

Kansas Energy Conference  
Wichita, Kansas  
October 12, 2010

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*Strategies for the  
Modern Energy Marketplace*





# *Agenda*

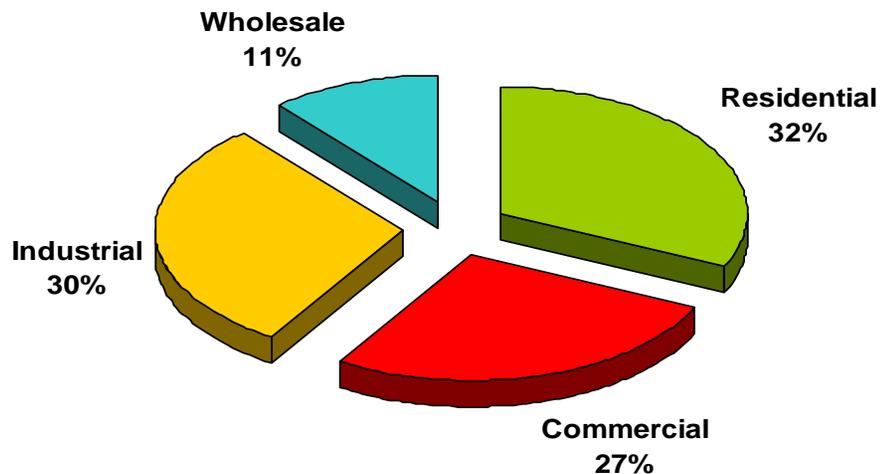
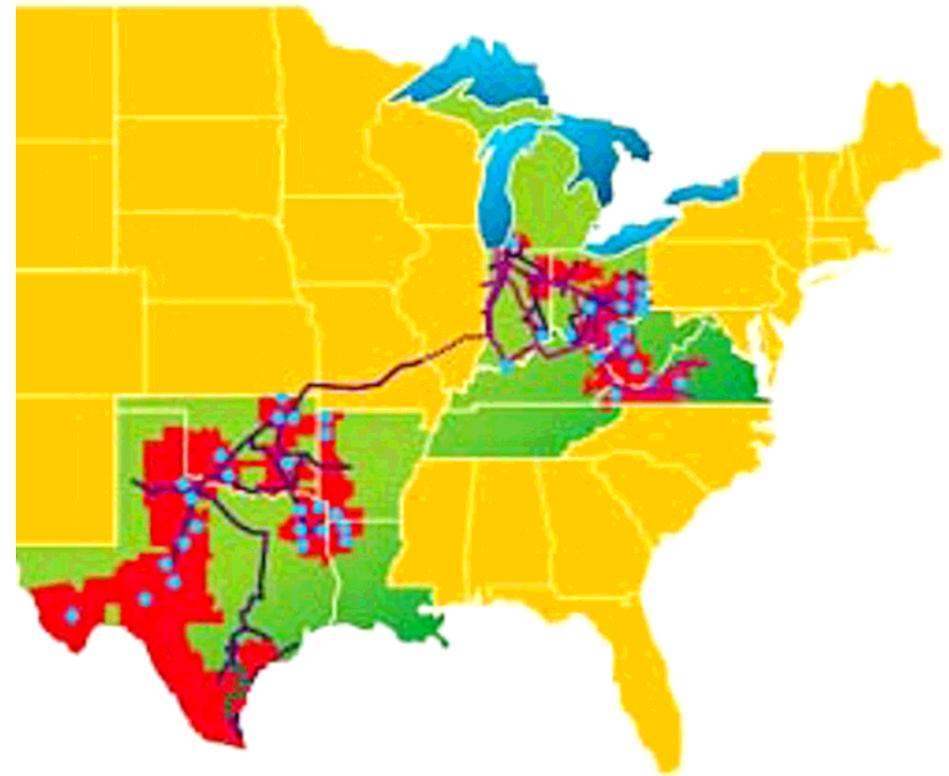
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- **AEP Overview**
- **Generation Fleet & New Generation**
- **EPA Actions**
- **gridSMART<sup>®</sup> Projects**
- **Plug-In Electric Vehicles**
- **Existing Energy Efficiency and Demand Response Programs**
- **New Consumer Program Examples**
- **Questions/Discussion**



# American Electric Power Overview

- **Customers:** 5.2 million
- **Employees:** 21,700
- **Companies:** 7
- **States:** 11
- **Gen Capacity:** 39,000 MW
- **2009 Rev:** \$13.5 billion
- **2009 MWH:** 195 million



# American Electric Power Overview



- ***Appalachian Power***
- ***Indiana Michigan Power***
- ***Kentucky Power***
- ***AEP Ohio***

AEP East

- ***Public Service of Oklahoma***
- ***Southwestern Electric Power Company***
- ***AEP Texas***

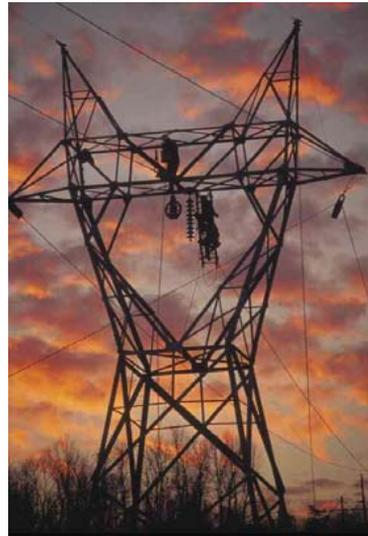
AEP West



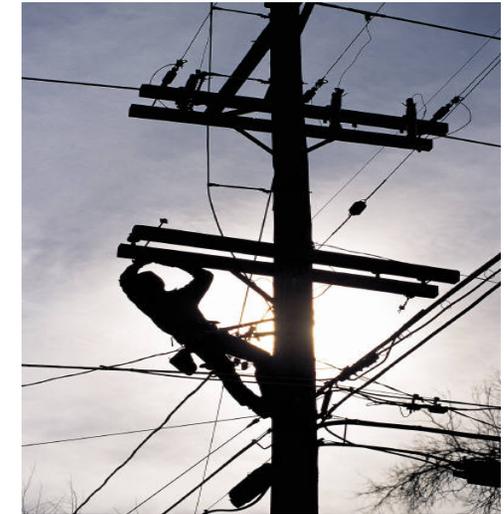
# Industry Leadership



One of the largest U.S. electricity generators



The largest U.S. electricity transmitter



One of the largest U.S. electricity distributors serving 5.2MM customers

### Generation owned<sup>1</sup> (GW)

SO	42.9
NEE	42.7
<b>AEP</b>	<b>40.6</b>
DUK	38.9
EXC	31.2
ETR	30.0
D	27.5
CPN	25.0
NRG	24.0
PGN	21.0

### Transmission miles<sup>1</sup> ('000s)

<b>AEP</b>	<b>39.0</b>
SO	27.0
DUK	20.9
PCG	18.6
MidA	18.0
ETR	15.5
ITC	15.1
FE	15.1
Oncor	14.0
EIX	12.0

