



RHODE ISLAND

DIVISION OF PUBLIC UTILITIES AND CARRIERS

Power Sector Transformation: Grid Connectivity and Meter Functionality – Meeting 2 June 2017



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**Benefits of
Modernizing the
RI Electric
Grid**

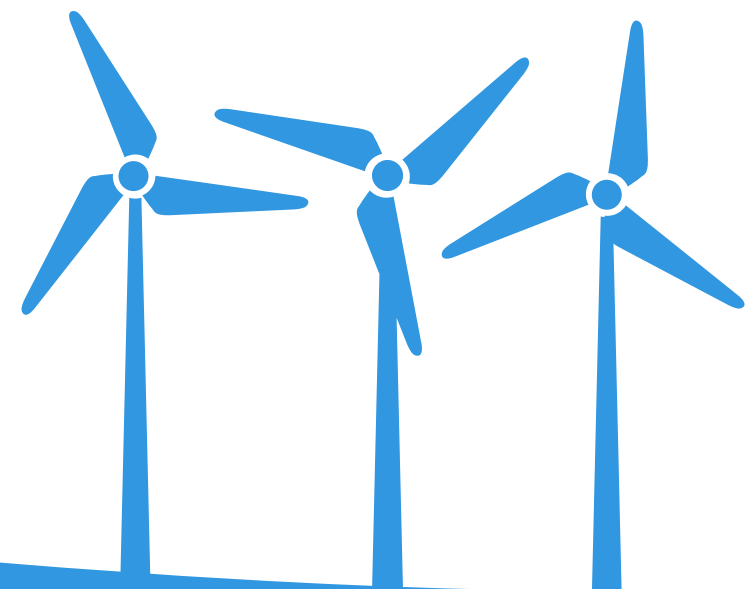
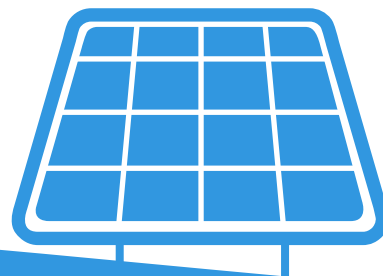


Give customers more energy choices.

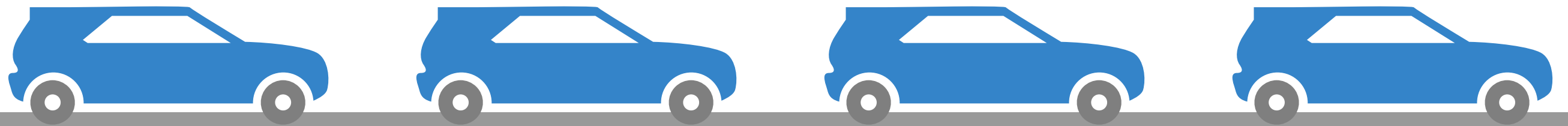
Clean energy technologies are **more affordable now than ever**. Our utility rules should allow consumers to access and enjoy creative solutions to manage their energy production and use.

Build a flexible grid to integrate more clean energy.

The Governor's goal of **1,000 megawatts of clean energy by 2020** will bolster our growing local clean jobs economy and help us meet state climate goals.



Control the long-term costs of the electric system.



