



KCP&L Green Impact Zone SmartGrid Demonstration

DOE Project Kick-Off Meeting

January 6, 2011

DOE Agreement DE-OE0000221



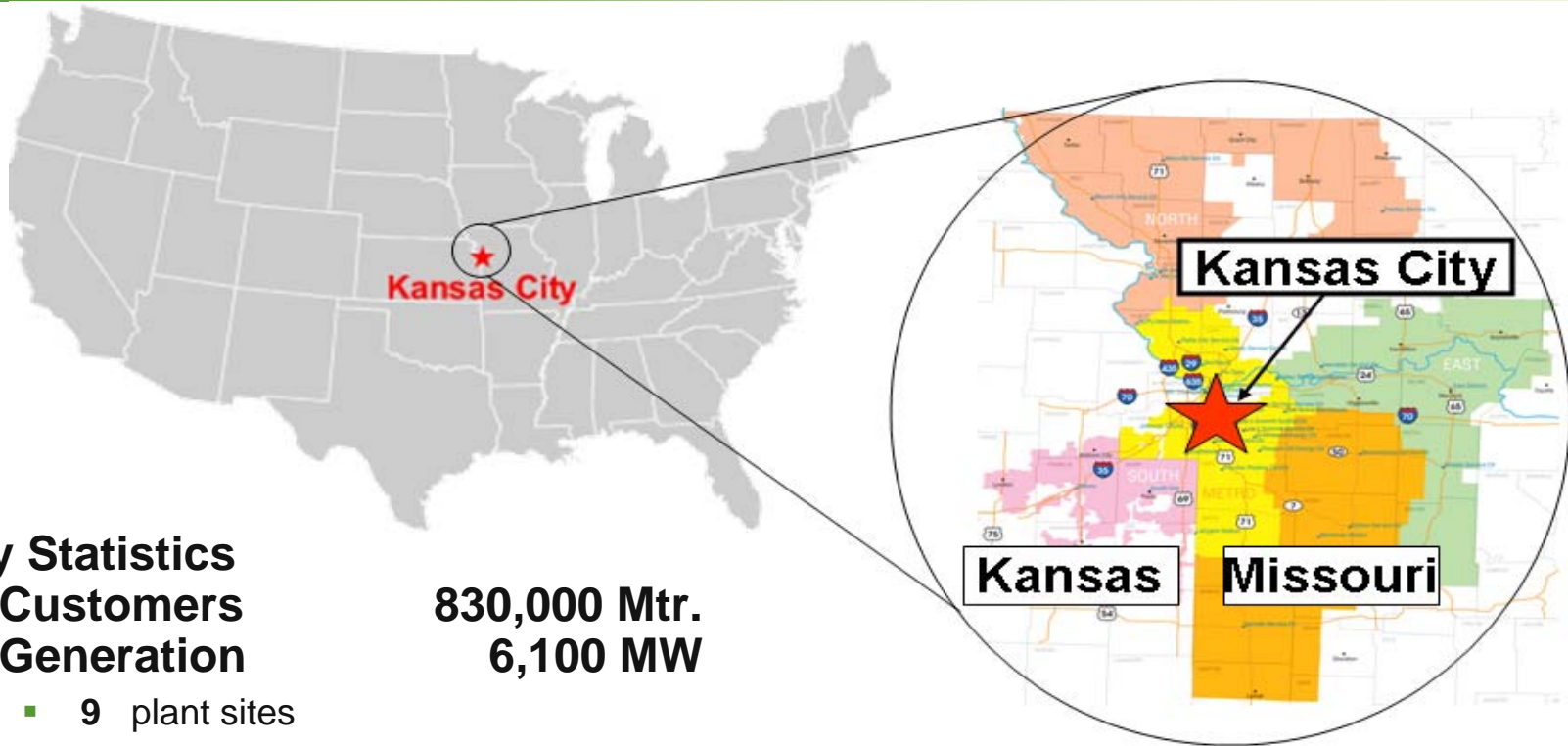
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Meeting Agenda

- **Introductions**
 - KCP&L Company & Project Team
- **Project Overview**
 - Objectives, Components, Timeline, Budget
- **2010 Accomplishments**
 - Milestones, Activities, Reporting & Deliverables
- **2010 Project Financial Status**
- **Major Vendor Contract Status**
- **2011 Objectives**
 - Milestones, Activities, Reporting & Deliverables
- **Discussion**

