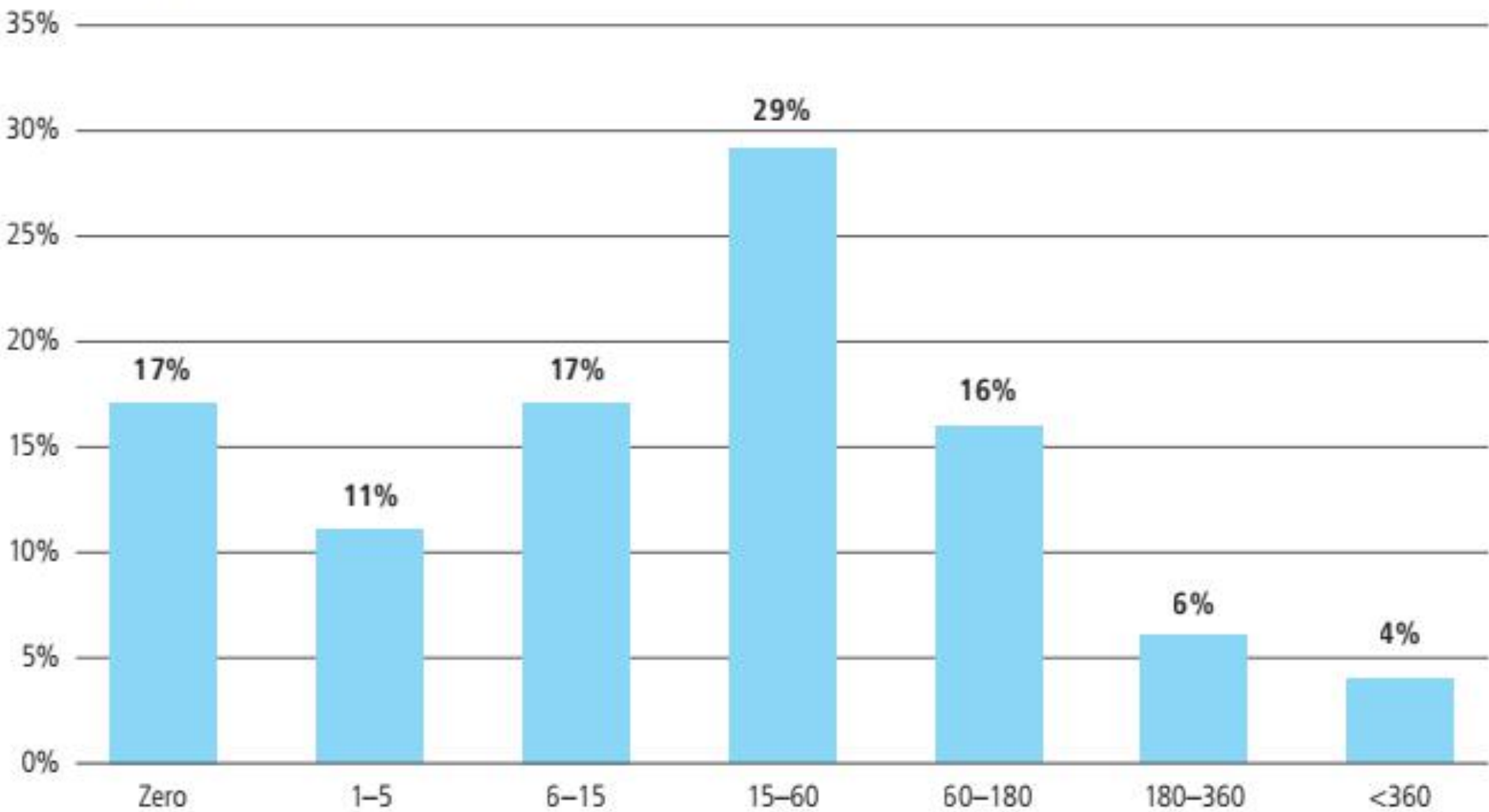
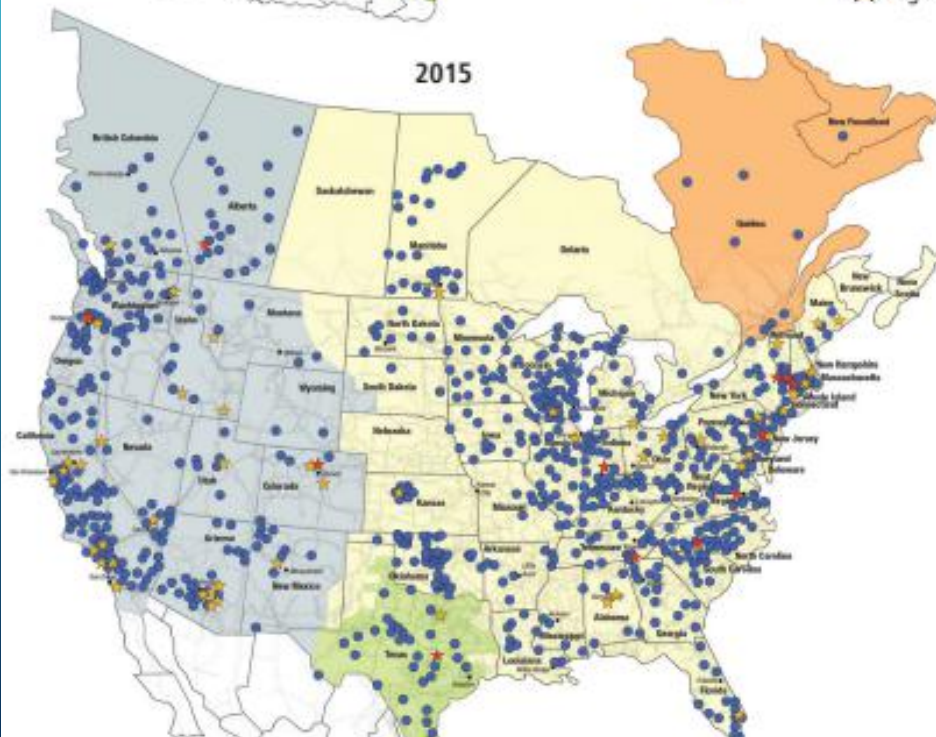