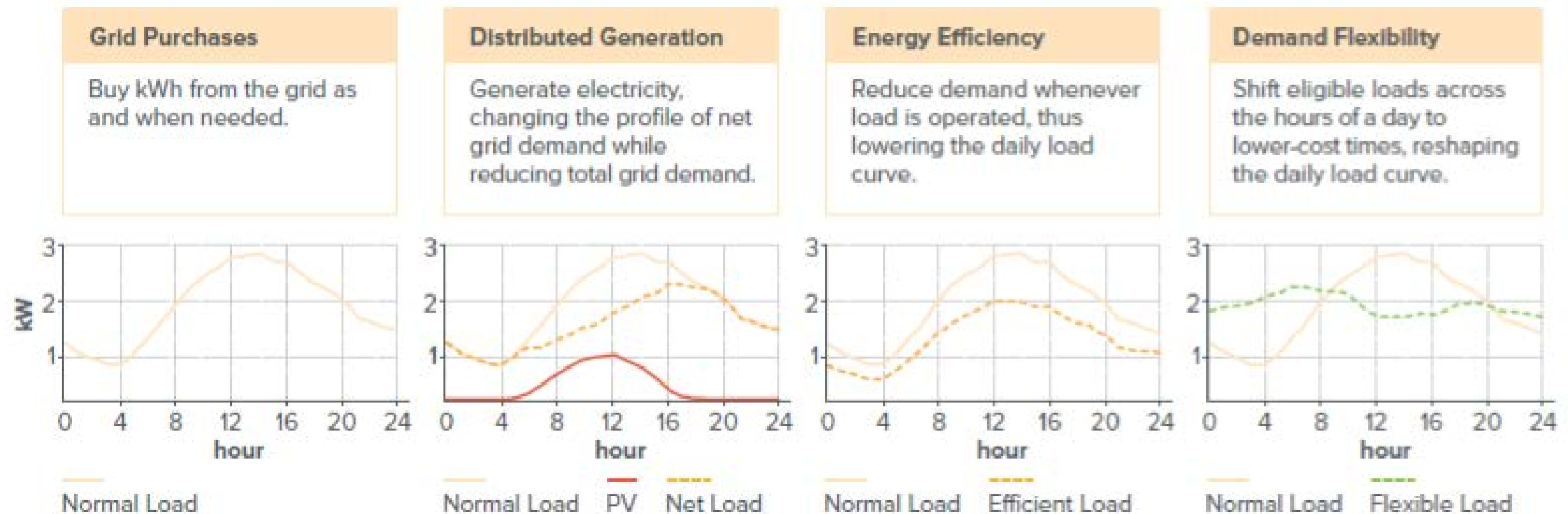
Today's electric grid is built for peak usage. That's like constructing a **100-lane highway for Thanksgiving traffic.** New technology provides us with more ways to right-size the system to Rhode Islanders' needs.

