



The United Illuminating Company

a subsidiary of



UIL HOLDINGS CORPORATION

Building the FUTURE with Smart Systems and Advance Meters

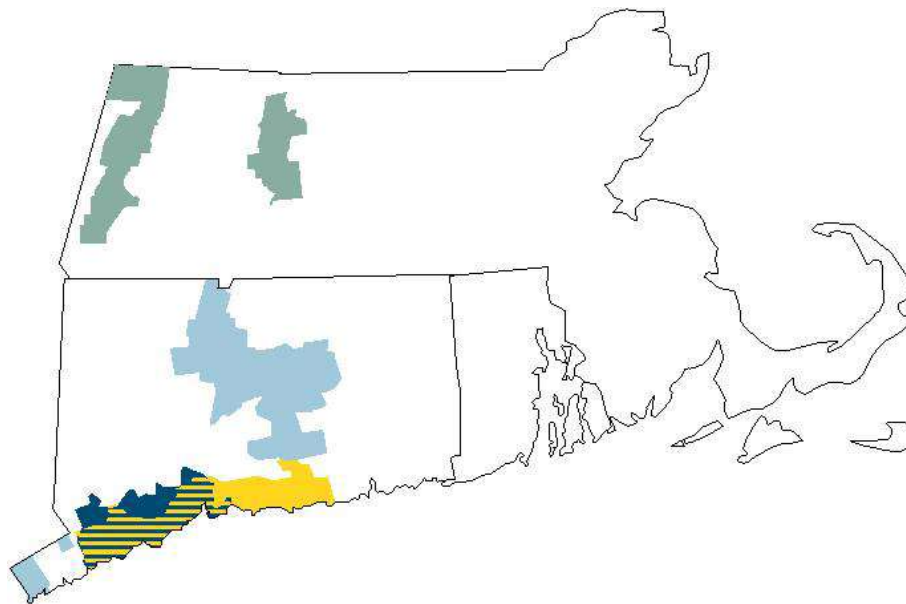
The United Illuminating Journey

Joe Thomas, Vice President Electric System
Operations and Client Fulfillment

UIL – Companies



UIL Holdings Corporation



The United Illuminating Company

- Territory: 335 sq miles
- ~324,000 customers
- 1,066 employees
- Allowed '10 Transmission ROE (composite) of 12.52%



Southern Connecticut Gas (SCG)

- Territory: 512 sq miles
- ~173,000 customers
- 324 employees
- 2,269 miles of mains with ~131,000 services



Connecticut Natural Gas (CNG)

- Territory: 716 sq miles
- ~158,000 customers
- 341 employees
- 2,011 miles of mains with ~124,000 services



Berkshire Gas Company

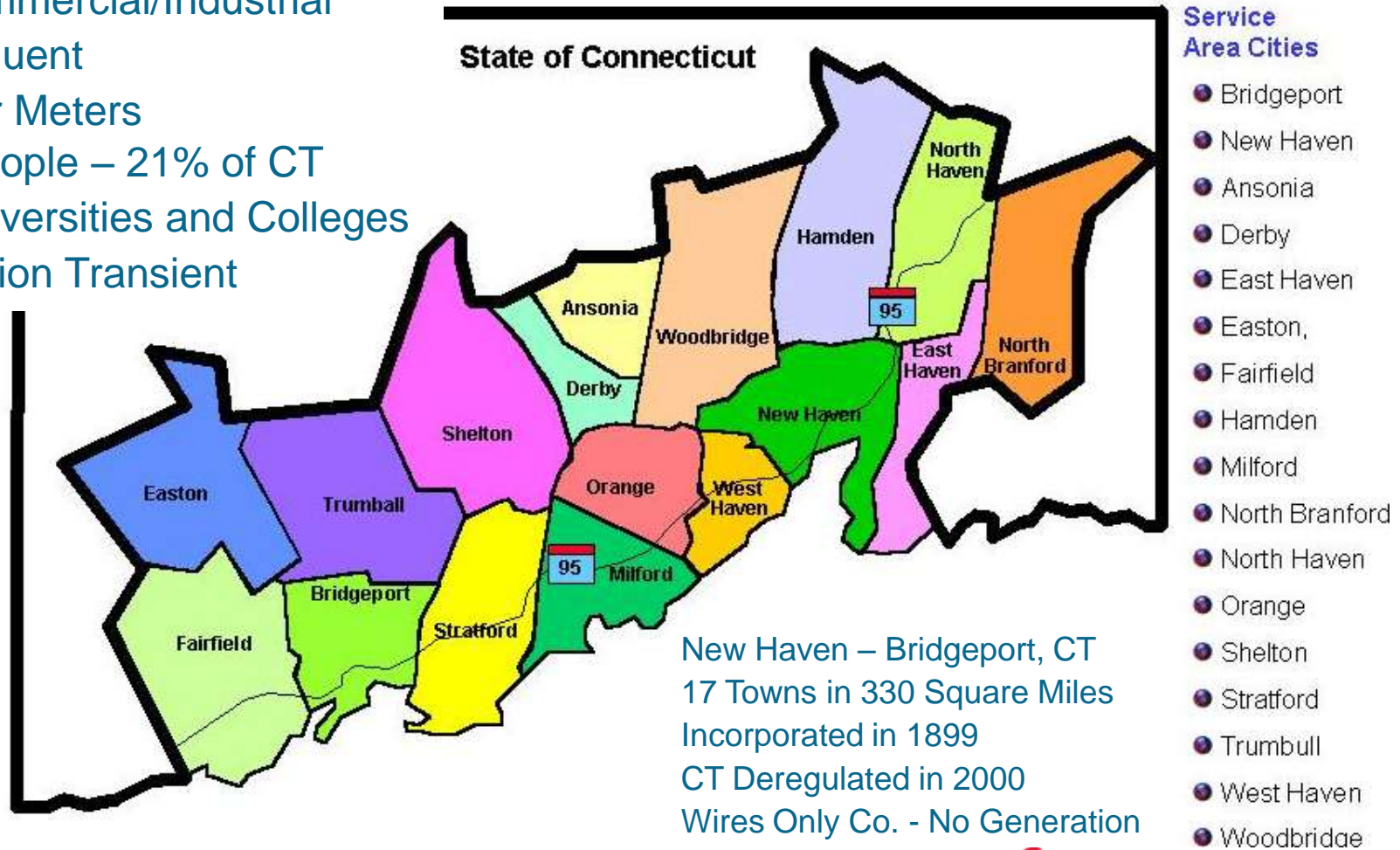
- Service territory: 738 sq miles
- ~35,000 customers
- 127 employees
- 738 miles of mains



