Control Number: 32093

Item Number: 412

Addendum StartPage: 1

SOAH DOCKET NO. 473-06-2043
PUC DOCKET NO. 32093

PETITION BY COMMISSION STAFF FOR A REVIEW OF THE RATES OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC PURSUANT TO PURA § 36.151	§ § § § §	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

Contact: Denise Hardcastle

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Fax: (713) 207-9840

June 14, 2006

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Request No: OPC10-01

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
PUC DOCKET NO. 32093
SOAH DOCKET NO. 473-06-2043

OFFICE OF PUBLIC UTILITY COUNSEL

QUESTION:

Please provide all internal planning memoranda and documents pertaining to future deployment of advanced meters in the residential class.

ANSWER:

Please see the attached four documents - Initial Comments of CenterPoint Energy Houston Electric, LLC in Project No. 31418, Rulemaking Related to Advanced Metering, Time of Use Metering, CNP Utility Automation Strategy 4-17-06 Rev 2, and American Utility Week Metering Presentation 0410 - that pertain to the future deployment of advanced meters in the residential class.

Sponsor: Don Cortez

Responsive Documents:

1. Initial Comments of CenterPoint Energy Houston Electric, LLC in Project No. 31418, Rulemaking Related to Advanced Metering
2. Time of Use Metering
3. CNP Utility Automation Strategy 4-17-06 Rev 2
4. American Utility Week Metering Presentation 0410

PROJECT NO. 31418

RULEMAKING RELATED TO ADVANCED METERING	§ § §	PUBLIC UTILITY COMMISSION OF TEXAS

INITIAL COMMENTS OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

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January 30, 2006

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PROJECT NO. 31418

RULEMAKING RELATED TO ADVANCED METERING	§ § §	**PUBLIC UTILITY COMMISSION OF TEXAS**

INITIAL COMMENTS OF CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

On December 21, 2005, the Public Utility Commission of Texas ("the Commission") filed six questions in this Project and invited interested persons to comment on those questions. The questions were published in the *Texas Register* on December 30, 2005. CenterPoint Energy Houston Electric, LLC ("CenterPoint Energy") is a transmission and distribution service provider ("TDSP") in the Electric Reliability Council of Texas ("ERCOT") Region. CenterPoint Energy appreciates the opportunity to participate in this Project and submits the following comments.

I. BACKGROUND

CenterPoint Energy supports recent legislation encouraging advanced metering as a necessary step toward a robust deregulated market. The advantage of advanced metering to the electric market is the timely flow of metered data to support billing, enhance retail market capabilities for customer switching, load and outage management, support price transparency, and energy conservation decision making. Advanced metering offerings and data collection methodology and frequency differs among metering manufacturers.

CenterPoint Energy views advanced metering in several categories according to the methods required to retrieve metered data: individual application, drive-by Automated Meter Reading ("AMR"), Fixed Area Network, and hybrid. One metering technology or one communications medium does not necessarily fit all applications. CenterPoint Energy is considering the use of several different mediums for communicating with advanced metering components. Telephone and cellular communication are already used for some industrial metering. Wireless and broadband over power line communication is being reviewed as the medium for handling the general metering population.

A. Categories of Advanced Metering

1. Individualized Advanced Metering

Advanced metering is typically used in the residential market to resolve an individual need, such as obtaining monthly meter reading data from a hard to access meter. The handheld devices used by CenterPoint Energy meter readers to store meter readings are equipped with wireless signal transmitters and receivers to accept reading data from meters fitted with an electronic receiver and transmitter ("ERT") device. A meter reader walking by the residence presses a button instructing the handheld device to "wake up" the meter's ERT. A typical ERT response signal includes a unique ERT identifier ("ID"), tampering alert, and the meter reading. The handheld device will receive any ERT signal within range. The handheld device compares each signal's ERT ID with the ERT ID unique to the specific account being read. If the signal ID matches the account's ERT ID, the handheld device accepts and logs the meter reading and the Meter Reader goes to the next meter. This application is highly limited because the meter reading device must be within a certain range to obtain a reading. Low handheld device batteries and the placement of the meter affects the distance required between devices for successfully obtaining meter reading information through the handheld device.

2. Drive-By Automated Meter Reading

A drive-by AMR consists of a mobile data collection device capable of reading ERT equipped meters. As a meter reader drives through an area, a data collection unit receives all ERT signals within its range. Each ERT ID signal is matched with a unique ERT ID assigned to each meter serving accounts in the Meter Reader's route. As these signals are matched, meter reading and tampering alert, if present, is logged by the data collector.

The meter's ERT device read by the mobile data collection unit is the same type of ERT device read individually by walk-by meter reader. As long as the signal frequency is compatible, an ERT works in both walk-by and drive-by data collection methods. It is common for a metering manufacturer's water, gas, and electric meter ERTs to broadcast in the same bandwidth. For this reason, drive-by systems are attractive to utilities reading combinations of water, gas, and electric meters. This application is limited because a drive-by data collection device must be within range of the meter signal. Signal distance is affected by meter placement.

3. Fixed Area Network

There are various Fixed Area Network ("FAN") AMR systems that are available. FAN systems require a communication link to each meter served. The communication device at the meter may be the same ERT technology used by walk-by or drive-by systems or may use any other communication module necessary to transmit and receive meter reading data. FANs comprise a closed architecture system because the network is developed from the end point meter through some form of data concentration that is then communicated over a medium to a network operating system and into a data management system. Simply put, as metered data is handed from one component of the network to the next, the data must be tightly secured and understood. For example, a meter with a 900 MHz transmitter could not communicate with a data collector searching for 250 MHz signals.

The broad components of a typical fixed area network for advanced metering include:

- **End point meter with communication functionality** – a means of measuring service and communicating that measurement to some remote data collection system.
- **Data collection system** – a means of moving metered data from a set of end point meters to some remote data management system.
- **Communication backbone** – the system supporting the communication medium between the end point meter and metered data collection system and some remote data management system.

- **Data management system** – the network center and software required to manage the collection and reporting of metered data between the advanced metering systems and billing systems. Additional functions of network operating centers include system analysis and diagnostics for identifying and prompting correction of operational problems or failures.
- **Data and hardware security** – the data and hardware protection veneer.

FANs offer a greater range of flexibility to utilities than do walk-by or drive-by AMR systems. FAN systems support time-of-use rates with varying time intervals between meter readings because the metered data collection frequency from an individual meter within a FAN system may be changed by a central systems operating center. Additional advantages of FAN systems include, readings on-demands, outage management, load management, energy conservation support, and remote connect and disconnect capability. Time sensitive rates are enhanced by FAN systems as meter readings are collected as often as required to support the needs of retail electric providers ("REP") and customers. There are several ways to collect time-of-use measurement by a FAN system; increasing the frequency of meter readings obtained from ERT metering or deploying specialized time-of-use metering with internal intelligence for measuring service usage within preset time intervals. Advanced meters equipped to obtain time-of-use data require individual programming to set starting and stop times, such as 6:00 a.m. and 6:00 p.m. for data measurement and storage. Once programmed, a field visit to each meter is required to reset time-of-use measurement periods. This is less flexible and poses a costly alternative to using the central intelligence capability of the FAN's network operating center and data management system for increasing or decreasing the data collected from ERT metering to support customized time-of-use rates.

4. <u>Hybrid Systems</u>

Hybrid Systems are any combination of walk-by, drive-by and FAN meter reading systems. Hybrid systems utilize the individual strengths of advanced metering and communication mediums to build cost effective systems over diverse service areas.

An urban advanced metering system would differ from a rural system largely due to differences in communications needs.

B. Functions of Advanced Metering

CenterPoint Energy believes that technology for transforming distribution grids into an "intelligent grid" is similar throughout the various vendors and that the Commission should not dictate the technology to be used by the TDSPs. Yet, there are different functions that can be utilized through intelligent grids that should remain open for retail electric providers ("REPs") and customers to make choices. The key function is the various forms of the metered data that is collected and communication methodology to collect and store the data. Interest in what data is collected, how often, in what form and how accessed, will vary between each REP and customer.

Advanced metering helps resolve a variety of needs in the electric retail market. Such needs include individualized information supporting the timeliness and accuracy of billing determinants, off-cycle meter reading data, outage restoration efforts, and remote connection activity with the meter. In addition, maintaining a data repository supported by a fixed area advanced metering network that is accessible to REPs would facilitate the flexibility required to meet the metered data needed to support monthly billing or billing customization.[1] Other functions that could be offered to REPs would be the ability to establish billing intervals that are independent of those used in the current market. For example, billing intervals could be set on any period rather than monthly.

REPs and customers will be able to determine the frequency of the meter reading data to be obtained in order to support such specific needs as time sensitive rates. The specific set of customers that desire such information can contract through the TDSP to increase data collection frequency. Arrangements then can be made for the REP or customer to receive specified intervals of meter reading data.

Initially, the TDSP should manage the data repository containing at least the minimal required meter reading data per meter served by the TDSP. If a REP requests additional data storage beyond the minimum established for the TDSP data repository,

[1] Walk-by and drive-by meter reading collection methods could not support billing flexibility.

such request can be satisfied by either having the TDSP store the data at a cost to the REP or by allowing the REP to take data from the repository and store in its own data warehouse. The repository does allow REPs a common communication interface protocol and minimal data expectation within the TDSP domain. In such a data environment, the individual advanced meter would be expected to support minimal data standards.

Another function addresses the ability to better respond to outages. In the current environment, the TDSP does not become aware of the outage until it is reported to the TDSP by the customer or REP. The actual outage event may have occurred hours before a TDSP response is initiated. In some advanced metering systems, a report to the TDSP that an outage has occurred is initiated with the loss of power supply from the meter to the network managing the advanced metering system. In other advanced systems, the loss of meter reading data groups may indicate the loss of service. Utilizing such intelligent grid systems, the TDSP's response to restore power actually begins well ahead of the customer or REP outage report. Further, the TDSP may be able to respond to inquires from the customer or REP with information about when the outage occurred and any effort underway to restore service, including estimated time of restoration.

Another function that can be provided is the ability for remote connection and disconnection of service to a location at the meter. This functionality allows timely execution of REP instructed service connections or disconnects. When deployed, a customer's service may be remotely connected twenty-four hours daily, seven days a week, regardless of holidays. In addition, with an intelligent grid, service connection or disconnection can be instructed to occur at some specified future time in support of future scheduled move-ins.

C. Costs and Benefits

Implementation of advanced metering is expensive. Regardless of the type of AMR system that is deployed, the hardware and labor associated with the meters comprise the highest cost component of AMR due to the number of meters that will be required to be replaced. In addition, the stranded costs of the meters currently in service must be recovered.

Drive-by AMR technology is the least cost system option. An ERT equipped meter costs approximately $40 to $60. As long as the ERT device communicates with a compatible radio frequency, the meter will work with either a fixed network or drive-by data concentrator. The meter conversion cost of a drive-by AMR system is almost the same as it is for a FAN system.

The benefits of drive-by AMR technology are limited to read-to-bill activities. Utilities operating drive-by AMR systems have the following possible reductions:

- some meter reading staffing,
- back office costs associated with evaluating, validating and correcting meter reading errors,
- customer call volume, and
- field service calls required to validate meter reading accuracy.

FAN communication and data collection systems add significant data retrieval costs over that of drive-by AMR, but combine to enable system flexibility required to automate a greater range of utility applications. Cost for an advanced metering fixed network is generally comprised of 55 percent metering, 15 percent data collection backbone, 30 percent communication system, and 5 percent for manpower, software and hardware costs associated with a central operating network. These percentage relationships will vary greatly between vendor and metering combinations.

FAN systems allow the TDSP to leverage its investment beyond monthly meter reading collection efforts. In a FAN system, the end meter point can be used for scalable frequent collection of meter readings in support of monthly billing or time-of-use rates and as a sensor device in an intelligent grid. With such technology, the TDSP is better positioned to support moving customer service well beyond the current expectations. Savings and benefit opportunities associated with FAN systems include:

- near elimination of meter reading staffing,
- significant reduction of meter reading related back office processes,
- elimination of service field calls requiring meter readings,

- elimination of service calls to required connect or disconnect a meter (where remote connect or disconnect devices are installed),
- enhanced outage management and response,
- enhanced proactive processes for distribution system analysis and diagnostics,
- time-of-use rate support,
- on demand meter reading support, and
- customization of data measurement in response to individual customer needs quickly and with minimal effort or cost.

