Advanced Metering Implementation Team (AMIT) & Demand Response

AMI's Next Frontier: Demand Response

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Agenda

1. Smart Meter Deployment Status
2. Implementation Team
3. Snapshot of REP Products
4. Texas AMI Solution – End to End Integration Smart Meter Infrastructure
5. SEP 1.0 Functionality and SEP 2.0
6. Current & Future HAN Functionality
7. SMT Overview
8. AMS & the HAN
9. Connectivity: HAN & ZigBee

Smart Meter Deployment

- Over 6 million smart meters will be deployed by the end of 2013.

- As of August 15, 2011, over 3.6 Million meters are installed:
  - Oncor – 2 Million + installed, 60% complete
  - CenterPoint – 1.5 Million + installed, 69% complete
  - AEP – 339,000 + installed, 33% complete
  - TNMP – 13,306 installed, 5.83% complete

- Customers with a smart meter can access their usage data and join an In Home Device (IHD) through Smart Meter Texas

- Several REPs are offering products and services that utilize smart meter functionality, such as energy monitoring, time-of-use pricing, or pre-paid service.

Implementation Team (AMIT)

The purpose of this project is to identify and implement changes needed in retail and wholesale markets as a result of advanced metering. Issues relating to:

- Settlement
- the Smart Meter Texas web portal
- security
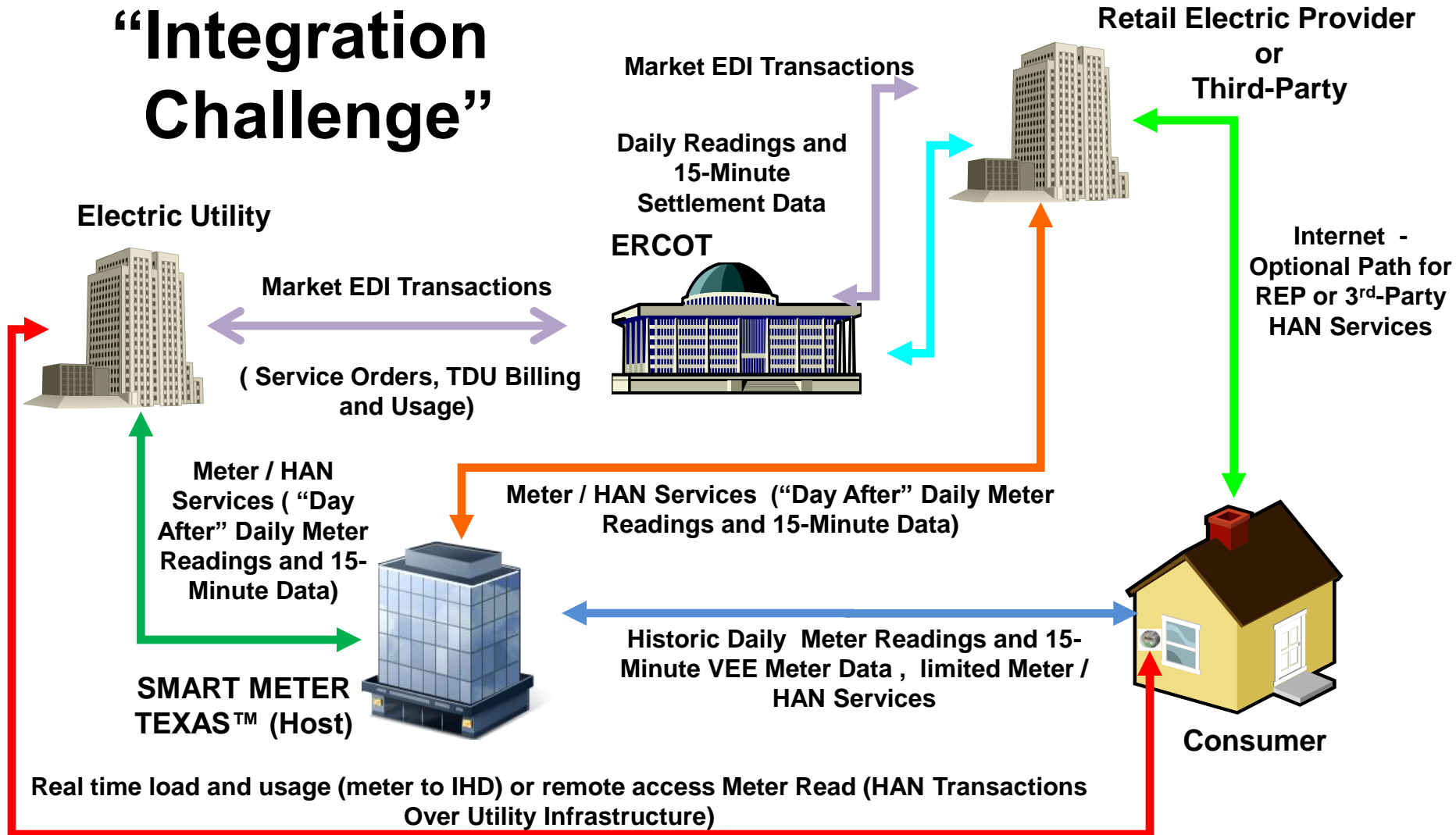- the Home Area Network (HAN)
- demand response
- and customer education