### Electric customers<sup>1</sup> (mm)

EXC	5.4
<b>AEP</b>	<b>5.2</b>
PCG	5.1
NEE	4.5
FE	4.5
SO	4.4
DUK	4.0
ED	3.6
XEL	3.4
PGN	3.1

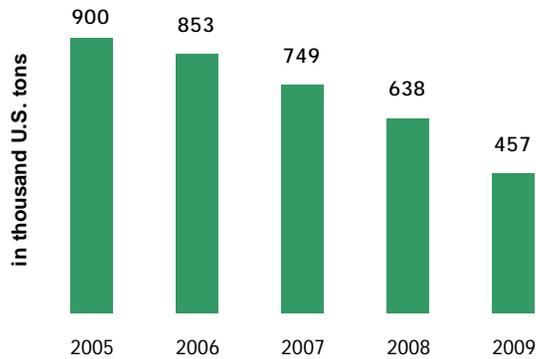
<sup>1</sup> Source: Company Filings

\*AEP generation includes long-term PPAs and generation under construction

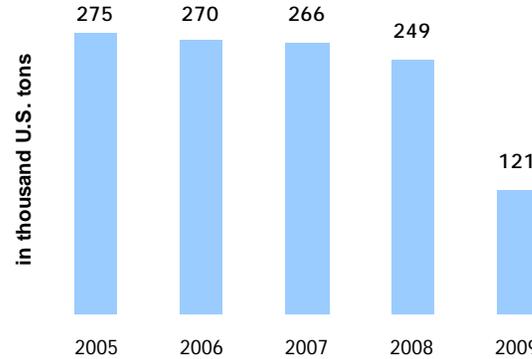


# Our Fleet Will Continue to Transform

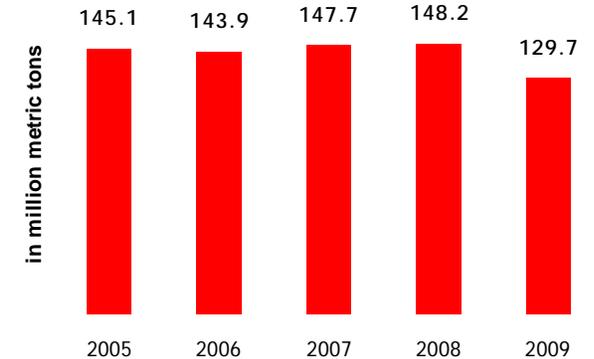
TOTAL SYSTEM – ANNUAL SO<sub>2</sub> EMISSIONS



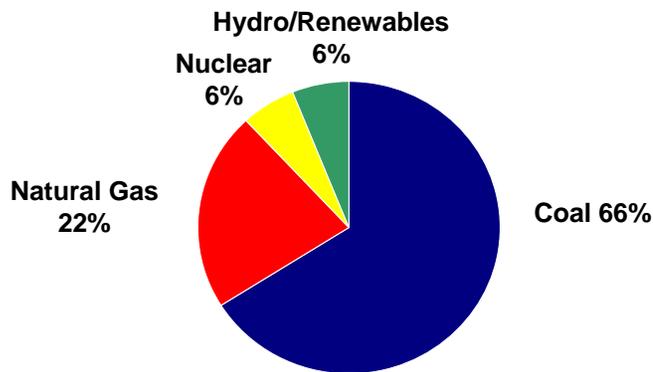
TOTAL SYSTEM – ANNUAL NO<sub>x</sub> EMISSIONS



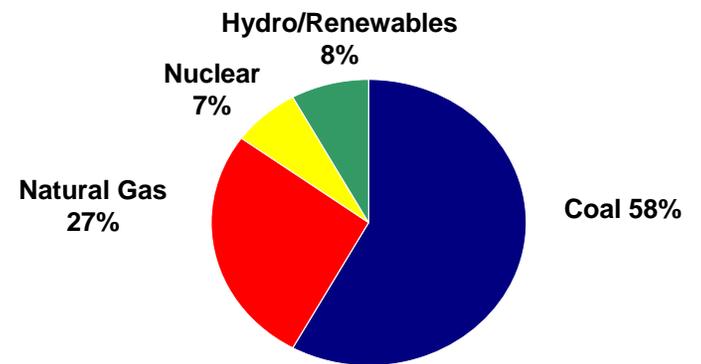
TOTAL SYSTEM – ANNUAL CO<sub>2</sub> EMISSIONS



~ \$5.2B capital invested from 2004-2010 to reduce SO<sub>2</sub>, NO<sub>x</sub> and Mercury emissions



Fuel Mix - 2009



Projected Fuel Mix - 2017

# Carbon Capture & Storage

- Mountaineer Plant in New Haven, WV

- CO<sub>2</sub> Capture: Alstom's chilled ammonia process for post-combustion capture

- CO<sub>2</sub> Storage: Compressed CO<sub>2</sub> injected 1.5 miles below earth's surface

- Phase I Validation

- Small scale
- In operation

- Phase II Commercialization

- 1.5 million metric tons per year
- 50% DOE funding
- Commercial operation 2015



# *John W. Turk Jr. Ultra Supercritical Coal Plant*



- Base load 600 MW advanced coal combustion plant
- Located in AEP's SWEPCo operating company area
- AEP owns 73% of unit (440 MW and \$1.4 billion)
- Commercial operation 2012
- Low sulfur coal and state-of-the-art emission control technologies
- Various legal challenges are ongoing