II. RESPONSES TO QUESTIONS

1. ***In assessing possible deployment approaches and advanced-metering technologies and functions, how should the costs and benefits to Transmission and Distribution Service Providers (TDSPs), Retail Electric Providers (REPs), and customers be considered? Should the commission prescribe rules on deployment approaches, technologies, and functions, or should it leave broad latitude to TDSPs to make these decisions or to REPs to choose on behalf of customers?***

The Commission should not prescribe rules on deployment approaches, technologies, and functions. Instead, the Commission should allow the TDSP broad latitude to implement advanced metering within its service territory. The key shared value of deploying advanced metering for TDSPs, REPs, and customers rests in the quality and frequency of meter reading data. The communication methodology for collecting advanced metering data, as well as the data that can be collected, varies from meter to meter. Interest in what data is collected, how often, in what form and how the data is accessed, will vary with each REP and customer. As meter reading data frequency and the type of data collected changes beyond minimally defined performance for an individual account, a REP and customer may be required to make communication, software, and hardware investments necessary to access the meter data and use the information provided. This makes individualized advanced metering functionality cost prohibitive to most customers other than large ones. A single meter on the market that is individually capable of meeting all REP and customer needs is cost prohibitive for general deployment. An advanced metering system should be minimally able to support the general data interests of REPs and customers and remain flexible enough to handle individualized data needs for specific sets of customers.

2. ***To what extent should advanced-metering technologies and functions be standardized and to what extent should REPs be able to select functions on behalf of customers? To what extent can standard protocols for the information produced by advanced meters output be prescribed?***

Once the appropriate information is gathered, minimal standards should be set that govern the meter reading frequency, storage periods, and meter reading data access that would best serve the market. CenterPoint Energy encourages the Commission to implement pilot programs that will include various technologies so that the necessary data can be gathered. Issues that the Commission should consider after the pilot programs include establishing minimal time intervals for collecting meter reading requirements, such as one reading per day. A single reading for each day would eliminate many of the meter reading error or availability problems experienced in today's market and support enhanced retail customer switching. Once minimal standards are established, REPs will continue to have the opportunity to pursue specialized metering for individual customers or groups of customers at additional costs to the basic required functions.

3. ***Should the commission prescribe cost-recovery rules for the costs of advanced meters? What should these rules say?***

Yes. Section 39.107(h) of the Public Utility Regulatory Act ("PURA") states the following:

> The commission shall establish a nonbypassable surcharge for an electric utility or transmission and distribution utility to use to recover reasonable and necessary costs incurred in deploying advanced metering and meter information networks to residential customers and nonresidential customers other than those required by the independent system operator to have an interval data recorder meter. The commission shall ensure that the nonbypassable surcharge reflects a deployment of advanced meters that is no more than one-third of the utility's total meters over each calendar year and shall ensure that the nonbypassable surcharge does not result in the utility recovering more

> than its actual, fully allocated meter and meter information network costs. The expenses must be allocated to the customer classes receiving the services, based on the electric utility's most recently approved tariffs.

In order to comply with this statutory mandate, the Commission should establish rules so that TDSPs have notice of the requirements that must be met to receive recovery. The cost recovery rules should provide for timely recovery of costs associated with installation and implementation of advanced metering technologies by TDSPs. The rules should allow for a surcharge that would be similar to the current interim transmission cost of service update provided for in P.U.C. Subst. R. 25.192(g), but with additional allowances that take into account the frequency of meter changes resulting from customer requests and the evolving metering and data administration technologies. The rule should provide for the recovery of the addition of facilities to implement advanced metering and include appropriate depreciation, federal income tax and other associated taxes, and the commission-allowed rate of return on such facilities as well as related operation and maintenance cost changes. The recovery should include the remaining installed cost of the "old" meters (meters prematurely made obsolete by advanced metering) minus net salvage, which would be the costs to remove less resale value received. The remaining costs minus the net salvage value should be established as a regulatory asset that would be amortized over a period that would be shorter than the remaining depreciable life of the asset. The regulatory asset should include a recovery of return during the amortization period. Without such cost recovery, there is no justification for replacing older meters more rapidly than would occur under normal meter lives.

4. ***Should the commission prescribe open-architecture rules for advanced meters? Has open architecture been successfully implemented elsewhere? If the commission prescribes rules, what should these rules say?***

At this time, "open architecture", which is defined as a common platform and standard that all manufacturers use, does not exist for advanced metering technologies. Therefore, the Commission should not prescribe such rules. The issue of system architecture should apply to meter reading data access rather than advanced metering technology. The Commission should not prescribe the type of meter to be used, but should allow the TDSP to choose the technology that would be most compatible with its systems. CenterPoint Energy does support the adoption of rules to address issues related to the "open access" to data, which should be allowed. It is important for the metered data to be in an industry standard format with file structures that are compatible between market participants using standard communication protocols.

Meter readings collected through advanced metering systems should be in an industry acceptable format that is easily understood by the REP using the information. Depending on the advanced meter used, the data may require conversion to a prescribed protocol and format. The need for such information will become more critical as REPs develop time-of-use rates. At that point, REPs will need a stream of meter reading data capable of supporting such rates. Rules should be established to standardize requirements for such data.

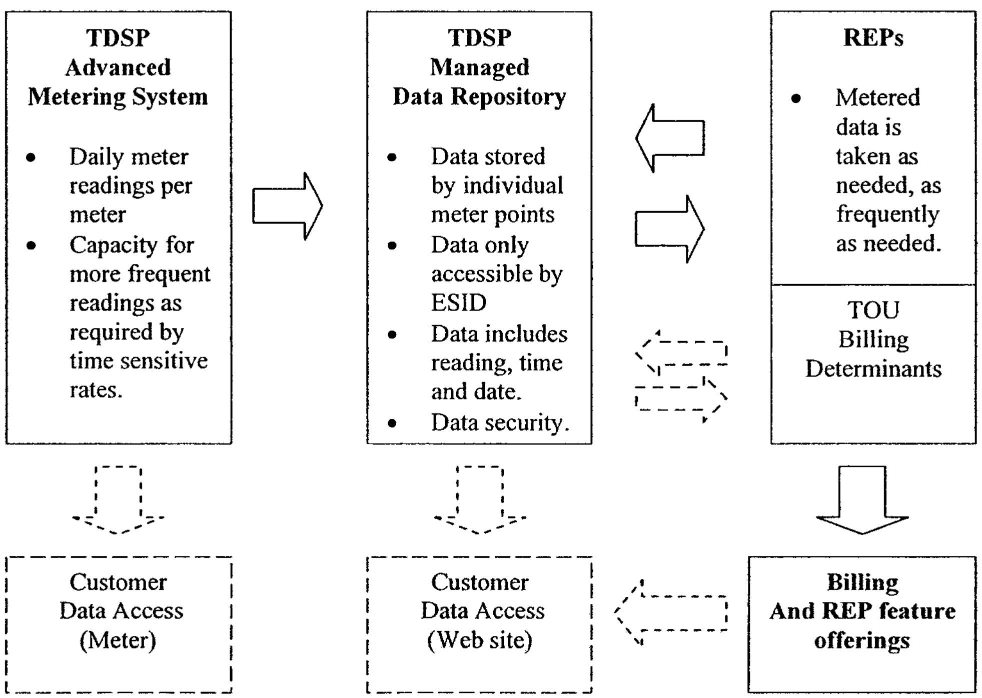
In contrast, nothing is gained by establishing open or closed architecture rules for advanced metering technology. Advanced meters do not address the various methods for collecting metered data. By their nature, FANs are closed architecture systems so that the various parts from the end meter to the network operating center work together to provide a reliable flow of metered data. Such one-way or two-way communication sessions between the network operations center and end point meter dictate the advanced metering components deployed. Therefore, the choice of technology should be determined by the TDSP.

Another system architecture issue to be considered is the potential for independent "data management agencies" handling large customer groups across different REPs. In an open architecture data environment, such agencies could form businesses to manage energy conservation, load management, or any other information based opportunities. Important questions are the oversight for such data management companies and the security of the customer's data.

5. ***Should the commission prescribe rules to deal with information transmission and storage issues? Should it require a pilot project or gradual deployment of advanced meters, in recognition of the volume of information that the market participants will have available from advanced meters?***

Data and communication protocols differ from manufacturer to manufacturer given both the individual meter functionality and the method used to collect metered data. Rather than concentrating on standardizing advanced metering technology and risk placing undue limitations on future metering or communication innovations, the Commission should address the product of advanced metering, which is meter reading data, the frequency meter reading data is collected, and provide for how the data is accessed. Therefore, the Commission should prescribe rules on information collection and storage.

The following diagram illustrates the possibilities for data gathering, storage, and access.



REPs that require more frequent meter reading data in support of time-of-use rates for a specific set of customers may contract with the TDSP to increase data collection frequency and storage. If REPs prefer to store data beyond the minimum established for TDSPs' data repository, either the REP can compensate the TDSP for the additional data collection and storage or the REP could remove the data from the repository and store in it own data warehouse.

The Commission should encourage, but not prescribe, the specifics for pilot programs to be used by the various TDSPs for studying advanced metering technologies. Each TDSP should be allowed to determine the appropriate advanced metering, distribution sensing, and communication network technologies necessary to enhance its distribution grid. The Commission should allow for a multi-year implementation of advanced metering.

6. ***Are there other issues the commission should address in this rulemaking?***

The Commission should consider the following issues:

- The end customer owns their metered data. An advantage of advanced metering is an ability to collect and store frequent meter readings. How is access to the "off cycle" readings to be handled? Does a customer need to give their REP access to this data or is it inferred?
- For several years, TDSP's deploying advanced metering systems will be operating two types of meter reading systems; advanced and legacy. Service offerings to customers will naturally vary between both systems.
- Massive metering deployment efforts will be required to retrofit or replace millions of existing meters to support advanced metering systems. A ten year build out by CenterPoint Energy for the gas and electric meters in the Houston area would require about 6,000 meters per week; 12,000 for a five year build program. The volume of meters involved indicates any deployment activity will likely concentrate on defined geographies, such as all meters on a specific circuit. On the day of installation, all the meters are exchanged after which time the deployment crew moves along to another location. Each meter may require customer communication and will require access. Latitude allowing TDSP communication with customers to gain meter access would simplify and reduce deployment processes and costs.
- Severance should be recognized as a logical cost resulting from advanced metering technology, and cost recovery should be allowed.

III. CONCLUSION

CenterPoint Energy supports the implementation of an intelligent grid for the electric industry. The Commission should allow TDSPs the ability to design advanced metering systems that are best suited for the TDSP's service territory and goals. While the costs of implementation are substantial, there are also significant benefits that can be realized by the TDSPs, REPs, and consumers. Timely cost recovery should be allowed for the new equipment as well as the equipment that becomes obsolete. CenterPoint Energy appreciates the opportunity to file these comments and looks forward to continued participation in this project.

Respectfully submitted,

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ATTORNEYS FOR CENTERPOINT ENERGY

Time of Use Metering

There are several advanced metering options for time sensitive metering; internal time register intelligence within a meter or meters supporting external time register intelligence. Both forms of time interval usage measurement requires a means of collecting and communicating metered data. A meter may be optically probed at the meter's location for information, such as done for Interval Data Recorders (IDR) metering. A meter equipped with a communication module may be polled from a remote site for interval data via some communication medium, such as telephone or wireless. The meter type and means of communication determine the granularity and availability of metered information. The meter, communication modules, added internal intelligence and data storage combine to determine both front end system investment and subsequent maintenance. Each type advanced meter and communication method offer unique advantages and disadvantages.

Advanced meters with Internal Time Register Intelligence

Advanced residential meters incorporating on board time registers include Itron's Centron, GE's I210, Landis & Gyr's Focus, and Elster's REX meters. Each of these meters requires additional modules to enable internal time registers and storage and a means of communicating reading data. One manufacturer has quoted their meter with internal time register intelligence plus communication module will cost about $100. They use programmed time intervals for assigning metered usage which is later downloaded either at the meter or via communication connection to a remote site.

Advantages The advantages of these meters include precise service usage measurement within predetermined time periods. For example, the meter can be programmed to measure service used between midnight and 6:00 a.m., 6:00 a.m. and noon, noon and 6:00 p.m. and 6:00 p.m. and midnight.

Disadvantages Each meter must be visited and reprogrammed any time someone wants to change the time periods for storing usage values. This reprogramming effort limits the benefits for a broad deployment in the residential market. These meters also require the addition of a communications module if the TOU data is to be remotely retrieved further adding to unit cost. A communication module will cost about $20 to $25 bringing the total TOU meter cost to about $125. Otherwise, retrieval of the TOU data requires a monthly field visit to either manually or probe read.

