

# The Future of AMI at AEP Texas

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# AEP's Vision for the Distribution and Customer Services Business



# AEP Vision and **gridSMART**<sup>SM</sup>

AEP's gridSMART<sup>SM</sup> initiative is a suite of customer programs and advanced technology initiatives that will transport us into a new era of energy delivery and customer service.

gridSMART initiative features:

- Customer programs including energy efficiency, conservation and demand response opportunities and options,
- Distribution automation and **advanced metering infrastructures** that improve service reliability, provide real-time use and price information and allow AEP's facilities to accommodate customers' new technologies,
- Distributed resources that respond quickly to local needs and conditions for greater service reliability, and
- Internal efficiencies by which AEP demonstrates its commitment to overall efficiency improvements.



# AEP Texas Perspective

- AEP Texas has chosen to focus its efforts on AMI and Demand Side Management (DSM) initiatives.
- Distribution Automation will be tested in the near future.



# Stakes in the Ground (what we know)

- Residential customers have not benefited from deregulation as much as they would have liked.
- Retail Electric Providers (REPs) want standardization, consistency and a level playing field.
- The technology is changing rapidly.
- A number of technologies have failed to live up to their billing when put under a microscope.
- A lot of announcements have been made, but few deployments.
- This is an expensive undertaking.



# Predispositions (what we think)

- The deployment of AMI across Texas should give the residential customer more opportunity to benefit from deregulation.
- AMI deployment in Texas does not pay for itself in the short term, but the ability to get concurrent cost recovery through a surcharge makes it attractive.
- It will take more than one AMI technology to cover AEP Texas adequately.
- BPL is not an attractive solution for our service area.
- The jury is still out on Zigbee.



# Current Perspective (where we think this is taking us)

- We are not interested in doing pilots.
- Phase one of deployment needs to be a relatively small number of meters (40,000).
- Install 200,000 to 250,000 meters per year in years 2010 through 2013.
- Start with urban areas saving areas with AMR for later years.
- Rural areas will be the last to deploy AMI.
- Technology used in the first few years of deployment may not be the technology used in the later years.



# Key Issues

- Security of data and the grid
- Telecom technology performance, availability and cost
- Home Area Network (HAN) technology format research and selection
- IT integration requirement determination and costing
- Determining reliability and durability of remote disconnect device
- Joint development of a TDSP WebPortal



# AEP Texas Strategy

- We do want to deploy AMI across all of our service area.
- We need equipment contracts and some solid cost estimates on system integration and server costs to put together a filing package.
- We need to be able to defend our vendor/technology selection at the PUCT.
- We want cost recovery assurance before we spend a bunch of money on AMI.



# Schedule Imperatives

- October 2008 - Select AMI technology vendor(s)
- December 2008 – File Deployment and Surcharge plans with PUCT
- Spring 2009 – PUCT approval anticipated; order equipment
- Summer 2009 – Initial AMI deployment (5,000 meters)
- Fall 2009 – Complete phase 1 deployment (assuming initial deployment passes acceptance testing)
- 2010 – 2013 – Build out the rest of AEP Texas AMI system



# Questions?



# AEP CR Workshop

## October 16, 2008

# Customer Owned Generation



# Customer Owned Generation Discussion Themes

- Safety Consideration
- Types
  - Standby Generators
  - Portable Generators (off-the shelf)
  - Distributed Renewable Generation:
    - Solar
    - Wind
    - Biomass
    - Geothermal
- Market Drivers for Change
- TDSP and Market Processes
- References



# CONSIDERING THE INSTALLATION of ELECTRIC GENERATING EQUIPMENT?



American Electric Power is ready to work with you on the safe and reliable interconnection of your electric generating equipment with the AEP System.

Interconnection occurs whenever your generating equipment (including inverters and batteries) is simultaneously connected to your electrical system and to AEP's distribution system. To

## INTERCONNECTION

protect your generating equipment, as well as AEP employees and facilities, certain equipment must be in place to automatically remove your generator from the AEP distribution system should any problems occur.



