

*A New Century,
A New Technology*

The Intelligent Utility Workshop

Wednesday, April 18, 2007

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- Smart Grid Development
 - Advanced Metering
 - BPL

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- While not necessarily linked, the Legislature made two changes to PURA in 2005 that will certainly bring evolutionary and might bring revolutionary change to the electric service experience for Texas customers.

PURA 39.107(h)

- Nonbypassable surcharge for cost recovery of advanced meters to residential and smaller non-residential customers and the associated network.
- Cost recovery no faster than 3 years.
- Recovery is only for actual costs
- Surcharge design is modeled after the electric utility's most recently approved tariff.

PURA Chapter 43 - BPL

- In 2005, the Texas Legislature added Chapter 43 to PURA in which the guidelines for Broadband over Power Lines (BPL).
- Besides providing another path to bring broadband services to homes and businesses, the Legislature envisioned BPL services as a way to enhance existing electric delivery systems, with the expectation that improved service and reliability for electric customers would result.

A Key Distinctions

- Smart Grid is largely a function for the wires company.
- Smart grid receives normal regulatory treatment
- Advanced metering touches all market segments (wires, retail, customers, generation)
- Special provisions in statute for advanced metering.

Advanced Meters, Smart Grid & Keeping the Lights on.

- The alignment of technology and markets facilitates the roll out.
- Development and deployment is coming during a time when electric customers have substantial visibility into power prices, power supply and load management.

Benefits from Advanced Metering & Smart Grid

- Automated Outage Detection and Restoration
- Automatic Meter Reading
- Remote Load Management
- Service and Maintenance Dispatch
- Grid Status Monitoring

Smart Grid Benefits to Customers

- Fewer outages
- Shorter outages
- More efficient repair and maintenance dispatch

Gazing into the Future

- Local damage to distribution grid is identified.
- System automatically reconfigures itself to restore service to customers not directly impacted by the system failure
- Repair crews dispatched to well-identified location
- Duration of many outages reduced.

PURA 38.005 Electric Service Reliability Measures

- Requires the Commission to implement service quality and reliability standards for utilities.
- Requires the Commission to act if a feeder is habitually poor performing or performs significantly worse than the utility's average performance.

Advanced Metering Benefits to Customers

- Detection of service location outages
- Reduction or elimination of estimated meter reads
- Faster service initiation and discontinuation
- No meter readers in yard (privacy, security, liability).

Gazing into the Future

- Ubiquitous automated meter reading (AMR) will make the normal billing cycle obsolete because the dependence on a meter reader's geographic route will no longer exist.
- The utility will be able to offer to REPs and their customers the option of choosing a preferred meter date (or bill due date).

Texas is not Alone

- PG&E applied for approval of a 5-year deployment of advanced meters.
- Manitoba Hydro has begun an advanced meter program for 500,000 electric customers.
- Italy deploying smart meter to 27 million customers.

Gazing into the Future

- Today in ERCOT average time to switch a customer to a new electric service provider takes between 40 to 45 days. (no instant gratification)
- 5 to 10 years from now, routine operations for utilities with advanced meter networks should be able to offer retailers “while you wait” meter reads and provider changes.

Advanced Metering Rulemaking

- At the May 10th Open Meeting, the Commission will amend its metering rules to reflect the changes in PURA 39.107.
- Staff is asking the Commission to make some policy decisions on April 26, that will instruct the Staff how to draft a recommended rule.
- Early feedback reflects Staff's satisfaction with the Stakeholders' efforts in this rule.

Still to be worked out

- How will retailers and customers access the meter data?
 - Direct access?
 - Through a data portal?
- How will advanced metering services be priced?
- Will certain services cost more, or will it all be a flat rate within a customer class?
- How will retailers or others signal prices to customers?
- How close to real-time do we need?
- Where does advanced metering end and smart grid begin?
- Are smart grid costs recoverable through the surcharge?

Will everyone be ready?

- Will retailers have products ready to use an advanced metering system?
- Will customers be ready to buy products made possible by the deployment of advanced meters?