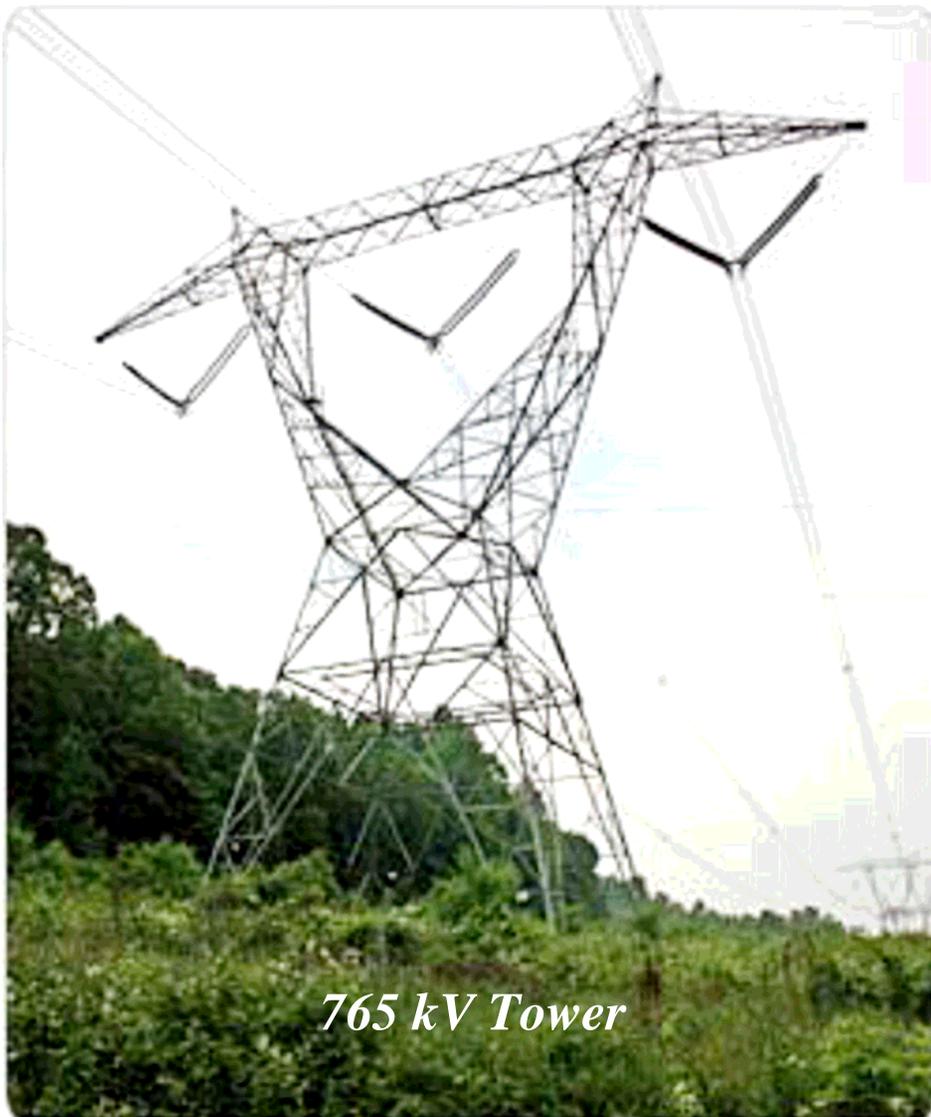
# *J. Lamar Stall Combined-Cycle Gas Plant*

- Base load 508 MW unit
- \$433 million
- Commercial operation June 2010
- Located at existing Arsenal Hill Power Plant in Shreveport, LA (SWEPCo)
- Serves customers in Arkansas, Louisiana and Texas service territories





# Transmission Investment Opportunities



*765 kV Tower*

- Electric Transmission Texas (ETT):
  - Projects in Texas ERCOT jurisdiction
  - \$600MM projects in service by 2013
  - Could reach \$3.0B by 2020
- Transco: Within our existing footprint
- Joint Ventures: Outside of our footprint

# *AEP Ohio & Turning Point Solar*



- October 5 2010 announcement
- Turning Point Solar LLC - joint venture between Agile Energy Inc and New Harvest Ventures
- Largest commercial solar development east of the Rockies
- 49.9 MW ramped up over 3 years
  - 20 MW by 2012
  - Additional 15 MW by 2013
  - Remaining 14.9 MW by 2014
- 500 acres in southeast Ohio
- 300 new permanent jobs and 300 construction-related jobs



# Recent and Major Upcoming EPA Actions



## Transport Rule – Proposed July 2010

- Governs power plant emissions of SO<sub>2</sub>/NO<sub>x</sub> that affect downwind fine particle and ozone concentrations
- Limited interstate trading; no use of previously banked SO<sub>2</sub> allowances from CAIR program
- 2014 SO<sub>2</sub> limits in AEP-East states will require almost all coal units to be scrubbed or retired/use gas
- AEP believes an extension of the compliance deadlines is essential to allow states to develop implementation plans and give companies time to install the retrofits needed to comply

