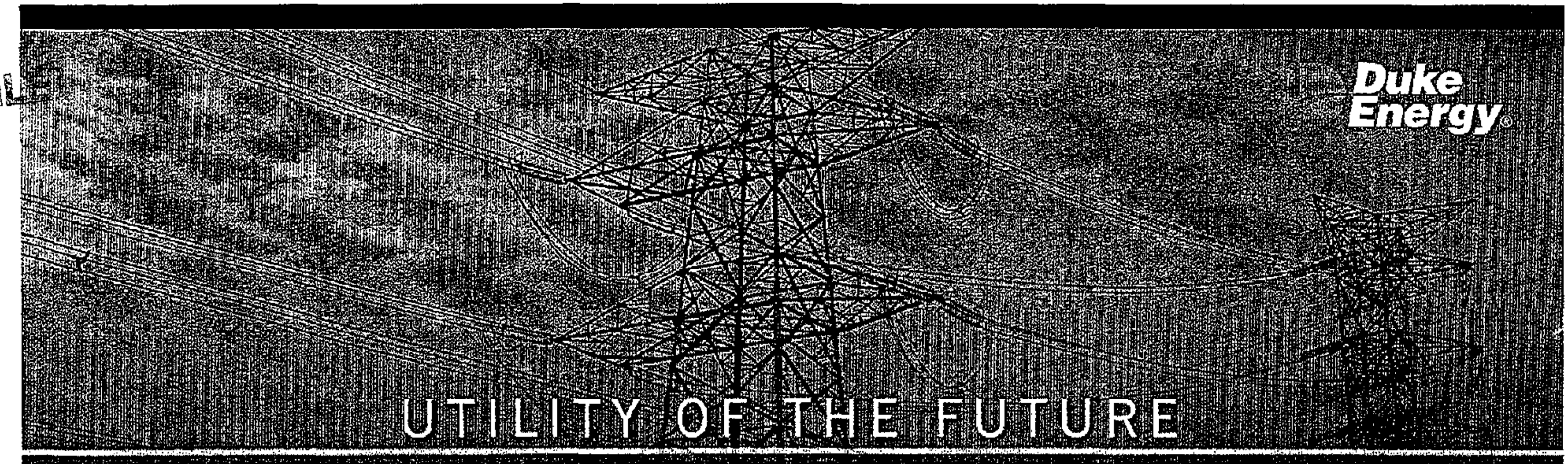


Public Utilities Commission of Ohio

Smart Metering Workshop

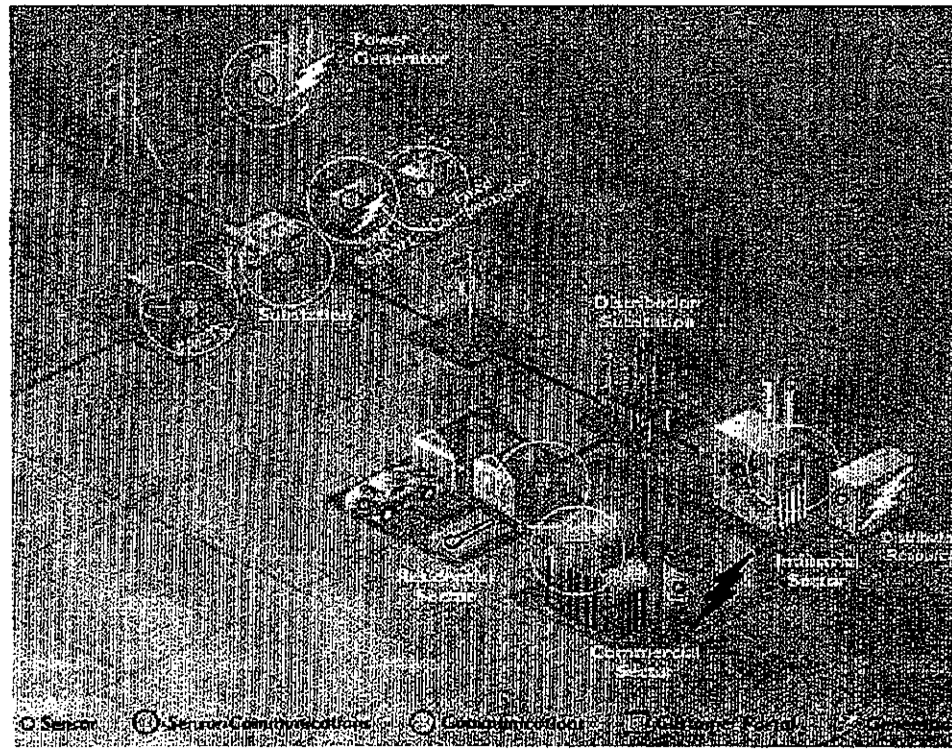
December 13, 2007

07-589-GA-AIR

Duke Energy's Utility of the Future Initiative

Vision

Our vision is to transform the operation of our electric power grid and gas distribution network by creating a networked infrastructure capable of delivering and receiving information from intelligent devices distributed across our power and gas system, automating components of the distribution system and leveraging the network for improved operational efficiencies and customer satisfaction.



Definition

Utility of the Future is a comprehensive improvement to our electric and gas delivery system to provide the right information at the right time to the right places to optimize system performance, increase reliability, reduce outages and outage duration, deliver customer benefits, and extend energy efficiency to the fullest extent possible.

Achieving the Digital Grid Vision with Technology

20th Century Grid	21st Century Grid
Electromechanical	Digital
One-way communications (if any)	Two-way communications
Built for centralized generation	Accommodates distributed generation
Radial topology	Network topology
Few sensors	Monitors and sensors throughout
"Blind"	Self-monitoring
Manual restoration	Semi-automated restoration and, eventually, self-healing
Prone to failures and blackouts	Adaptive protection and islanding
Manual equipment inspections	Monitor equipment remotely
Emergency decisions by committee and phone	Decision support systems, predictive reliability
Limited control over power flows	Pervasive control systems
Limited price information	Fully available price signals
Few customer choices	*Many customer choices*

Consider the following:

- What would it cost to read meters daily?
  - Much larger workforce, equipped with vehicles and readers
- Could service be activated (or terminated) within the same business day?
  - Much larger workforce with vehicles
- Can real-time pricing occur?
  - Need to send a price signal and have meters that can read multiple increments
- In home communications are impossible
  - Infrastructure doesn't exist
- Could prepayment plans be established?
  - Execution of turning on/off very burdensome