# Standby Generators

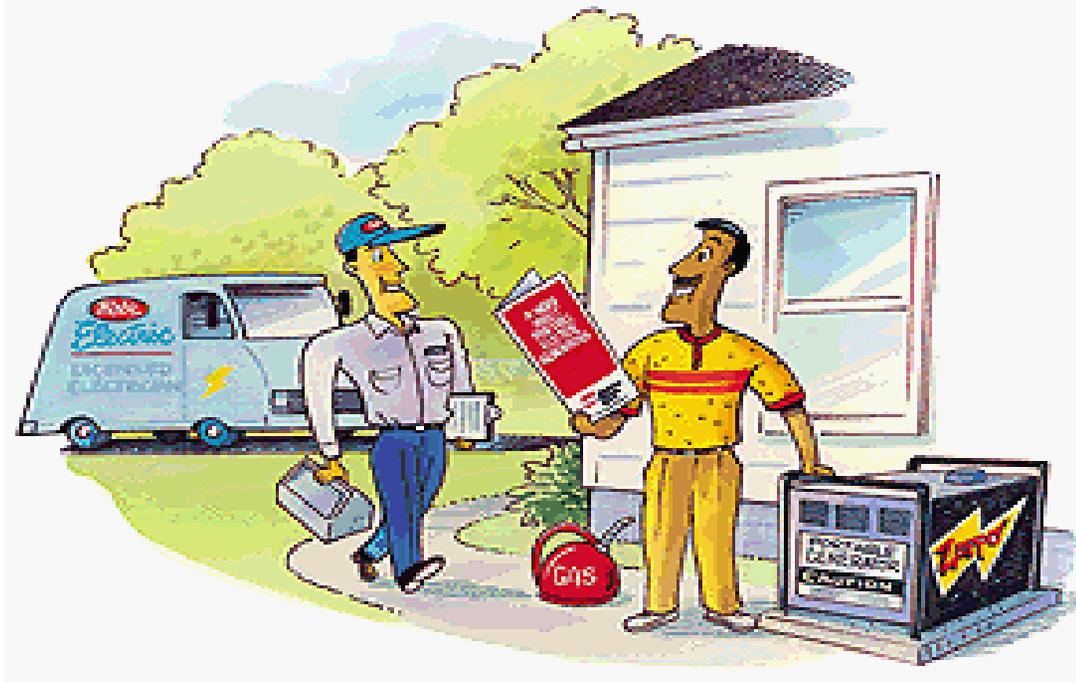


# Standby Generators

- **Standby generators** can come in handy during storm-related outages. However, be sure that your generator is installed by a qualified electrician so that the generator's circuits and AEP Texas's circuits are not connected - in other words, they must be "isolated." If they're not properly isolated, customer-generated power can flow back to the power line, electrocuting an AEP Texas worker attempting to restore power. Conversely, if the circuits are not properly isolated, power distributed from AEP Texas can lead to overheating the generator. This could cause an electrical fire at your home or business. The most common isolation method is to install a double-throw double-pole transfer switch.



# Portable Generators



# Portable Generators

- The easiest way to use a generator is to simply plug the equipment to be operated directly into the proper outlet on the generator. Never connect the generator's electrical output to any live home or building electrical circuits. Never plug a generator into a wall outlet.

