

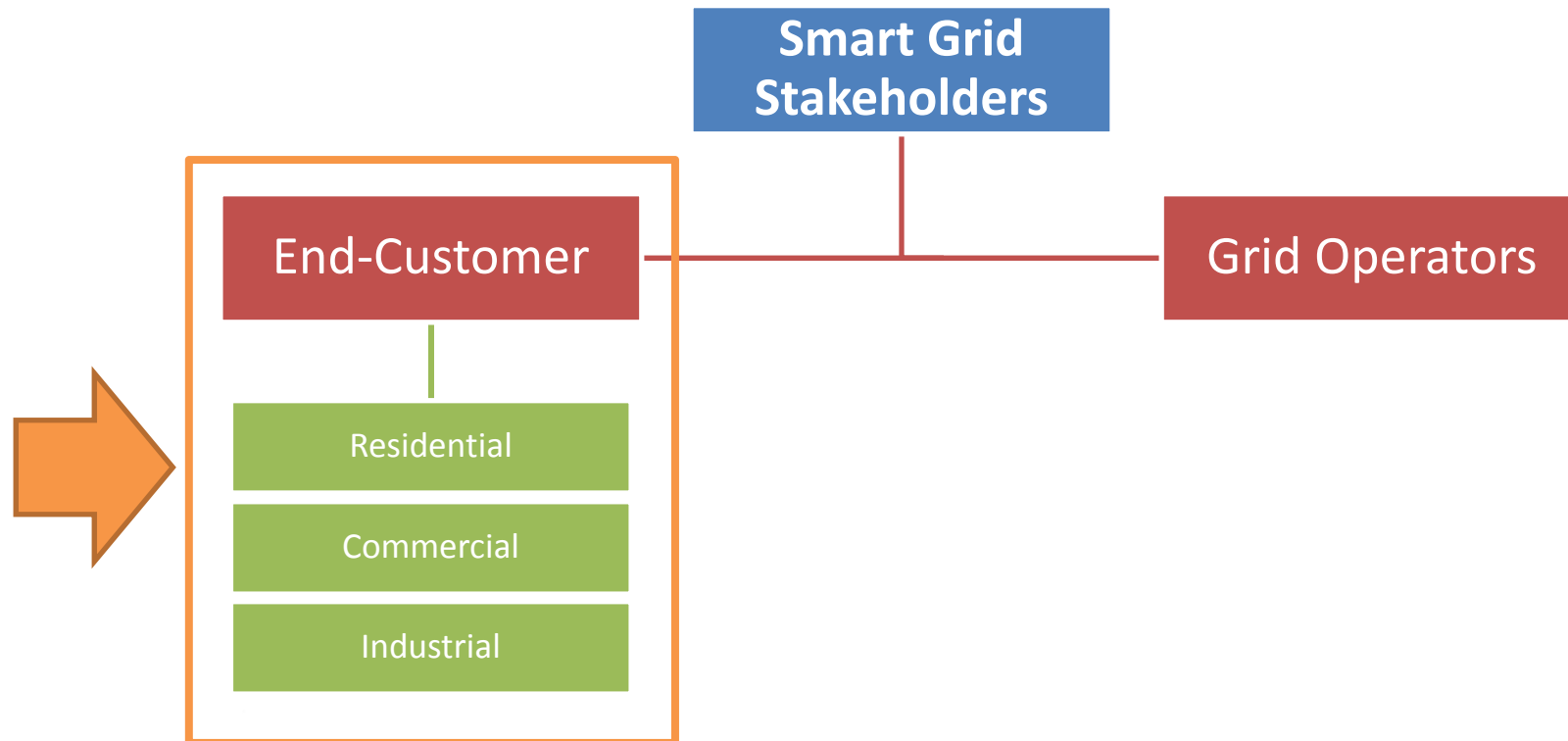
Smart Grid and Customer Innovation

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West Monroe Partners

Smart Grid & Stakeholders

- Smart Grid Technologies enable real-time information communication and control of grid infrastructure for the benefit of grid operators and end-customers



Smart Grid End-Customer Benefits

-  **Customer Empowerment**
 - Increased access to, and transparency of, electricity usage and cost information allowing for consumer awareness and choice
-  **Monetary Savings**
 - Ability to reduce electricity expenses through behavioral change or utility programs
-  **Electricity Reliability**
 - Reduced electricity outages and outage durations
-  **Environmental**
 - Paving the way for increased adoption of new technologies such as plug-in electric vehicles and alternative energy sources

Smart Grid Customer Innovations

- From Equipment to Behavior
 - Rather than relying solely on installing energy efficient equipment upgrades, smart grid technologies empower customers to save energy and electricity costs by modifying *how* they use electricity through the introduction of market-based incentives for efficient electricity use
- From Disparate to Integrated
 - Smart Grid technologies bring customers and the grid together, forming new relationships that benefit customers and utilities (through increased load knowledge and control) to build a more robust, intelligent and secure grid which meets the needs of its customers
- From Industrial to Residential
 - Currently, many industrial and large commercial facilities already have smart grid technologies (e.g. advanced meters, real-time pricing), therefore a utility-wide smart grid allows these same benefits to impact a much larger volume of customers through the small commercial and residential markets

Customer Innovation in Action

- Large public institution with annual electricity use equivalent to the electricity consumption of **1,500 households** and emissions from the total consumed energy equivalent to the greenhouse gases emitted from **2,200 vehicles**
- With a diverse team of stakeholders a Master Energy Roadmap was developed to bring energy use in line with the missions of the public institution



Customer Innovation in Action

Old Grid: “Energy User”

A forward thinking institution working to reduce energy consumption. An energy saver implements discrete facility modifications to improve sustainable energy use but lacks an integrated energy management strategy.

