

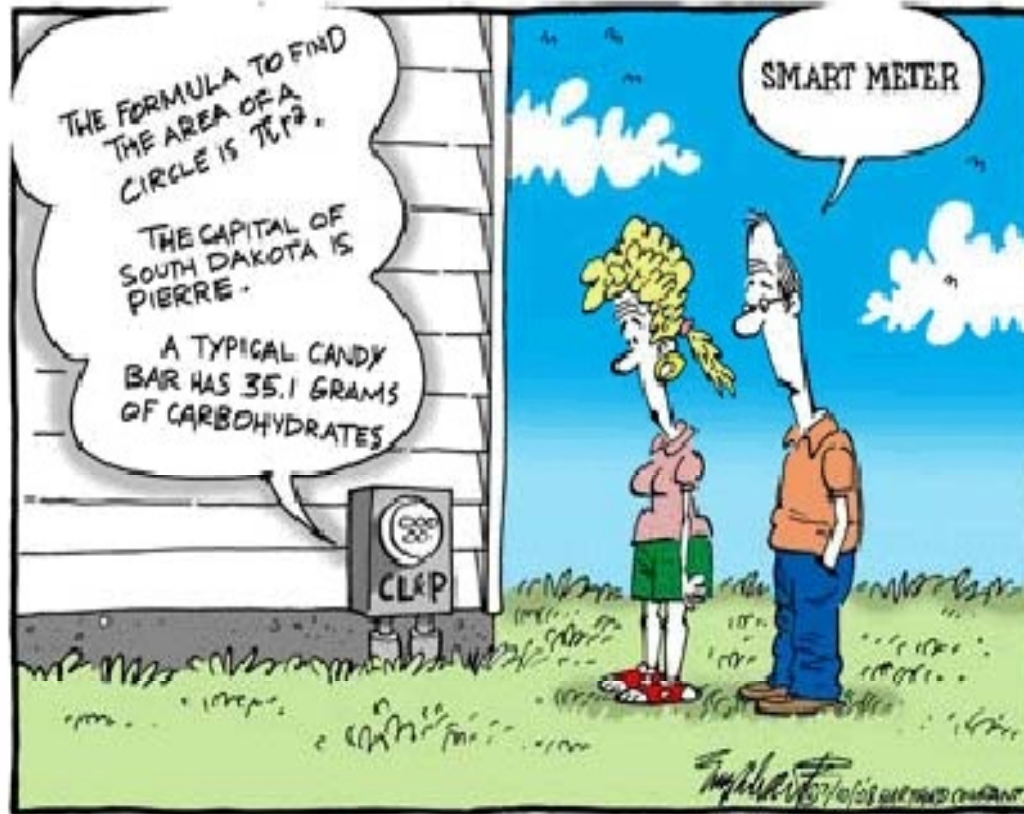


PECO's Smart Grid & Meter Plan

Glenn Pritchard



What is a Smart Meter?



Smart Meters are the foundational element of a Smart Grid

Smart Home/Business

- Real-time usage and pricing statistics
- Home Area Network composed of smart devices and appliances that know the price of energy

Smart Meters (AMI)

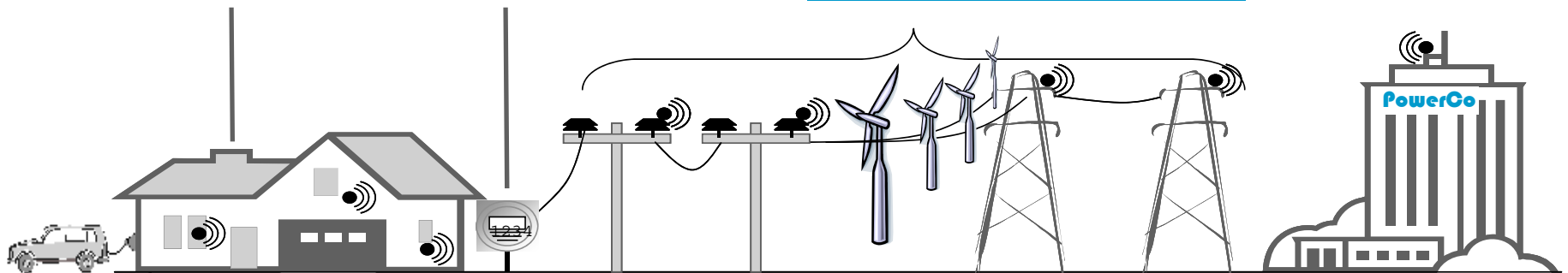
- A method to enable two-way information flow
- System status, customer outage status, usage and pricing signals delivered to and from location