Also:

- Avoid contact with bare wires and terminals.
- Use a ground fault circuit interrupter (GFCI) in any damp or highly conductive area.
- Consult a licensed electrician to choose a generator and make certain it meets national and local electrical code requirements



# Portable Generators

## One More time...

- **Portable generators** that are not properly isolated could lead to the same hazards. To properly isolate portable generators, customers should be careful that they never connect the generator to an electrical outlet. Instead, appliances should be connected directly to the generator.
- <https://www.aeptexas.com/Customerservice/HelpfulInformation/YourSafety/ElectricalSafetyTips/Default.aspx#generators>



# Distributed Renewable Generation



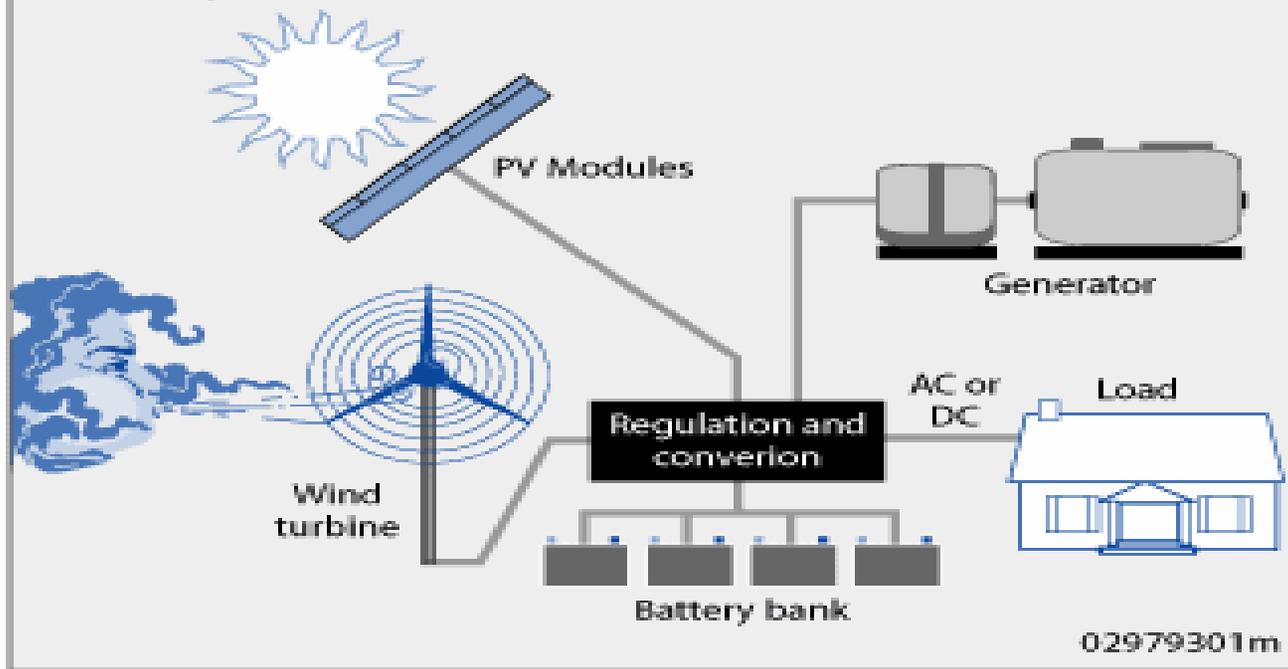
# Distributed Renewable Generation

- Most common:
  - Wind Turbines
  - Solar or PV
  - Geothermal
  - Biomass
- Really most common:
  - Wind and Solar PV



## Hybrid Power Systems

Combine multiple sources to deliver non-intermittent electric power



# Market Drivers for Change

HB 3693 Section 24:

– PURA § 39.914 Credit for Surplus Solar Generation by Public Schools

• HB 3693 Section 26:

– PURA § 39.916 Interconnection of Distributed Renewable Generation

• PUC Project No. 34890: *Rulemaking Relating to Net Metering and Interconnection of Distributed Generation*



# ERCOT's Statutory Responsibility for Distributed Renewable Generation

- [ERCOT] shall develop procedures so that the amount of electricity purchased for a [ISD]district ... is accounted for in settling the total load served by the provider that serves the district's load. A district ... must have metering devices capable of providing measurements consistent with [ERCOT's] settlement requirements. PURA § 39.914(c).
- [ERCOT] shall develop procedures so that the amount of electricity purchased from a distributed renewable generation owner... is accounted for in settling the total load served by the [distributed renewable generation owner's retail provider] by January 1, 2009. A distributed renewable generation owner requesting net metering services ... must have metering devices capable of providing measurements consistent with [ERCOT's] settlement requirements. PURA § 39.916(j).