KCP&L Company Overview



Key Statistics

Customers

Generation

830,000 Mtr.
6,100 MW

- 9 plant sites
- 26 generating units
- 10 peaking facilities

Dist. Subs
Dist. Circuits

315
1600



SmartGrid
the future of energy

KCP&L Smart Grid Project Organization

Sponsor Team

Executive Sponsor:

M. Deggendorf, SVP Delivery

Green Impact Zone Project Sponsor:

S. Gilkey, Sr. Dir., T&D Engineering and Planning

J. Alberts, VP Customer Services

K. Bryant, VP Energy Solutions

B. Herdegen, VP T&D Operations

M. Jenks, VP Supply Chain

C. Tickles, VP IT

C. Blanc, Sr. Dir. Regulatory

C. Caisley, Sr. Dir. Public Affairs

Project Management Office

Project Corporate Support

Communications:

M. Paxton, C. Beatty

Regulatory: L. Liechti

Purchasing: R. Funk

Legal: J. Rosa

Project Financials: C. Ruble

Audit: C. Parr, B. Lee

Data Analytics: L. McIntosh, EPRI

**Green Impact Zone
Coordinator**
P. Snider

Smart Grid Director
B. Menge

Project Office Support
Bridge Consulting
Burns & McDonnell

**DOE Smart Grid Project
Manager**
P. Cosey

**Smart Grid
Planning**
E. Hedges

**DOE/Strategic
Partner
Coordination**

Implementation Teams

Community Outreach
R. Boyd

- MARC
- Green Impact Zone Office

- G. Allen
- M. McMurtry
- J. Waddell
- B. Spielberger
- L. Blake
- M. Paxton
- S. Tiley
- P. Gooch

End Use
G. Allen

- Tendril PM

- **Products & Services** – K. Riggins
- **Customer Acquisition** – E. Steinberg
- **DG/Rooftop Solar** – R. Maliwat
- **eServices** – T. Bergerhofer
- **M&V** – M. McConnell

Customer Operations
V. Barszczak

- L&G PM
- eMeter

- **AMI** – T. Howe
- **Billing** – R. Anderson
- **Metering** – C. Paczosa
- **Change Mgmt.** – L. Gillotte

Delivery
S. Grafelman

- Siemens PM
- OATI PM
- Exergonix PM
- Intergraph

- **SS/DA** – D. Rucker, S. Goeckeler
- **DERM** – M. Hopkins
- **DMS** – D. Rucker
- **Battery** – G. Elliott
- **Change Mgmt.** – P. Manson

