



## PSerc Forum

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# Current Electric Utility Environment

- **Changing consumer needs**
- **Emphasis on climate change, energy conservation and efficiency**
- **Increasing demands in the restructured Texas electric market**
- **Regulatory reliability concerns / awareness**
- **Internal drive for continuous improvement of people, processes and technology**

**The overall utility environment is demanding higher performance in an ever-increasing cost environment.**

# Changing Consumer Needs

“The greatest challenge facing electric distribution is responding to rapidly changing customer needs for electricity. Increased use of information technologies, computers, and consumer electronics has lowered the tolerance for outages, fluctuations in voltages and frequency levels, and other power quality disturbances. *Source: “Grid 2030” A National Vision for Electricity’s Second 100 Years, p 7*



1960



1970



1980



1990



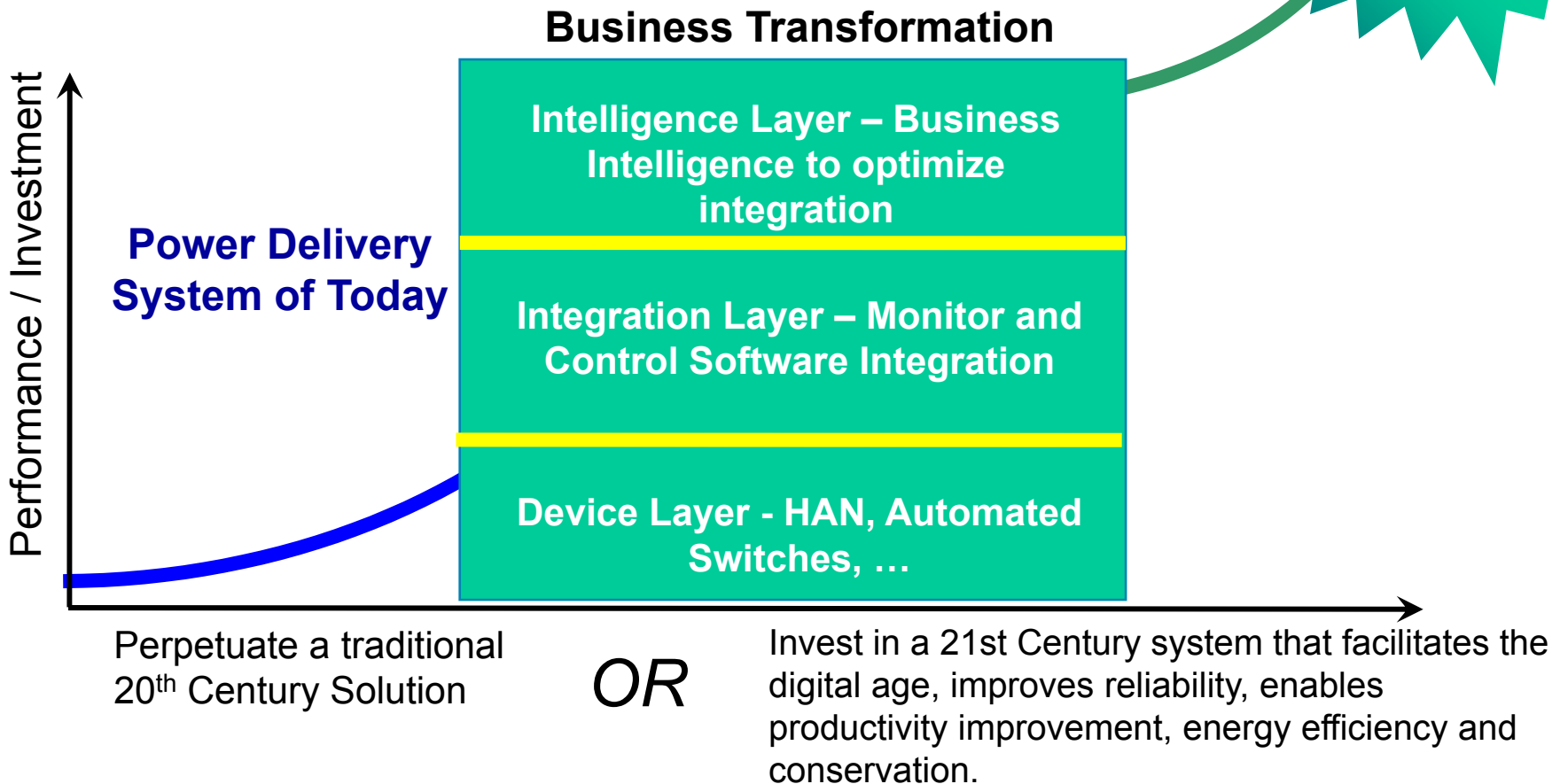
TODAY

CUSTOMER EXPECTATIONS

# Utility Transformation Opportunity

Utilities are at a crossroads .....