GRID ANIMATION CAN DRIVE SIGNIFICANT COST SAVINGS

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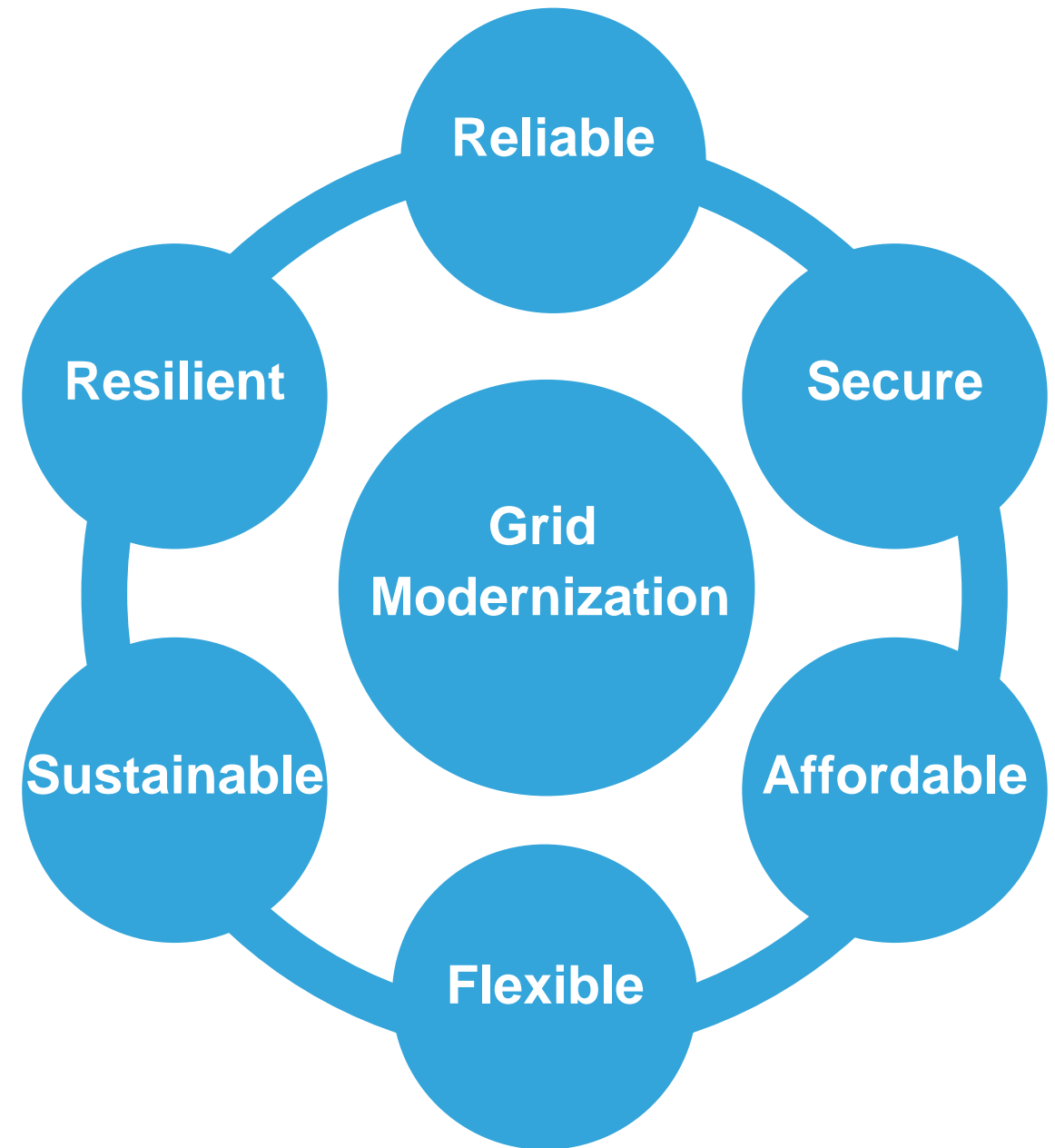
FIGURE ES1

GRID PURCHASES, DISTRIBUTED GENERATION, ENERGY EFFICIENCY, AND DEMAND FLEXIBILITY COMPARED



A MODERN GRID MUST HAVE...

- **Greater resilience** to hazards of all types (cyber, extreme weather, etc.)
- **Improved reliability** for everyday operations
- **Enhanced security** from an increasing and evolving number of threats
- **Additional affordability** to maintain our economic prosperity
- **Superior flexibility** to respond to variability and uncertainty
- **Increased sustainability** through additional clean energy and energy- efficient resources