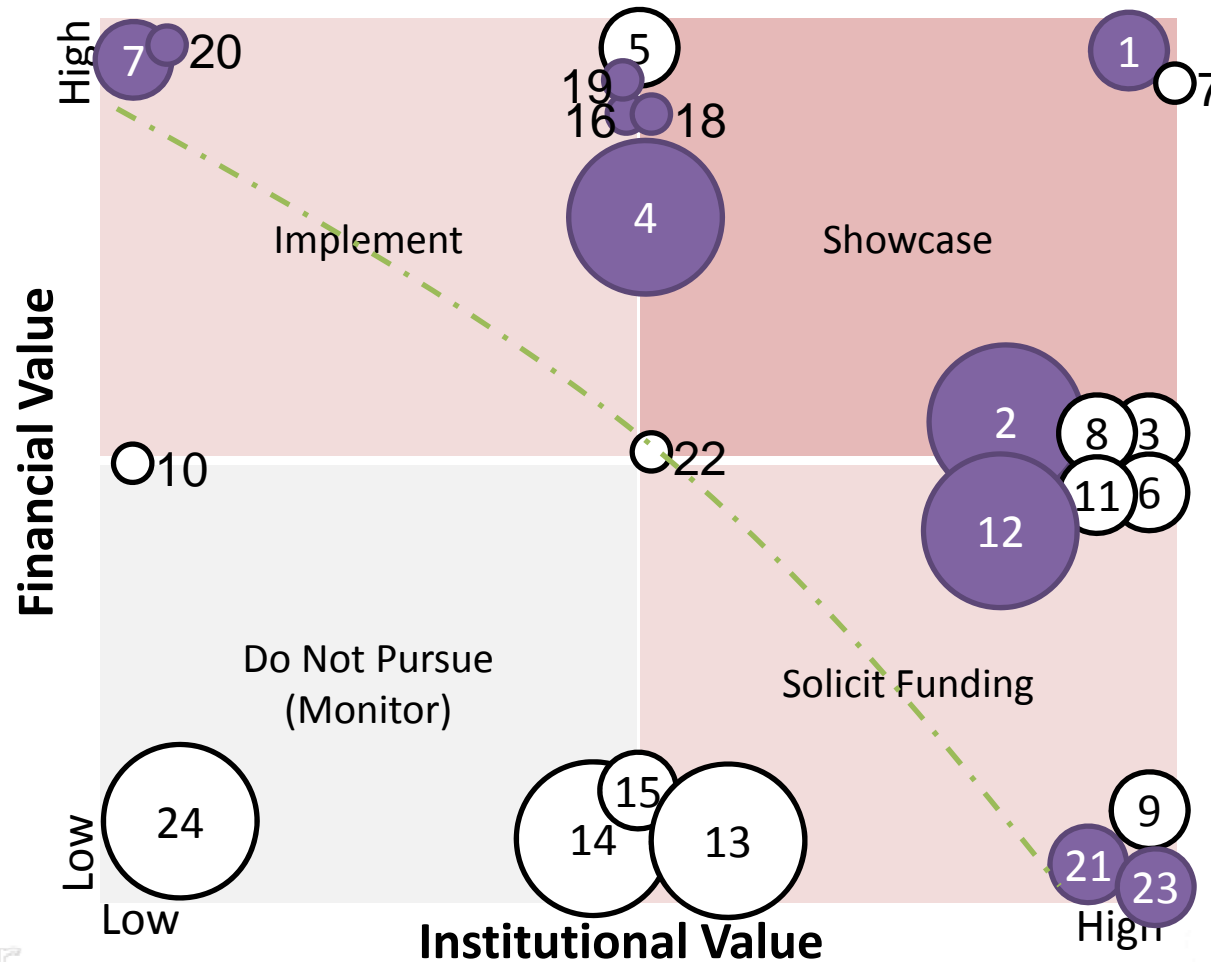


Smart Grid: “Energy Innovator”

A state-of-the-art institution which facilities from around the globe look to for sustainable energy practices. An energy innovator implements integrated energy management strategies and showcases advanced technologies.







Energy Opportunity Value Mapping

LEGEND Smart Grid Enabled Not Smart Grid Related



- Note:
- Size of figure represents the opportunity's energy value

Customer Innovation in Action

	Old Grid: "Energy User"	Smart Grid: "Energy Innovator"
 Data Intelligence	Month-old energy use data	Access to real-time energy use and costs
 Consumption	Discrete, equipment-specific facility modifications	10 – 20% reduction in energy use through behavioral shifts in system energy use
 Production	No onsite clean energy production	Onsite community solar PV installation, integrated energy management strategy
 Electricity Procurement	Fixed rate pricing structure	20 – 30% cost reduction from real-time pricing and optimized load control
 Demand Response	No identification of discretionary loads	Load prioritization for participation in an adjustable demand response program
 Critical Reliability	Manual grid supply	Microgrid for critical facility functions

Customer Innovation in Action

- Smart grid technologies Leading To:
 - Data Intelligence Advancements
 - Technology Integration
 - Energy Cost Reductions
- Smart Grid Technologies are empowering this the public institution to bring smart energy use into their mission by educating the public on their energy management efforts, decreasing the environmental impact of their energy use, and managing a more efficient and cost effective facility