UI Company Profile



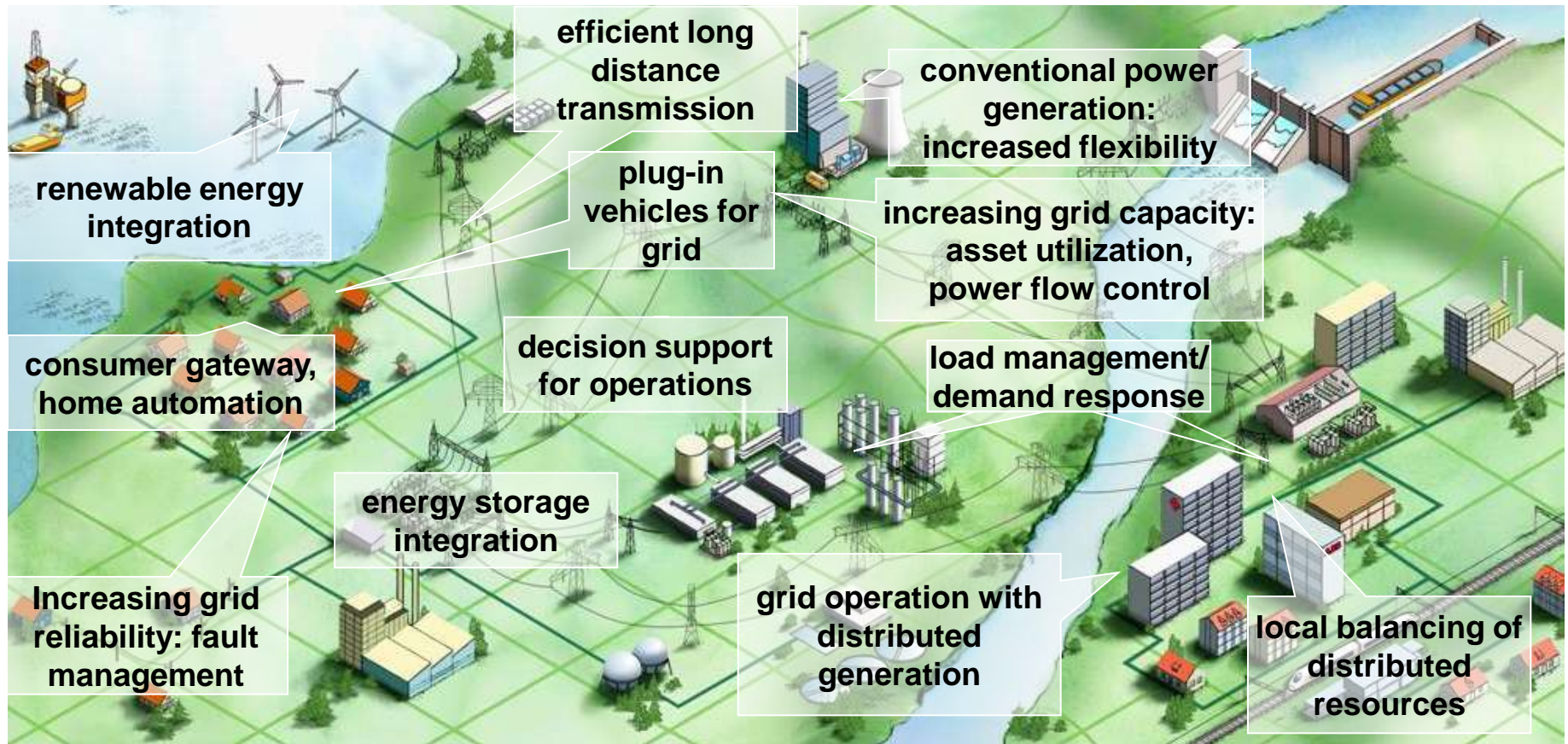
323,000 Accounts
290,000 Residential; 54,000 TOD
31,000 Commercial/Industrial
25% Delinquent
34% Indoor Meters
726,000 People – 21% of CT
7 Major Universities and Colleges
1/3 Population Transient



Smart System...



...supports the entire electricity supply chain





Multiple Benefits, Various Stakeholders

Smart Grid Benefit	Nature of Benefit		Primary Beneficiary		
	Service	Cost	Customer	Utility	Society
Customer Participation					
Smart meters & home automation	✓	✓	✓	✓	
Accommodation of plug-in hybrid electric vehicles	✓	✓	✓		✓
Facilitation of demand response		✓		✓	✓
System Reliability & Efficiency					
Improved customer service	✓		✓	✓	
Enhanced grid reliability	✓		✓	✓	✓
Optimization of network performance	✓	✓		✓	
Reduce system losses, operating expense		✓	✓	✓	
Asset Utilization					
Equipment monitoring & reduced risk of failure	✓		✓	✓	
Optimization of asset utilization		✓	✓	✓	
Prioritization of system enhancements, repairs	✓	✓	✓	✓	
Environmental Benefits, Renewable Energy, Energy Storage					
Reduced carbon footprint					✓
Wind, solar, biomass integration	✓	✓		✓	✓
Facilitate distributed generation		✓	✓	✓	✓
Enabling micro-grids		✓	✓		

Value Proposition & Stakeholder Benefits



Regulators

Time of Day and Daylight Savings
Net Metering
Flexible Rate Options
Demand Response
Conservation and Load Management

Customers

Customer Empowerment
Self Service Options
Billing and Payment Preferences
Real Time Energy Management

Company Efficiencies

Outage Management
Theft Detection / Low Use
Remote Turn On – Turn Off
Meter Accuracy
Improved Asset Utilization (Txfs)
Operations - DR & ISO

Savings

Collections
Field Visits
Labor Efficiencies

New Opportunities

- ▶ Notification / Monitoring Services
- ▶ Residential Interruptible Rates
- ▶ Threshold Alerts
- ▶ Consolidated Billing
- ▶ Advanced Distribution Automation, Outage & Work
- ▶ Prepayment

Environment (1999 – 2011)



Regulatory Environment

Deregulation of Supply
Time of Day Rates
Customer Presentment
Mandated Fees
Conservation
Load Management
Cost Control



Business Environment

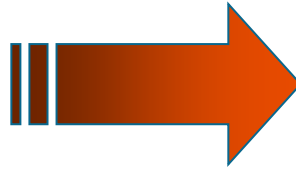
- More complicated billing statements
- More interaction with technology in service process
- More stress on conservation and load management
- Increase in need for decision making
- Increased need for assistance with financials
- Supplier choice options; present range 7.99 – 9.75 cents/kwhr
- Intense focus on costs



The United Illuminating Company



Partner with:
Our
Customers
and
Technology
Solution
Providers



- ❖ Help customers better manage their energy use
- ❖ Help to reduce operating cost, Improve Customer service, and meet Energy/Regulatory Market Req'ts



Process Improvement / Technology Integration

Responsive Service



SAP
MDMS



Remote Connect /
Disconnect



Field Service

Customer
**A Commitment
to Caring**



Outage Restoration

Reliable Service



Customer
Presentment



Payment Options

IVR




Advanced Mesh Metering

Flexible Service

UI Mesh Network



- Over 337,000 meters -
 - 80,000 two- way w/ remote disconnect capability
 - Meters have  ZigBee™ Wireless Control 1
 - Meters read every hour
- 4100 Concentrators [meters act like repeaters as well]
- 30 Collectors
- Mesh Network - RF, Fiber and...
- Master Data is stored in MDM - interface with SAP
- Robust billing process - electronic presentment to payment
- *Outage Mgt System* uses meter intelligence for restoration and communication
- Over 33% of our customers have Time-of-Day option
- Capital Cost of Install ~\$29M