Utility of the Future: A Forward-looking Solution

- Maximizing long-term benefits requires investing in infrastructure capable of meeting current and future needs
- Moving towards the Utility of the Future provides accelerated benefits that aren't achievable at lower level solutions

Manual meter reading

- Monthly kWh reads

Automatic Meter Reading (AMR)

- One-way or two-way
- Monthly kWh reads
- Interval data
- Basic theft detection
- Outage/Restoration Detection

Advanced Metering Infrastructure (AMI)

- On-demand reads
- Programmable load intervals
- Bi-directional and net metering
- TOU, RTP, CPP pricing options
- Demand response

Smart Meters

- Solid-state platform
- Integrated communications
- Integrated disconnect switch
  > Remotely disconnect
  > Remotely connect
- Power quality data
  > Voltage readings
  > Current readings
  > Power Factor
  > Frequency
  > Detailed power outage data
- Remotely programmable
- Remotely upgradeable
- Internal expansion port
  > Future functionality

Utility of the Future (Digital Grid)

- Energy Management Services
  > Residential/Commercial
- Home area network gateway
  > PLC (i.e. LONWORKS)
  > RF (Bluetooth)
- Web-based applications
  > Demand response
  > Prepayment
  > Load control
  > Revenue protection
  > Web move in/out
- Distribution
  > Load profiling/engineering
  > Phase balancing
  > Transformer optimization
  > Energy forecasting
  > Outage and GIS
  > Work force management
  > Asset management

Utility of the Future: Building for Future Needs

Interoperability and open, Internet Protocol based standards

- Helps prevent future stranded costs
- Enables easier deployment of new technologies
- Allows technology adoption without replacement

Technological Obsolescence

- Stranded assets and costs
- Proprietary technology reduces future options
- Incremental investment to build the digital grid vision after implementing AMI is unknown

Enabling the home is an open issue

- Home area networks can exist through the power line or wireless
- Messages from the back office to the home may need several mediums
- Wired and wireless should be available to communicate into the home
- Communicating exclusively through the meter may limit access to the home network