Gazing into the Future

- Reduced customer hardship from reliability-triggered load shedding
- Public services will not be affected (traffic signals, police and fire stations, doctors' offices, schools)
- Critical care customers will not be affected. (registered residences of medically certified customers, nursing homes)

Emergency response

- In emergency conditions that require load shedding, when ERCOT directs an electric utility to shed load, a utility with an advanced metering network can satisfy its share many different way besides rolling blackouts.
- turn off major appliances
- turn off non-critical loads
- Hospitals, public services, traffic signals, and critical care customers are better protected against supply disruption.

Outage vs. Type of Outage

- As the grid and meters become smarter, the Commission and the industry may need to reconsider appropriate outage measures.
- Current-style outage. On or off.
- Future-style outage. Involuntary A/C or water heater curtailment, feeder outage may not be applicable measurement.
- Involuntary reliability outages may not be geographic. Could the term rolling blackouts become obsolete?
- What retail reliability products will be developed?

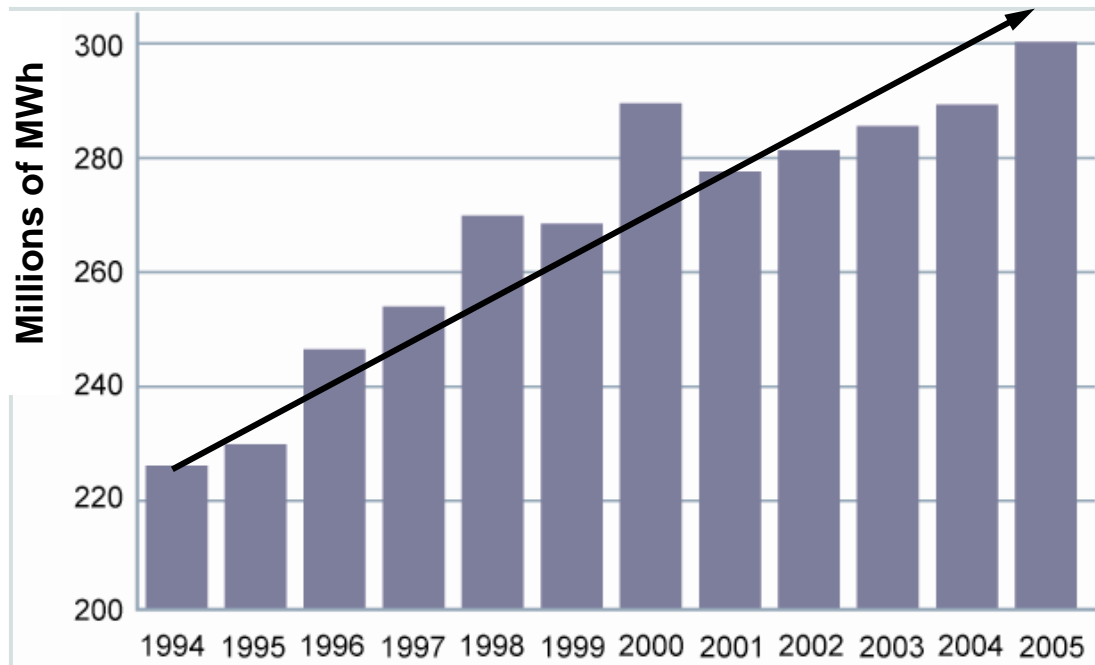
Electricity theft reduced

- Smart metering systems will help protect against electricity theft.
- All paying customers benefit from reduced unaccounted for energy uplifted to the market.
- Tamper detection and better expert data systems will help detect and deter electricity theft.

Advanced Load Control

- REPs and energy efficiency providers will be able to design products that exploit the opportunity to control appliances (notably, A/C, pool pumps, and electric water heaters for residential customers) in an aggregate manner.
- Customers participating in a demand response program will be compensated.
- All customers will benefit from the dampened prices because load response reduces clearing prices.