## “Coal Ash” Rule – Proposed May 2010

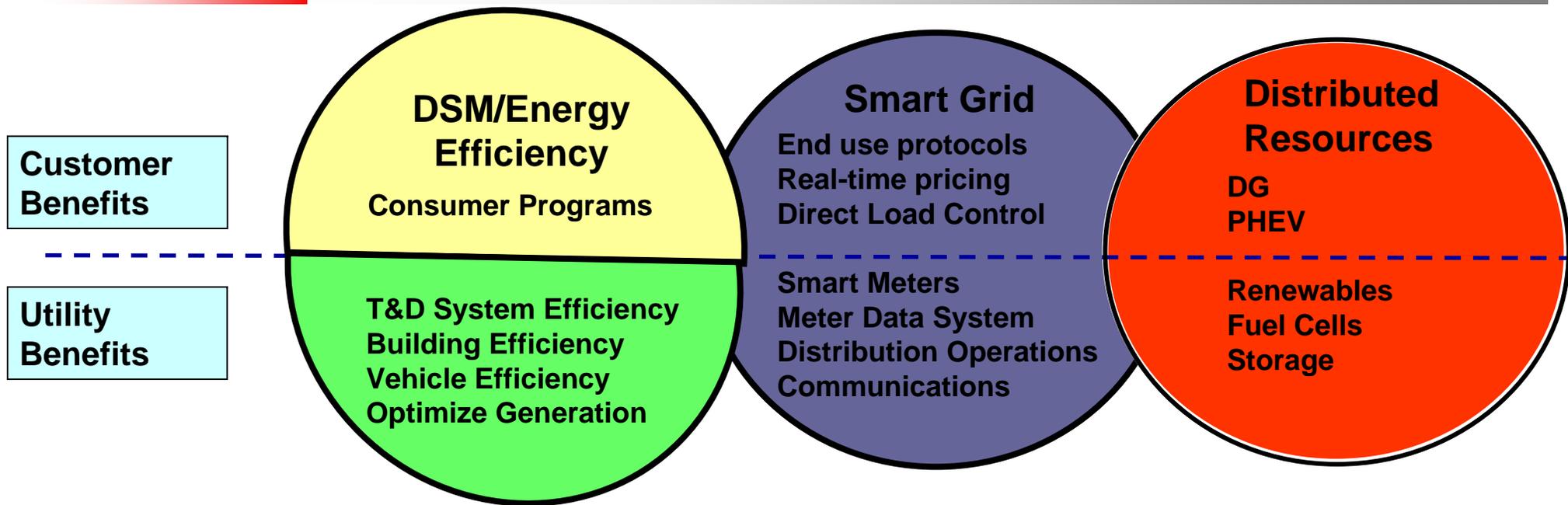
- EPA proposed two different regulatory designations:
  - ✓ Solid waste – action required by ~2017
  - ✓ “Special” hazardous waste – action required by ~2018-2020
- AEP supports regulation of coal ash under the Subtitle ‘D Prime’ option of the RCRA
- Cost to AEP customers estimated at \$3.9 billion by 2020 to comply with Subtitle D option

## Mercury and other Hazardous Air Pollutants (HAPs) Rule

- Expect proposed rule in spring 2011, finalized in late 2011; likely compliance year - 2015
- Could require major pollution control retrofits at most U.S. coal plants

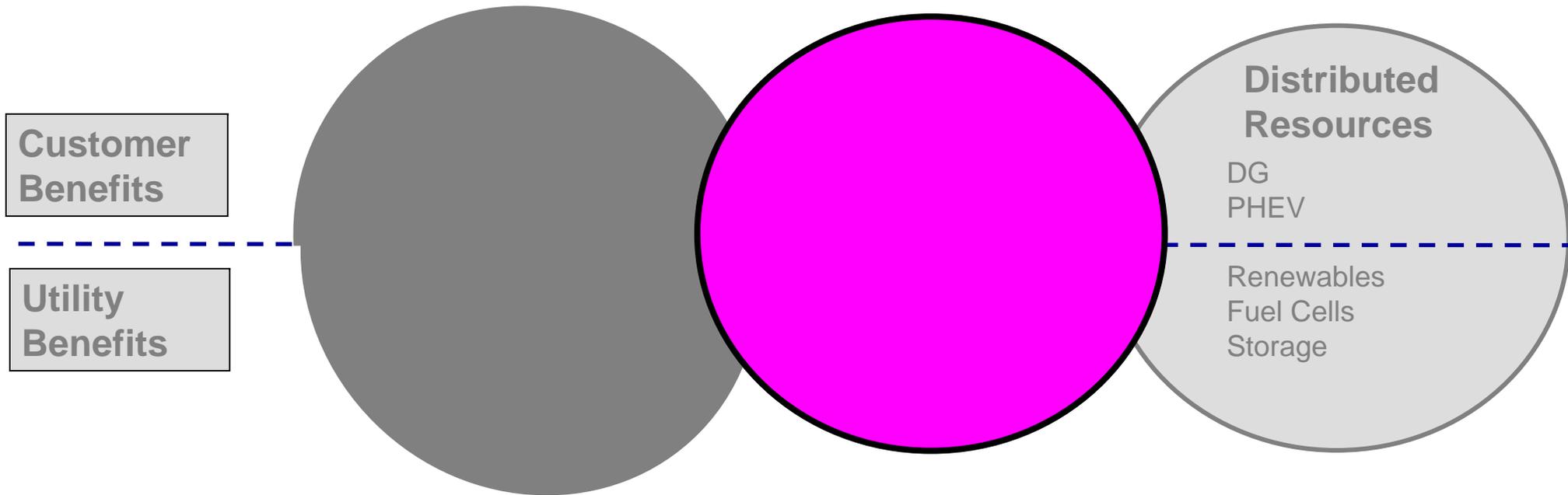
*Cumulative effects of EPA proposed rule and carbon legislation/regulation are a major concern for utility resource planning*

# AEP's gridSMART<sup>®</sup> Initiative



A suite of customer programs and advanced technologies that will transport us into a new era of energy delivery and customer service. It includes **consumer programs, new energy delivery system technologies** that improve service quality and reliability, **integration of future generation and storage devices** that will respond to energy needs in the neighborhood and **advancement of AEP internal system efficiencies.**

# AEP's gridSMART® Initiative



***AEP views “smart grid” as the first step in its comprehensive gridSMART® initiative.*** It is the set of technologies and systems enabling consumer energy efficiency, system efficiency, and the integration of emerging forms of distributed energy resources - solar, wind, distributed fuel cells, waste heat recovery engines.

# AEP's gridSMART® Initiative



## Indiana Michigan Power

- 10,000 AMI pilot program in South Bend, IN
- Distribution automation and Integrated Volt-Var Control
- Two-tiered, two-season time-of-use tariffs
- Web portal displaying 15-minute interval data up-to-previous day
- Field testing direct load control using programmable communicating thermostats

## Public Service of Oklahoma

- Received \$8.75 million low interest loan from OK Department of Commerce (ARRA source)
- Planned scope is 15,000 meters in Owasso
- Distribution technologies include DA and IVVC

## AEP Texas

- Legislature enabled and commission directing TDSPs to deploy advanced metering
- Enables REPs to innovate around electricity pricing and consumer technologies
- Received approval from PUCT for 4-year deployment of 970,000 meters, \$270 million project
- AEP Texas to collect a surcharge over 11 years
- Includes 10,000 in-home displays for low income customers

## AEP Ohio

- PUCO-Approved 110,000 AMI deployment in NE Central Ohio
- Selected by DOE as a Smart Grid Demonstration Project for \$75 million in federal funding, 42-month deployment/evaluation
- Partnered with Battelle
- Full suite of distribution grid management technologies on over 70 distribution circuits
- Advanced technology deployment (Energy storage, PHEVs)
- Enhanced time-of-use tariffs, including a field trial of real time pricing
- Home area networks & grid-friendly appliances