# Project #34890

## 25.213 Metering for Distributed Renewable Generation

- Upon request by a customer that has, or is in the process of installing distributed renewable generation with a capacity of less than 50 kW on the retail electric customer's side of the meter and that desires to measure the generation's out-flow production, a transmission and distribution utility shall provide metering at the point of common coupling using one or two meters that separately measure both the customer's electricity consumption from the distribution network and the out-flow that is delivered from the customer's side of the meter to the distribution network and separately report each metered value to the transmission and distribution utility. The two metered values shall be separately accounted for by the entity responsible for settlement.
- Transmission and distribution utilities shall file tariffs for metering under this section within 60 days of its effective date.
- The entity responsible for settlement shall develop processes for settlement of electricity consumption and out-flow that reflects time of generation by January 1, 2009.



## Project #34890 continued

**The proposed new §25.217 addresses interconnection, renewable energy credits, and the sale of out-flows for distributed renewable generation.** The proposed amendment to §25.242 establishes metering requirements for Distributed Renewable Generation in non-competitive areas of the state in accordance with Public Utility Regulatory Act (PURA) §39.914 and §39.916.

### **Sale of out-flows by an ISD-SG Owner.**

In areas in which customer choice has been introduced, ISD-SG Owners shall sell out-flows to the REP that serves the facility at which the ISD-SG is located, at a price to which both parties agree.

### **Sale of out-flows by a DRGO.**

In areas in which customer choice has been introduced, DRGOs who choose to sell out-flows shall sell the out-flows to the REP that serves the load of the DRGO at a price to which both parties agree.



# Market Issues

- Clarify the status of the renewable DG owner under existing protocols and whether any protocol modification is necessary
- Determine what meter standards are necessary to account for and settle excess generation produced by the renewable DG owner
- Determine settlement methodology (actual meter reads, profiling, or some combination) for the renewable DG when acquired by the REP



# Market Resolutions

- PRR756 allows for settlement of distributed renewable generation Resources with a capacity of less than 50 kW.
- For installations with generating capacity greater than 50kW, the process to establish a resource ID and the TDSP communication of separate load and excess generation values remain static.
- Metering for <50kW to accommodate separate load and excess generation values of the ESI ID and will be represented in the monthly usage statement from the TDSP (867\_03) to ERCOT and REP of Record.



# Market Resolutions

- Retail Market Guide addition of Section 7.14 documenting process for Customers to receive credit for generation presented to the grid, metering requirements, electronic communication of data and broadly defines settlement process.
- New Load Profiles established to represent DG applications based on source, customer type and location and will be updated with on-cycle meter read dates in January.
- Effective 1-1-09 ERCOT will acknowledge new generation values in 867\_03 to support settlement processes.





# WHAT YOU NEED TO KNOW

Electricity produced from renewable energy technologies – hydroelectric plants, wind turbines, solar cells, fuel cells and biomass plants – is an important part of America's energy supply. American Electric Power is helping develop these renewable resources through generation, research, promotion and education.

## HOW AEP CAN HELP

If you are considering the installation of electricity generating equipment, AEP can help by reviewing your plans. Even though you may not plan to send electricity back to AEP, there are circumstances under which your generating equipment could have an adverse impact on the AEP system. Voltage variations and distortions are just two examples. In addition, your system will attempt to supply energy to AEP when short-circuits occur on the AEP system or when AEP's local distribution system becomes isolated from its grid. Information is available to help you plan for the safe and reliable operation of your generating equipment.

## TECHNICAL REQUIREMENTS

Your generating system must be installed in accordance with the manufacturer's specifications, as well as all applicable provisions of federal, state and local codes. AEP's technical requirements for interconnection are available upon request.