We “think” we have a choice...



## CenterPoint Energy (CNP) is pursuing a smart grid initiative as part of its Energy InSight<sup>SM</sup> deployment

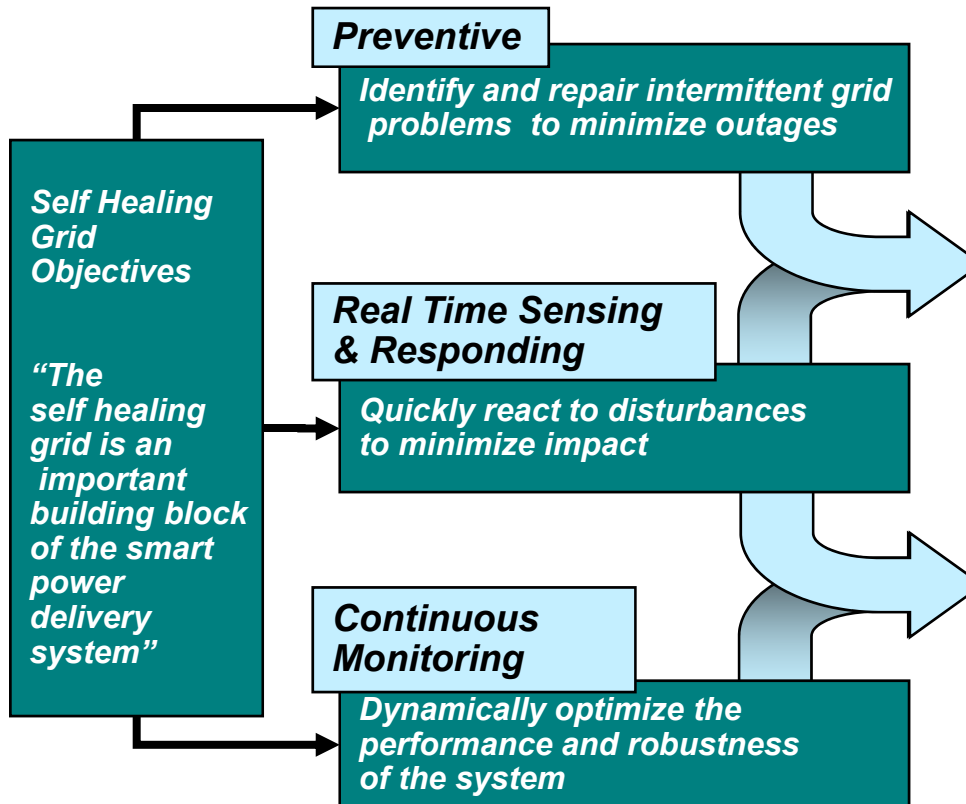
Energy InSight<sup>SM</sup> will utilize smart grid technology to link electricity with power line hardware, appliances, communications, systems integration and an intelligence layer of monitoring and control to create a highly automated, responsive and resilient power system. The grid will be transformed from a centralized, producer controlled network to one that is grid autonomous, less centralized and end user device interactive.

Interaction groups with smart grid include:

- ✓ **Electric Grid Field Personnel** - CNP line workers, local area electricians, distributed generation personnel...
- ✓ **CNP Office Personnel** – Engineers, Accounting, Call Center, Information Technology, Operations...
- ✓ **Retail Energy Providers and Consumers** - Interactive consumption feedback, Demand management Programs, Service provider switching, bill analysis...
- ✓ **Devices and Systems** - Devices from solar panels, Home Area Network devices, smart thermostats, grid switches, grid diagnostic devices, grid management systems...