Advanced metering with External Time Register Intelligence

Advanced residential meters supporting time sensitive rates with a frequent flow of time stamped meter readings include Itron's Centron, GE's I210, Landis & Gyr's Focus, and Elster's REX meters. These are the same base meters as mentioned earlier, but rather than inclusion of internal time register intelligence components, they are equipped with modules supporting fixed network communication. These meters provide reading data continuously to a central network operating system over a fixed network's communication system. The time interval between meter readings depends on the manufacturer and meter type as well as the communication methodology used. Read data flow along a power line carrier communication system is generally limited to one meter reading every four hours. Meter reading data through broadband over power line, cellular or wireless communication can get very granular; a 5 to 15 minute interval between meter readings is typical. The central network operating system intelligence can either strip one reading per day or as many readings as required to support time of use rate making. The price for these meters equipped with a communication module will range from $40 to $70 per unit. This compares to a basic electromechanical residential meter cost of about $25. The communication system expense and network operating center costs are almost identical the same between internal and external time of use metering. Both metering types require a data repository. However much of the time of use data measured by internally equipped meters are stored at the meter which reduces the need for additional central storage capacity.

Advantages The advantage of externally controlled time-of-use metering is that the time intervals between readings are centrally controlled. This allows retailers to easily customize time periods among customers or to alter measurement intervals with minimal cost and effort. Time intervals for service measurement are changed via a central program. A customer not on TOU rates and served by an advanced meter in a fixed area network, but wants to enter into such a rate, would not require a meter change. Conversely, a customer on TOU rates preferring to return to a monthly billing rate would not require a meter change or loss in metering investment value.

Advanced metering supported by a fixed area network system also supports real time pricing. The communication properties of a fixed network can allow for the continual flow of metered usage measurement on properly equipped meters. An equivalent meter that is not served by a fixed network would require an independent means of communicating data which would make real time pricing cost prohibitive for residential customers.

Disadvantages The TOU measurement is reliant upon a steady stream of time stamped meter reading data and the communication system that supports the retrieval of that data. The data requires central storage. The cost components supporting this system model include the meter, meter module, data collection hardware, communication hardware, network system operating hardware and software and data storage and management.

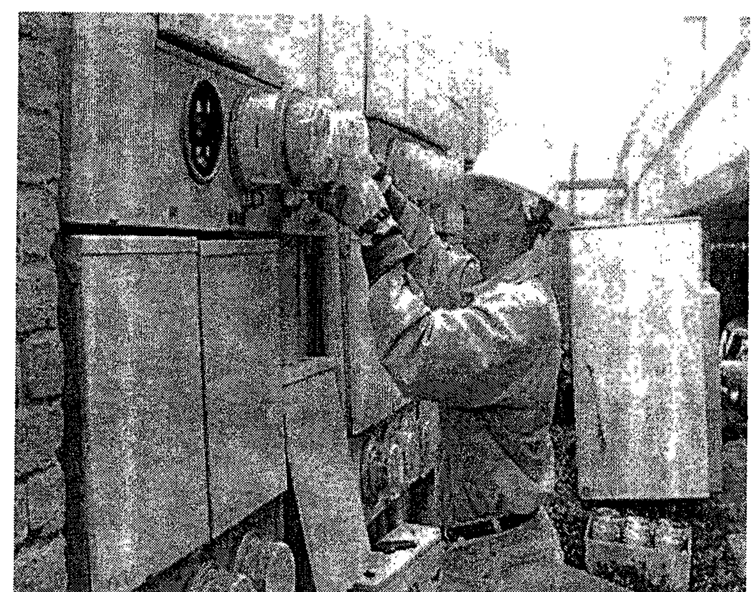
In conclusion, there are alternative options supporting time-of-use metering. The ability to customize individual customer measurement rates or alter measurement intervals with minimal effort, imply meters served by a fixed area communication network is preferable. Meters with internally equipped modules supporting precise measurements between preset start and stop time intervals provide highly accurate measurements within the preset times, but cost more per unit, require a field visit to read and reprogram, and are not easily adaptive to changing measurement periods.

Distribution Automation At CenterPoint Energy, Inc.

"Evolving Role of Metering"

A Business Transformation Opportunity

April 26, 2006



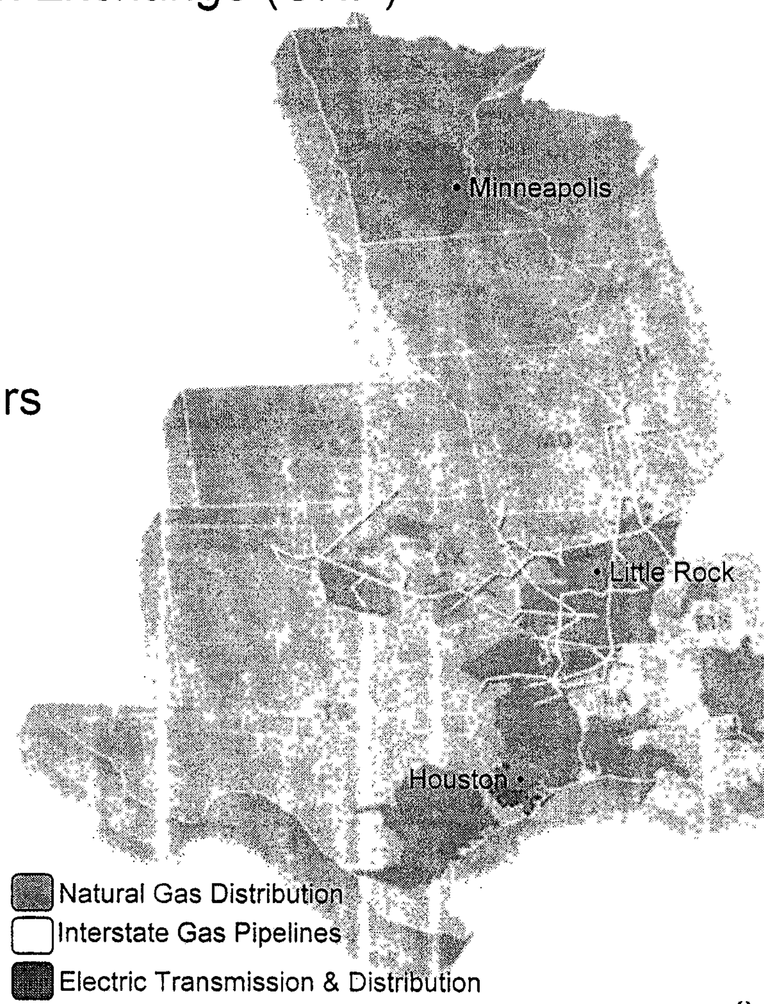
CenterPoint Energy

Jim Sheppard
Director Business Processes
Distribution Support
CenterPoint Energy, Inc

CenterPoint Energy
A Domestic Energy Delivery Company …. And More

CenterPoint Energy

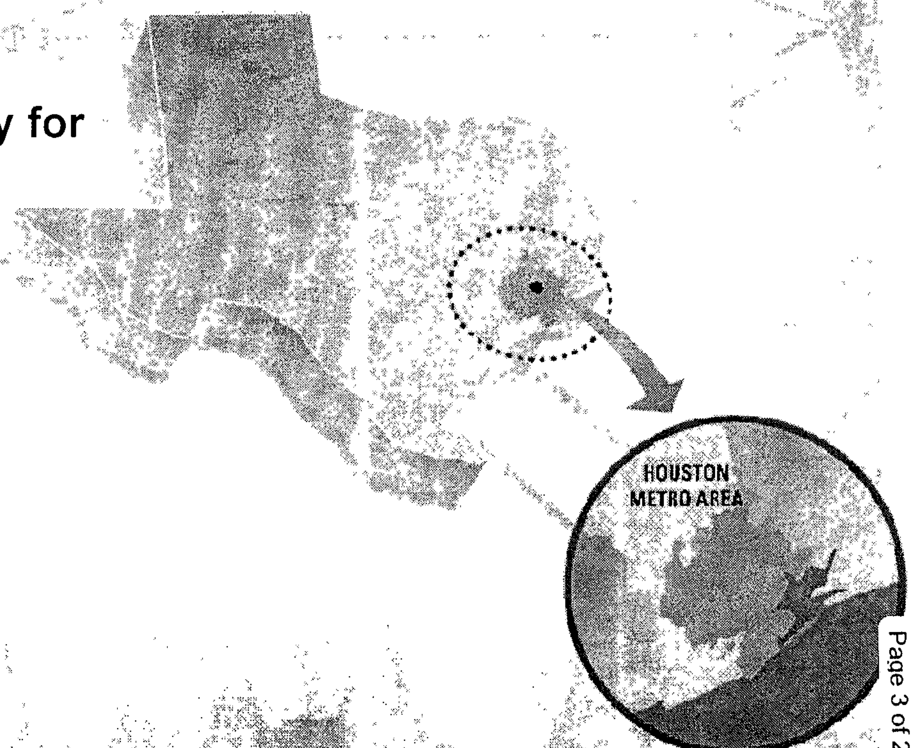
- Public company traded on the New York Stock Exchange (CNP)
- Headquartered in Houston, TX
- Operating 3 business segments in six states
  - Electric transmission and distribution
  - Natural gas distribution
  - Interstate pipelines and natural gas gathering
- Serving nearly 5 million electric / gas customers
- $17 billion in assets
- $8.5 billion in revenue
- More than 9,000 employees
- Over 130 years of service to our communities



CenterPoint Energy
Electric Transmission & Distribution

CenterPoint Energy

- Chartered in 1882
- 5,000 square-mile service area
- 1.86 million metered customers
- 73.6 billion kilowatt hours delivered yearly for about 60 certified competitive retailers
- Transmission and Distribution System
  - 3,640 miles of transmission lines
  - 41,913 miles of distribution lines
  - 225 substations



Texas Regulatory Environment

CenterPoint Energy

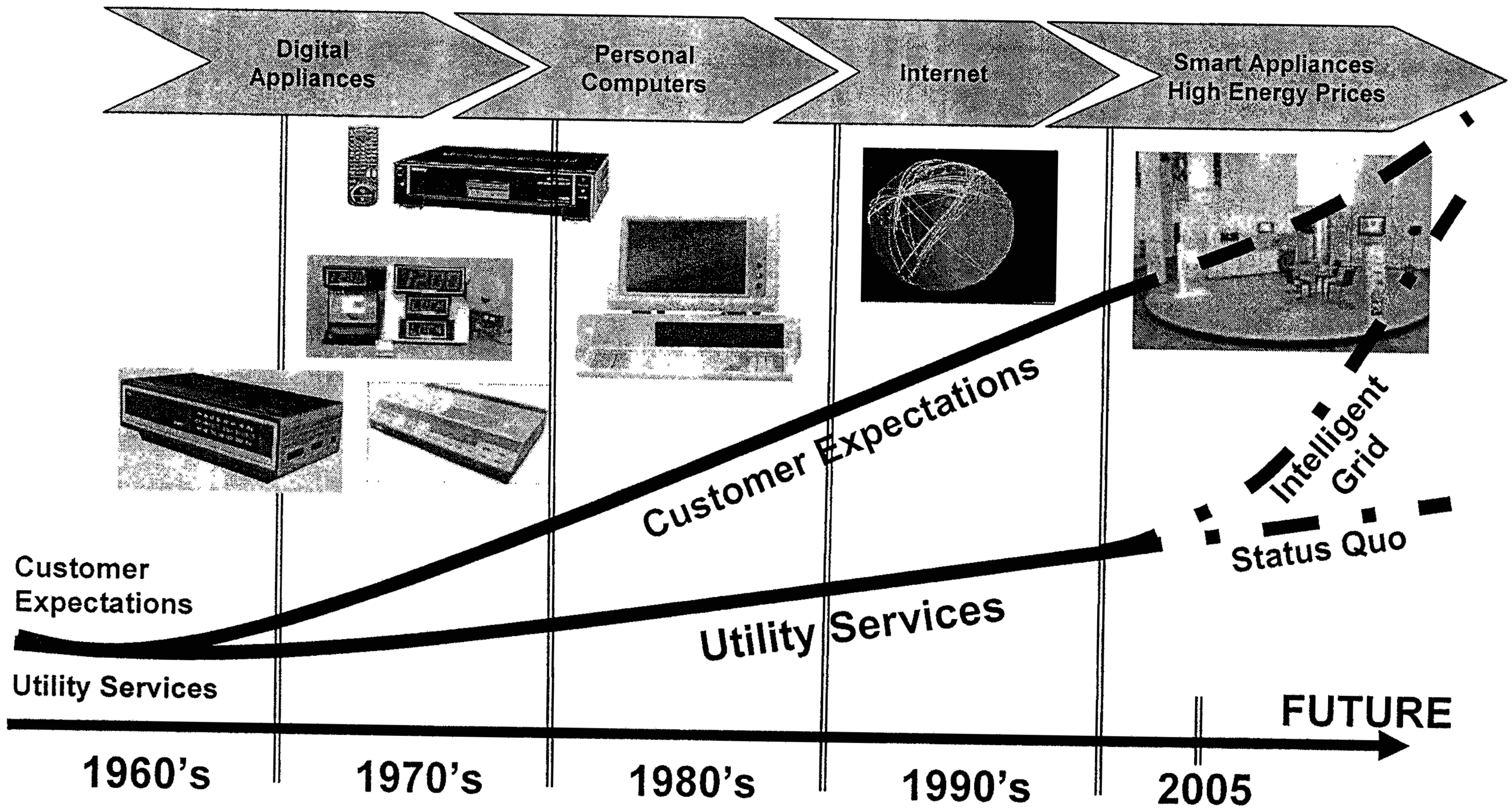
–Texas Telecommunications Law (SB-5) update...