# AEP Ohio gridSMART<sup>®</sup> Mobile



# Plug-In Electric Vehicles (PEV)



*Toyota Prius*



*Chevrolet Volt*

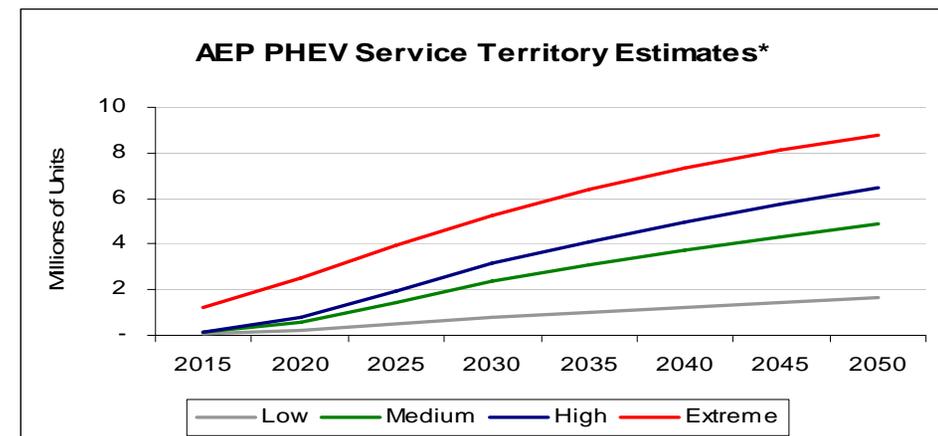
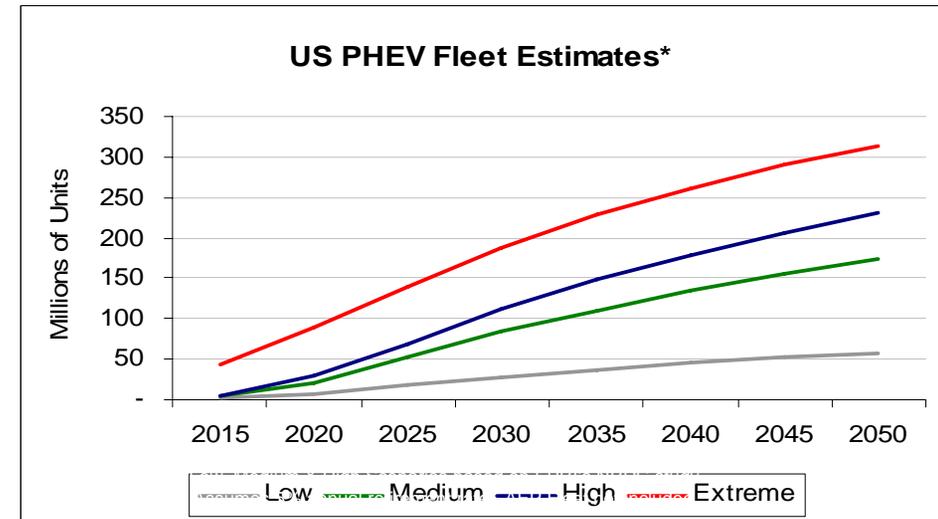


*Nissan Leaf*

# AEP's PEV Readiness



- Most manufacturers plan to begin production of EVs/PHEVs in late 2010-2014
- Vehicle price will be high due to high initial battery cost
- Dealer franchising laws require automobile manufacturers to offer vehicles by state (not region or city)
- Gas prices
- Economic downturn likely to slow new vehicle purchases although federal tax credits (\$2,500-\$7,500 per vehicle) might counter economic conditions
- Potentially slower penetration rates due to low population densities and low income per capita in majority of AEP service territory



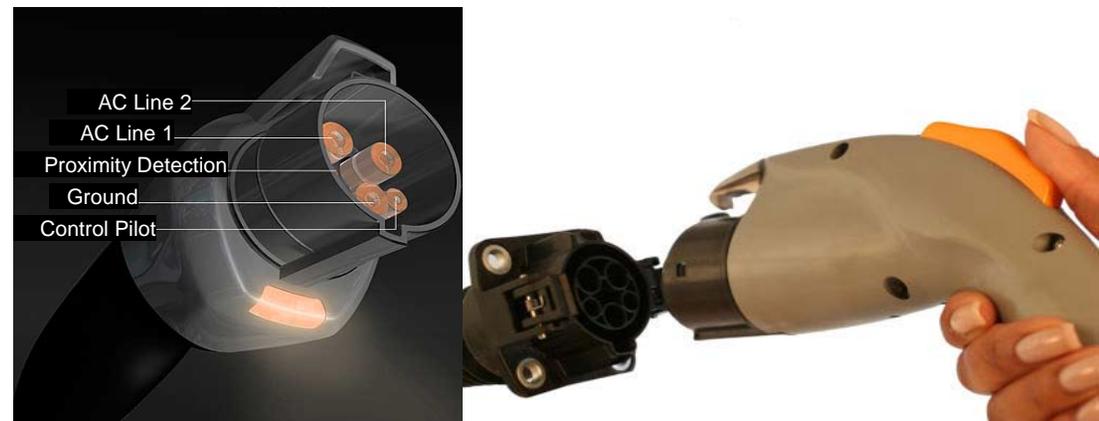
\*We assume AEP's service territories will be slow to adopt due to low population densities (MSA) and low income per capita.