UI Mesh Network



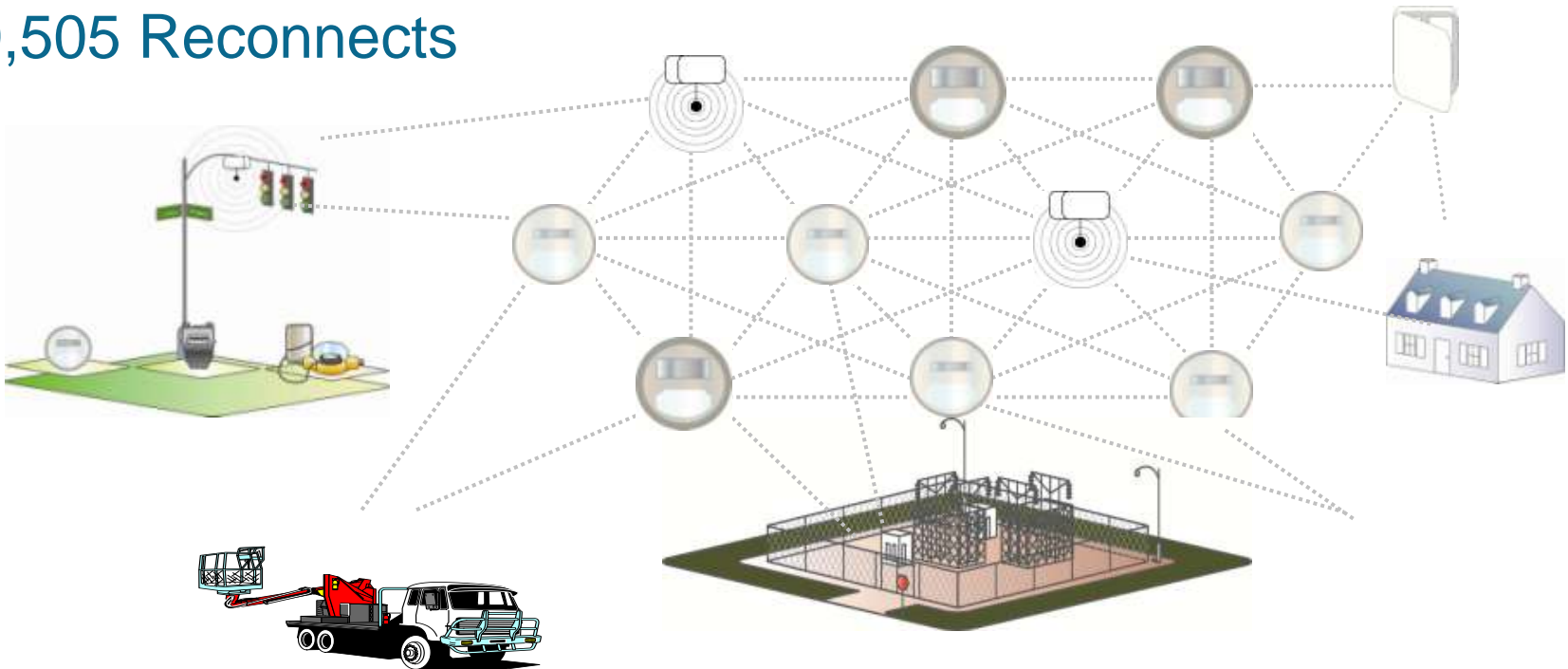
September 2010 to July 2011

62,520 Activations

33,015 Disconnects

29,505 Reconnects

Savings - \$3,313,560.00



Reduction in DPUC complaints and customer calls

AMI Voltage Data



Immediate
Response to
Voltage
Complaints

Provides
monitoring
tools to track
and address
voltage sags
and swells

Voltage History For Meter # 89437206

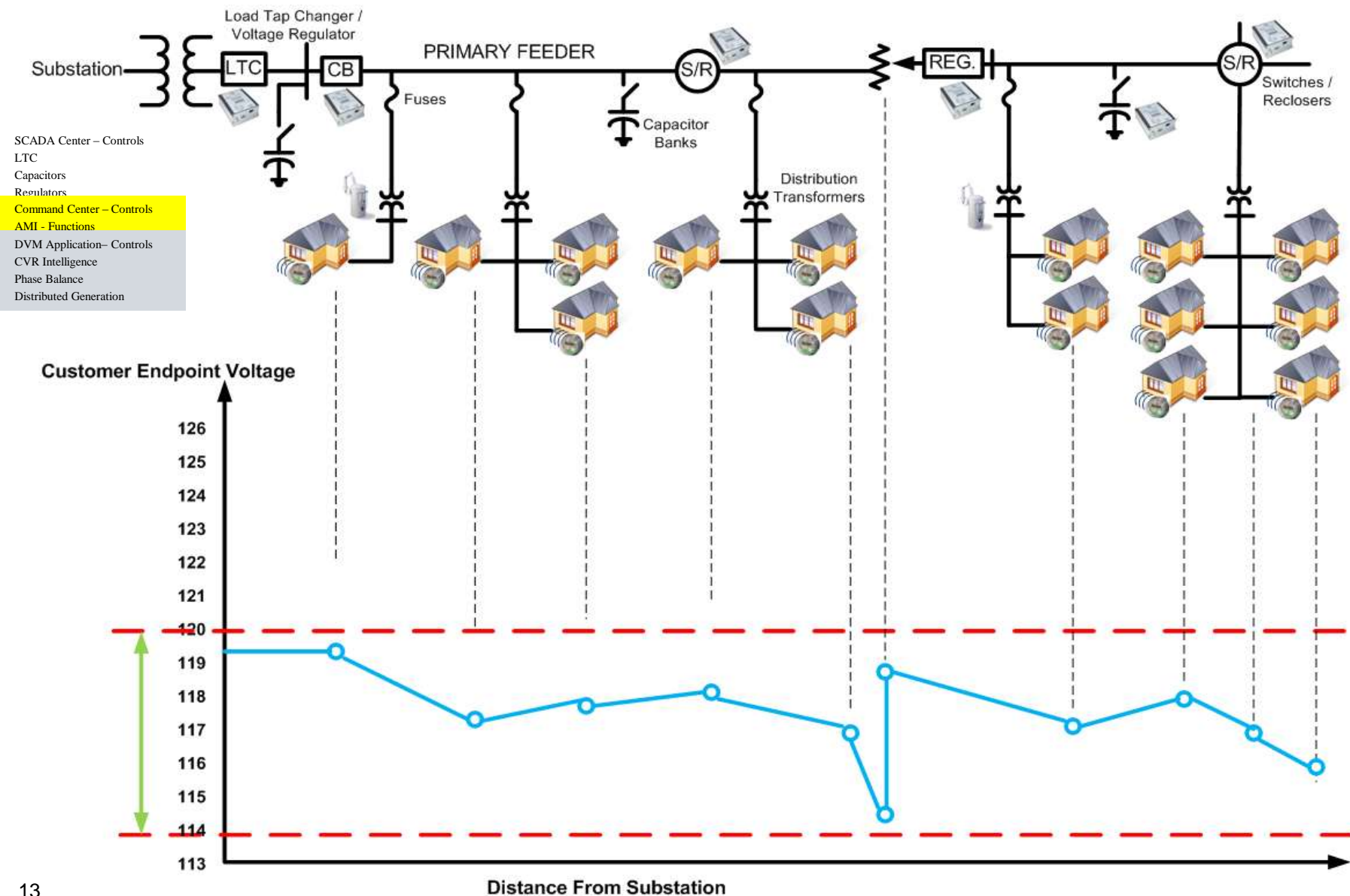
Account Number		Recent Meter Read	53760
Service Location	242112018	Date of Recent Usage	1/28/2008
Customer ID		Date Range	1/23/2008 to 1/30/2008
Billing Cycle	560	Average Usage During This Period	58.0
Grid Location		Average Usage 30 Days Prior to Date Range	59.1
Meter Number	89437206	Average Usage During This Period Prior Year	47.3
Address			