REP Products Snapshot

- Green Mountain Time of Use Pilot
- Direct Energy:
  - Pay As You Go, Web Portal, Home Energy Monitor, Appliance Pilot (Whirlpool)
- TXU Energy:
  - Weekly Usage Email, Web Portal, Time of Use Rate Plan, In Home Display and Thermostats, Mobile App
- Reliant Energy:
  - Weekly Summary Email, Web Portal, iGoogle Gadget, Time of Use Rate Plan, SMS Alerts, In Home Monitors, Mobile App
- Prepaid Services – smart meter enabled
  - More than 11 REPs offering services using smart meters
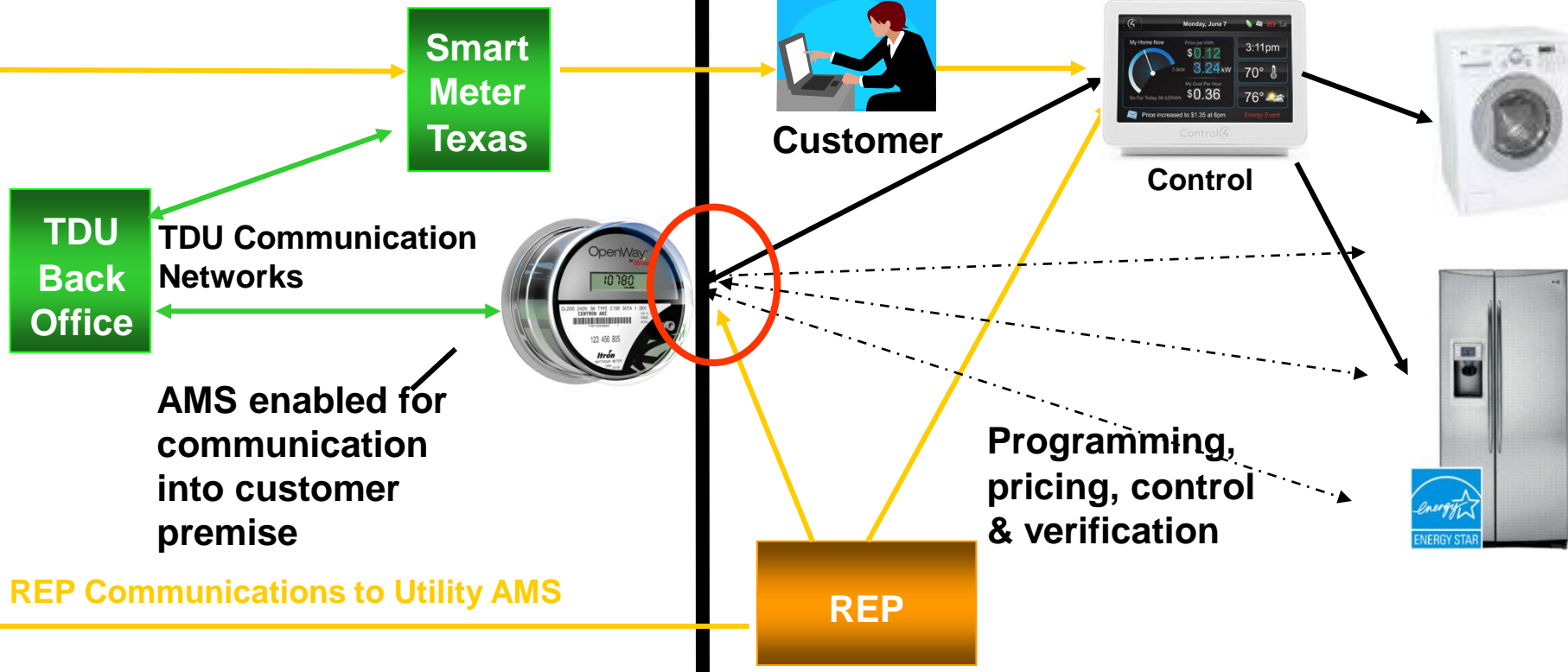
Texas AMI Solution – End-to-End