# PEV Charging

- Vehicles can be charged at multiple power levels
- SAE J1772 Standard Charge Connector
  - Level 1 – 120VAC, 1 Phase up to 16A
  - Level 2 – 240VAC, 1 Phase up to 80A
- Level 3 (DC Fast Charging)– No current standard for charging or connector
  - Will require different connector (A standard exists in Japan)
  - Japanese charge rate: Max 500VDC, 200A
- Energy usage: one vehicle is equal to 2 refrigerators (~250kWh/month, ~30 miles/day)

Type	Power Level	Charge Time	Reference
Level 1 120 VAC, 12-16A	1.4 - 1.9 kW	PHEV–5-8hrs BEV–14-30hrs	Hairdryer
Level 2 240 VAC, 15-80A	3 – 19 kW (6.6 kW typical)	PHEV–1-3hrs BEV–2-8hrs	Water Heater, Oven, Electric Furnace
Level 3 500VDC, 20-200A	10 kW – 200kW +	PHEV–N/A BEV–15-30min	Small Comm. Bldg

Level 1 and Level 2 vehicle charging rates are similar to other loads within the home



# *AEP's Energy Efficiency Goals*

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- Program cost-effectiveness
- Supportive regulatory climate and timely recovery of investments
- Important component of the Integrated Resource Plan
- Viable tool for meeting federal & state environmental, sustainability, and consumer energy reduction goals
- Collaborative decision making with state government entities
- **1,000 MW / 2,250 GWh reduction by 2012**

# Current State Legislative Energy Efficiency Goals



**AEP Service Territory**

**Michigan**  
Percent of retail sales:  
0.3% (2009) to  
1.0% (2012)

**Indiana**  
Percent of retail sales:  
0.3% (2010) to  
2.0% (2019)

**West Virginia**  
EE eligible to meet  
alternative generation target  
of 10% (2015) to 25% (2025)

**Ohio**  
Percent of retail sales:  
0.5% (2010) to  
2.0% (2019)

**Virginia**  
Voluntary goal:  
10% of 2006 retail sales  
(cumulative) by 2022

**Texas**  
20% of annual Res. & Comm.  
demand growth + Associated  
energy reduction (@ 20% CF)

- Service Territories**
- Appalachian Power
  - Kentucky Power
  - Indiana Michigan Power
  - AEP Ohio
  - Public Service Company of Oklahoma
  - SWEPCO
  - AEP Texas

No mandated goals or targets, yet, in KY, TN, OK, LA, or AR



# Energy Efficiency Cost Recovery: AEP East States



State	Status
<b>Kentucky</b>	<ul style="list-style-type: none"> <li>• Approved recovery of program costs, net lost revenue, shared savings.</li> <li>• Recovery through Rider.</li> </ul>
<b>Ohio</b>	<ul style="list-style-type: none"> <li>• Approved recovery of program costs, net lost distribution revenues, performance incentive.</li> <li>• Recovery through Rider.</li> </ul>
<b>Indiana</b>	<ul style="list-style-type: none"> <li>• Utility administered 'non-core programs': Approved recovery of program costs, net lost revenue, and shared savings.</li> <li>• 3<sup>rd</sup>-party administered 'core programs': Approved recovery of program costs, Settlement pending on net lost revenue; Not eligible for incentives.</li> <li>• Recovery through Rider.</li> </ul>
<b>Michigan</b>	<ul style="list-style-type: none"> <li>• 3<sup>rd</sup>-party administrator for program implementation.</li> <li>• Approved recovery of program costs; Filed for net lost revenue; Not eligible for incentives.</li> <li>• Recovery through Rider.</li> </ul>
<b>West Virginia</b>	<ul style="list-style-type: none"> <li>• Proposed recovery of program costs, net lost revenues, and shared savings.</li> <li>• Open docket.</li> </ul>
<b>Virginia</b>	<ul style="list-style-type: none"> <li>• Administrative code allows for recovery of program costs, net lost revenue, and incentives.</li> <li>• EE filing being contemplated.</li> </ul>
<b>Tennessee</b>	<ul style="list-style-type: none"> <li>• Cost recovery mechanism not currently established.</li> </ul>

# Energy Efficiency Cost Recovery: AEP West States



State	Status
<b>Oklahoma</b>	<ul style="list-style-type: none"><li>• Approved recovery of program costs, net lost revenue, shared savings.</li><li>• Recovery through Rider.</li></ul>
<b>Texas</b>	<ul style="list-style-type: none"><li>• Approved recovery of program costs and performance incentive.</li><li>• Active docket on net lost revenues.</li><li>• Recovery through Rider.</li></ul>
<b>Arkansas</b>	<ul style="list-style-type: none"><li>• Approved recovery of program costs.</li><li>• Lost revenues and incentives being discussed.</li><li>• Recovery through Rider.</li></ul>
<b>Louisiana</b>	<ul style="list-style-type: none"><li>• Formula rates in-place.</li><li>• Docket open to discuss incentives.</li></ul>



# Program Status (AEP East)

State	Status
<b>Ohio</b>	<ul style="list-style-type: none"> <li>• Programs began in early / mid 2009 with 5 core programs</li> <li>• A total of 12 programs are in place or being planned for 2010 (excl gridSMART programs / tariffs)</li> <li>• 3 year plan filed and approved by the PUCO</li> <li>• 2009 spend ~ \$15 million</li> </ul>
<b>Indiana</b>	<ul style="list-style-type: none"> <li>• Phase I programs approved April 2010</li> <li>• Additional filing for non-core programs anticipated July 2010</li> <li>• Programs are being ramped up / awarded to program implementation contractors</li> <li>• Some initiatives in place in 2009, but minimal – 2009 spend including internal efficiency ~ \$4.4 million</li> </ul>
<b>Michigan</b>	<ul style="list-style-type: none"> <li>• Programs currently being operated by statewide administrator</li> <li>• Program kickoff in November 2009</li> <li>• Opportunity to bring these programs in house, if appropriate, in 2012</li> </ul>
<b>Kentucky</b>	<ul style="list-style-type: none"> <li>• Programs in place since 1996 (7 programs presently)</li> <li>• All programs focus on residential sector at present, but commercial collaborative reestablished - 2009</li> <li>• Program filings for 5 additional programs, including commercial, in Feb and May 2010</li> <li>• 2009 spend ~ \$1 million (newly requested programs will approximately triple Kentucky's budget)</li> </ul>
<b>Virginia</b>	<ul style="list-style-type: none"> <li>• Program portfolio filing in March 2010 for 5 programs (~\$30 million over three years)</li> <li>• Hearings in June 2010</li> </ul>
<b>West Virginia</b>	<ul style="list-style-type: none"> <li>• Program portfolio being developed for Virginia (recent VA SCC order recommended RIM as the primary economic test)</li> </ul>
<b>Tennessee</b>	<ul style="list-style-type: none"> <li>• Discussions underway with Tennessee Regulatory Authority for potential programs in Kingsport (who has stimulus funding for EE-type initiatives)</li> </ul>