Voltage Information



No customer data is included in this slide

AMI Volt Management



Command Center



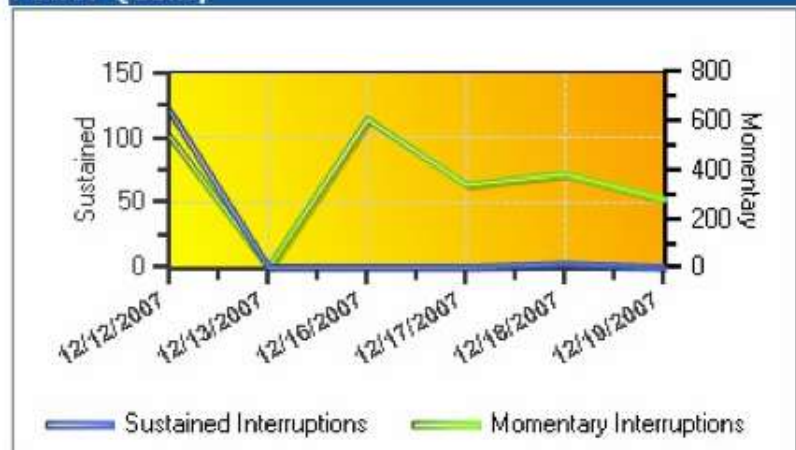
Executive Dashboard

Message Center

Collector Type	Total	Comm Issues	Map
TS2	7	1	
TS1	6	2	
TS1 E-SPU	5	2	
Grand Total	18		

Endpoint Type	Deployed	Inventory
TS1	4746	1005
TS2	4554	13659
RSS	17	1005
LCS	18	0
EOLVM	8	1
Grand Total	9343	15670

Power Quality

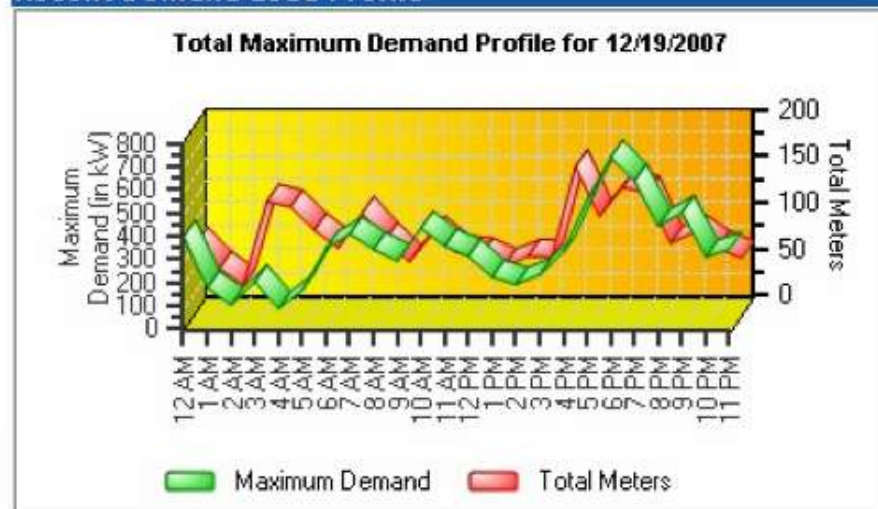


Load Control	Date
Load Control Temporary Schedule	3/16/2007 7:47 AM

Total System Electric Usage (in MWh)



Recent Demand Load Profile

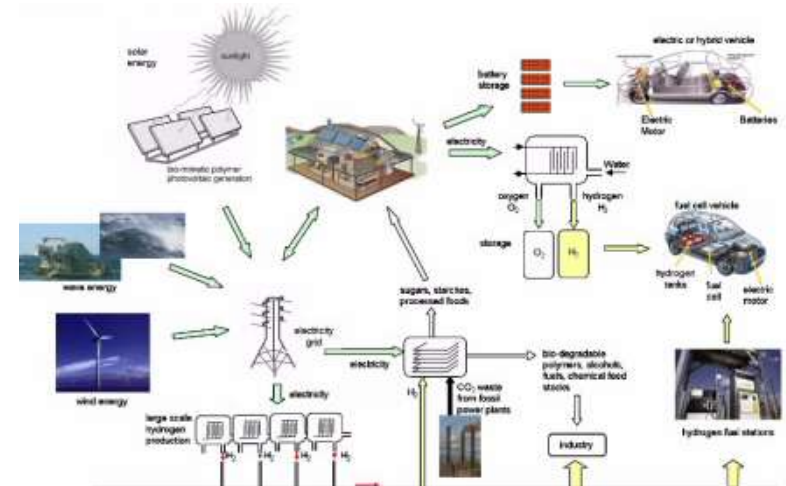


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Load Management



217 Solar Sites



24,000 Water Heater
Load Control Devices

1,118 Distributed
Generation Sites
75.04 MW Generation

Legislative & Regulatory Benefits



- ❖ Implemented mandatory time-of-use rates
- ❖ Remotely Implement Meter Program Changes
- ❖ Shifted on-peak time period
- ❖ Implemented Net Metering
- ❖ Support adaptable and flexible rate and energy management options

Legislative & Regulatory Benefits



Avoided 87,000 meter site visits

Avoided over

\$4 million

in cost

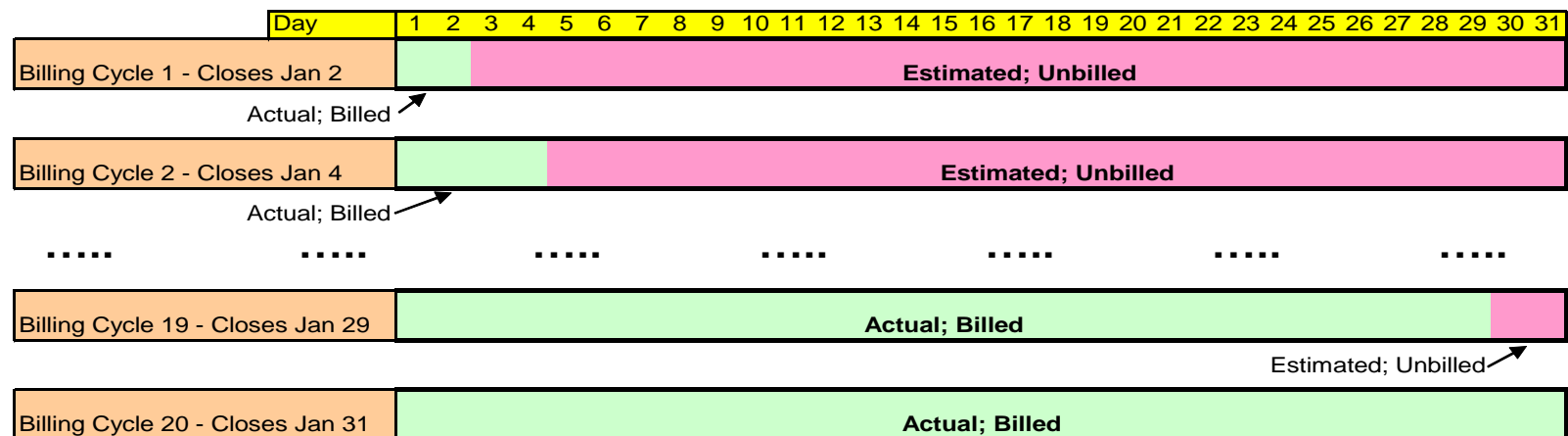
Revenue Assurance and Billing



Using the information from AMI meters:

- Improve Billing Accuracy
- Identify and reduce illegal usage
- Eliminate unbilled estimates by receiving actual reads at end of month for every meter.