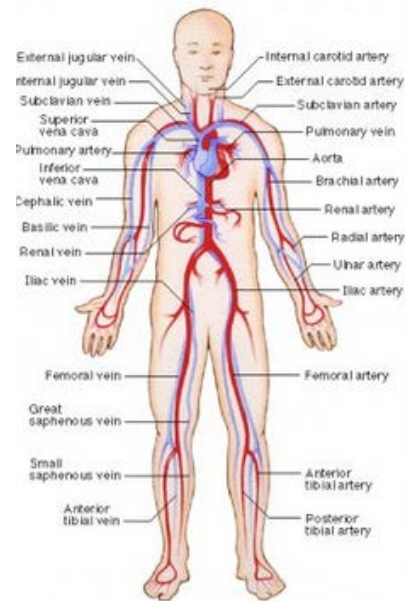


MODERN ELECTRICITY AND TELECOMMUNICATIONS INFRASTRUCTURE ARE INTERTWINED

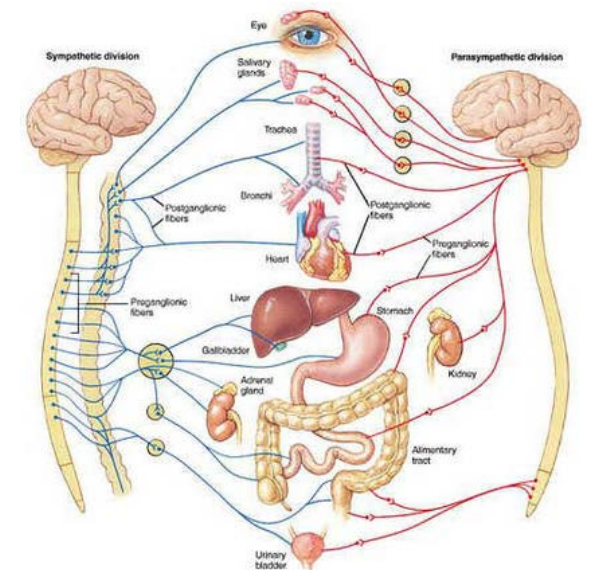
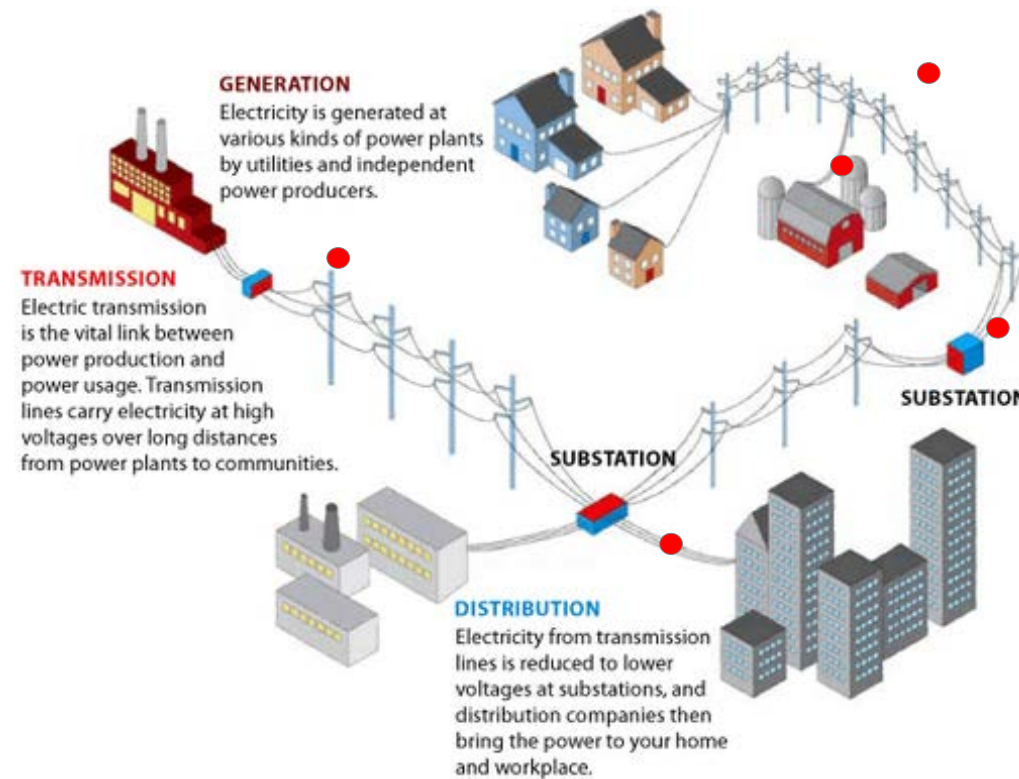


Digital control is needed at each junction point.

Like electricity, broadband can be used for multiple things.