*The smart grid initiative focuses on installing the smart meter system as a first stage to allow consumers to begin taking advantage of the benefits of smart meters. The next stage is to focus on grid automation.*

## DOE's "Grid 2030" and EPRI's IntelliGrid Framework



## CenterPoint Energy Energy InSight<sup>SM</sup> Outcomes

### Event Avoidance

- Remote Load Profiling / Mgmt
- Grid Event Diagnostics
- Advanced Data Analysis
- Grid Condition Sensing & Predictive Response

### Self-Healing Grid

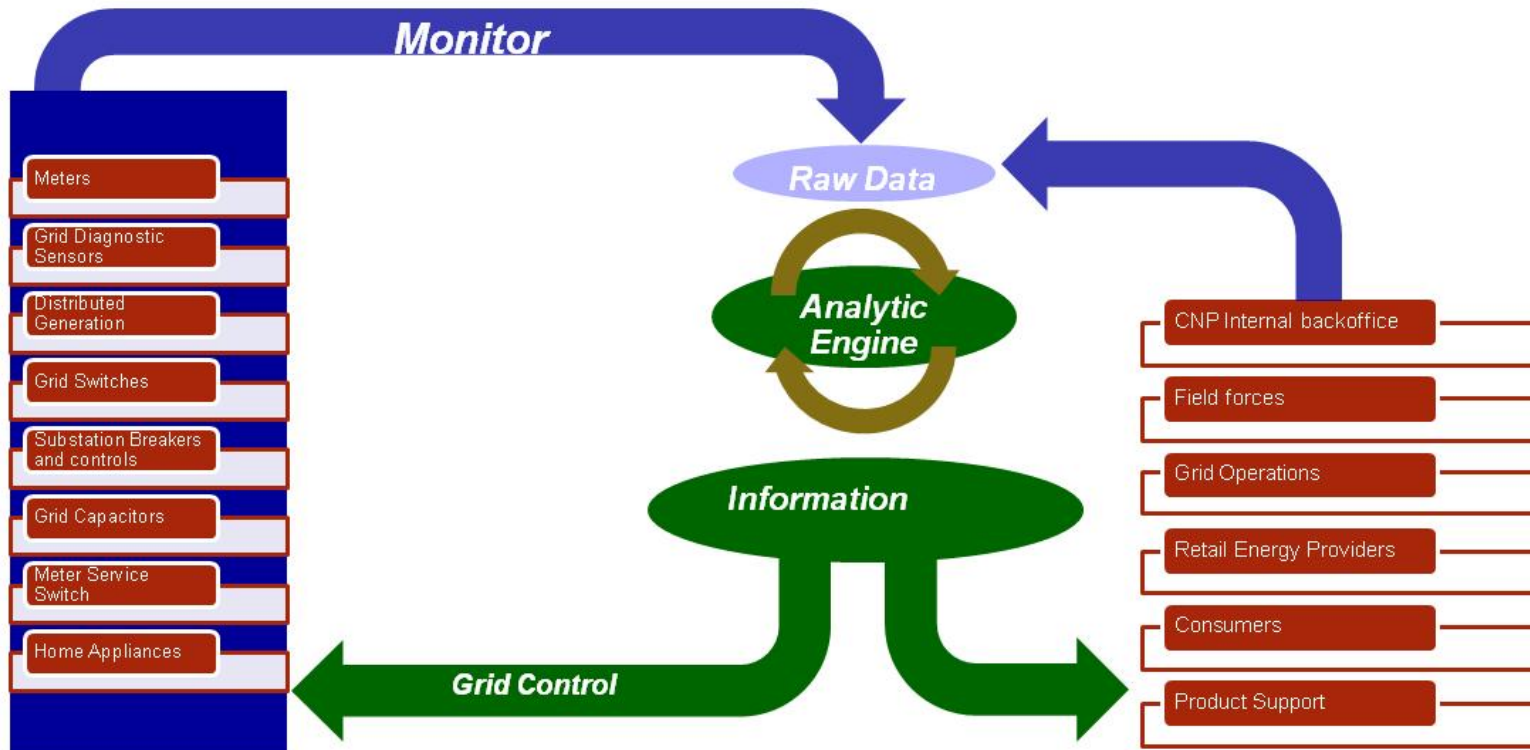
- Improved Asset Mgmt / Visibility
- Real time Grid Condition Monitoring
- Automated Grid switching, etc.
- Meter as a Sensor
- Transformer Load Mgmt
- Condition Based Crew Dispatching
- Grid Event Detection and Location