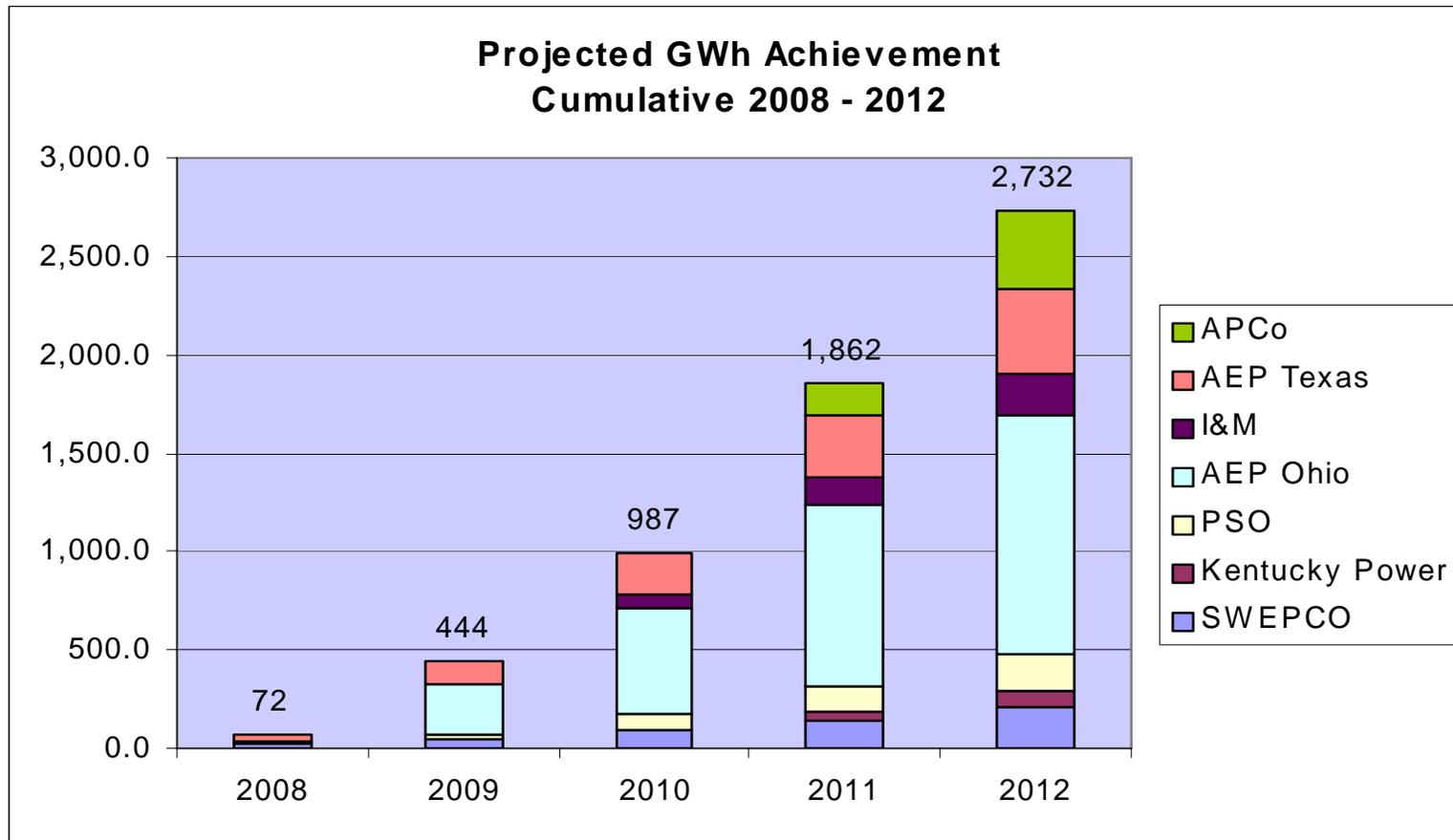
# Program Status (AEP West)

State	Status
<b>AEP Texas</b>	<ul style="list-style-type: none"> <li>• Programs in place since early 2000's</li> <li>• 17 programs currently underway including R&amp;D and pilots (TNC and TCC)</li> <li>• 2009 spend ~ \$14 million</li> </ul>
<b>Oklahoma</b>	<ul style="list-style-type: none"> <li>• Programs began in PSO as "Quick Start" programs in 2008</li> <li>• Recently received approval for 17 new or expanded programs for 2010 – 2012 period</li> <li>• 2009 spend ~ \$3 million</li> <li>• 2010 – 2012 program portfolio represents ~ \$59 million excluding lost revenues / incentives</li> </ul>
<b>SWEPCO Arkansas</b>	<ul style="list-style-type: none"> <li>• Programs began as "Quick Start" programs in 2007</li> <li>• 9 programs currently underway including interruptible tariff and education program</li> <li>• Comprehensive filing due October 1, 2010 which will include new programs for 2011</li> <li>• 2009 spend ~ \$0.8 million</li> </ul>
<b>SWEPCO TX</b>	<ul style="list-style-type: none"> <li>• Programs in place since early 2000's</li> <li>• 13 programs currently underway including market transformation, R&amp;D and pilot programs</li> <li>• 6 new programs or R&amp;D projects planned for 2011</li> <li>• 2009 spend ~ \$3 million</li> </ul>
<b>SWEPCO Louisiana</b>	<ul style="list-style-type: none"> <li>• No programs currently in place</li> <li>• Docket opened to review EE</li> </ul>



# GWh Achievement Projections

Based on Current OPCo Strategic Plans (DRAFT)