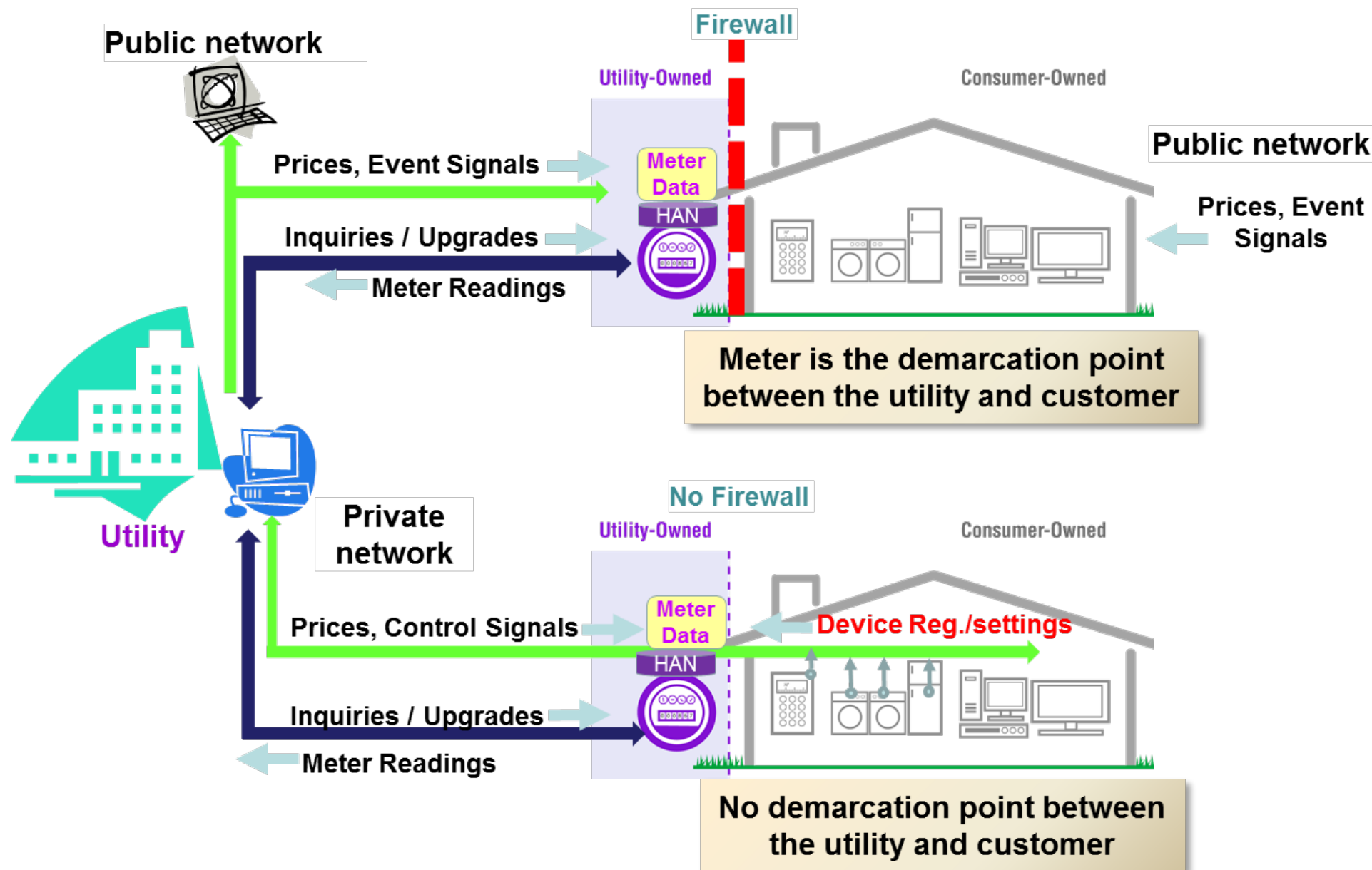


The Circulatory System



The Nervous System

AMI Firewall Location Defines the Grid Edge



- ◆ Grid data incorporated into local control algorithms
- ◆ SmartMeter observes and records results
- ◆ Utility determines control
- ◆ SmartMeter observes and records results
- ◆ Or, conventional meter assumes function without verification