The Benefits of the Digital Grid - Operations

Metering	Reduced meter reading costs, refurbishment, replacement and testing; reduced theft; improved accuracy; fewer unoccupied premises costs; and the ability to diagnose meters remotely
Outage	Improvement in outage detection, duration and repair verification
Direct Load Control	Peak shaving for residential and commercial loads; decreased reserve generation; reduced emissions
Distribution	Reduced capacitor and substation inspection costs; improved VAR management, system voltage control, and continuous voltage monitoring; more accurate asset management; enhanced system fine-tuning
Miscellaneous	Improved call center efficiency; fewer billing exceptions; enhanced safety precautions; more pre-payment billing plans offered; reduced vehicle costs

The Benefits of the Digital Grid - Customers

Point of Service	Introduction of remote initiation, transfer, and termination of service; increased speed of automatic disconnection and reconnection; improvement in restoration speed
Tariff Optionality	Increase in the customer choice for rate plans (e.g., prepaid plans); individualized programs and additional payment conveniences (eCommerce); enable time of use and/or critical peak pricing rate offerings
Energy Services Offerings	Introduction of energy efficiency programs and energy savings for residential and non-residential customers; ability to offer load control initiatives
Service Improvements	Elimination of meter access issues and estimated meter reads; increased power quality; more reliable and better power quality
Additional Benefits	Operational benefits also accrue to customers; societal benefits enabled by infrastructure; increased customer satisfaction; upgrading of antiquated meters and equipment; enhancing safety precautions

The Benefits of the Digital Grid - Societal

Concepts evaluated in the SAIC & EPIC study

- Reduction in peak demand,
- Power quality, reliability, and system availability and capacity improvement due to improved power flow,
- Increased capital investment efficiency due to tighter design limits and optimized use of grid assets,
- Environmental benefits gained by increased asset utilization and reduced peak demand,
- Reduction in restoration time and reduced operations and maintenance due to predictive analytics and self-healing attribute of the grid,
- Other benefits due to self-diagnosing and-self healing,
- Increased safety for employees and customers,
- *Reduction in congestion cost, blackout probability, and forced outages/interruptions,*
- *Increased integration of distributed generation resources and higher capacity utilization, security and tolerance to attacks/natural disasters,*
- *Job creation and increased gross regional product,*
- *Tax savings for the utility from a depreciation increase*

Comparative Financials

SAIC study for EPIC (SDG&E system)

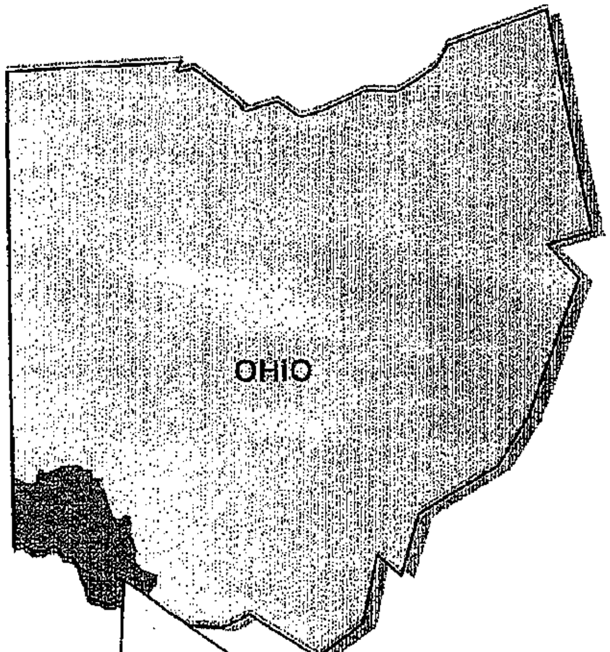
- Annual Societal Benefits: $69.8MM
- Discounted over 20-years and adjusted on a per-meter basis for Duke Energy Ohio's size, it equates to $355MM

ConEdison – New York AMI Filing

- Societal Benefits(15-yr PV): $261MM
- Adjusted for 20-year present value and a per-meter basis for Duke Energy Ohio's size, it equates to $75MM

Legend: Quantified by Duke Energy Partially quantified by Duke Energy *Not quantified by Duke Energy*

Duke Energy - Ohio



Duke Energy - Ohio Overview

Number of Meters: 1,216,000

- 456,000 Gas Meters
- 760,000 Electric Meters

➢Rollout: 5 year straight line

➢Total Cost: $316 – 341 Million

➢Cost per Meter: $260 - $280

➢NPV: ($55) – ($70) Million

➢Project Life Cycle: 20 years

Cincinnati, OH

The Cincinnati deployment will configure meters (Gas and Electric) along with communication systems, both meshed wireless and digital cellular.