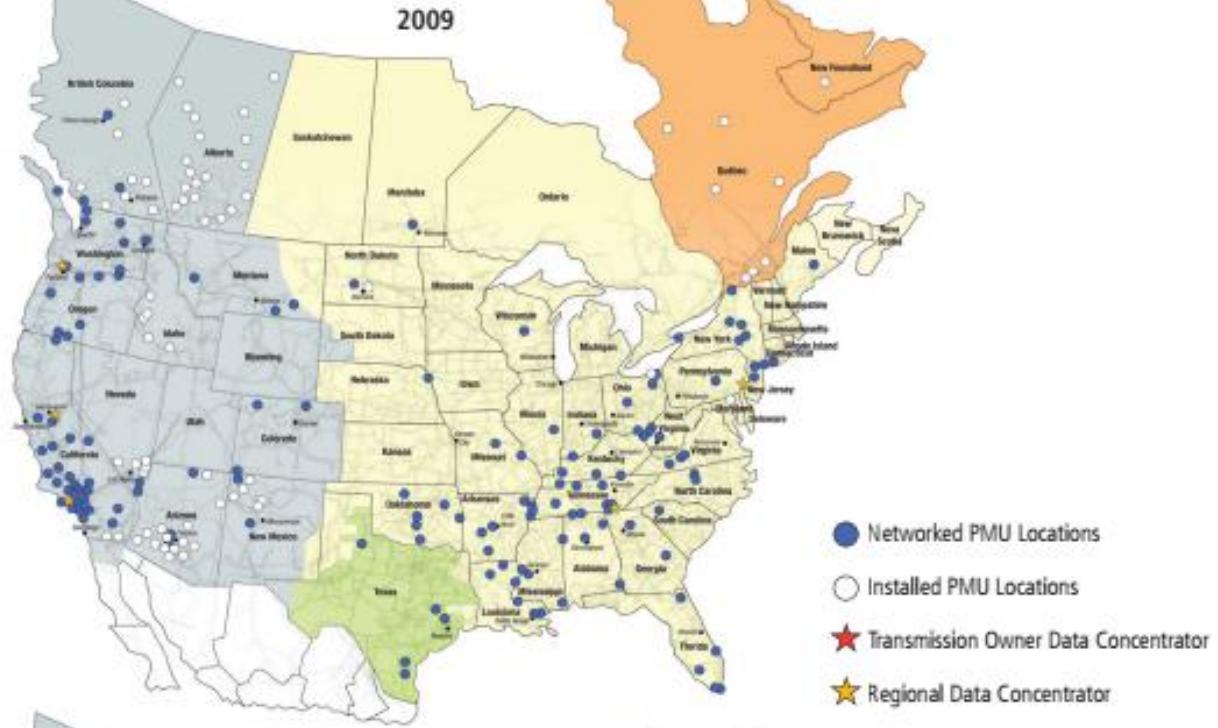