"Integration Challenge"

Retail Electric Provider or Third-Party

Market EDI Transactions

Daily Readings and 15-Minute Settlement Data

ERCOT

Electric Utility

Market EDI Transactions

(Service Orders, TDU Billing and Usage)

Internet - Optional Path for REP or 3rd-Party HAN Services

Meter / HAN Services ("Day After" Daily Meter Readings and 15-Minute Data)

Meter / HAN Services ("Day After" Daily Meter Readings and 15-Minute Data)

SMART METER TEXAS™ (Host)

Historic Daily Meter Readings and 15-Minute VEE Meter Data , limited Meter / HAN Services

Consumer

Real time load and usage (meter to IHD) or remote access Meter Read (HAN Transactions Over Utility Infrastructure)

Advanced Metering System

Utility AMS

HAN

Consumption Monitor

Customer

Control

Smart Meter Texas

TDU Back Office

TDU Communication Networks

AMS enabled for communication into customer premise

Programming, pricing, control & verification

REP Communications to Utility AMS

REP

AMIT Market Presentation - August 2011

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Smart Energy Profile (SEP)

SEP 1.0

- Primary focus on consumption data
- Demand Response
- Pricing
- Establish underlying security and device authentication

SEP 1.1 (spec approved and released)

- Over the air software updates
- Fast polling
- Pricing Updates
- Large number of test spec improvements and cleanup from field events

Smart Energy Profile (SEP)

SEP 1.1 additional features (in testing)

- Tunneling (for DLMS)
- Prepayment
- Trust Center replacement
- Multi-ESI behavior

SEP 1.2 (in marketing discussion)

- Compatibility with HA networks
- British Gas requirements
- Security Improvements from CSWG review
- Other features under discussion with Members

SEP 2.0 Profile Functionality

Application functionality includes:

- DRLC
- Messaging
- Pricing
- Prepayment
- Metering
- Plug-in electric vehicles
- Distributed energy resources
- Billing

- Registration
- Device configuration and capabilities
- Network management
- Firmware downloads Diagnostics and monitoring

Current HAN Functions

1. Grant the Admin HAN Access Automatically
2. Grant / Revoke HAN Access to REP Portal User
3. Grant / Revoke HAN Access to TDSP Portal User
4. Provision HAN Device via GUI*
5. Provision HAN Device via API
6. De-Provision HAN Device via GUI*
7. De-Provision HAN Device via API
8. View HAN Devices by ESIID (Current Status)
9. Send Text Message via API

1. Cancel Text Message via API
2. Send Load Control Message via API
3. Cancel Load Control Message via API
4. Cancel All Load Control Events via API
5. Send Price Signal via API
6. Send a single message to multiple HAN devices
7. View HAN Message Log Report
8. View HAN Device Details*
9. View HAN Device History*

