



Smart Energy Solutions

National Grid's Smart Grid Pilot in Worcester

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A SMART CITIES FOUNDATION

SMART ENERGY AND WATER

The measurement, management, and analysis of energy and water production, delivery, and consumption are critical.



- » Intelligent meters and sensors positioned throughout the system, enabling efficiency, conservation, and effective balancing of supply and demand
- » Location-aware devices detect and locate theft as well as provide accurate, timely event information such as outages and leaks
- » Provide city planners, businesses, and consumers with detailed consumption information, enabling them to become more resourceful about their energy and water consumption

IT BEGINS WITH THE NETWORK

A scalable, secure, reliable communications network is critical to the success of every smart city.

- » Leverage existing networks if in place: utility (RF, PLC), telecom (cellular), WiFi, cable (coax, fiber)
- » Utilities are uniquely qualified to build and deploy dedicated infrastructure networks



LEVERAGE THE POWER OF DATA

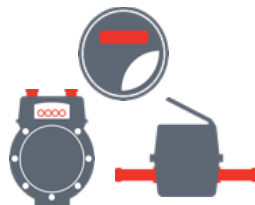
- » Smart devices provide real-time data
- » Data sharing opens new possibilities
- » Analytics turns data into insights
- » Data can be shared across city departments
- » Drive awareness for behavioral change

Expertise to solve our customer's business need with outcome-based solutions

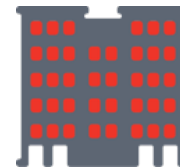
EXPERIENCE. INNOVATION. INSIGHT.

We've been building smart energy and water systems for decades. Our industry-leading platforms are field-tested, scalable, and secure. We're ready to grow with the needs of smarter cities now and in the future.

We're moving beyond simply managing data, we're helping cities manage outcomes.



130 million
communication
modules deployed
globally



8000 utility customers
served, who provide
energy and water to
millions of citizens
and businesses
around the world



World leader in
resource forecasting
and data
management

NATIONAL GRID'S SMART ENERGY SOLUTIONS

SMART ENERGY SOLUTIONS

- » National Grid's smart grid project in Worcester, Mass.
- » Conducted in support of Mass. DPU Grid Modernization order
- » Promotes sustainability and resiliency
 - Reduce demand in peak periods
 - Technology enabled consumer engagement
 - Time-varying pricing
 - Advanced distribution network control
- » Extensive community and stakeholder involvement