Depending on the size and complexity of your generating system, it may be necessary for AEP to perform a System Impact and Facility Study. AEP will inform you of the need for this study and any associated costs. If AEP must upgrade its system to accommodate your generator, you will be informed of the cost. Generally, smaller sized units that have AEP-approved and manufacturer-tested interconnection equipment will not require an extensive review.

## THE INTERCONNECTION PROCESS

Regulations governing generator interconnection can vary by state. These requirements may include provisions for:

- Application for Interconnection
- Interconnection Agreements
- Technical Requirements
- Electrical System Impact Reviews
- Metering
- Liability Insurance Coverage
- Inspections and Testing
- Fees and Expenses



# What You Need To Know

- Customer Requirements:
  - Application Process
  - Interconnection Agreements
  - Technical Requirements
  - Electric System Impacts Reviews
  - Metering
  - Inspections and Testing
  - Fees and Expenses



# What You Need to Know

- How AEP can help:
  - We can answer your customers questions.
  - We will take your customer through the process.
  - We have brochures and a Customer Information Packet to support you and your customer.
  - We will help them with resource information to support their decision.
  - We will help ensure a safe installation.
- Contact Larry Hutchison at 614-716-1377 or [lhutchison@aep.com](mailto:lhutchison@aep.com)



# AEP Customer Information Package

- Process Summary
- Links to solar and wind generation systems information
- A copy of AEP tariff 6.1.2.3 for DG
- Application for Interconnection form
- Interconnection Agreement Sample
- § 25.211 and § 25.212 defining the conditions that govern and the technical requirements for DG

Adobe Acrobat 7.0  
Document



# AEP Fees

	TCC	TNC
<p><b>Dual Register Meter Installation Fee</b> is charged to the REP when a dual register Meter is requested for the Retail Customer with distributed generation. Applicable where the existing standard Meter is to be replaced with a two-channel, two-register Meter, of the same type and class, or where no billing Meter currently exists and the installed Meter will be a two-channel, two-register Meter with two kWh registers only and no IDR register or remote interrogation. The two kWh registers will record in-flow and out-flow on separate registers such that both values are metered. The Fixed Price includes the dual register Meter. For IDR Meter installation, see 6.1.2.1.12 for the applicable fee.</p> <p><b>A. <u>Request for Single-Phase Dual Register Meter Installation:</u></b></p> <p>i. Fixed Price if the existing billing Meter is a standard Meter</p> <p>ii. Fixed Price if new installation with no existing Meter</p> <p><b>B. <u>Request for Poly-Phase Dual Register Meter Installation:</u></b></p> <p>i. Fixed Price if the existing billing Meter is a standard Meter</p> <p>ii. Fixed Price if new installation with no existing Meter</p>	<p></p> <p>\$124.00</p> <p>\$97.00</p> <p></p> <p>\$57.00</p> <p>\$30.00</p>	<p></p> <p>\$127.00</p> <p>\$97.00</p> <p></p> <p>\$60.00</p> <p>\$30.00</p>



## **25.211 Interconnection of On-Site Distributed Generation (DG).**

- Each electric utility shall designate a person or persons who will serve as the utility's contact for all matters related to distributed generation interconnection.
- Each electric utility shall identify to the commission its distributed generation contact person.
- Each electric utility shall provide convenient access through its internet web site to the names, telephone numbers, mailing addresses and electronic mail addresses for its distributed generation contact person.
- Each electric utility shall maintain records concerning applications received for interconnection and parallel operation of distributed generation. Such records will include the date each application is received, documents generated in the course of processing each application, correspondence regarding each application, and the final disposition of each application. By March 30 of each year, every electric utility shall file with the commission a distributed generation interconnection report for the preceding calendar year that identifies each distributed generation facility interconnected with the utility's distribution system.