IT Infrastructure
R. Nix

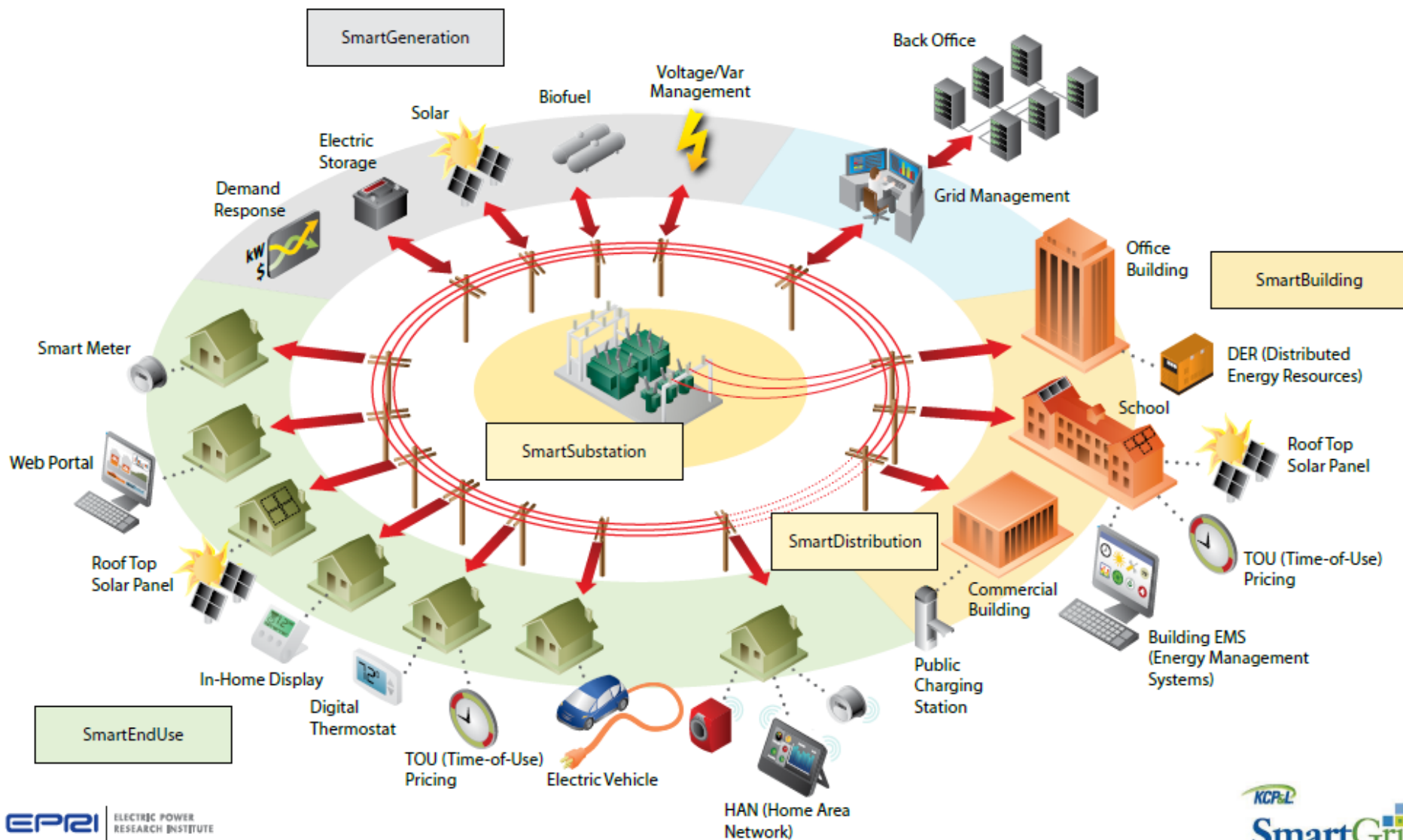
- **Data-Hardware** – P. Ancil
- **Applications** - DSS – R. Sparks, RTS – N. McCurry
- **Comms./Network** – W. Bean, Phil Pettis
- **Cyber Security** – J. Doetzel, A. Kloster