Unbilled Revenue

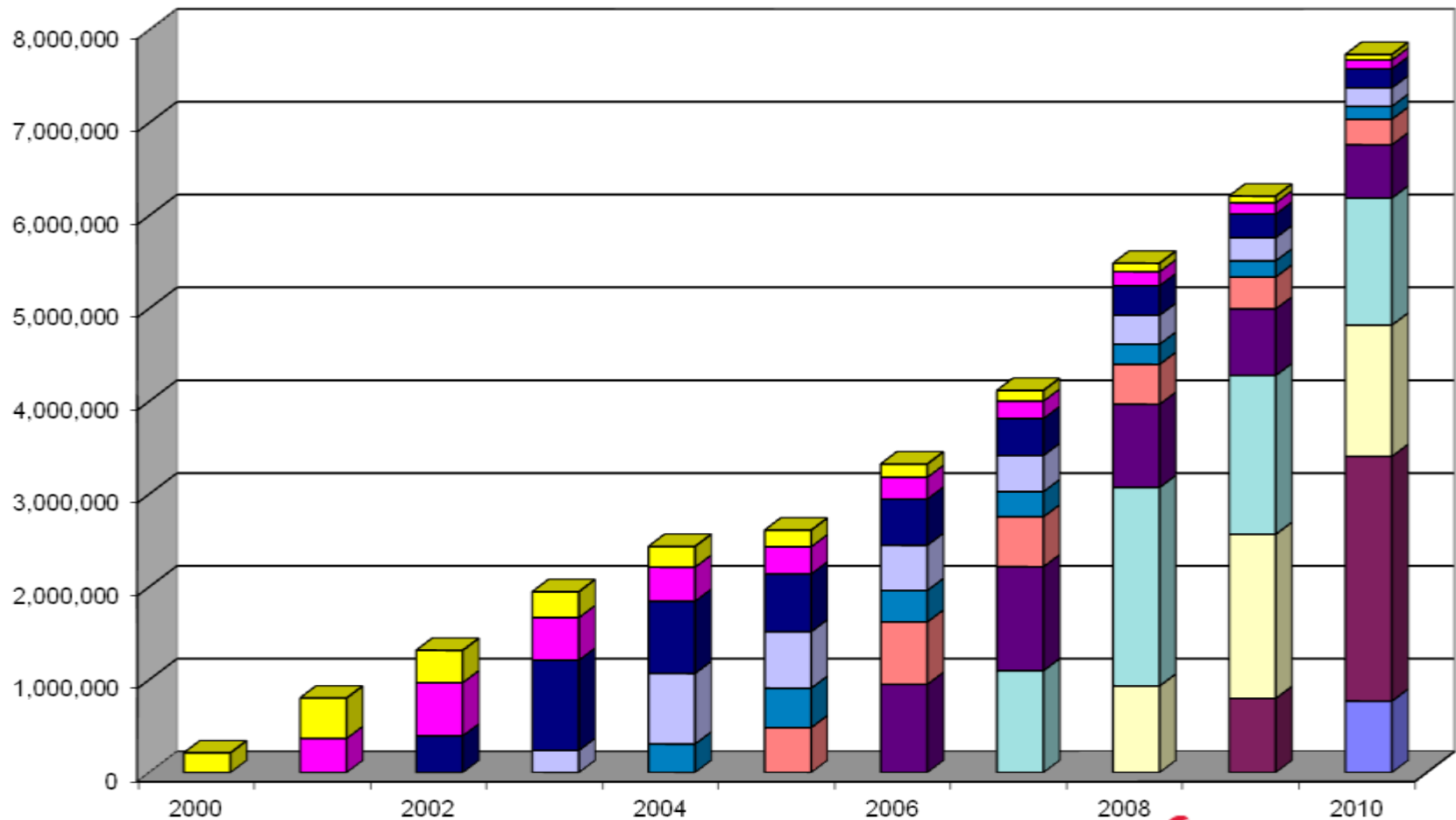


Revenue Assurance Results



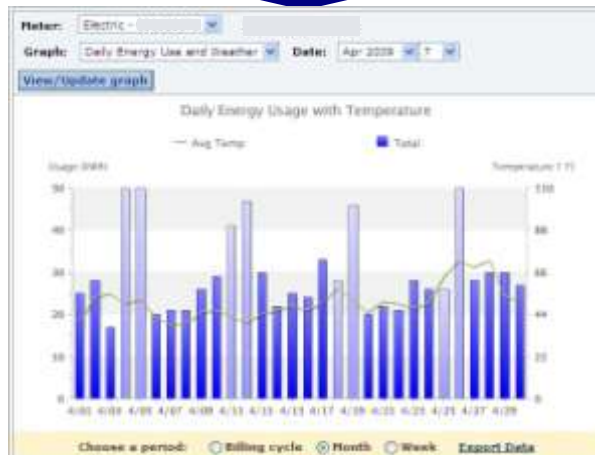
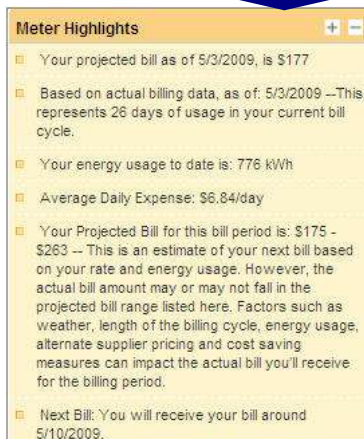
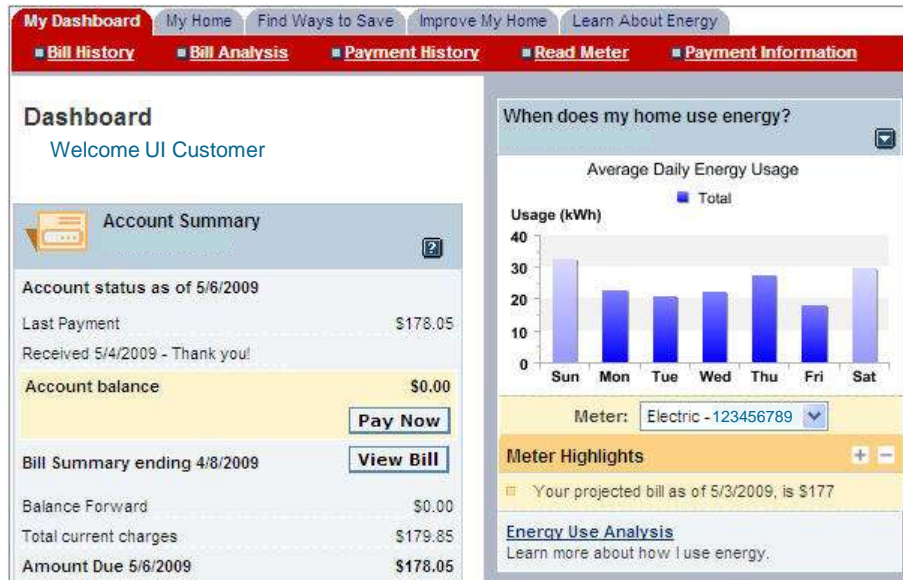
Aggregated Revenues
2000 - 2010