EXISTING TECH CAN BE DEPLOYED NOW TO LEAD TO A CHEAPER, CLEANER, MORE RELIABLE SYSTEM

ENERGY STORAGE

- Grid Storage
- Mobile Storage



ADVANCED METERING

- Real time usage
- Demand mgmt



BIG DATA

- Voltage Mgmt
- Cybersecurity



INTERNET OF THINGS

- Grid Edge
- Dispatchable Appliances

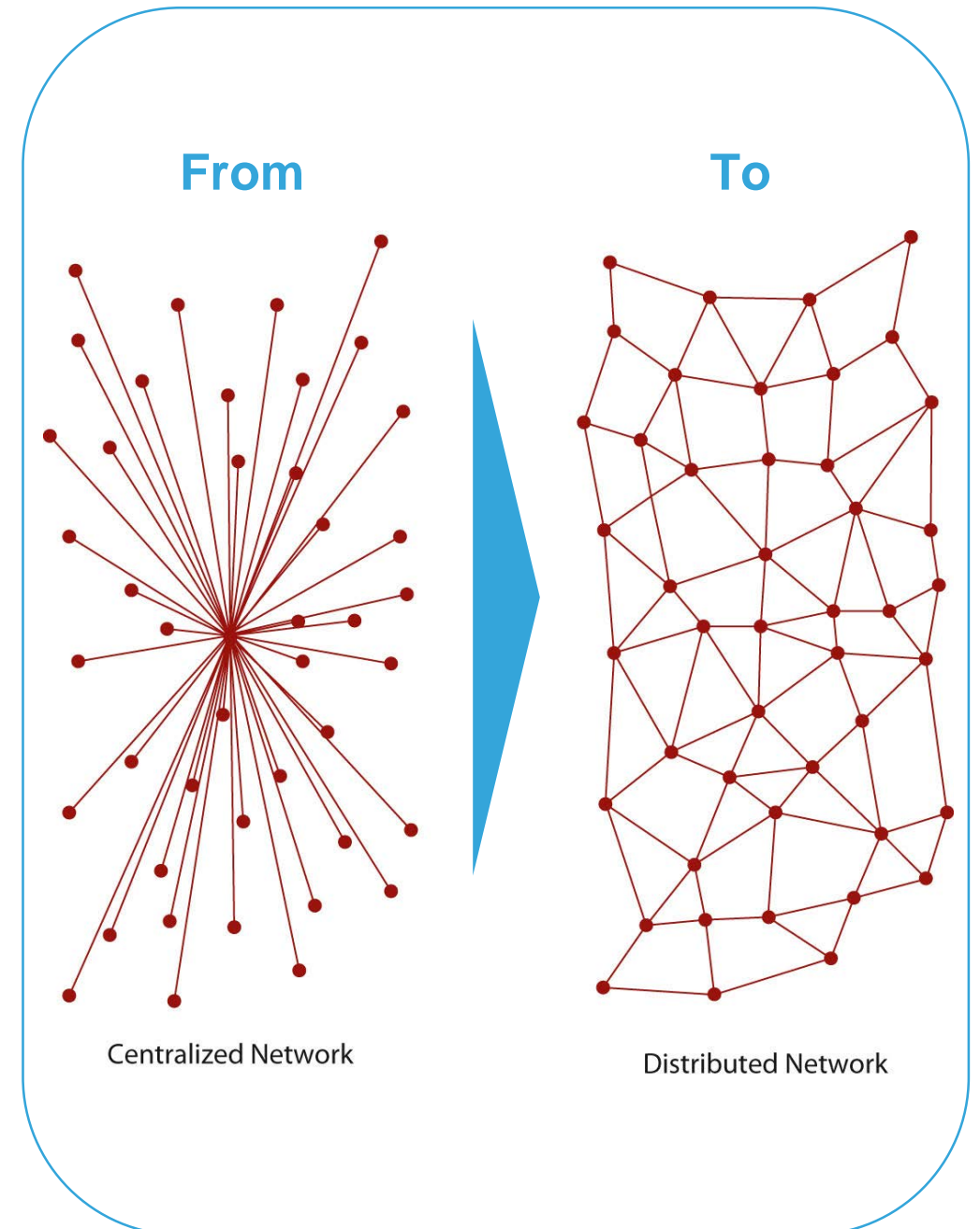


TIME VARYING RATES

- Low demand = cheap power
- High demand = more expensive

DISTRIBUTED GENERATION

- Solar/Wind buildout
- Cybersecurity



QUESTIONS FOR TODAY

- **Where is the Grid Edge?**
- **How to avoid obsolescence?**
- **What does the future look like?**
- **What do we need to get there?**