Project Objectives

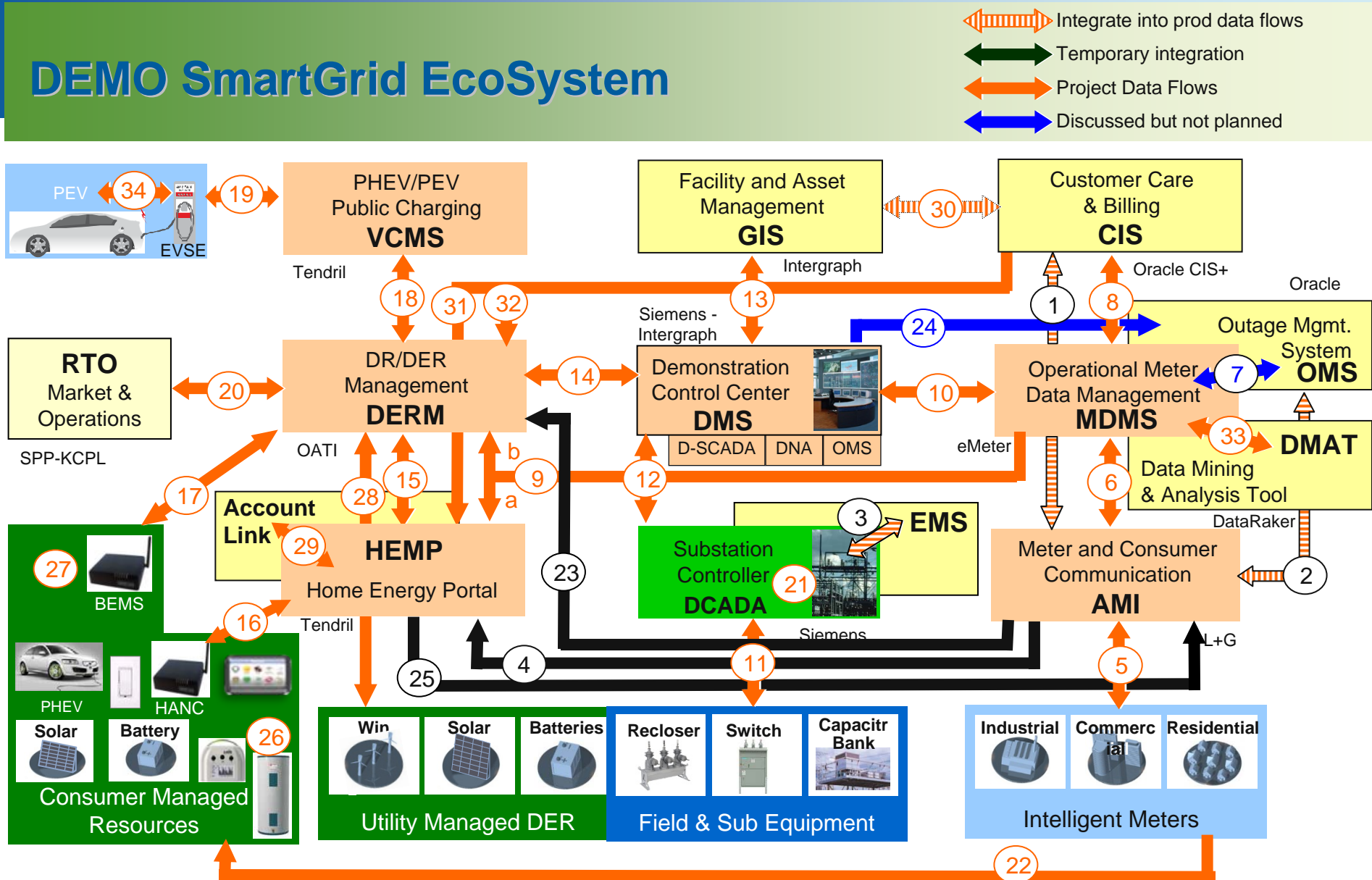
KCP&L's SmartGrid demonstration project complies with the Department of Energy's (DOE's) funding guidelines and combines commercial innovation with a unique approach to smart grid development and demonstration:

- First, **it creates a complete, end-to-end smart grid** — from smart generation to smart end-use — that will deliver improved performance focused on a major substation in an urban location.
- Second, **it introduces new technologies, applications, protocols**, communications and business models that will be evaluated, demonstrated and refined to achieve improved operations, increase energy efficiency, reduce energy delivery costs and improve environmental performance.
- Third, **it incorporates a best-in-class approach to technology integration**, application development and partnership collaboration, allowing KCP&L to advance the progression of complete smart grid solutions — with interoperability standards — rather than singular, packaged applications.
- Finally, KCP&L's demonstration project will provide the critical energy infrastructure required to **support a targeted urban revitalization effort** in Kansas City's Green Impact Zone.