Total \$36,197,073



Customer Tools

“My Account” Dashboard



Customer Tools



Investment Calculator



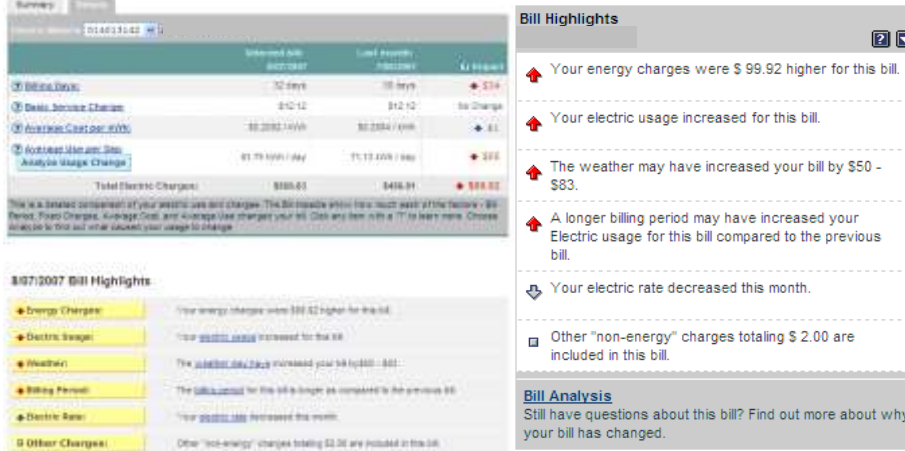
Use Management



Rate Comparison-TOD



Bill Analysis



Carbon Calculator





Remittance

❖ EZ Pay Project:

- Implement bill print, ACH and credit card solution to improve UI's remittance process
- Mitigate uncollectible risk
- Provide Smart Technologies to improve customer satisfaction and Reduce Operating Cost

❖ Business Need:

- Improve Revenue Cycle Service process
- Improve Cash Flow
- Mitigate Uncollectible Risk
- Improve Customer Satisfaction



Benefits

❖ Process Improvement

- Disconnect / Reconnect process

❖ Multiple payment options

- Non-enrolled one-time payments
 - Channels - web, IVR, & live agent
 - Payment Types – ACH, Credit, & Debit
- Enrolled Web Payment
 - Payment Types – ACH only
 - Integration with My Account (Aclara)
- Soft Post – Near Real-Time SAP Integration

❖ Implement Bill Print Solution

- Bill Management
- Bill Print, Insertion, and Mailing

EZ Pay Project

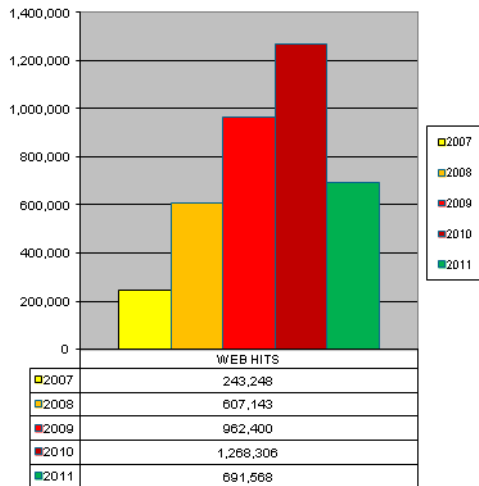


Results

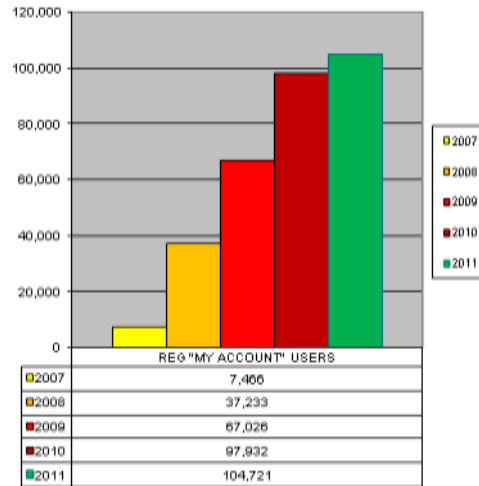
- ❖ Utilization of online payment channels
- ❖ Increase in registered “My Account” users
- ❖ Increase utilization of web/IVR

Online Payments										
Reporting Period: 09/29/2008 - 06/30/2011										
Payment Source	Count	2008 Net Amount	Count	2009 Net Amount	Count	2010 Net Amount	Count	2011 Net Amount	Count Total	Dollar Total
IVR	14,948	\$4,050,491.51	98,514	\$25,567,704.31	135,121	\$35,344,180.21	79,517	\$19,281,901.92	328,100	\$84,244,277.95
Non-Enrolled	4,722	\$1,255,491.97	20,992	\$5,584,262.81	21,176	\$6,964,032.04	8,619	\$2,459,799.76	55,509	\$16,263,586.58
Enrolled	38,718	\$7,113,419.02	283,066	\$52,881,569.19	386,114	\$71,416,969.56	223,891	\$39,201,760.53	931,789	\$170,613,718.30
Totals	58,388	\$12,419,402.50	402,572	\$84,033,536.31	542,411	\$113,725,181.81	312,027	\$60,943,462.21	1,315,398	\$271,121,582.83

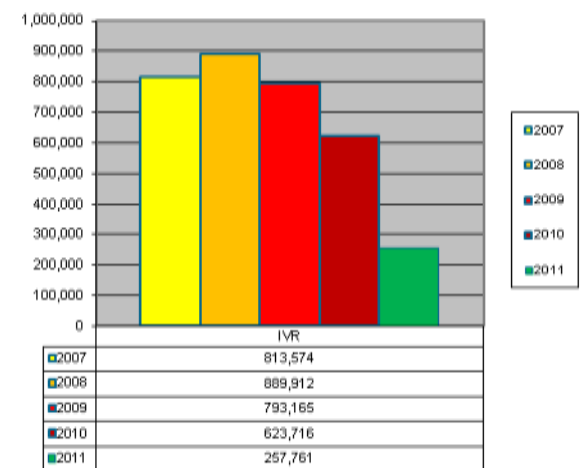
Client Fulfillment - Customer Self Service Technologies