- **Telecommunications:**
  - Further deregulates the Texas telecommunications market by providing for gradual phone-rate deregulation;
  - Allows telephone companies looking to enter the cable market to obtain statewide rather than local franchises;
- **BPL / Broadband:**
  - Right to use public roads / utility easements for BPL transmission;
  - Open access on the network. Utilities / affiliates able to participate as an ISP or not;
  - Provides cost recovery for portion of BPL that is used by electric utility for operations;
  - Utilities cannot be required to install BPL and provides exclusive access by the utility to the electric infrastructure to preserve safety and reliability of the electric grid;
  - Allows a state or municipality to impose fees on provision of BPL services, but no greater than those imposed on other providers;
  - Ensures that revenues of an affiliate BPL operator are not deemed to be revenues of the electric utility.

CenterPoint Energy
Why?... Utility Efficiency / Customer Sat

CenterPoint Energy

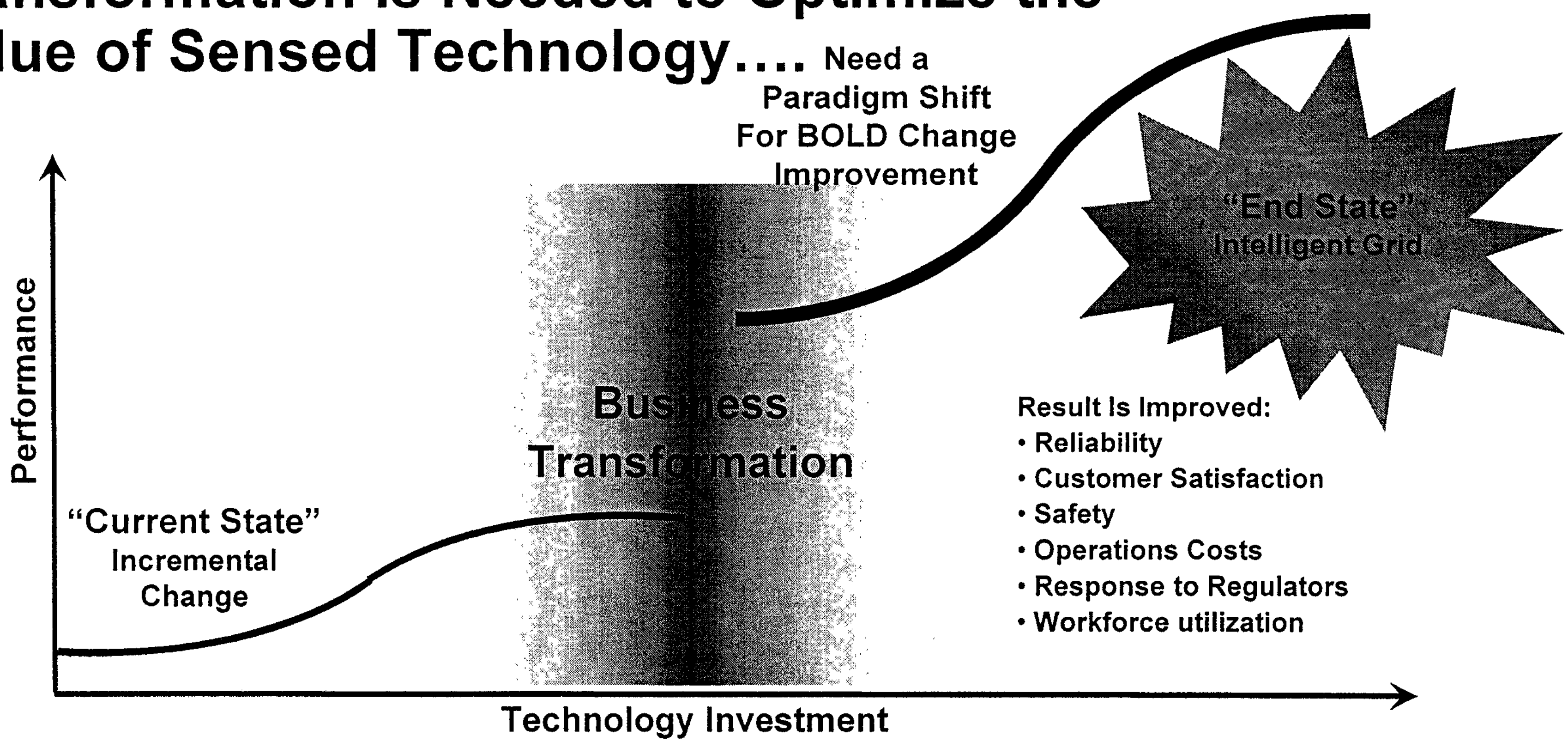
Are utilities meeting Customer Expectations? The expectations of customers today are not the same as those of yesterday.....



CenterPoint Energy
Business Transformation

CenterPoint Energy

Transformation Is Needed to Optimize the Value of Sensed Technology.... Need a Paradigm Shift For BOLD Change Improvement



Result Is Improved:
- Reliability
- Customer Satisfaction
- Safety
- Operations Costs
- Response to Regulators
- Workforce utilization

The Vision: An "Intelligent Grid"

CenterPoint Energy
... So, what is the 'Intelligent Grid'?

CenterPoint Energy

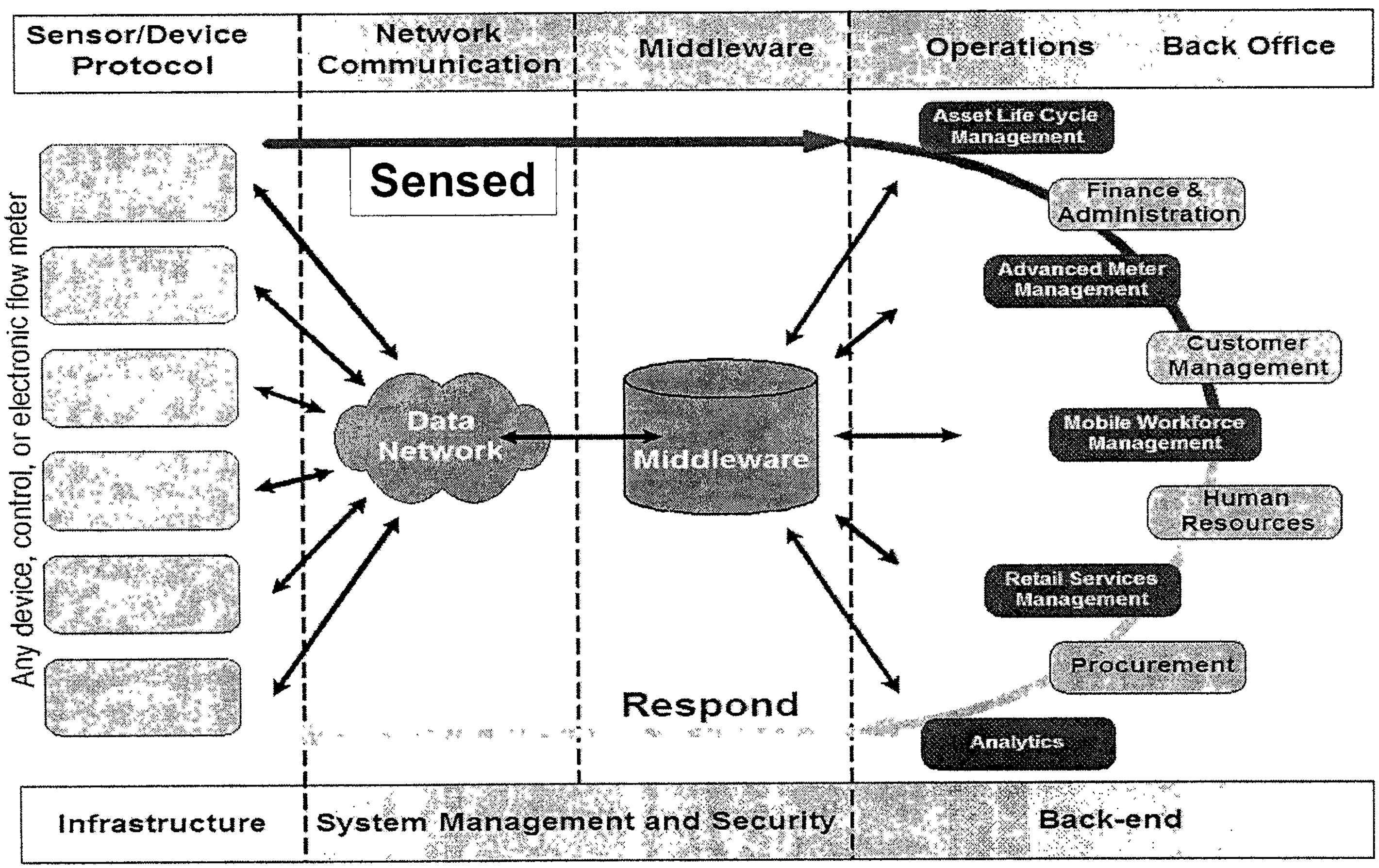
The 'Intelligent Grid' provides data and information on demand that can enable a "step change" in a utilities ability to improve grid planning, operations, and maintenance, contributing to fewer and shorter outages, better customer service, reduced capital, operations, and maintenance costs, improved security, and more effective use of the workforce.

	Intelligent Grid
Outages	• Intelligent meters, sensors and devices enable better detection, diagnosis and restoration of outages • Field crews with the right skills are dispatched to the right place, at the right time with the right parts • Wide area situational awareness provides improved event response, diagnosis and management
Aging Assets	• Investment based on sensor-based, accurate historical data analyzed with advanced tools • Deteriorating assets operated below design capacities to extend life and optimize replacement
Growing Peak Demand	• Accurate historical data enables grid to be built and configured to eliminate over or under design and utilization • Smart meters, along with time-of use tariffs and end user portals moderate the growth in demand

CenterPoint Energy
How we see the intelligent Grid working

CenterPoint Energy

Informed decision making via the Intelligent Grid. Directly connects the requestor to the device or the data needed.