### Advanced Meter System (AMS)

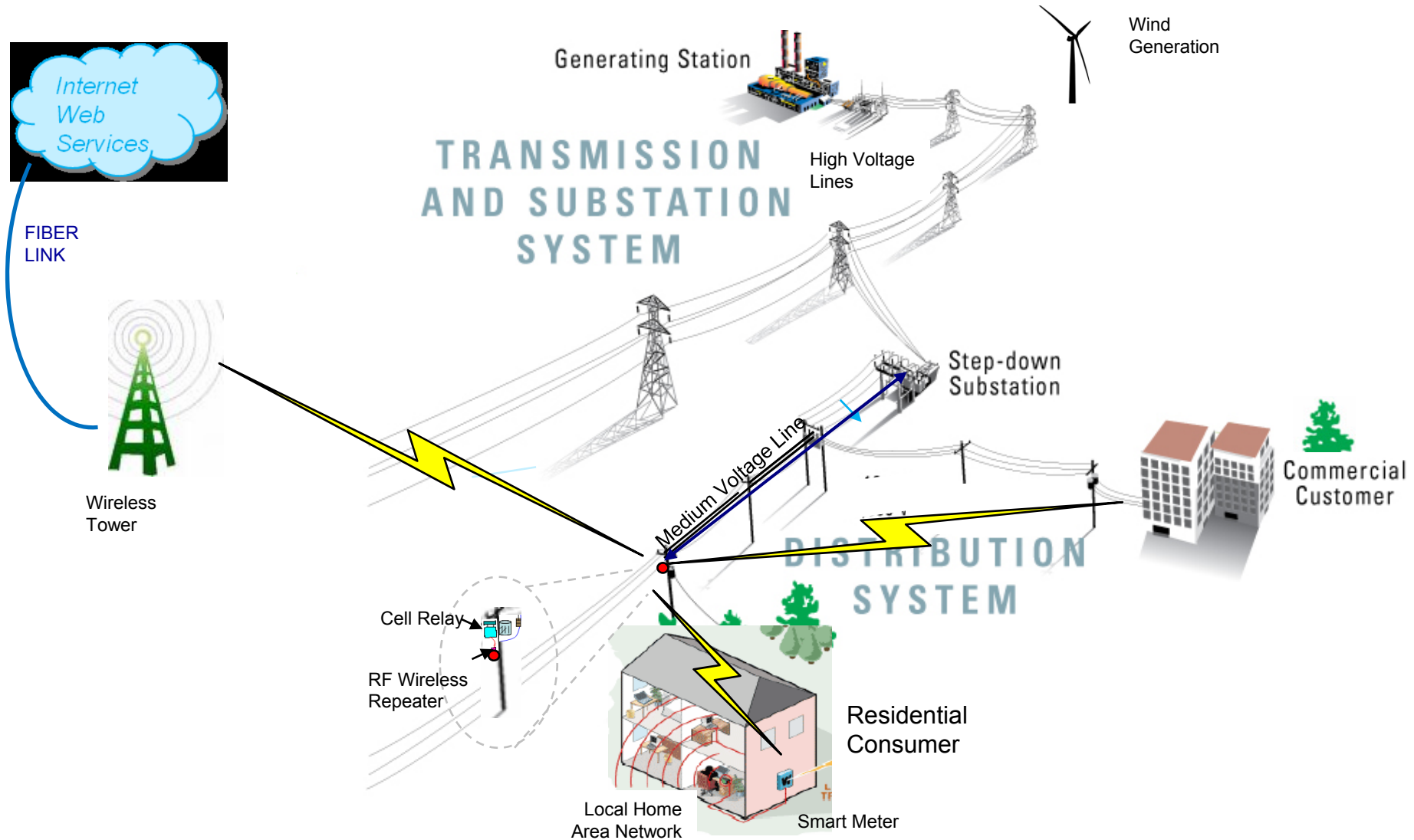
- Smart Meters
- Meter Interrogation
- Meter Connect / Disconnect

# What makes the smart grid “smart”?

Two way communication interaction and an analytic engine is the “Intelligent Brain” that will continuously monitor grid sensors and will respond with information or control of grid field devices. Analytics engine will respond based on engineering algorithms and rules derived and captured from institutional knowledge and experience. Information is provided on a “self-service concept” to all grid stakeholders.