## **25.212 Technical Requirements for Interconnection and Parallel Operation of On-Site Distributed Generation.**

- The customer will furnish and install a manual disconnect device that has a visual break that is appropriate to the voltage level (a disconnect switch, a draw-out breaker, or fuse block), and is accessible to the utility personnel, and capable of being locked in the open position.
- The customer shall follow the utility's switching, clearance, tagging, and locking procedures, which the utility shall provide for the customer.
- Site testing and commissioning. Testing of protection systems shall include procedures to functionally test all protective elements of the system up to and including tripping of the generator and interconnection point. Testing will verify all protective set points and relay/breaker trip timing.

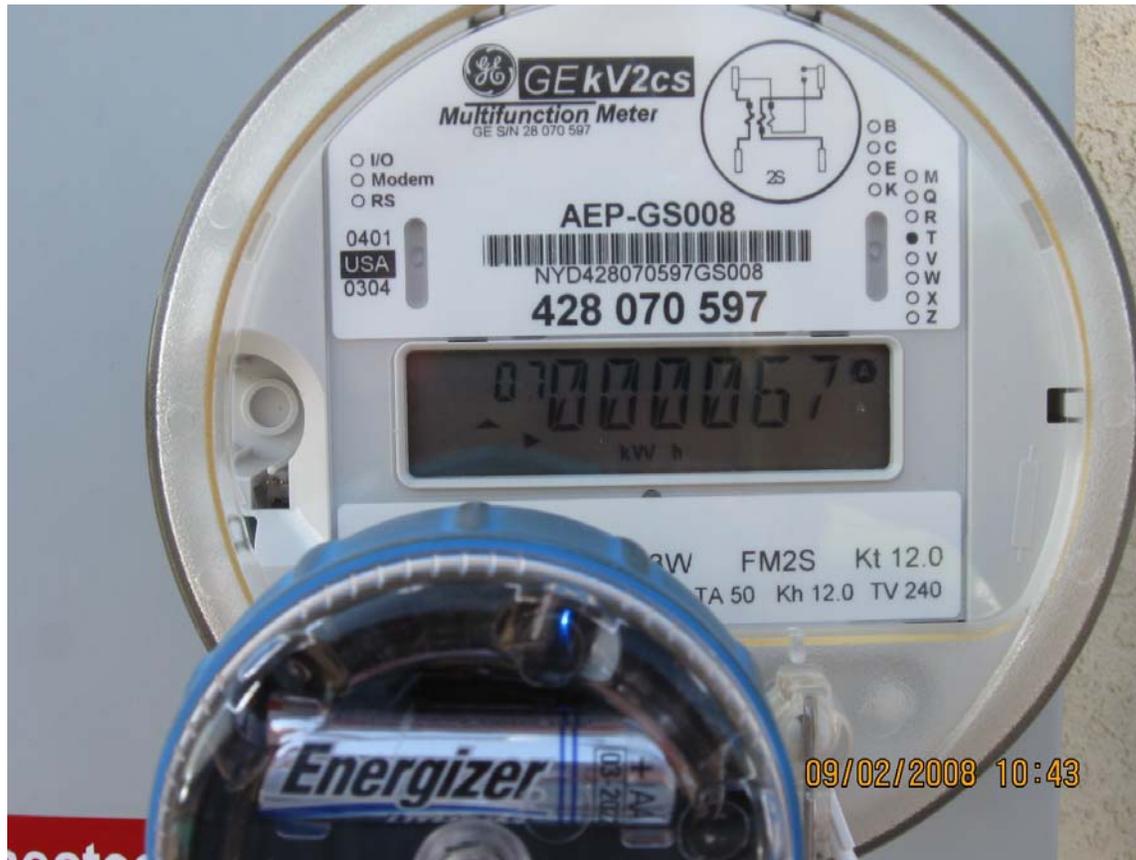




**AEP TEXAS**



# Dual Register or Bi-Directional Meter



# Hand Held Processor View



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