Figure 1-3. Company Survey: Approximately How Many Minutes of Information Technology Downtime Can Occur before Business Is Negatively Impacted?³⁰

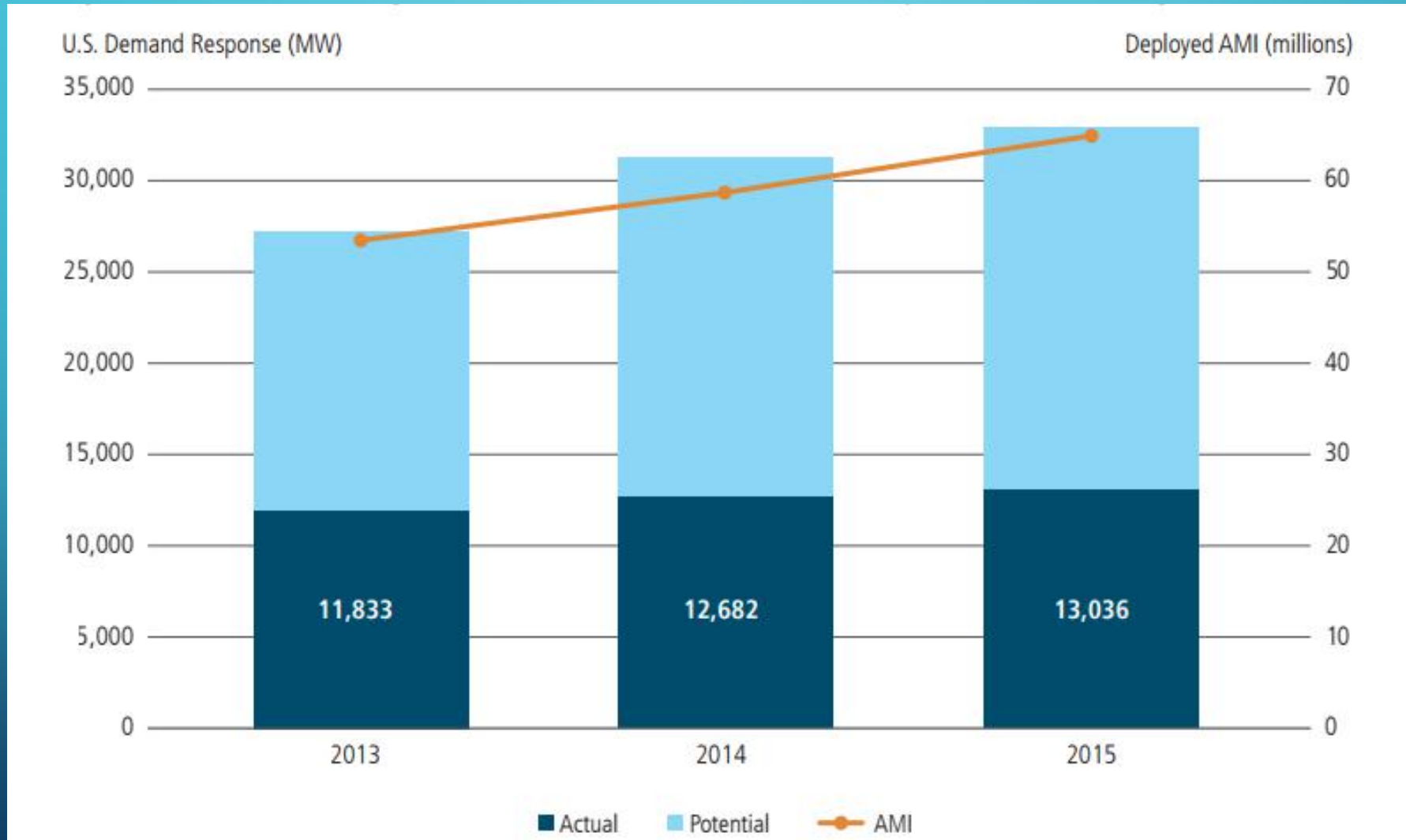
Share of Responses



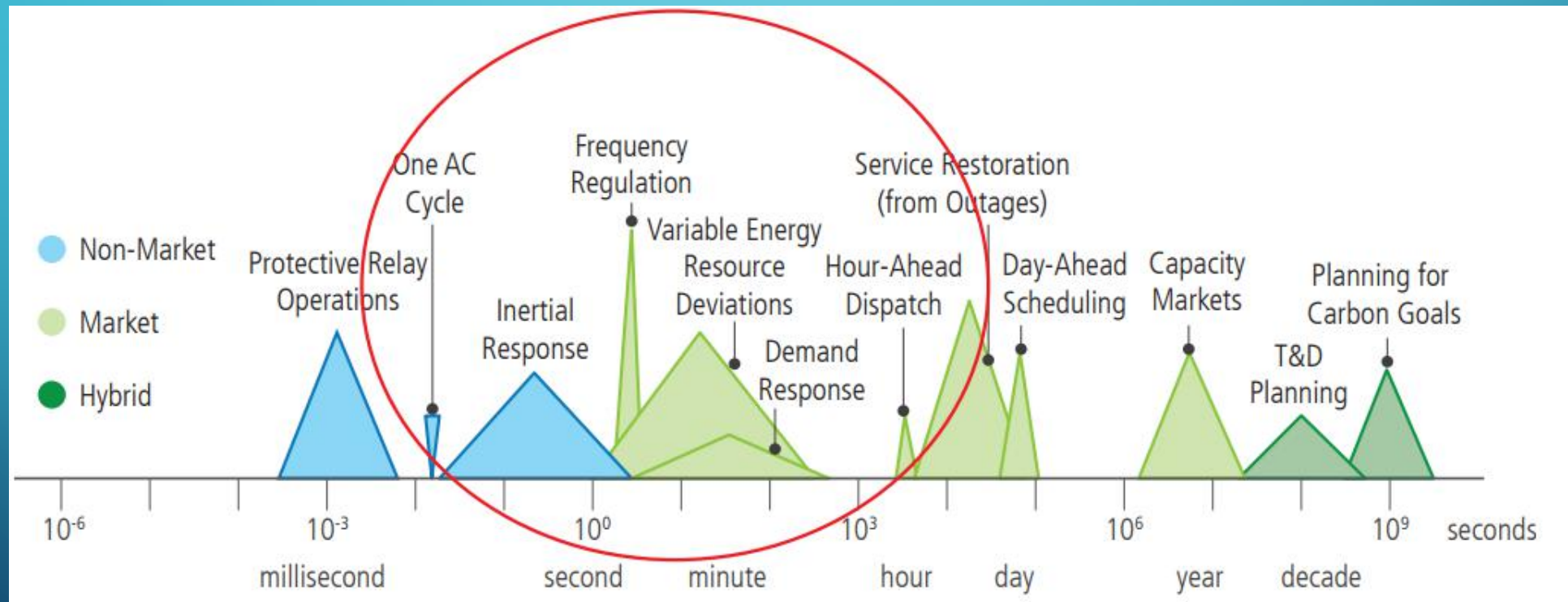


PMU Deployment

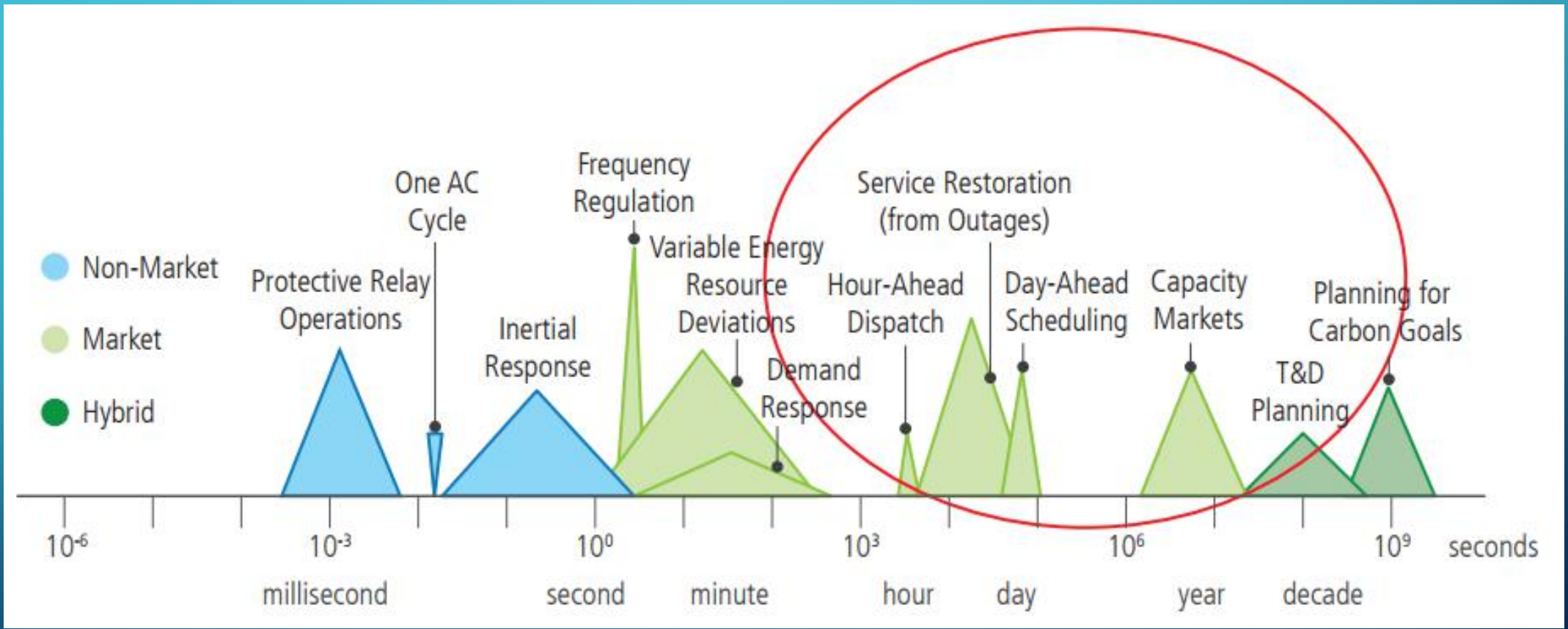
Demand Response and AMI



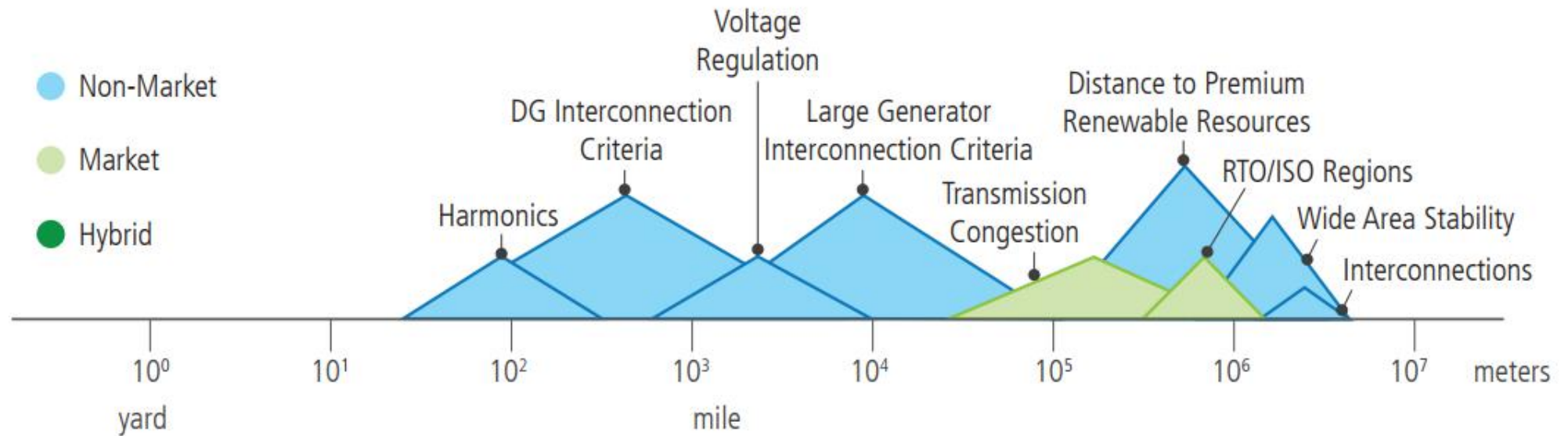
Time Scale of Grid Operations