Client Fulfillment - Customer Self Service Technologies



Client Fulfillment - Customer Self Service Technologies





2011 Mailing Campaign

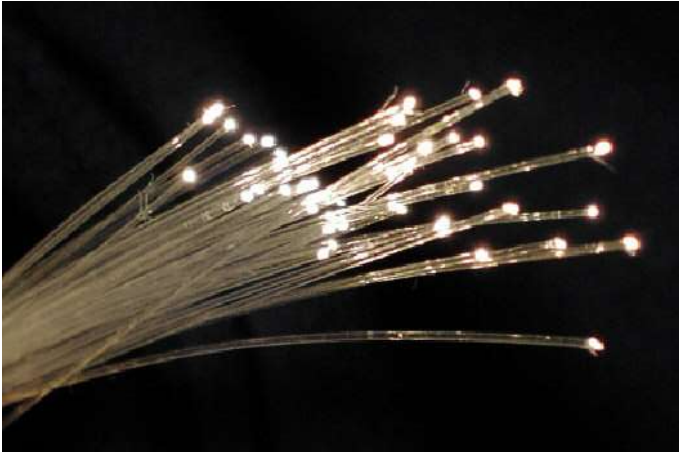


Financial Assistance
packages mailed to **20,599**
hardship customers

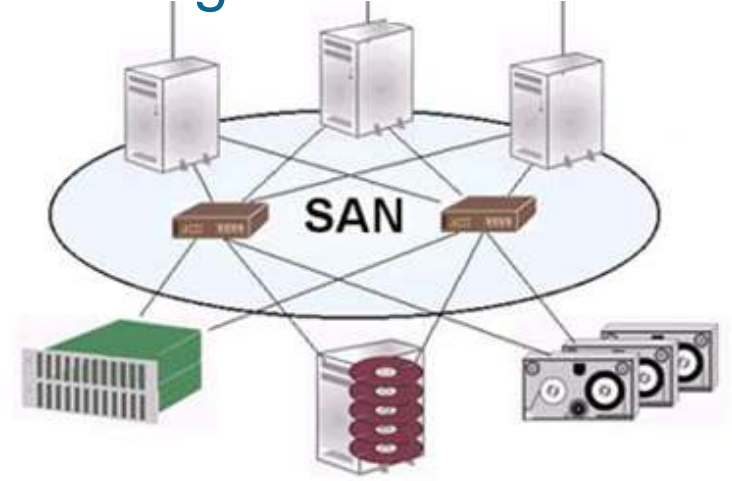
Technology



Fiber Optics



Storage Area Networks



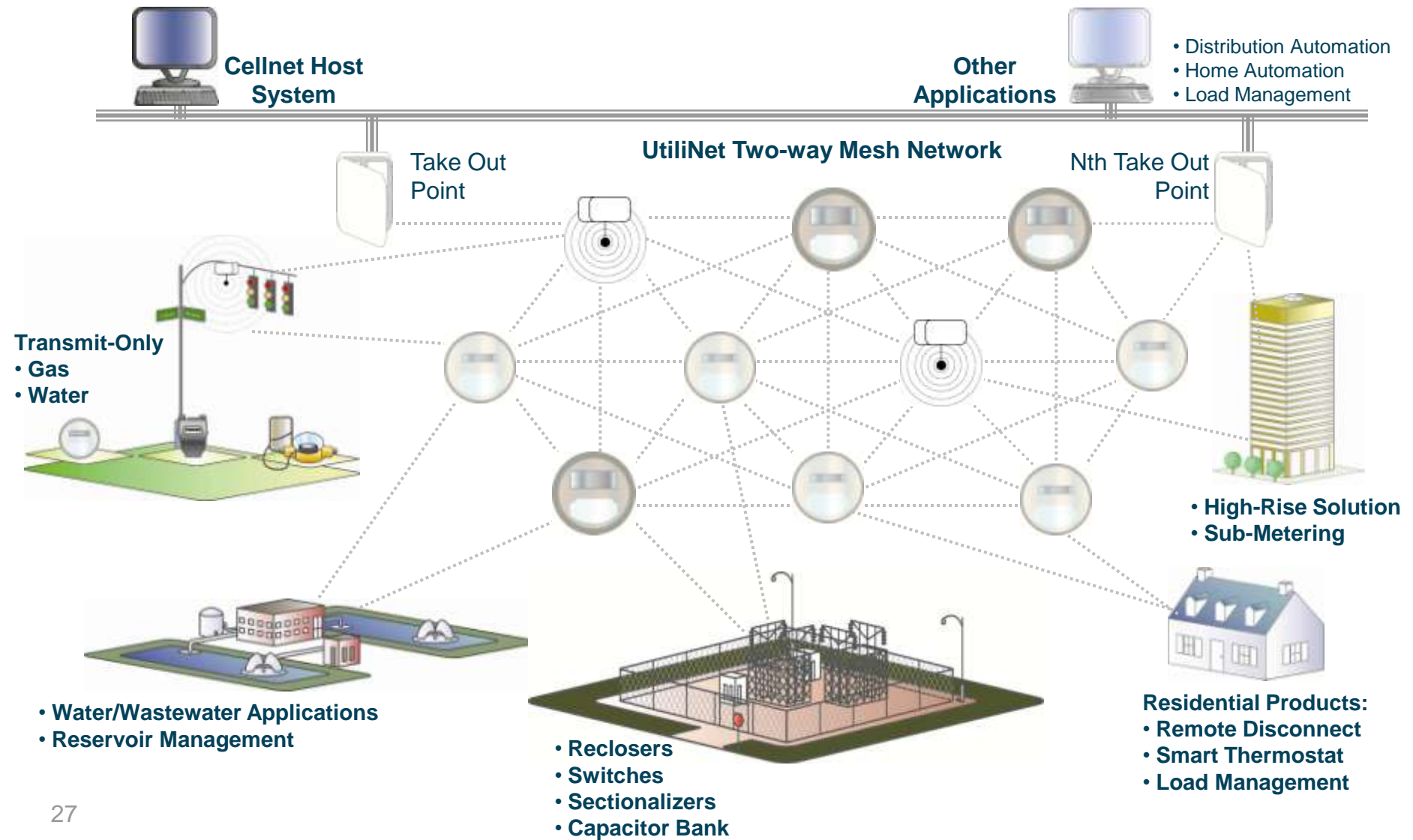
DataPower Security Appliance



Advanced Mesh Meter Networks



Mesh Network



Conservation



CONNECTICUT
ENERGY EFFICIENCY FUND

Connecticut's Energy Efficiency Programs are funded by a Charge on Customer Energy Bills.