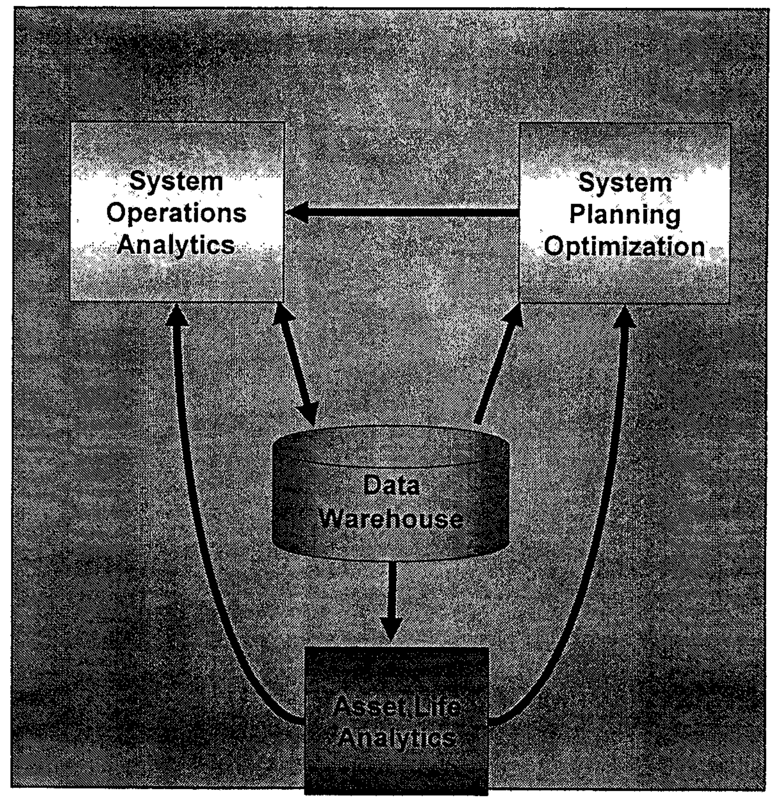


CenterPoint Energy
Advanced Grid Analytics: Asset Lifecycle

CenterPoint Energy

Asset Lifecycle Analytics focuses on understanding when to replace assets, and how to extend the life deteriorating assets

- Electrical Assets deteriorate with usage, e.g. insulation, which will deteriorate when heated
- Assets of same type will fail in a similar manner
- Analysis of the historic usage of assets can be used to build a pattern that indicates the expected remaining life for existing assets
- Prediction of historic life is improved when augmented with data from remote asset monitoring and off-line condition monitoring
- As assets start to fail, Remote Asset Monitoring may detect weaknesses which are only evident when the asset is loaded above a given level e.g. Dissolved Gas Analysis on transformers
  - Operations can be adjusted to protect the asset, i.e. keep it loaded at a level that will extend its life

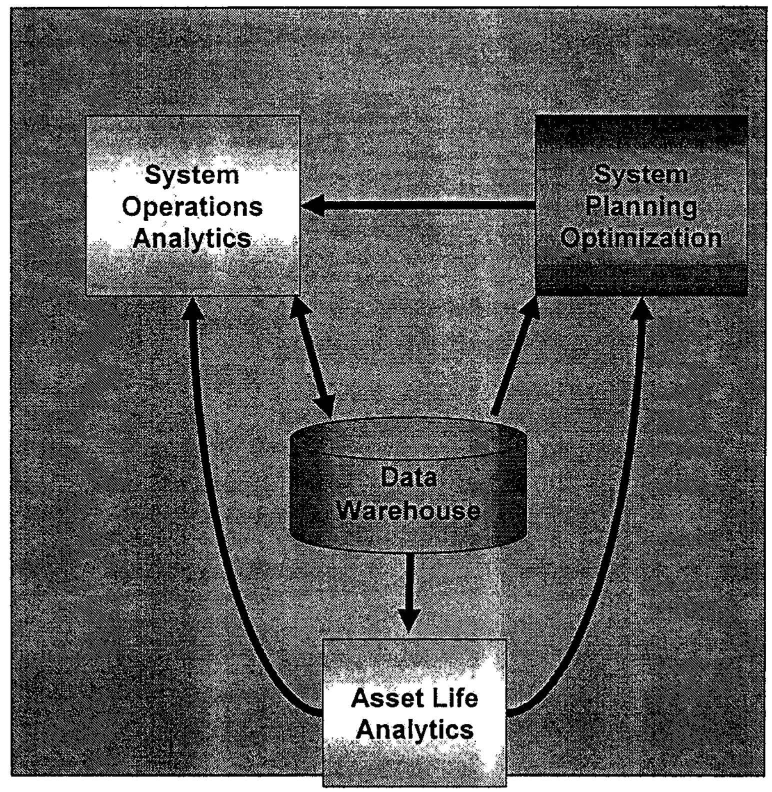


CenterPoint Energy
Advanced Grid Analytics: System Planning

CenterPoint Energy

System Planning Analytics can reduce or delay capital expenditures, as well as help design networks that are cheaper to operate

- Analysis of customer load patterns provides a detailed picture of which circuits need upgrading to avoid under-loading or overloading
- The results from Asset Lifecycle Analytics can be used to optimize the planning of system maintenance
- Detailed information on individual customer load patterns provides an opportunity to balance the load on each phase, reducing losses on the network
- Capital expenditure can be optimized based on business value of various grid components

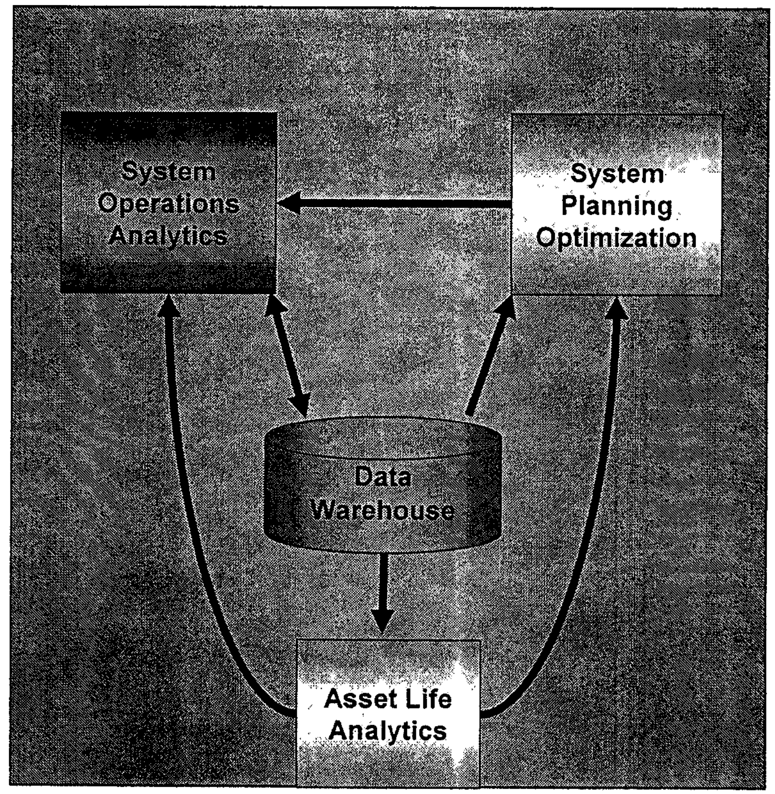


CenterPoint Energy
Advanced Grid Analytics: System Operations

CenterPoint Energy

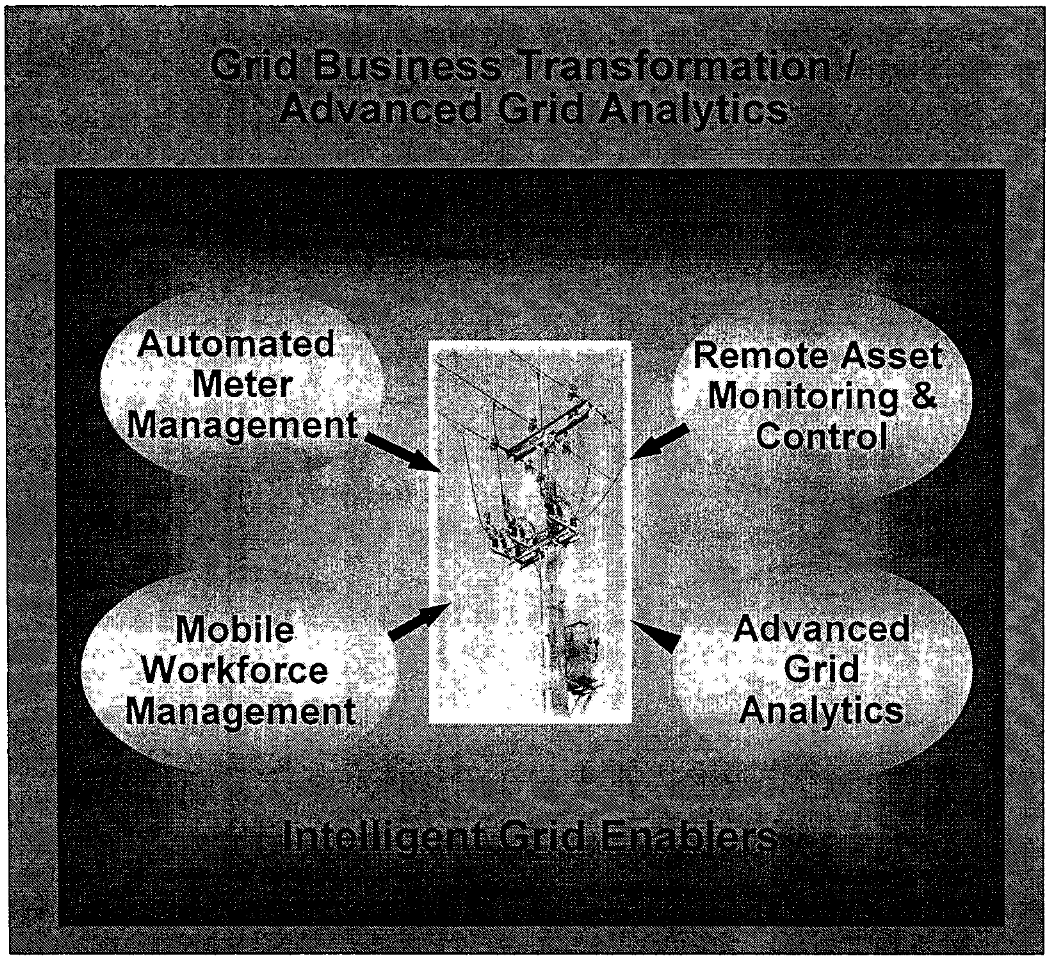
System Operations Analytics can reduce or delay capital expenditures and improve reliability

- **Real-time analysis of faults can enable:**
  - Grid reconfiguration to keep the system within safe limits
- **Analysis of meter energization and other power flow data allows faults to be analyzed off-line such that:**
  - Field crews, with the right skills, are dispatched to the right place, with the right tools and the right parts for the job - so that restoration is faster
- **Real time management of power flows can avoid over-loading circuits, avoiding or delaying the need to upgrade those circuits**



CenterPoint Energy
Intelligent Grid "Enabled" Functions

CenterPoint Energy



Advanced Grid Analytics **–** Using grid information to intelligently manage grid assets, upgrade planning, and operations

Automated Meter Management (AMM) Enabling customer participation and grid observability through intelligent device and communication installation

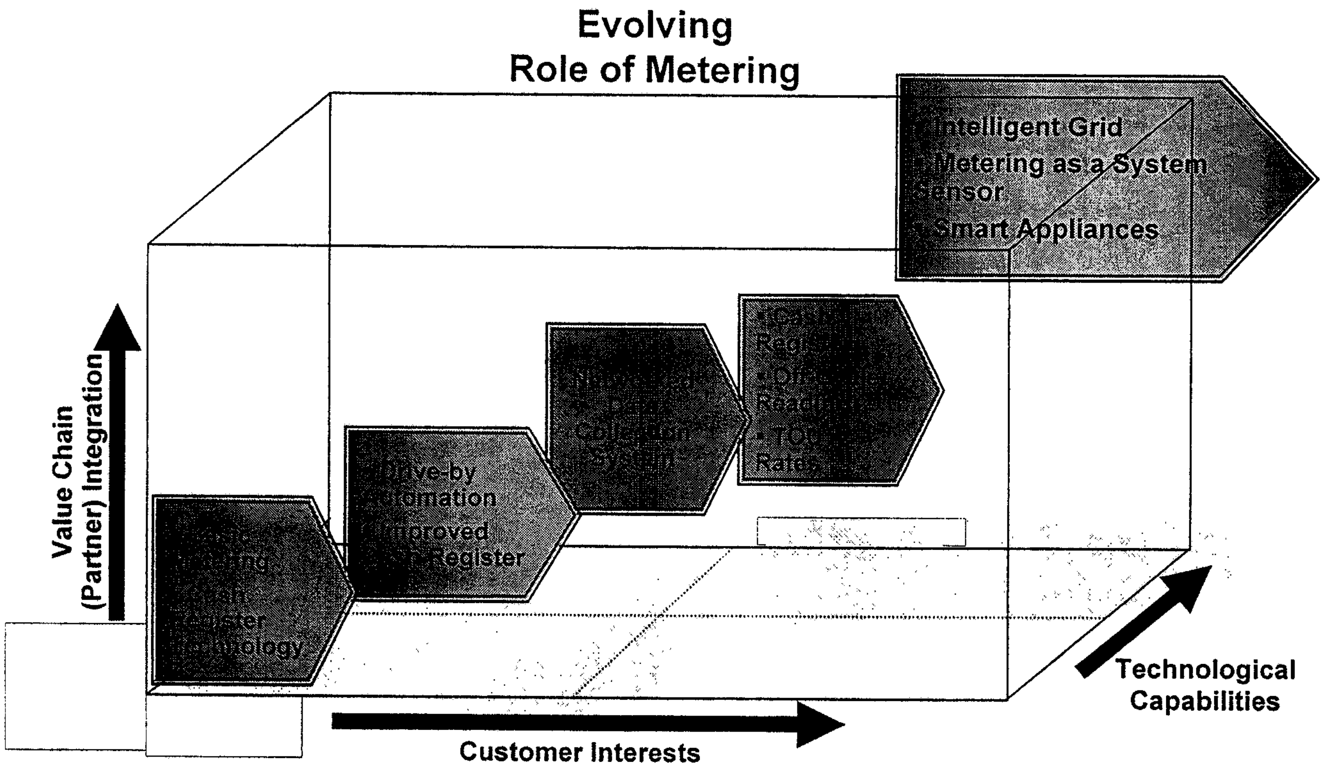
Remote Asset Monitoring (RAM) Providing telemetry integration, condition monitoring and advanced metering technologies to drive fact based asset management

Workforce Management (WFM) - *I*mplementing programs and systems to manage and utilize the workforce effectively

Moving From a Cash Register to a Network Sensor and Portal

CenterPoint Energy

Customer interests, independent technology development, and value chain integration require increasingly sophisticated services that are easy to use and easy to incorporate into existing business solutions



- Time based rate support
- Outage and restoration notification
- Self serve customer usage portals
- Remote (automated) service connect/disconnect
- Advanced distribution management
- Self healing distribution systems

CenterPoint Energy Advanced Metering Needs Model

CenterPoint Energy

	Business Needs	Technical Needs
AMI	• Quick access to meter data • On demand read access • Highly granular reading frequency • High reading reliability and accuracy • Metering and data security • Low risk of early obsolescence	• Advanced metering functionality • Low cost communication backhaul • Mechanism for data access • Metered data storage • Meters as distribution sensors
Service Management	• Analysis and usage reporting tools • Operating cost reductions • Remote meter connect/disconnect • Service status verification • Self healing systems • Self service sessions	• 2-way communication sessions • Outage reporting • Remote device control • Robust middleware controls • Analytic and diagnostic tools

CenterPoint Energy
A Disciplined Approach reduces risk and improves efficiency....