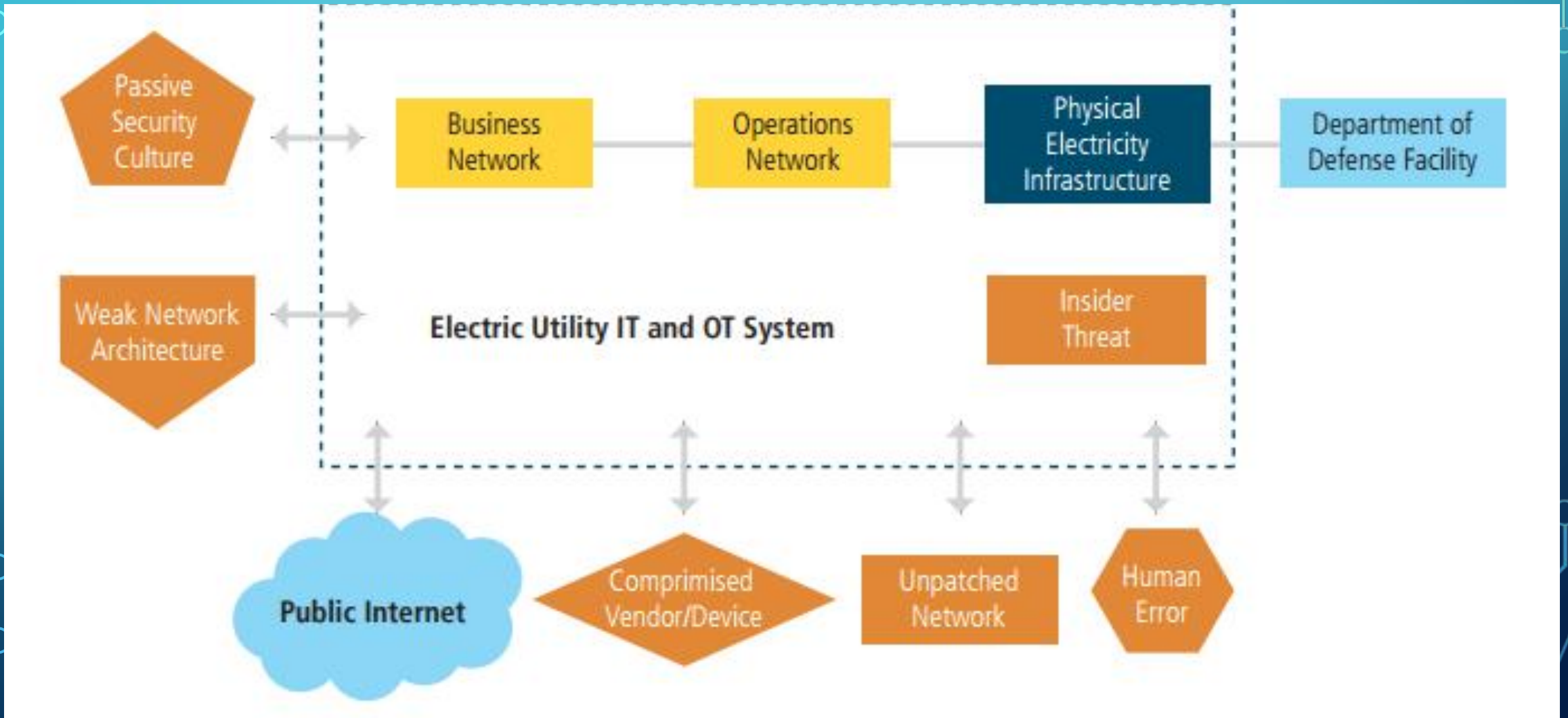
Time Scale of Grid Operations



Geographic Scale of Grid Operations

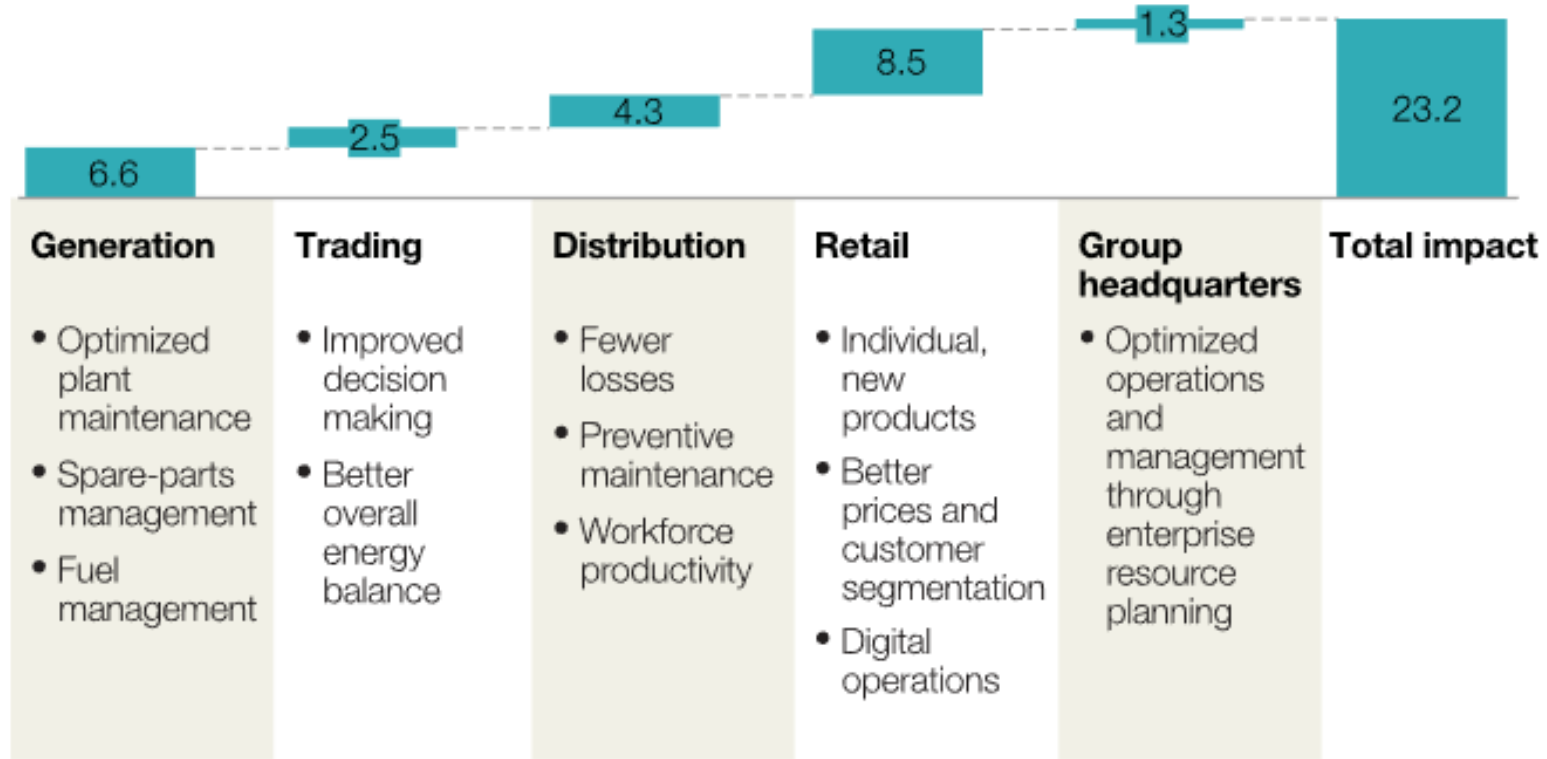


Security Threat Vectors



Digitization has demonstrable impact on utility earnings.

Improvement areas, case study, EBIT,¹ %



¹Earnings before interest and taxes.

Table 2-1. Potential Annual Cost Savings from Customer Engagement Solutions¹⁹⁸

| Value Source | Annual Savings Per Regulated Household |
|--|---|
| Effective marketing of new offerings | \$4–5 |
| Reduced cost-to-serve | |
| Reduced call volume, decreased escalations, etc. | \$3–16 |
| Increased adoption of e-billing | \$3–5 |
| Improved payment discipline | \$1–4 |
| Improved cost-effectiveness of energy efficiency (EE) program portfolio | |
| EE program cost savings via Behavioral EE | \$2–5 |
| EE program cost savings via Thermostat EE | \$20–35 |
| Behavioral DR capacity and energy cost savings | |
| Behavioral demand-response capacity savings | \$7–20 |
| Potential aggregate value, \$/household, per year | \$40–90 |

Customer engagement can provide cost savings to utilities across several functions: program marketing, customer care, energy efficiency, and demand response.