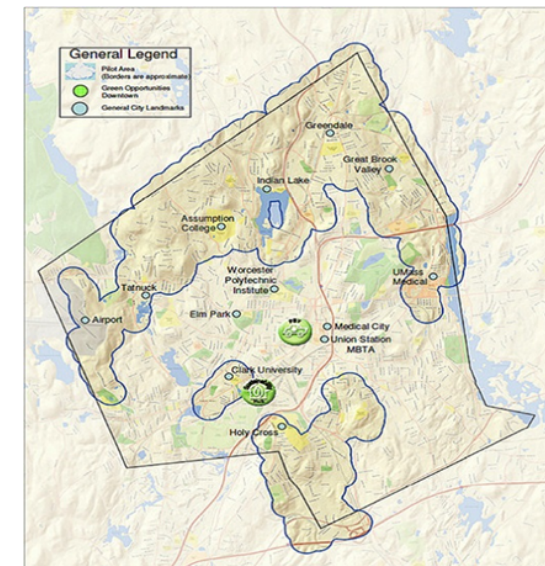


SMART ENERGY SOLUTIONS

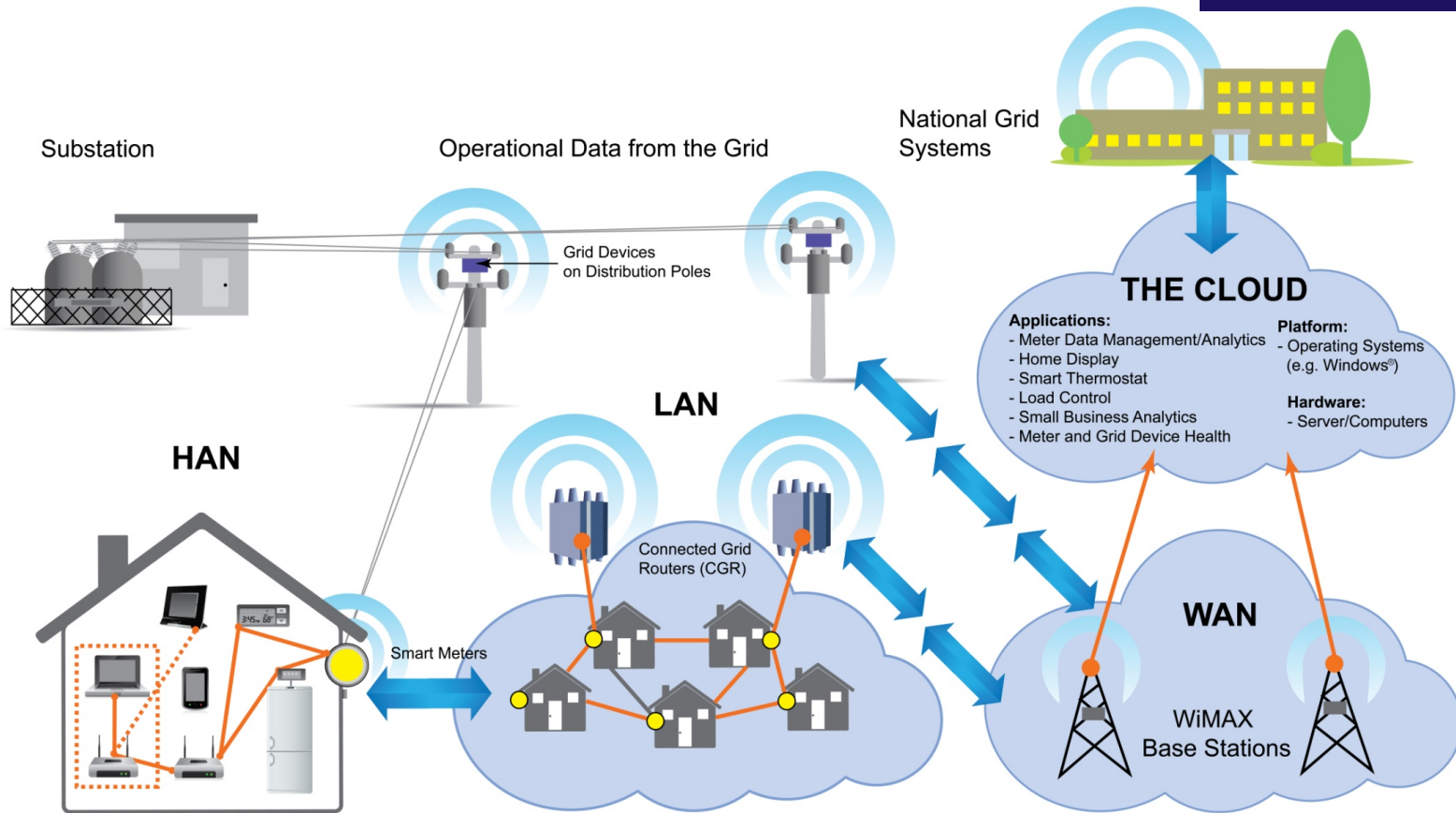
- Electric Distribution Scope
 - Ten 13.8 kV Feeders have 188 distribution automation devices
 - Four substations with various levels of automation
 - Mix of urban/suburban areas with OH and UG construction
 - Advanced Distribution Automation
 - Advanced Capacitor Controls
 - Advanced monitoring of Feeder, Transformer, DG, Solar and EV sites
- Customer Offerings
 - Customer Opt-out program
 - Time of Use Rate Plans with bill protection
 - AMI meters - 15,000 meters with remote reading capabilities
 - Web portal to access interval usage data
 - Home energy management devices/tools available
 - Sustainability Hub
 - Outreach and education program
 - Demand response capabilities



- Communications
 - Home Area Network (HAN) – ZigBee and WiFi
 - Local Area Network (LAN) – RF Mesh and cellular
 - Wide Area Network (WAN) – WiMAX and cellular



SMART ENERGY SOLUTIONS



Smart Energy Solutions Results - 2015



98%

Customers who joined Smart Energy Solutions & **remain in the program.**

Total Bill Savings
\$1.25 million

Cost of attending 11,000 Patriots football games.



Total Energy Savings
2,300 MWh

A month's worth of power for 5,100 homes.

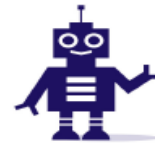


Conservation Days
saved more than just energy in 2015!

Conservation Day Rebate Plan
Average total credits earned.



Smart Rewards Pricing Plan
Average customer bill savings.



20%

Additional savings for homes with **in-home technology.**



Sustainability Hub



2,320
visitors in 2015



Avoiding appliances until off-peak hours is the most popular way to save.

4%



Average drop in customer energy usage during Peak Event hours.

Average additional savings for customers who visited WorcesterSmart.com

10%

Energy reduction during Peak Event hours.



\$60

Total bill savings for customers.

THANK YOU



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