CenterPoint Energy

How did CenterPoint Energy approach the evaluation of BPL?.....

CenterPoint Energy has taken a disciplined approach in it's evaluation of BPL and Distribution Automation opportunities and has essentially followed the timeline below.

2005

- Analyzed BPL
  - Communications platform
  - Cost Drivers
  - Technical viability
  - Utility / retail applicability
- More Detailed Analysis
  - Partnered with IBM
    - Pilot
    - Tech Center
  - Regulatory
  - Tested Utility / Retail Opportunities

2005 activities resulted in a:

- ***Distribution Automation Strategy***

And a......

Automation Roadmap

CenterPoint Energy

An Automation Roadmap is needed to get to an intelligent grid…

CenterPoint Energy

Customer Apps | Utility Benefits

Intelligent Grid

2-Way Communications

Retail Solutions

- Services (Security, Energy usage monitoring/control, VoIP, Internet)

Revenue

Utility Applications Proactive Mgmt

- Load profiling
- Outage detection
- Event Detection/diagnosis

- Advanced Data Analysis
- Automatic Switching
- SAIFI Avoidance
- MAIFI Avoidance

$ Savings, Cust Sat, Safety, Reliability

$

Utility Applications Real Time Mgmt.

- DACS
- Sensors
- Transformer Load Mgmt

- Meter Interrogation
- Theft Detection
- Time Sensitive Rate Making

Low Speed 1-way Comm

Revenue

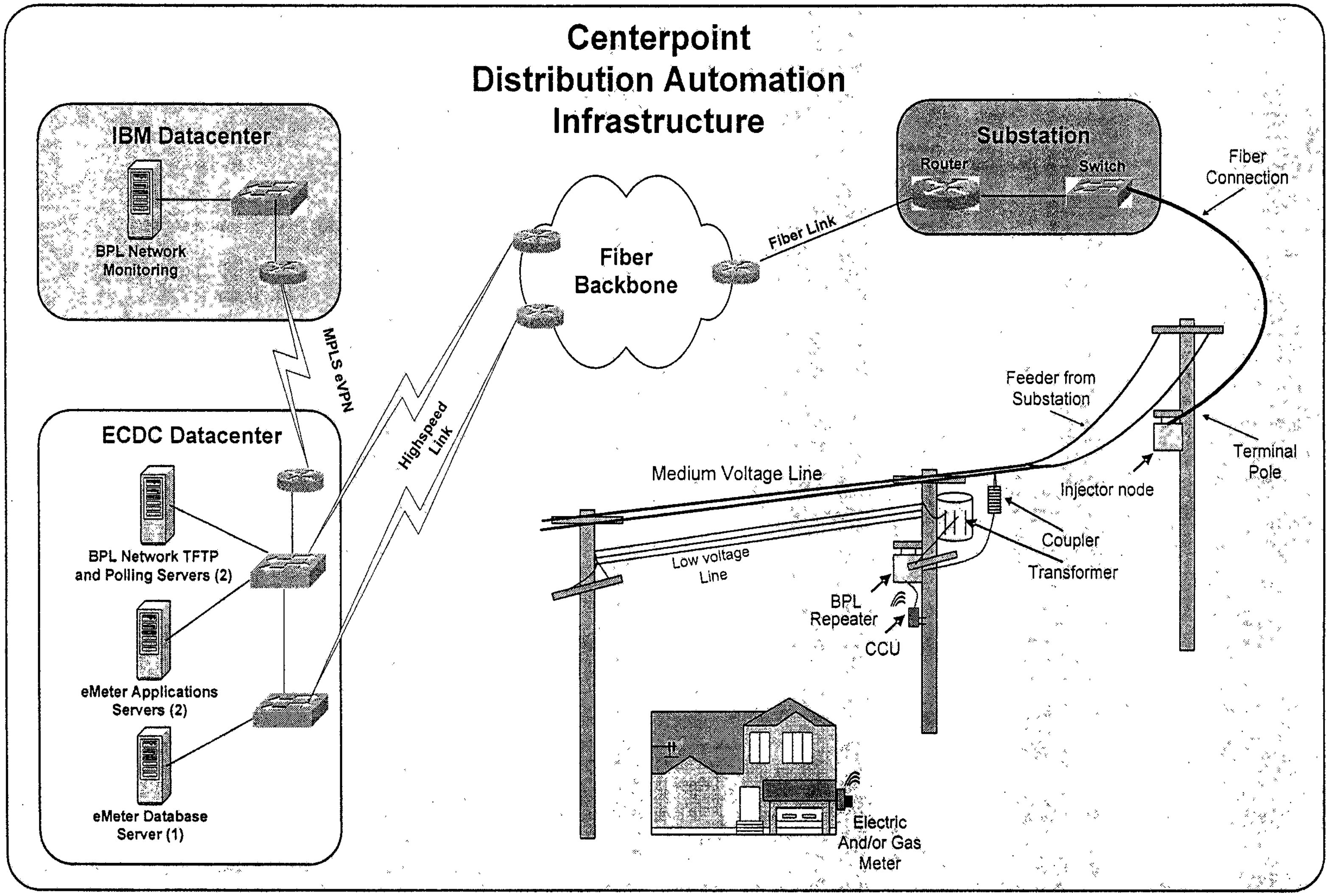
Basic AMR is too narrowly focused. No expansion beyond AMR.

- Largely revenue cycle services oriented
- Predominately focused on meter reading cost reduction
- Remote connect/disconnect

Traditional Basic AMR

CenterPoint Energy
Intelligent grid

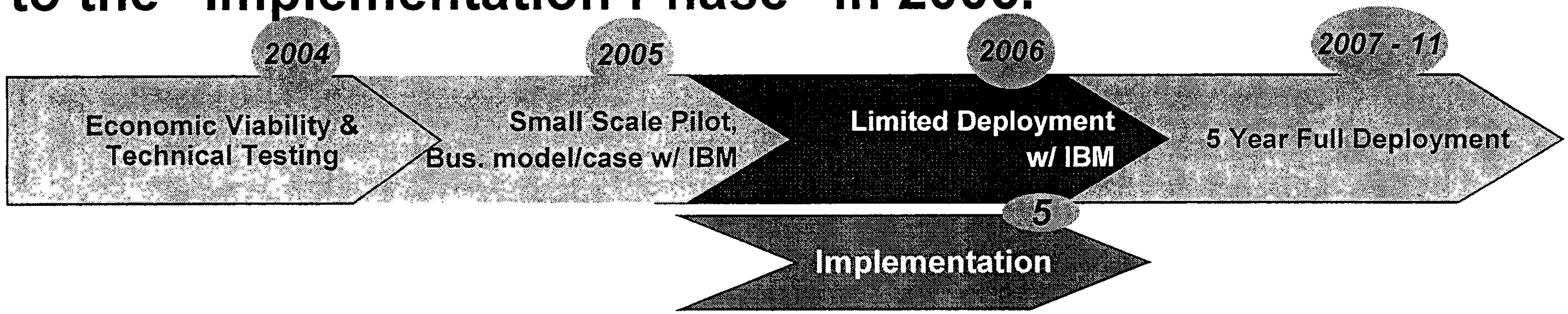
CenterPoint Energy



CenterPoint Energy
We are on target with our 2006 Plan…

CenterPoint Energy

Based on 2005 results, CenterPoint Energy is proceeding to the "Implementation Phase" in 2006.



2006 Phase Activities

- Engaged IBM to Implement the following:
  - Automated meter reading for gas (23k homes) and electric (45k homes)
  - Electric meter turn on / turn off for subset of above
  - A level of "Intelligent Grid" (Distribution Automation) capability
  - Utilize BPL as backhaul
  - Validate cost and performance assumptions
- IBM will provide technology expertise and end to end system integration

CenterPoint Energy
Minimal Value Expectations
Key Value Creation Drivers: Benefits

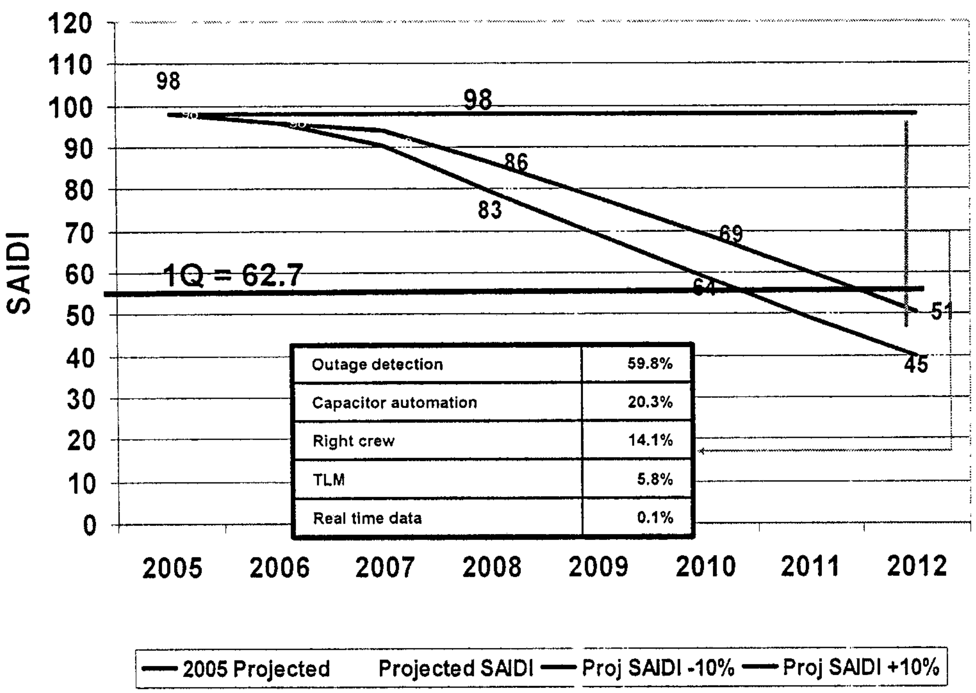
CenterPoint Energy

Benefits	% of Benefit	Comments
Meter Reading	37.6%	Replaces manual meter reading. Meets market expectations.
Remote Connect/ Disconnect	25.2%	70% workload replacement
Outage Management	11.4%	Reduces inside trouble and speeds circuit problem locating/resolution
Theft/ Quality Control	8.4%	Reducing truck rolls related to trouble calls and theft issues
DACS Circuit Coverage	5.8%	Distribution automation circuit protection