Generation



Variable Energy Resources



Grid-Scale Storage

Federal



Transmission



Distribution

State

Microgrids



Demand Response



Energy Efficiency



End Use



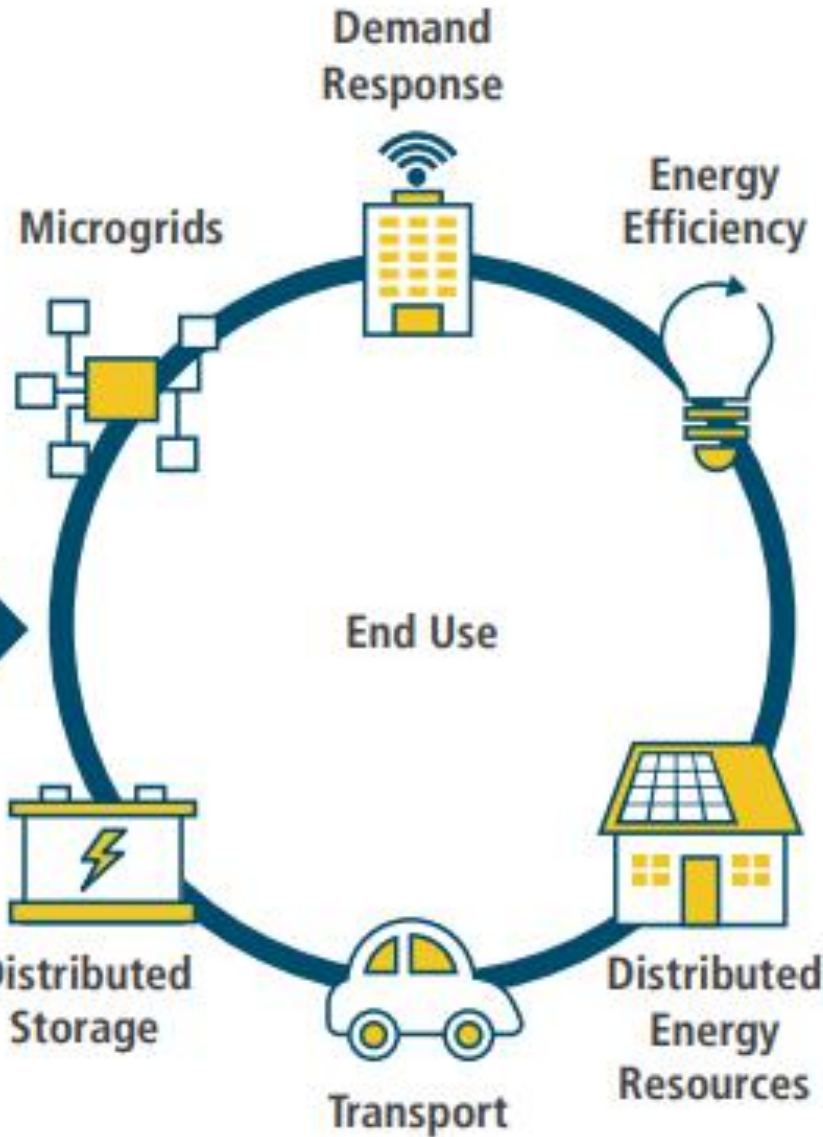
Distributed Storage

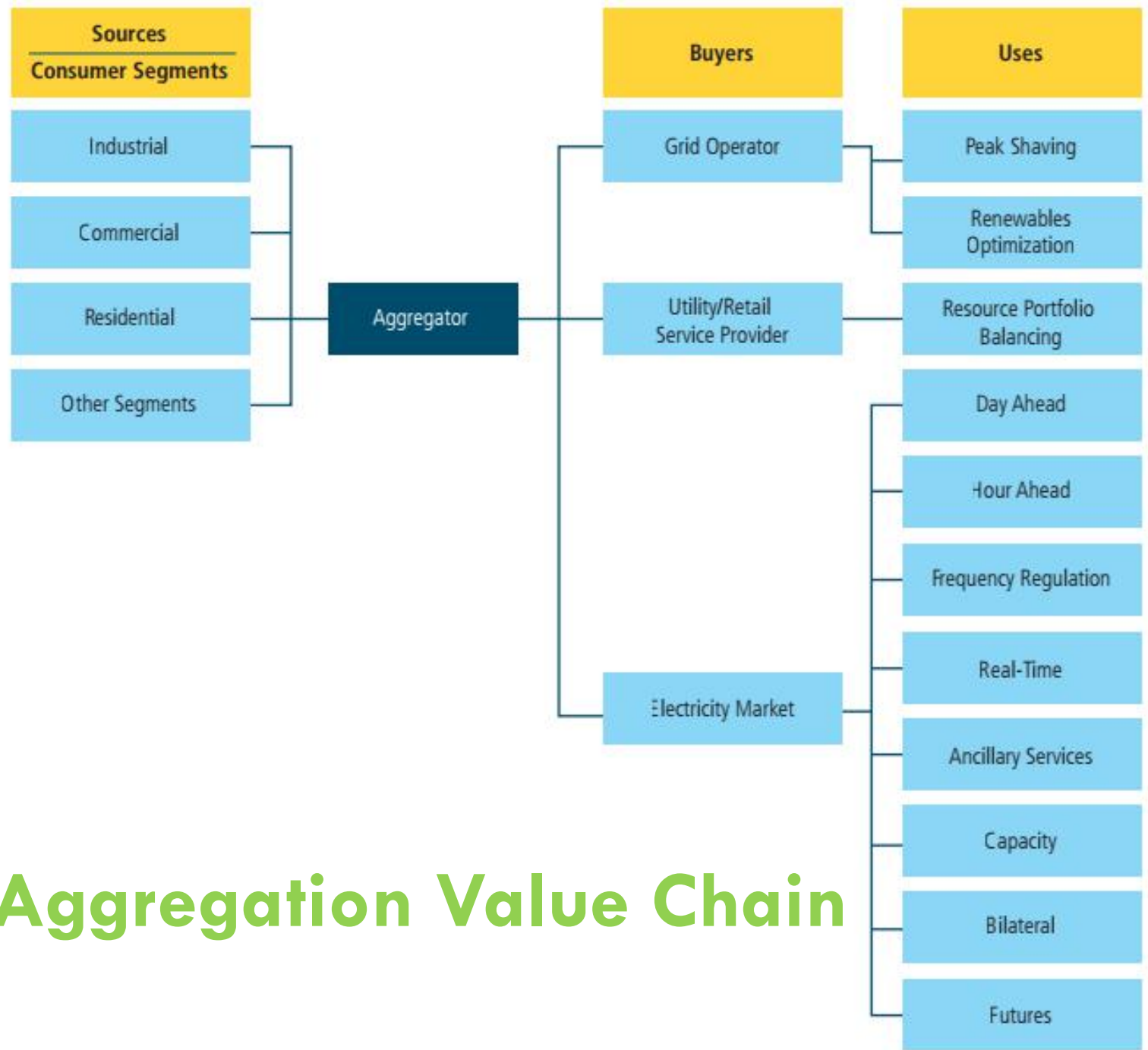


Transport



Distributed Energy Resources





Aggregation Value Chain

YOUR GIG IS HERE.

Right here, in Chattanooga.

CHATTANOOGA, TENNESSEE IS THE FIRST AND ONLY CITY IN AMERICA WITH A GIG.

On September 13, 2010 - every business and home that is connected to Chattanooga's fiber optic network will have access to a 1 gigabit per second Internet connection. By the end of this year, this will be true of 170,000 businesses and homes in a 600 square mile service area.



Workforce Development



Public Utilities Commission

Critical Infrastructure Interdependencies