**Connecticut
Light & Power**

28

The Northeast Utilities System



The United Illuminating Company

Residential



- ❖ UI Helps
- ❖ Home Energy Solutions Program
- ❖ Residential New Construction
- ❖ Residential HVAC Incentive Program
- ❖ SmartLiving™ Center
- ❖ ENERGY STAR® Lighting
- ❖ *eesmarts*™



Commercial & Industrial Programs



New Construction,
Major Renovation &
Equipment
Replacement



Retrofit
Projects &
Small Business



Operations &
Maintenance
Projects



Retro
Commissioning



Process Reengineering for
Increased Manufacturing
Efficiency



Loans &
Financing



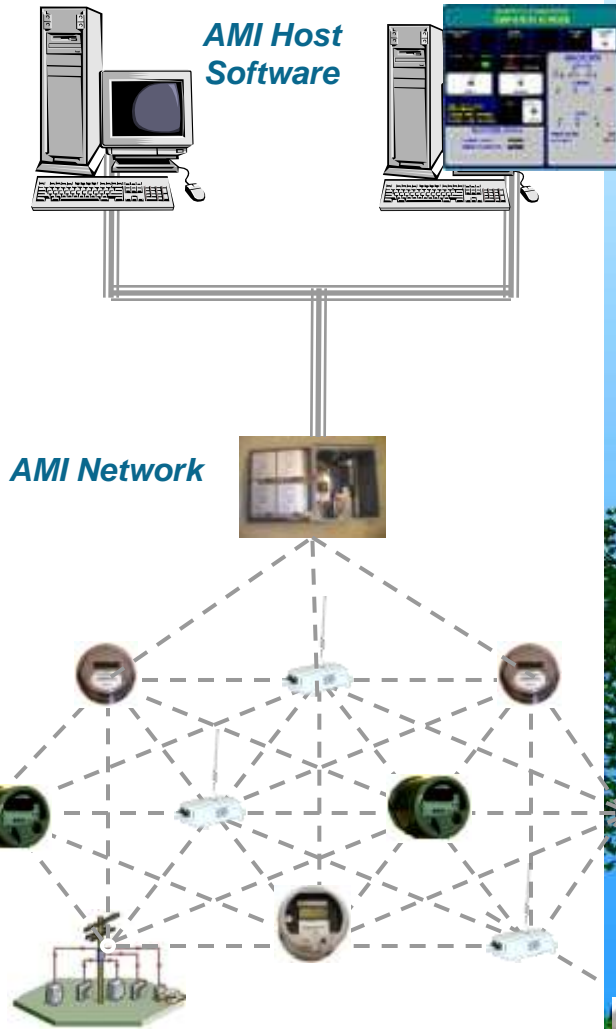
Load
Management

Demand Response



- ❖ Nearly 300 DR assets providing over 110 MW of capacity
- ❖ Assets registered throughout all of New England with over 70% located in UI territory
- ❖ 53% of load through curtailment (182 assets)
- ❖ 47% of load by running EGs (107 assets)
- ❖ Three major 'big box' retailers participate for a combined response of over 20 MWs from approximately 325 store locations throughout NE
- ❖ Target C&I customers greater than 300 KW with the average customer providing 504 KW of capacity

Energy Management



HAN Software





helo™

The evolution of power.



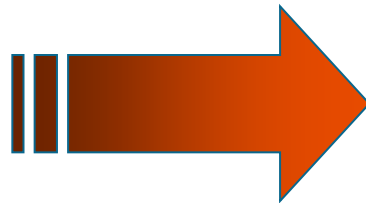
— from —

The United Illuminating Company





Partner with Our Customers



Help customers
better manage
their energy use



Objective :

Evaluate HAN system solution including devices, software, and implementation process in order to determine costs, benefits, and potential program offerings to the customer

- Pilot to include approximately 1,000 households
- HAN devices - Tendril & EnergyHub
 - In-home display, programmable t-stats, controllable plugs
- Research study with UC Davis
- Explore potential programs during pilot
 - Residential Demand Response
 - Dynamic Pricing
 - Integration of Behavioral component
- Assess application to other customer segments
 - Business customers are often more sensitive to price and open to innovative product and service offerings that boost profitability.



Centered around the Customer

- Customers learn about energy consumption with near real-time information to help them better manage their usage
- Become knowledgeable of the price of electricity and their cost for appliances
- Determine if appliances are operating incorrectly and costing them more money
- “White Glove” installation with customer education of device(s), software, and treatment group
- Customer Engagement with email updates and newsletters.
 - Behavioral groups also receive monthly mailer
 - Notification email of how they respond during the pricing events and effects on their bonus or incentive amounts.
- Surveys to determine what customers like and dis-like about the device(s) and software(s)?

What are Customers Saying?



I don't have time to figure out how to change out the device. Can you send someone?

I love it. Can I get another plug?

I upgraded my light bulbs to CFL's, added blinds, turn up my temperature on the AC to see the effects of my usage in real-time . I check it weekly.

I looked at the display for the first month, but now I don't.

When I go play golf after work, I just go on-line change my schedule so my AC and appliances turn on later. It's great!

I wasn't there for the installation and how to use the thermostat. I don't want to learn how to use it, I want my thermostat re-installed.

What's worked well?



- Comparing multiple suppliers with different strengths and weaknesses
- White glove installation
 - Installing and then educating customer of how technology works versus do-it yourself
 - Technician to call helo install line once at house and pairing device and meter over the phone
- Email as a communication tool with participants
- Communication of meter installs between meter services, helo pilot team, and installer
- Setting up participant 15 minute interval data to notify participant of response of price event within 1-2 days
- Customer Support line on same number for helo Pilot Team, EnergyHub, and Tendril

HAN Challenges Summary



- Customer recruitment, engagement, and education
- Scheduling installation appointments with customers
- Keeping customers engaged after delay with meter install and winter snowy conditions
- Thermostat compatibility
 - 37% of customers in UI service territory have central AC
 - Single Zone, specific number of wires, less than 10-15 years old
- Bandwidth availability of AMI
 - 67% of customers have internet in UI territory
 - Verifying Backhaul Solution in August
- Rapid evolution of technology
 - Suppliers have new devices and thermostats available. Already out of date.
- Installing everything in parallel, time lines were delayed: MDM, Meter Install, helo Install, and Load Profile Meter 15 minute data

Project Overall



- **Achieved 90% of Target number of Participants**
- **Installed 83% of targeted households**
- **First Pricing Event Thursday, July 21st**
 - 62% confirmed receiving message(s) about event
 - Opt-in versus Opt-Out – To Be Determined
- **First Emergency Response Event or Demand Response Friday, July 22nd**
 - Opt-in versus Opt-Out - To Be Determined
- **Ten more pricing events through September**
- **Final Customer Survey and pilot to be completed in fall**
- **Final Research Results by end of year**

Electric Vehicles and Chargers



Chevrolet Volt

- Extended Range Electric Vehicle
- 8 kWh battery (usable), 40-mile range
- Charging: 8 hrs at 120V, 12A or 3 hrs at 240V, 15A

Savings Are Significant
Gas ≈ 11.2 ¢/mi
Electric ≈ 4.3 ¢/mi
 Convenience is the key
 to success



Nissan Leaf

- Battery Electric Vehicle
- 24 kWh battery, 100-mile range
- Charging: 20 hrs at 120V, 12A or 8 hrs at 240V, 15A



AeroVironment



CabAire Overhead EVSE



G.E. EVSE



ClipperCreek



The United Illuminating Company



UI Activities

- Provide leadership and educate customers on EV technology
- Stay engaged with stakeholders
 - EVIC, REVI, EDTA, EPRI, EEI, etc.
- Build-out of EV charging infrastructure
 - EVSE pilot for six public charging stations
- Explore residential charging options
 - 95% of EV charging will occur at home
- Assess impact to distribution system
 - Impacts are most severe on transformers and low voltage wires
- Assess future opportunities, such as “Smart Charging” and “Vehicle-2-Grid”

Current Reality



Transformer
Load
Management

Hourly
Meter
Reads

Home Energy
Management

Improved
Outage
Management

Customer Notifications

Real Time
Pricing

Real Time
Energy Cost
Presentment

Redesign
Billing
Statement

Virtual Metering

Integrated Energy
Management

Growth in TOU Rates

What is SMART



Partnership