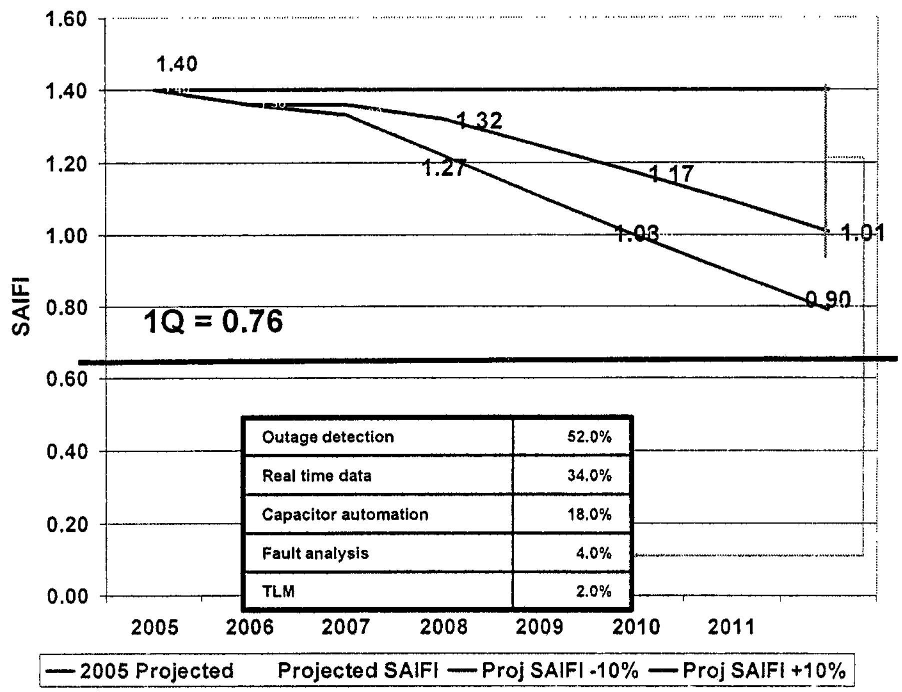
CenterPoint Energy *Identified Reliability Improvement Projections*

CenterPoint Energy

Projected improvements (see charts) in SAIDI and SAIFI based on implementation of the Distributed Automation Strategy



Outage detection	59.8%
Capacitor automation	20.3%
Right crew	14.1%
TLM	5.8%
Real time data	0.1%



Outage detection	52.0%
Real time data	34.0%
Capacitor automation	18.0%
Fault analysis	4.0%
TLM	2.0%

CenterPoint Energy
Key Value Creation Drivers: Investments

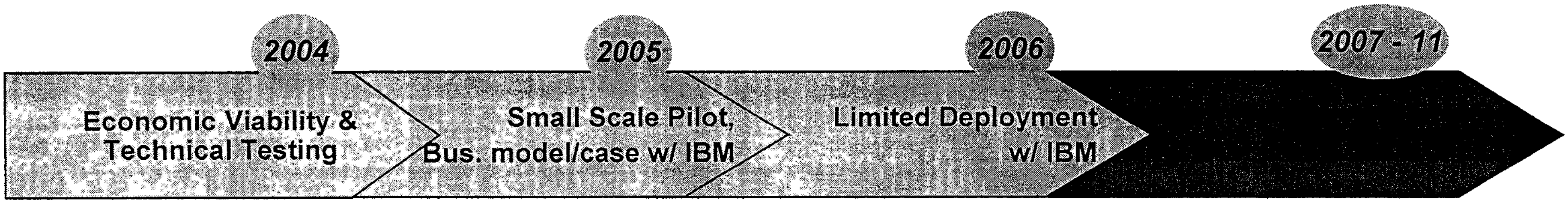
CenterPoint Energy

Investments	% of Investment	Comments
Utility Equipment	74.3%	Equipment directly related to utility applications
BPL Equipment	18.1%	Equipment to support deployment of BPL network
Backhaul / Other Equipment	7.6%	Other capital needed to support network

CenterPoint Energy 2007 – 2011: *Transforming the Business*

CenterPoint Energy

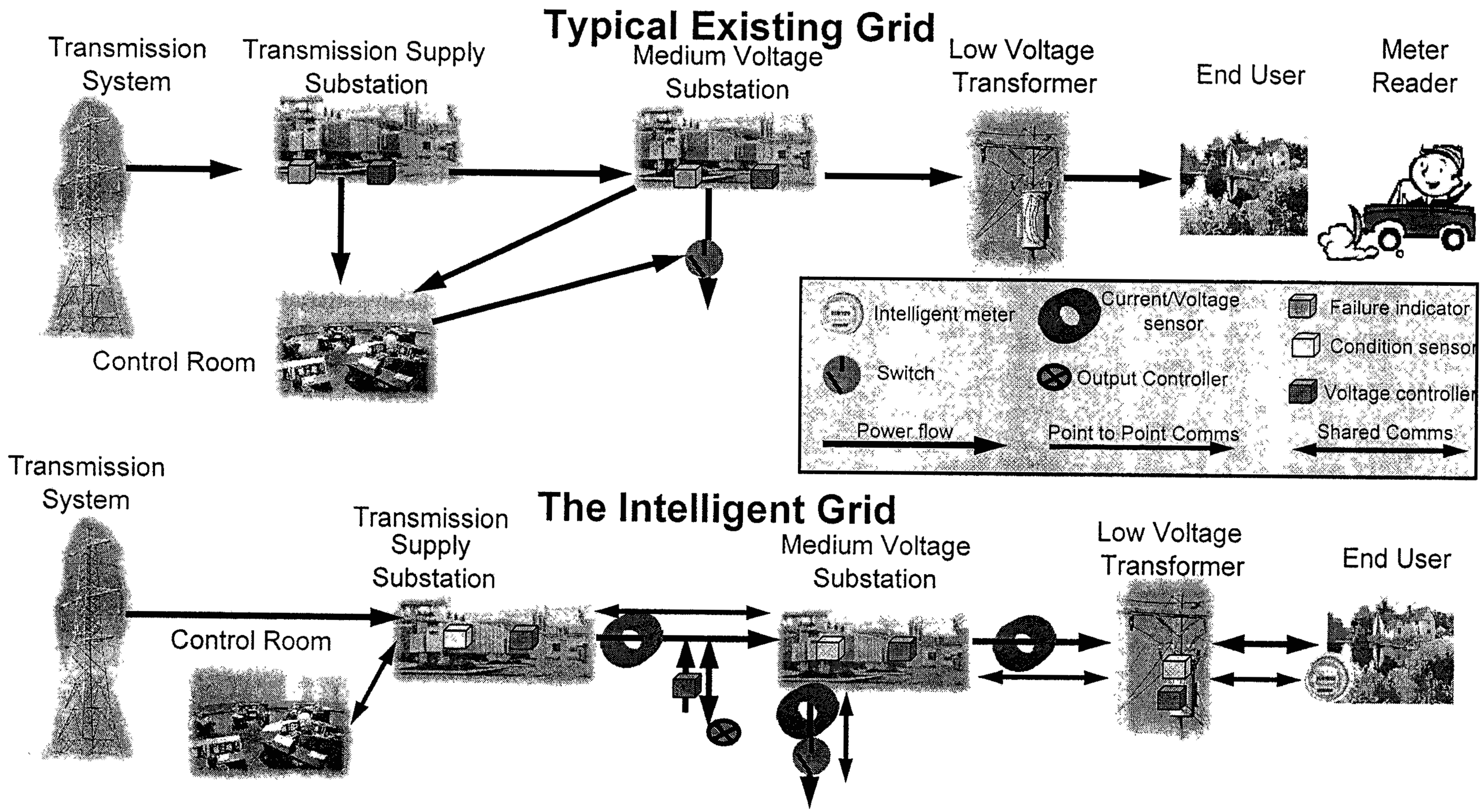
Full deployment of the Distribution Automation Strategy or "Intelligent Grid" using BPL in 2007 will depend on the results from 2006.



2007 – 2011 Phase Activities

- The strategy or "Intelligent Grid" implementation would include:
  - Automated meter reading (2m electric and 1m gas meters)
  - Meter Connect / Disconnect
  - Distribution grid sensors, switches, and substation breakers working together to improve reliability, optimize assets, and reduce O&M costs
  - Hybrid Communication Network:
    - 75% BPL (Urban)
    - 25% Wireless (Rural)

CenterPoint Energy
We see the Intelligent Grid not as an "End Point" but as a Journey...



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CenterPoint Energy
Intelligent Grid Ecosystem

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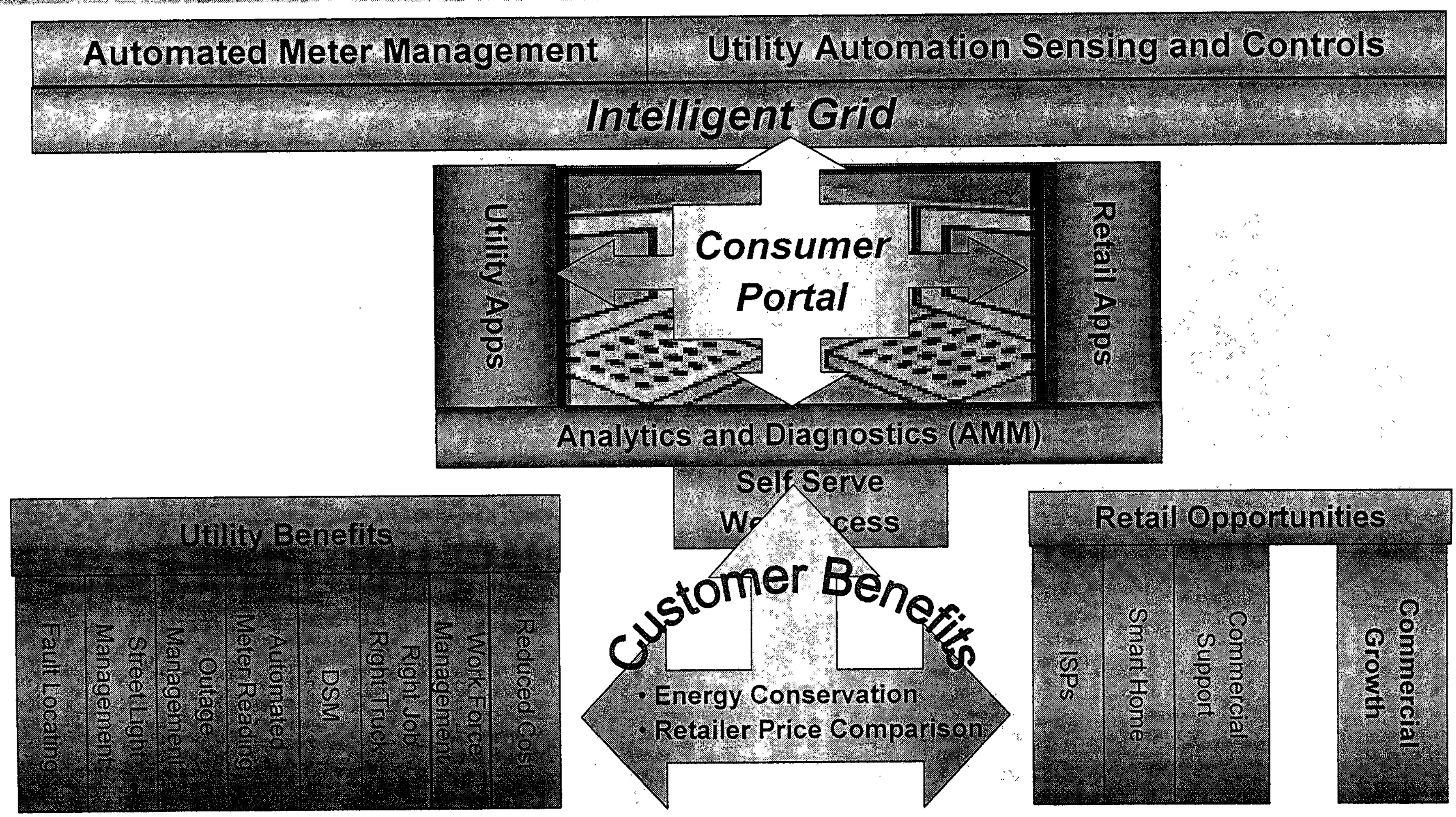
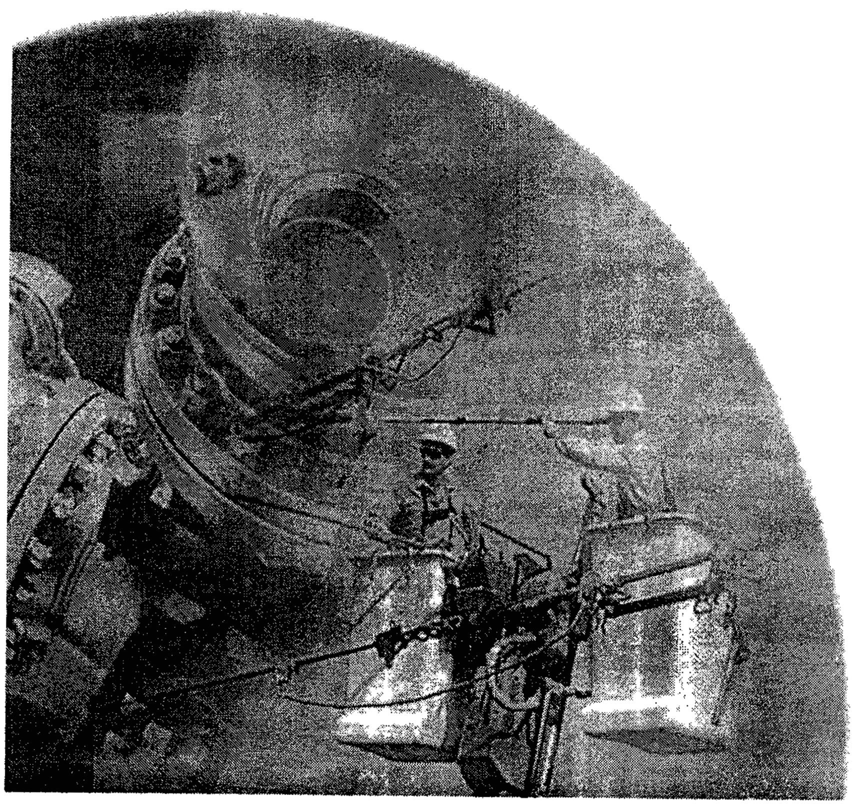


Docket No. 32093
OPC10-01 Attachment 3

CenterPoint Energy

Intelligent Grid Deployment At CenterPoint Energy, Inc.