Smart Distribution System

- Real-time reporting of status and outages
- Automated controls of relays and reclosers. Efficient field force management
- Effective interconnection of renewable energy sources

Smart Utility

- More efficient data collection, processing and back office functions



Leveraging **common** communication systems and information processing is critical

- In 2008, the PA Legislature passed Act 129, which applies to EDCs (Electric Distribution Companies) serving more than 100,000 customers

- Energy Efficiency and Demand Response
 - Overall load reduction goals
 - 1% in 2011, 3% in 2013
 - 4.5% on peak 100 hours in 2013
 - Nearly 20 different programs have been approved by the PUC, they include:
 - Compact Fluorescent Lighting Program
 - AC Cycling Program
 - Customer Education and Awareness Programs

- Smart Metering

✓ Smart Meters

- Obligates PECO to furnish “Smart Meter Technology”: (1) upon customer request; (2) in new building construction; and (3) in accordance with a depreciation schedule not to exceed 15 years
- Defines “Smart Meter Technology” as metering and network capable of **bi-directional communications**, which records customer usage on **at least an hourly basis**, enables **time-of-use rates and real time price programs**, and **supports automatic control** of the customer’s electricity consumption
- Provides for full-and-current cost recovery of all prudent and reasonable costs, including related electric distribution system upgrades, less operating and capital costs savings realized, through base rates or rider
- The implementation order further defined the requirements by identifying 14 specific capabilities of a Smart Meter

Smart Meter Capabilities

Capability	Act 129	Implementation Order
Bidirectional data communications	X	
Remote disconnection and reconnection		X
15-minute or shorter interval data to customers, EGSs, 3 rd parties and RTOs on daily basis		X
Record minimum hourly reads and deliver at least once per day	X	
On-board meter storage of meter compliant with national, non-proprietary standards		X
Open standards and protocols compliant with national, non-proprietary standards		X
Ability to upgrade minimum capabilities as technology advances and becomes economically feasible		X
Ability to monitor voltage at each meter and report data		X
Remote programming		X
Communicate outages and restorations		X
Ability to support net metering of customer-generators		X
Support automatic load control by EDC, customer and 3 rd parties with customer consent	X	
Support time-of-use and real-time pricing programs	X	
Provide customer direct access to consumption and pricing information (hourly consumption information)		X

Milestones

- ✓ Smart Meter Plan Filing – August 14, 2009
- ✓ Anticipated Smart Meter PUC approval – Mid-April 2010
- ✓ Initial Smart Meter deployment – October 2011

Key Smart Meter Project Tasks include:

- ✓ AMI Technology Selection
- ✓ Internal IT System Deployment
- ✓ Communication Network Installation
- ✓ New Rate Development

“Smart Future Greater Philadelphia”

- ✓ On February 18, 2009, the American Reinvestment and Recovery Act (ARRA) was signed into law, including a \$3.4B for the SGIG program which provides matching contributions of up to 50 percent for qualifying Smart Grid investments

- ✓ On August 6, 2009, PECO filed a \$200M grant request, the “Smart Future Greater Philadelphia” SGIG application
 - Up to 600,000 Smart Meters and associated infrastructure, supporting PECO’s Act 129 Smart Meter Initiative
 - Multiple Smart Grid Investments
 - Partnership Agreements with Penn, Drexel/Viridity, Liberty Property Trust and others

- ✓ On October 27, 2009, the U.S. DOE notified PECO that it had approved a SGIG award of \$200 million, subject to negotiations and finalization of a project agreement



Proposed Smart Grid Investments

Goals

- Enhance reliability of the electric power system by identifying, isolating and rapidly remediating outages and other disruptions
- Enable system visualization and harden and diversify communications and control to withstand cyber attacks and natural disasters
- “Smarten” substations and collect and store data for post-event analysis

COMMUNICATIONS AND OPERATIONS SUPPORT SYSTEMS

- ✓ Fiber Ring Upgrade – 340 miles of fiber optic construction through 61 substations to facilitate communications that will create a “self-healing network”
- ✓ Accelerated replacement of DMACS with DMS
- ✓ “Tier 2” backhaul communications to support telemetry backhaul, AMI and distribution automation (DA)