KCP&L Demonstration – True End-to-End Smart Grid



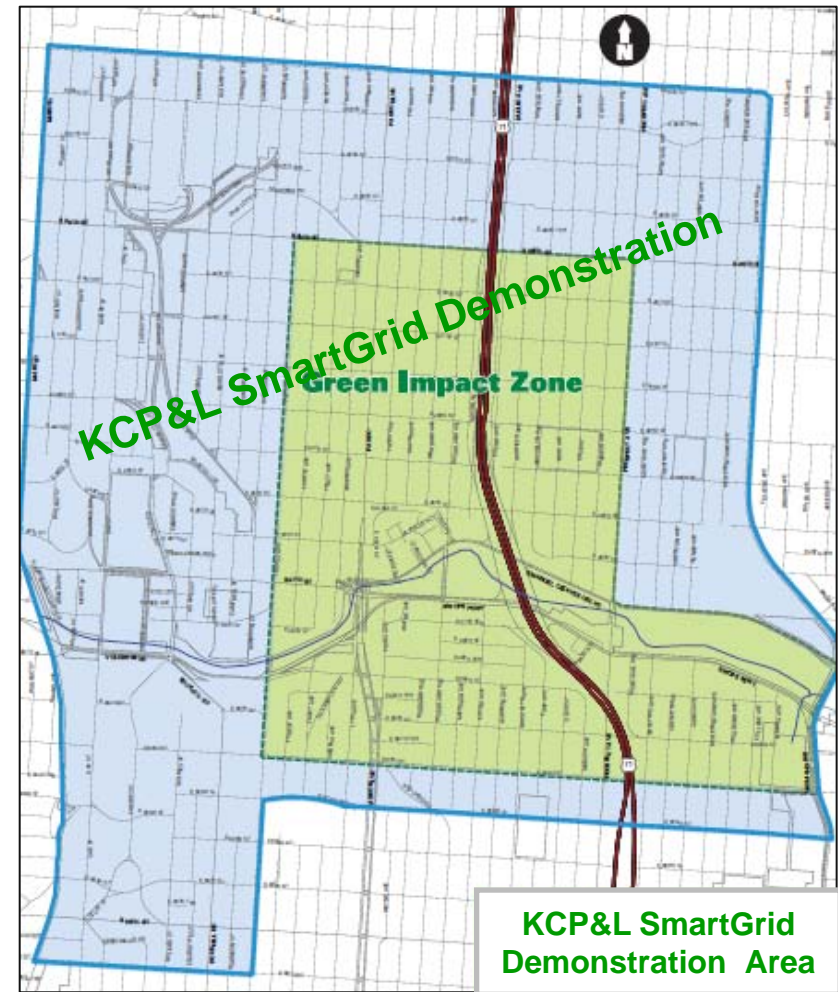
DEMO SmartGrid EcoSystem



Project Co-Located with Green Impact Zone

Green Impact Zone

- 150-square block area (39th to 51st between Troost and Prospect).
- Comprehensive set of programs using grant funds and other resources for:
 - Economic development
 - Community policing & service centers
 - Training and employment
 - Energy and water conservation
 - Grant funds (over \$100M) include
 - Transportation Investments Generating Economic Recovery (TIGER) grant
 - Energy Efficiency Conservation Block Grant (KC MO, MARC)
 - MDNR Innovative Weatherization Grant
 - KCP&L SmartGrid Pilot Project
 - Brownfields Grant — (Pending)
- Involves over 25 stakeholder groups including neighborhood groups, Congressman Cleaver, MARC, MEC, KCP&L, MGE, KCMO water & UMKC



Project Technology Components (1)

- **SmartSubstation** – will upgrade a major urban substation with electromechanical relays and demonstrate a fully automated, next-generation distribution SmartSubstation with a local distributed control system based on IEC 61850 protocols.
- **SmartDistribution** - will demonstrate a fully automated, next generation Distributed Control and Data Acquisition (DCADA) controller that incorporates a Common Information Model (CIM) based model of the local distribution network and performs local grid assessment and control of individual IED field controls.
 - The DMS and DCADA controllers will provide the operational backbone of the system supporting significant levels of automation on the feeders, complex and automated feeder reconfiguration decisions, and tightly integrated supervision with the Control Centers.
 - The DMS serves as the primary point of integration for the grid facilities and network management functionality including D-SCADA, Distribution Network Analysis (DNA), OMS, DERM system, GIS and other supporting systems.