"A Business Transformation"

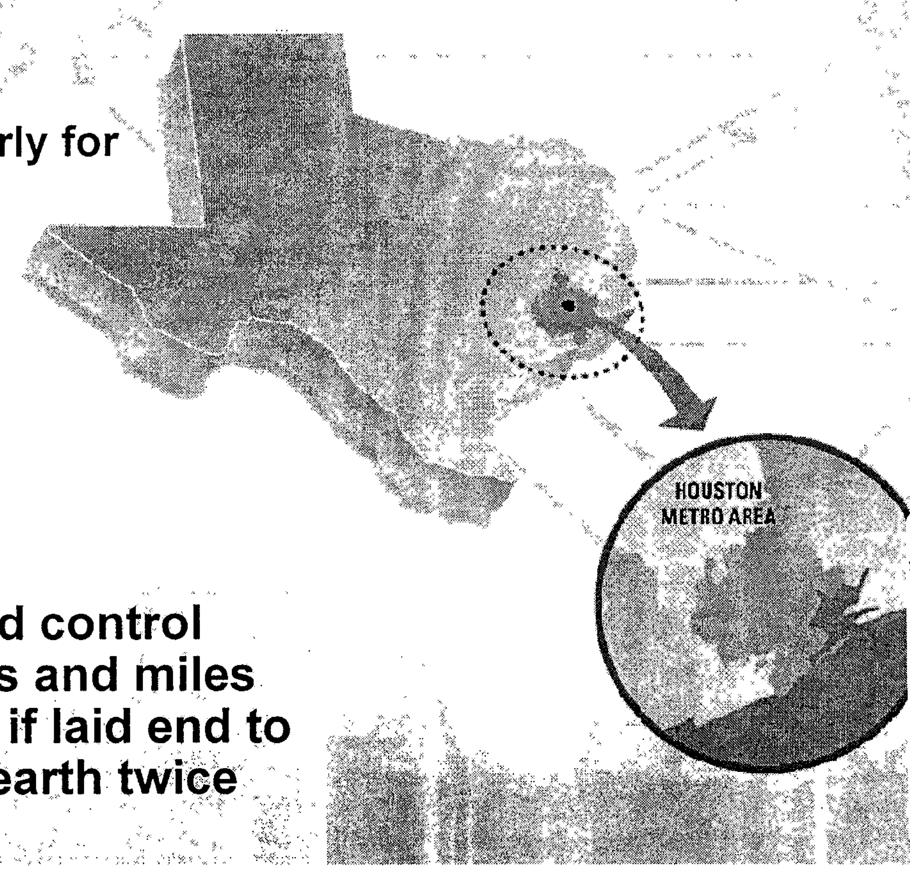


Gulf Coast Power Association
April 20, 2006

CenterPoint Energy
Electric Transmission & Distribution

CenterPoint Energy

- Chartered in 1882
- 5,000 square-mile service area
- 1.86 million metered customers
- 73.6 billion kilowatt hours delivered yearly for about 60 certified competitive retailers
- Transmission and Distribution System
  - 3,640 miles of transmission lines
  - 41,913 miles of distribution lines
  - 225 substations



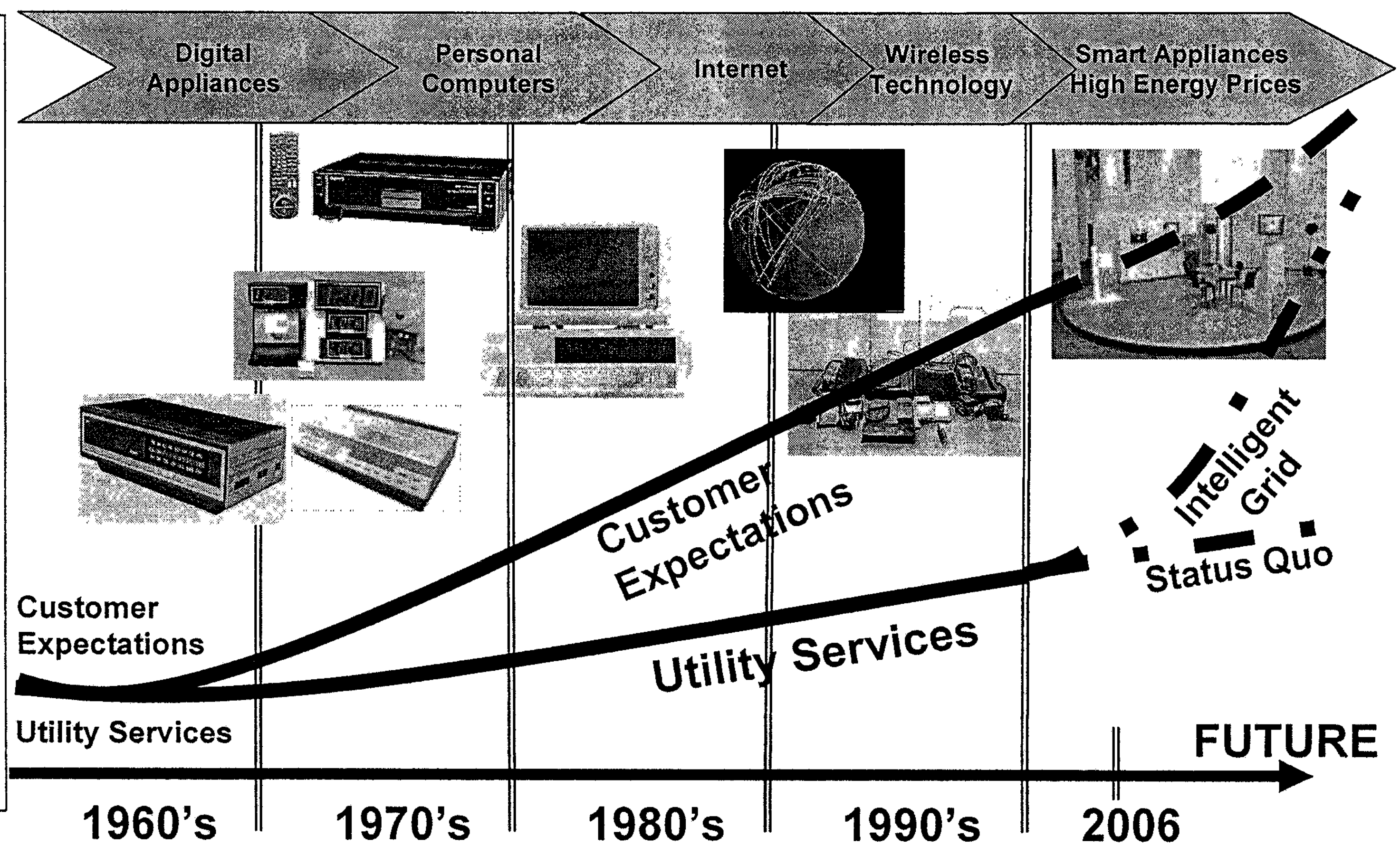
Challenge: **Effectively monitor and control millions of line devices and miles of delivery wire which if laid end to end almost circle the earth twice around the equator**

CenterPoint Energy
Consumer Environment

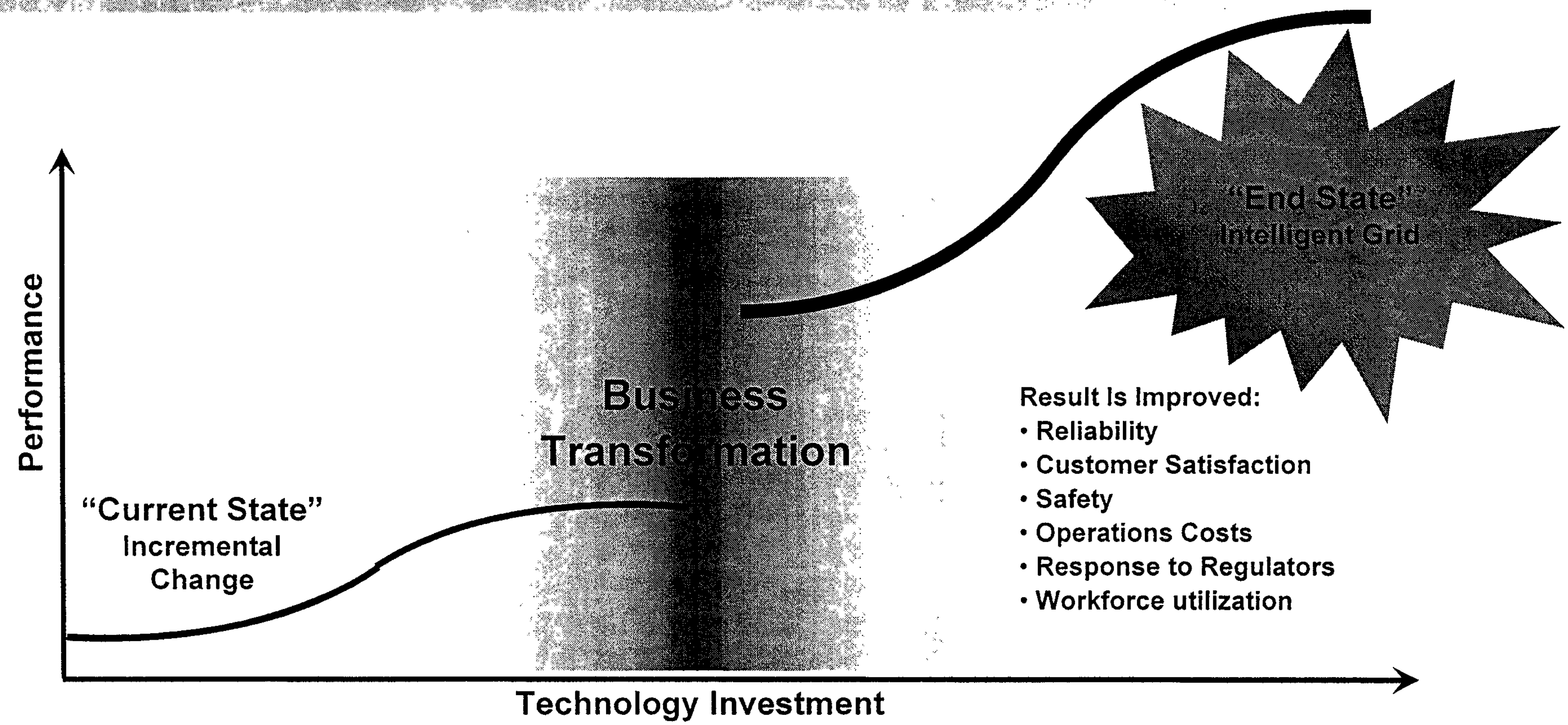
Are utilities meeting Customer Expectations? The expectations of consumers today are not the same as those of yesterday…..

The Challenge:

- Rapidly changing consumer environment;
- Increased use of computers and electronics lowering the tolerance for outages and voltage fluctuations;
- Meeting consumers expectations for information on demand.



CenterPoint Energy
Business Transformation needed to meet Challenges



The Vision and Solution? - An "Intelligent Grid"

A transformed smart power delivery system "Intelligent Grid" requires high speed broadband communications. The most effective option is Broadband over Power Lines (BPL).

CenterPoint Energy
How we see the intelligent Grid working

CenterPoint Energy

Simultaneous monitoring and control of millions of devices through software.