DISTRIBUTION AUTOMATION

- ✓ Install over 100 reclosers
- ✓ Install over 30 Underground Circuit Breakers in Center City Philadelphia
- ✓ Provide converged (with AMI) communications over 300 already installed reclosers
- ✓ Perform Conservation Voltage Reduction (CVR) on over 45 circuits, including ~80 capacitor controls
- ✓ Install Automatic Voltage Controls on 7 substation transformers

INTELLIGENT SUBSTATIONS

- ✓ Install DA with microprocessor relays at 7 substations
- ✓ Install microprocessor relay replacements for 16 transmission lines or transformers
- ✓ Install modern Disturbance Monitoring Equipment (DME) at 31 locations



Opportunities for the Customer

- ✓ Improved Reliability
- ✓ More information on personal energy usage
- ✓ New rate options including
 - Time-of-Use Rates
 - Real-Time Pricing
 - Critical Peak Pricing
- ✓ New tools and programs to help manage usage
 - In-Home Displays
 - Smart Thermostats
 - Load Control Devices

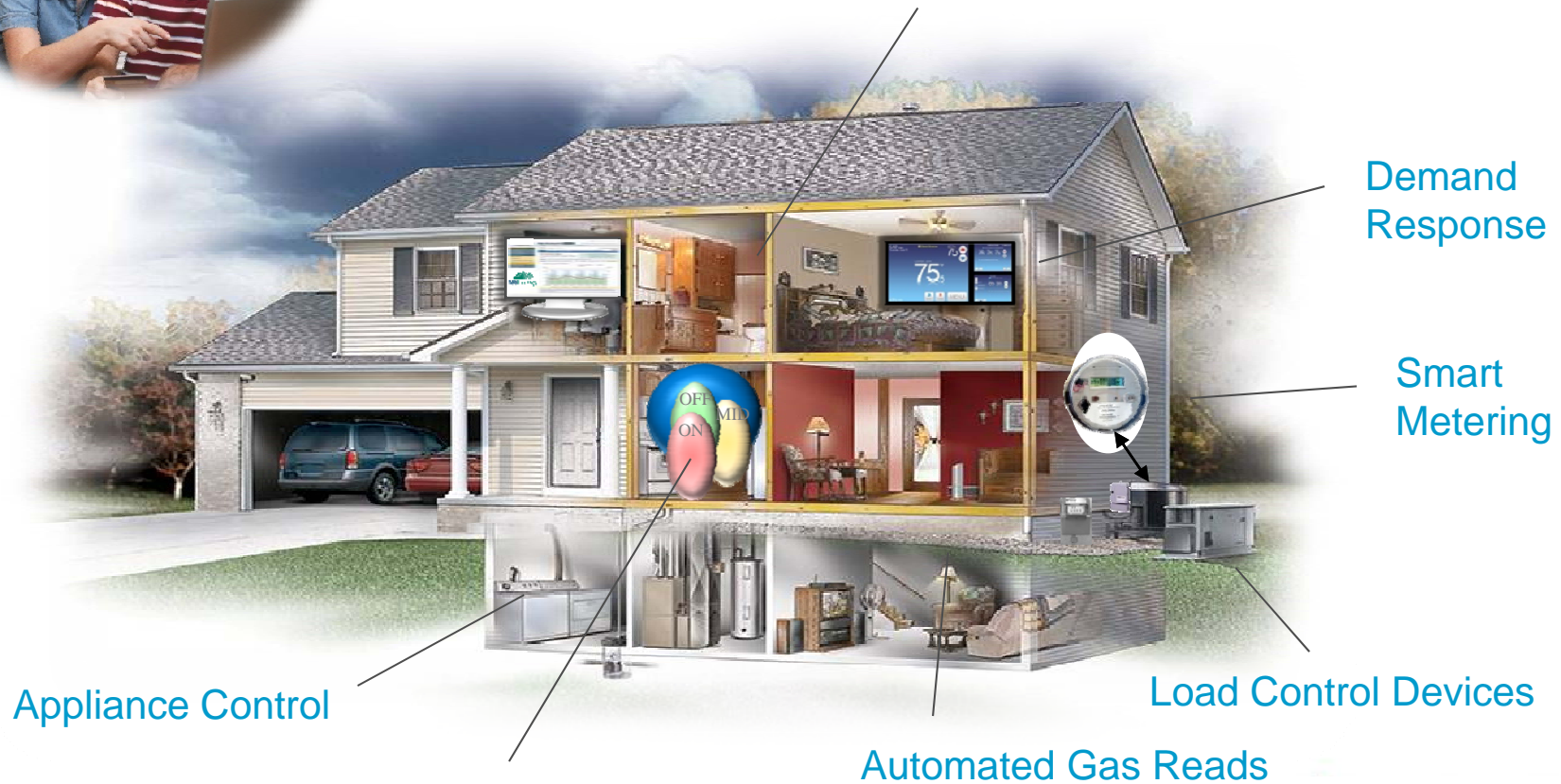


In-Premise Opportunities - Residential



Advanced Rates

Home Area Network



Demand Response

Smart Metering

Appliance Control

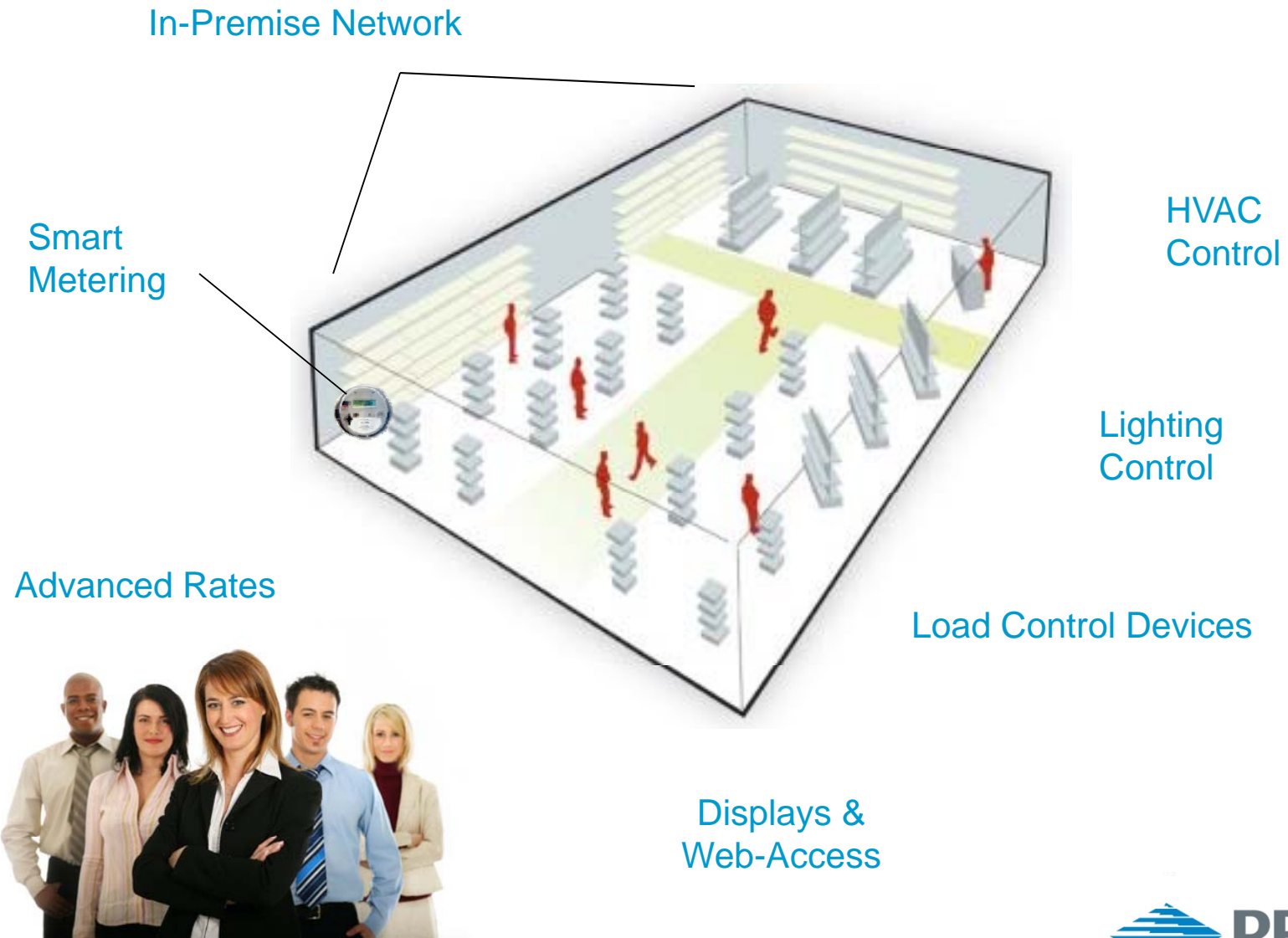
Load Control Devices

Automated Gas Reads

In-Home Displays & Web-Access



In-Premise Opportunities - Commercial



Thank You

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