Growth - Peak Demand & MWh



Electric Energy Consumption in the ERCOT Region - 1994-2005 (Actual)

New Peak set August

PEAK HISTORY

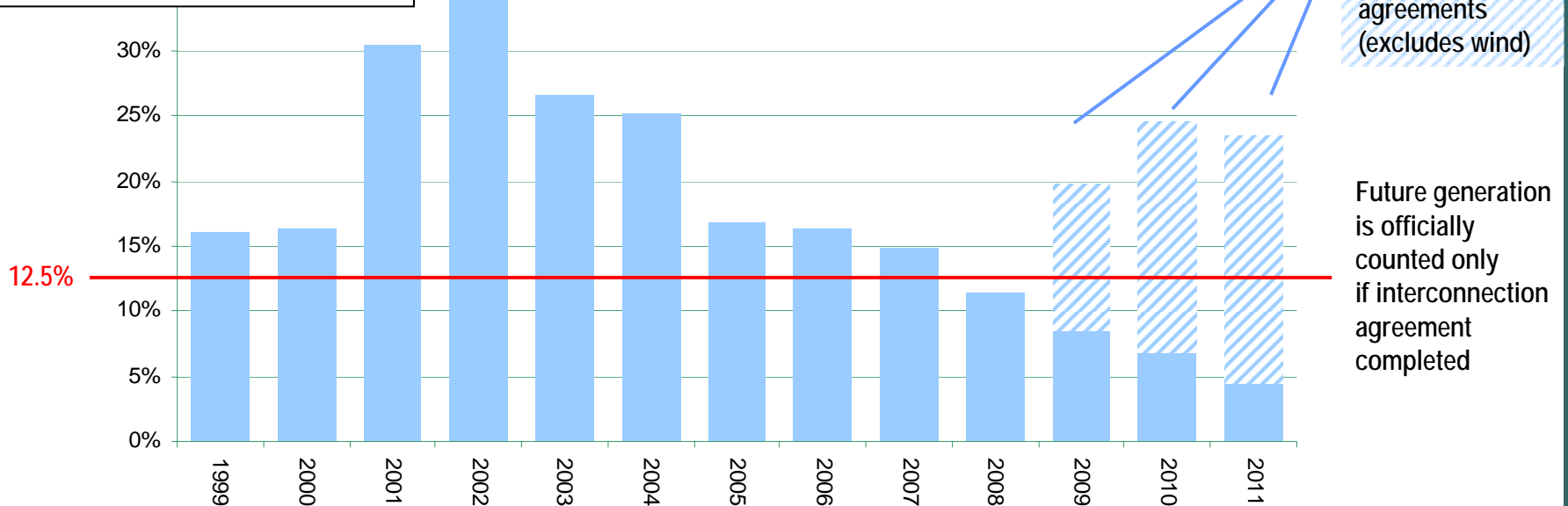
1999:	54,849 MW
2000:	57,606 MW
2001:	55,201 MW
2002:	56,248 MW
2003:	60,095 MW
2004:	58,531 MW
2005:	60,274 MW
2006:	63,056 MW

Reserve Margin Calculations

Over 26,000 MW of new generation added after passage of Senate Bill 7

Since 1999:
 • 2,800 MW retired
 • 8,700 MW mothballed*

Announced generation without interconnection agreements (excludes wind)



Percentage difference between projections for peak demand and available generation/resources

**1,100 MW of mothballed units have been returned to service*

Note: Reserve margins are calculated using 2.6% of wind generation capacity, based on historical performance during peak hours and probability analysis.

Interconnection Requests in Process

Fuel -Type	Public Projects	Confidential (Non-Public)	Total Capacity Under Review (MW)	%
Natural gas	2,850	10,900	13,750	19%
Nuclear	5,986	19,200	25,186	35%
Coal	4,971	4,052	9,023	13%
Wind	2,900	19,712	22,612	32%
Other	0	1,070	1,070	2%
Totals	16,707	54,934	71,641	100%

BPL Complements Advanced Metering and Smart Grid Efforts

- Both advanced metering and smart grid development depend on communications to and from the utility.
- That communication channel need not be technology specific.
- BPL is a high-throughput means of communication that permits more data-intensive services to be used by utilities on the grid and customers at their homes or businesses. And, if present, it's deployed where you need it for electric grid services.

Synergies from Advanced Meters, Smart Grid and BPL

- Can share a common communication system.
- BPL can be deployed in a limited or ubiquitous manner and serve the communication needs of a utility's smart grid and or it's advanced metering needs.

Irony or Coincidence?

- Could the duration of the outage that befell my house last night have been shorter?
- Could service have been restored by a robust self-diagnosis and self-healing program?
- Could repair crews have received orders more quickly and with more knowledge about what they would find?

Questions