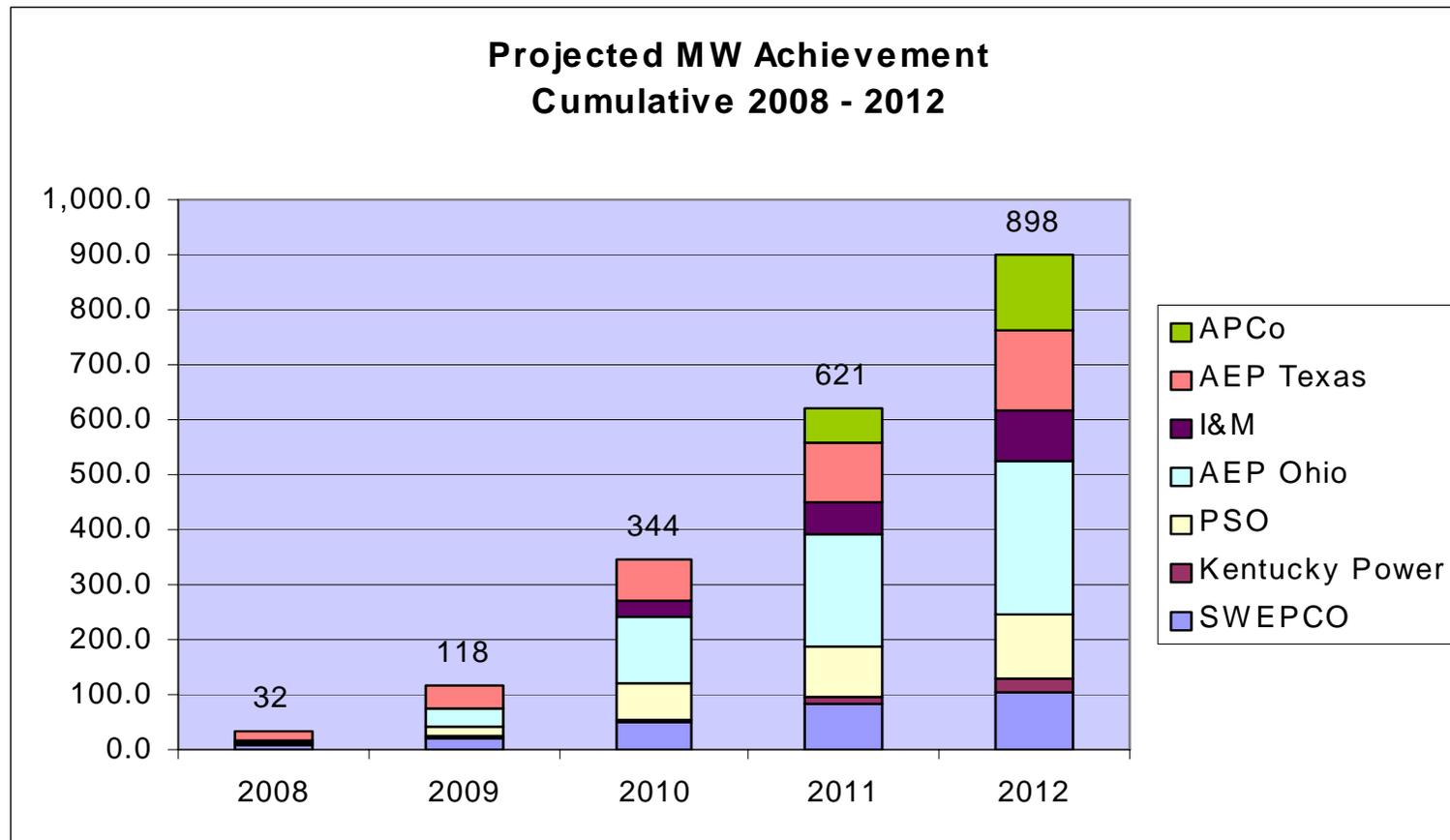
Total projected energy reduction achievement = 2,732 GWh

Some Programs are in place, some are before regulatory agencies, and some yet to be filed.



# MW Achievement Projections

Based on Current OPCo Strategic Plans



2012 Total projected demand reduction achievement = 898 MW.  
Additional MW will need to be identified to meet 1000 MW Goal.



# *Demand Response Initiatives*

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- Various interruptible tariffs, time-of-use rates, and peak load management programs are in place
  - C&I load management programs in AEP Texas, SWEPCO, and PSO
  - Interruptible Tariffs in most jurisdictions for large C&I
  - South Bend Smart Meter Pilot – Thermostat Control through AMI network
  - Residential Direct Load Control programs are being ramped up, or are in the planning stage, for PSO, SWEPCO & Kentucky
- Demand Response Strategy Team in place to identify opportunities and develop a strategy to participate in PJM DR Emergency program and other initiatives
  - Interviewing various curtailment service providers (CSPs) to identify partnering arrangements, if applicable
  - Addressing issues with intermittent DR
  - Also looking at organizational structure required to optimize DR

# Potential New Programs



## Online Energy Audit

### HOME TYPE AND OCCUPANTS

Multi Story/1990 to 1999/2,000SF/1 Person

### INSULATION AND INFILTRATION

Typical

### WINDOWS AND GLASS

Single Pane

### HEATING AND COOLING SYSTEMS

Heat Pump / 72F , Central AC / 75F

### WATER HEATING

Electric / New Energy Efficient

### REFRIGERATORS AND FREEZERS

1 Refrigerator , 0 Freezers

### TELEVISIONS AND LIGHTING

1 Television, All Incandescent Lighting

### OTHER MAJOR APPLIANCES

[Click here to view details](#)

### POOLS AND HOT TUBS

Pool - No / Hot Tub - No

BACK

NEXT

### Your Home Type

Click on the options below for more information.

- Single Story       Townhouse End  
 Multi Story       Townhouse Mid  
 Split Level       Apt Lower Floor  
 Manufactured Home       Apt Top Floor

### Optional Information

- Do you have a basement level?  Yes  No  
If yes, is it a walk out/garage?  Yes  No  
Is it heated?  Yes  No  
Is it cooled?  Yes  No

### Multi Story



If you have more than one level to the main part of your home, please select the multi story home option. If you also have a basement, indicate in the menu below whether it is a walk-out basement and/or if the garage is on the basement level. Also, indicate whether the basement is heated and/or cooled.

### Year Home Was Built

Select the year your home was built

1990 to 1999

### Home Size / Square Footage

Select the appropriate home size / square footage excluding your basement

3 Bedroom - 2,000 SF

### Occupants

Home during day: 0

Away during day: 1

# Potential New Programs



## Electric Lift Truck

- Aligns with AEP's strategic goals
  - Secures a lower-carbon energy future
  - Meets the energy needs of our customers
- Improves customer satisfaction
  - Improved technology advances
  - Increased operating efficiencies/savings
  - Enhanced workplace health and safety
  - Ergonomic improvements for operators
- Delivers value to shareholders
  - Generates incremental kWh revenues
- Piloting in SWEPCo starting Nov 1





*Thank you!*  
*Questions/Discussion*

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