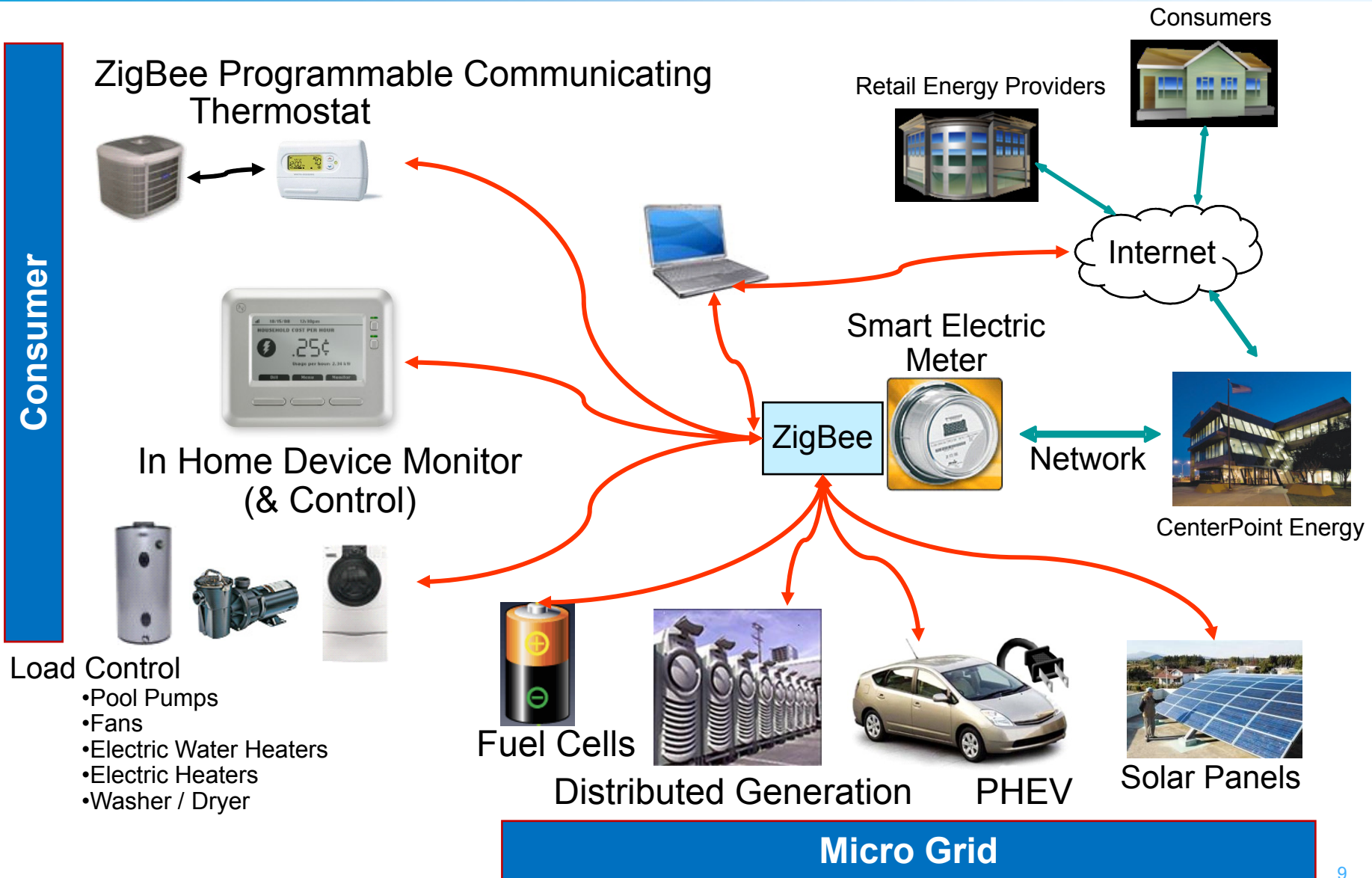


# Energy InSight<sup>SM</sup> Network Design

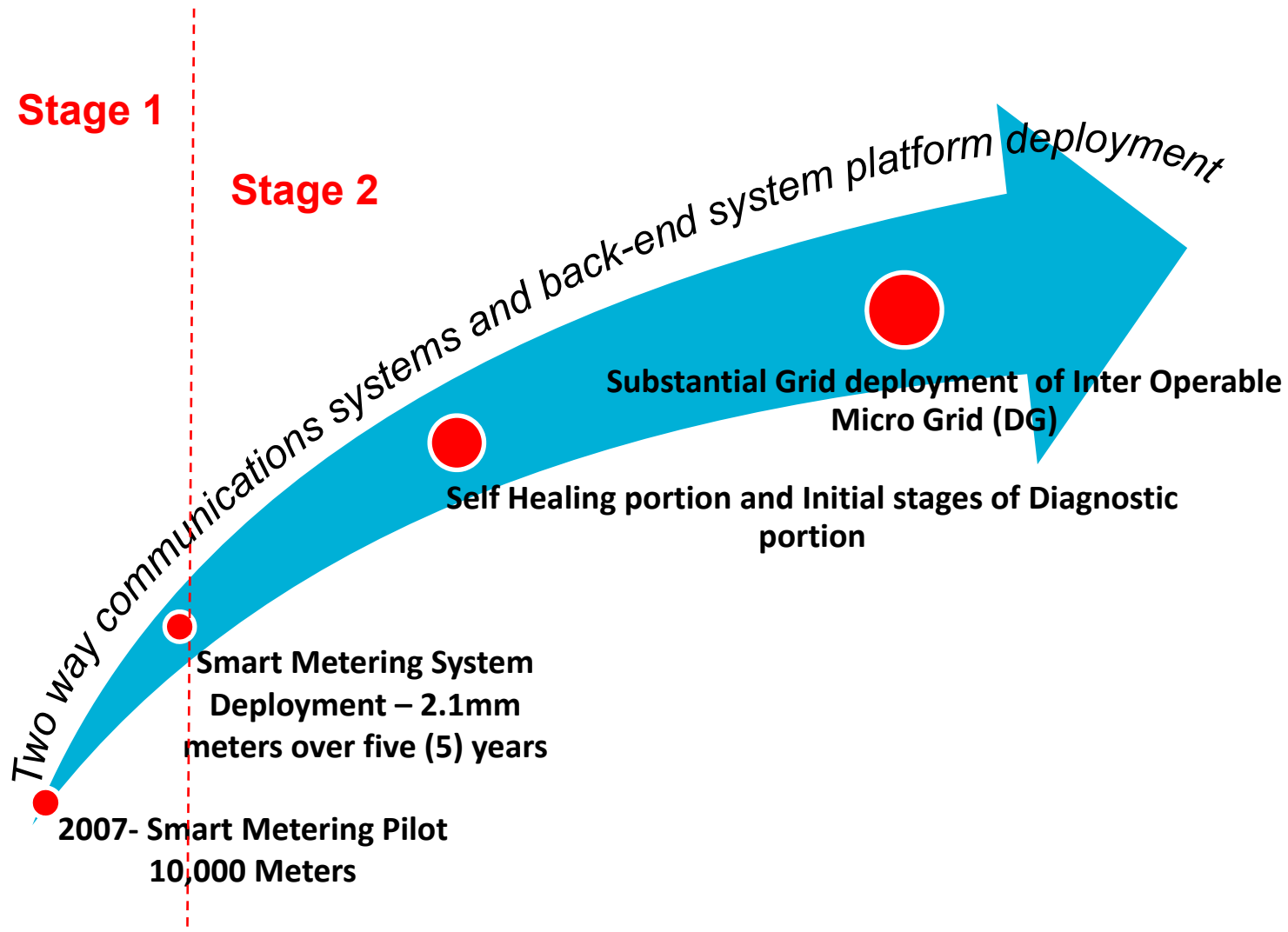




# Interactive Grid Concept



# Energy InSight<sup>SM</sup> Next Steps



## Key Stakeholder

## Benefits

|                         |  |
|-------------------------|--|
| <b>Electric Utility</b> | <ul style="list-style-type: none"><li>• Enables more effective loading of utility assets (lines, transformers...)</li><li>• Enables increased monitoring and diagnostics to enhance the life of utility assets</li><li>• Improved line fault detection and diagnostics</li></ul> |
| <b>Consumers</b>        | <ul style="list-style-type: none"><li>• Power quality and reliability improvements</li><li>• Friendly access to detailed consumption information to make informed choices and enable faster transactions</li><li>• Enables and promotes energy conservation</li></ul>            |
| <b>Retailers</b>        | <ul style="list-style-type: none"><li>• Expands retailer's ability to offer new service offerings</li><li>• Enables time-of-use rates and critical peak pricing</li><li>• Establishes platform to offer future home appliance monitoring and control</li></ul>                   |
| <b>Environment</b>      | <ul style="list-style-type: none"><li>• Enables demand-side management</li><li>• Facilitates integration of solar and wind generation into grid</li><li>• Promotes energy efficiency through immediate energy consumption awareness</li></ul>                                    |

**The Energy InSight<sup>SM</sup> Network Transforms the Way We Buy, Deliver and Use Electricity**