Indicates both present and future based by user role

Future HAN Functions

1. Grant and Revoke HAN Granular Permissions
2. View, Print or Extract HAN Granular Permissions
3. Provision HAN Device via GUI
4. Provision HAN Device via API
5. De-Provision HAN Device via GUI
6. De-Provision HAN Device via API
7. Display reason for de-provision of a HAN device
8. Delete pending provision request
9. Send a single message to a single HAN device

1. View HAN Device Details
2. View HAN Device History
3. Assign Message Priority
4. Ping ESI
5. Ping HAN Device
6. Notify authorized user of normal operations status of ESI
7. Notify authorized user of status of HAN device
8. Create ESIID groups

Indicates both present and future based by user role

SMART METER TEXAS™

Meter Interval Usage

HAN Messages

Meter Attributes

Customer Premise

Meter Provisioning

Demand Response

Settlement

Pricing

Text Messaging

Presentment

- Smart Meter Data provided in a 15-minute, day after basis
- 300 + Million data points per day (3 million customers / 15-minute data Summer 2011)
- Service for Customers, REPs, 3rd Parties
- Standard tool for all Utilities in ERCOT – different vendors, 1 format for data files
- Joining of In Home Devices for Customers, REPs, and 3rd Parties

SMART METER TEXAS™

Functionality

- Monthly, daily, and 15-minute consumption up to 18 months
- HAN Registration
- English and Spanish
- ADA Compliant
- "Friends" Access

Next Release

- Consumer Mobile Experience
- Enhanced Data reporting and exporting
- Enhanced Security
- On Demand Reads
- Poll for Power Status
- Event Notifications

Participating Utilities

- American Electric Power
- CenterPoint Energy
- Oncor Electric Delivery
- Texas New Mexico Power

Participating REPs

- 58 Different REPs with 345 accounts are registered in SMT using one or more functions available only to REPs:
  - Usage for some or all their customers
  - HAN registration for their customers
  - Reporting
  - Help Desk

AMS & the Home Area Network

Advanced Metering System
(Consumer Perspective)

Meter / HAN Services

Meter / HAN Services

TDSP

Meter / HAN Transactions Over Utility Infrastructure

Displays and Interfaces

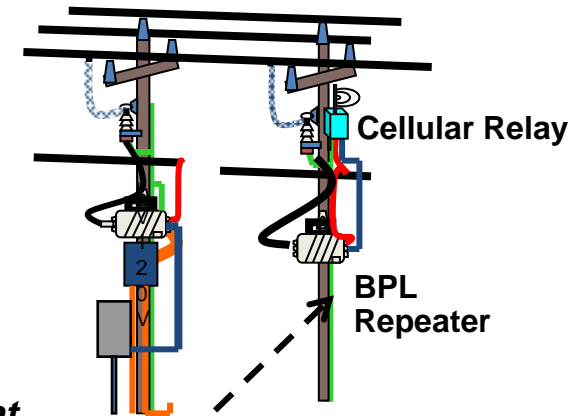Appliances and Other Controlled Devices
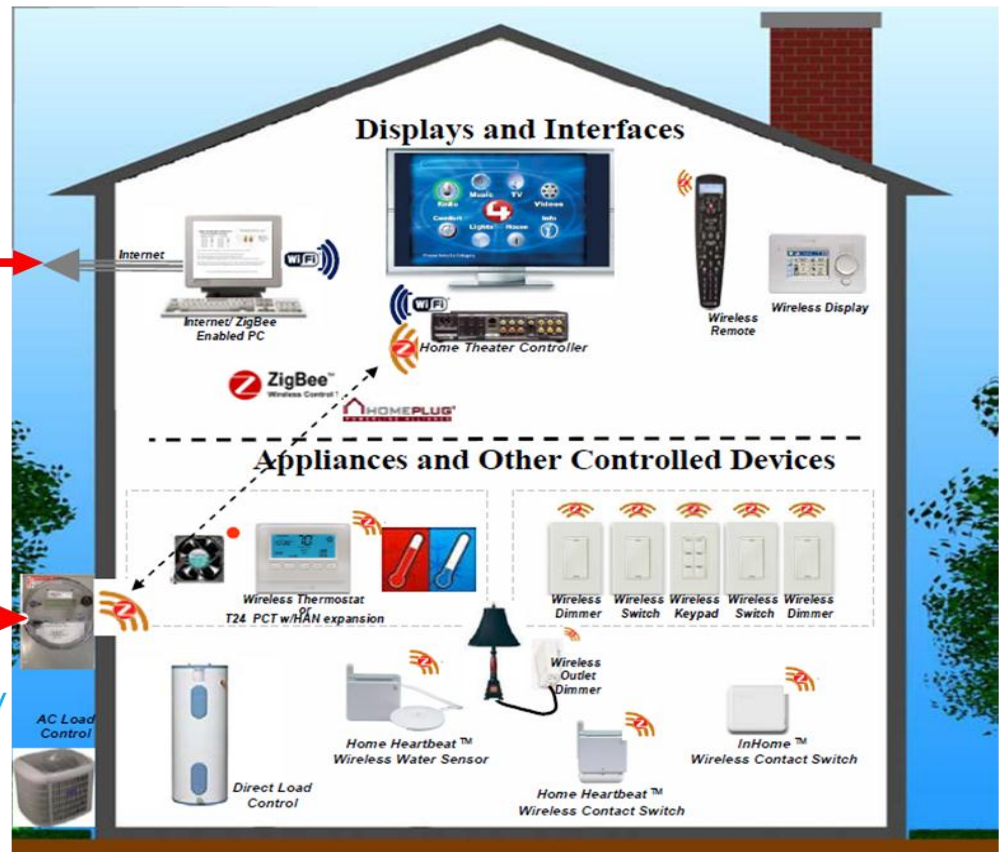
Connectivity - Meter to HAN using ZigBee