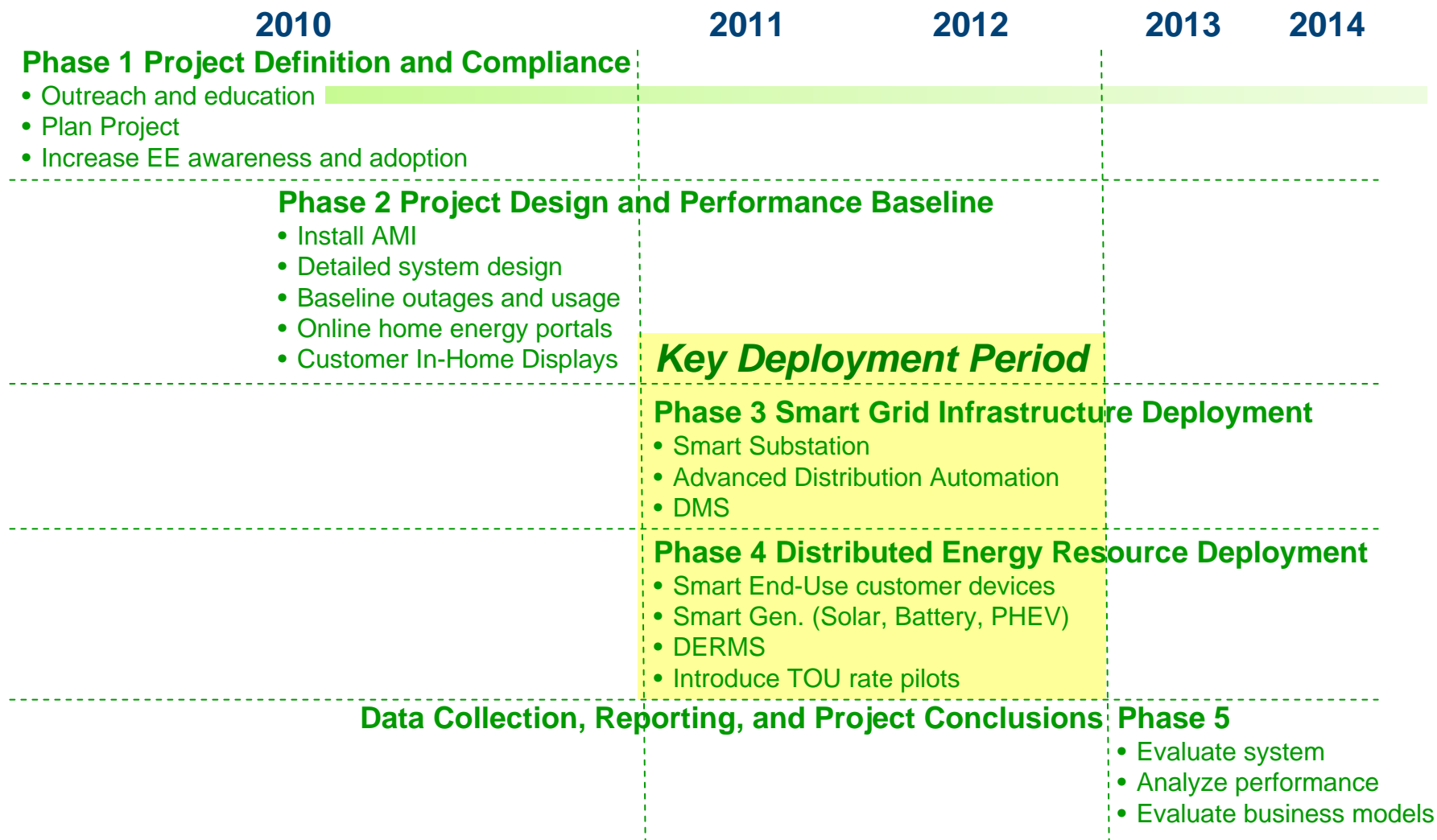
Project Technology Components (2)

- **Smart Generation** - will implementation of DER technologies and DR programs sufficient in quantity and diversity to support the DERM development and demonstration. To achieve this objective, the demonstration program will include:
 - Installation of a variety of distributed solar systems with a mix of residential and commercial installations (a larger scale, 100kw, installation is planned for a school or public building)
 - Installation of a 1MWh grid-connected battery to provide grid support.
 - Integration of the existing EnergyOptimizer DR thermostat program in the demonstration area
 - Integration of the existing MPower load curtailment program customers in the demonstration area
 - Potential conversion of customer stand-by generation to parallel generation
- **SmartDR/DERM** - will demonstrate a next-generation, end-to-end DERM system that provides balancing of renewable and variable energy sources with controllable demand as it becomes integrated in the utility grid, coordination with market systems, and provision of pricing signals.

Project Technology Components (3)

- **SmartMetering** – will demonstrate state-of-the-art integrated AMI & meter data management (MDM) capabilities that support two-way communication with 14,000 SmartMeters in the Demonstration Area and provide the integration with CIS, DMS, OMS, and DERM. The SmartMetering infrastructure will provide the technology basis for recording customer and grid data that will be used to measure many SmartGrid benefits. The SmartMetering technology will also provide advanced meter-to-HAN communications to facilitate in-home display, home energy management systems, and other consumer-facing programs.
- **SmartEnd-Use** - program will achieve a sufficient number of consumers enrolled in a variety of consumer-facing programs to 1) support the DERM development and demonstration; and 2) measure, analyze, and evaluate the impact that consumer education, enhanced energy consumption information, energy cost and pricing signals and other consumer-based programs have on end-use consumption.