Distribution assets will also be connected to the network and back office integration systems. Customers will be connected to an online portal where energy information gathered from the system can be delivered to shape energy usage.

Duke Energy's Utility of the Future Initiative

Investing in infrastructure will benefit customers into the future

Achieving operational, customer and societal benefits requires investment in technology

– Full functionality and benefits of the equipment may not be realized until utility systems and customer behavior evolve

Investment in open, IP based systems will reduce the potential for stranded costs and optimize future technology adoption

Case No. 07-589-GA-AIR
Attachment MWS-2
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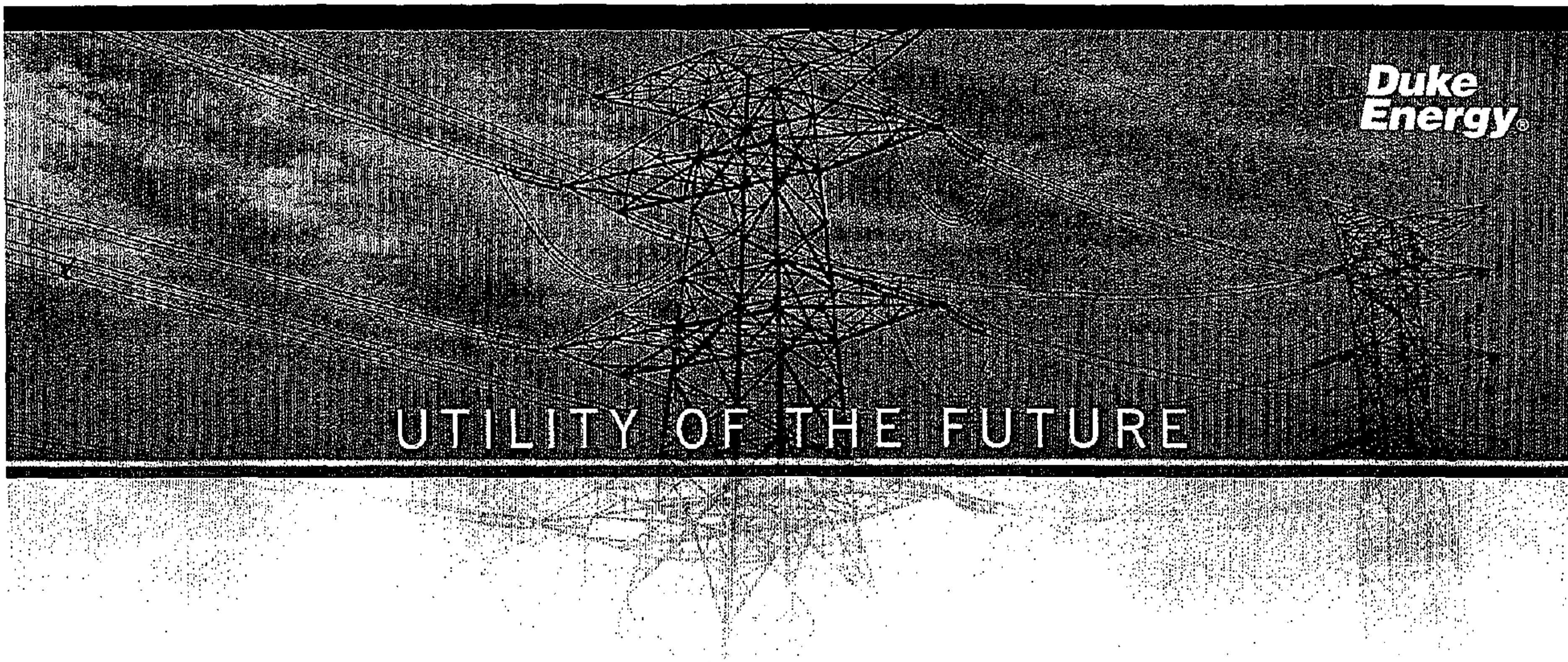

Questions?