Meter is one method to provide a communication portal that enables demand side energy management and monitoring

Smart Thermostat

Cellular Relay

BPL Repeater

RF
(Radio Frequency)

ZigBee

Water Heater
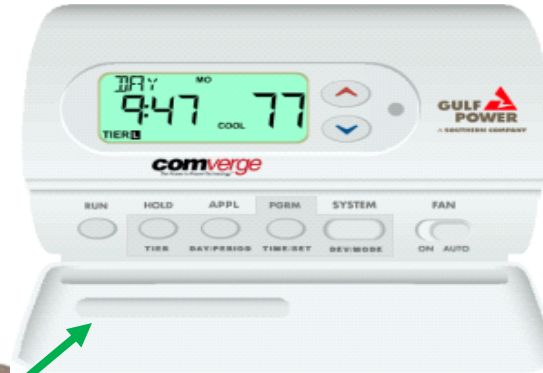
Pool Pump

Compressor

Let's take some questions

Appendices

How to Access Data

Tool	Description	Data	Product Support
Smart Meter Texas (SMT)	• Online repository • Tool for joining devices, friends and family, pinging the meter • Only for smart meters	• VEE data • 15-minute data • Day -after basis	• All smart energy products • HAN services • API
Programmable Thermostat (PGT)	• Joined to the smart meter • Can control air conditioning, and/or other devices	• Can receive data from smart meter	• Based on product choice and customer preferences
In Home Display (IHD)	• Joined to the smart meter • Provides data, messaging, alerts • Communication path using the TDU network and/or customer broadband connection	• Presents real time data from smart meter (updated 5-10 seconds)	• Bill Estimate based on cents/kWh • Messages
Smart Phone	• Allows provider to send messages to customer • Does not link with meter	• Data provided comes from the provider • Works for both standard /smart meters	• Bill Reminders; • Messages for Disconnect & Reconnect

Meter Deployment and Data Access

- **Data Access**
  - 15-minute data provided on a day-after basis through the Smart Meter Texas web portal
  - Real-time access for customers and the REP through the Home Area Network (HAN)
  - The ability to ping the meter and provide an on demand read (ODR)
    - Set for SMT Release #3
    - CenterPoint Energy Interim Portal supports pinging today