KCP&L SmartGrid Pilot Timeline – Project Overview



Project Budget & Funding Sources

Funding Source	Budget Period 1 2010 Costs	Budget Period 2 2011 Costs	Budget Period 3 2012 Costs	Budget Period 4 2013 Costs	Budget Period 5 2014 Costs	Total Funds	Project Funds %
Vendors							
L+G	\$657,400	\$372,875	\$16,500	\$16,500	\$16,500	\$1,079,775	2.2%
Intergraph	\$24,724	\$750,625	\$12,362	\$0	\$0	\$787,711	1.6%
Siemens/eMeter	\$0	\$292,044	\$0	\$0	\$0	\$292,044	0.6%
Siemens	\$0	\$0	\$519,800	\$0	\$0	\$519,800	1.0%
Exergonix	\$1,413,069	\$2,424,090	\$94,781	\$7,863	\$7,862	\$3,947,665	7.9%
OATI	\$403,402	\$894,676	\$477,622	\$152,881	\$125,429	\$2,054,010	4.1%
KCPL	\$4,511,246	\$5,735,470	\$3,172,054	\$1,479,471	\$2,310,923	\$17,209,163	34.5%
DOE	\$5,378,296	\$8,432,213	\$4,266,939	\$2,657,289	\$3,205,375	\$23,940,112	48.0%
All Funding Sources	\$12,388,137	\$18,901,992	\$8,560,058	\$4,314,004	\$5,666,089	\$49,830,280	100.0%

2010 Project Milestones

No.	Milestone	PMP Scheduled Complete	Actual or *Target Completion Date
2	NEPA Compliance Obtained	5/18/2010	05/10/2010
1	Revised PMP to DOE	10/29/2010	10/29/2010
	Contract Definitization Complete	0930/2010	09/30/2010
3	Interoperability Plan to DOE For Review	10/28/2010	10/28/2010
3	Cyber Security Plan to DOE For Review	10/28/2010	10/28/2010
4	Data Metrics & Reporting Plan to DOE for Review	12/30/2010	12/30/2010
5	Education & Outreach Plan to DOE	12/30/2010	12/30/2010
8	AMI Meters Delivered	09/17/2010	12/01/2010
9	Residential Meter Deployment Completed	12/31/2010	02/28/2011*
21	Deploy Home Energy WEB Portal	TBD	10/20/2010
24	Deploy In-Home Display	TBD	10/27/2010
25	SmartGrid Demo Home - Opening	11/15/2010	12/01/2010

2010 Other Project Activities

- Baseline Data Collection Initiated
 - Daily AMR beginning 2/1/2010 (all meters)
 - Interval AMR beginning 7/1/2010 (~6,000 meters)
- Field Area Network Deployed and Operational - 10/01/2010
- AMI HeadEnd System Operational – 10/01/2010
- Completed Green Zone Residential Meter Exchanges – 12/13/2010
- AMI Meters Exchanged & Normal 1/1/2011 – 6,200
- Education & Outreach
 - Tour for Mid-America Regulatory Commissioners Conference Attendees
 - 4 - Local Energy Fairs
 - 7 - Neighborhood Meeting Presentations
 - Project staff in Green Impact Zone Office
 - SmartMeter Welcome Kits



2010 Reporting and Deliverables

■ Reports

- Draft PMP to DOE for Review – 10/29/2010
- Draft Interoperability Plan to DOE for Review – 10/28/2010
- Draft Cyber Security Plan to DOE for Review – 10/28/2010
- Revised Draft Cyber Security Plan to DOE for Review – 11/18/2010
- Metrics & Benefits Reporting Plan v1.0 to DOE – 12/30/2010
- Education & Outreach Plan v1.0 to DOE – 01/04/2011

■ Reporting

- DOE Project Progress Report (Quarterly) – April, July, & October
- DOE Project Progress Report (Monthly) – November & December
- DOE SF-425 Financial Report (Quarterly) - April, July, & October
- ARRA Reporting (Quarterly) – April, July, & October

2010 Project Financial Status – Year End

Funding Share	Budgeted 2010 Costs	2010 Actuals Period 1-10	2010 Actuals Period 11	2010 Actuals Period 12*	2010 Actuals Total*
Vendor In-Kind					
L+G	\$657,400	\$0	\$0	\$66,358	\$66,358
Intergraph	\$24,724	\$0	\$0	\$0	\$0
Siemens/eMeter	\$0	\$0	\$0	\$0	\$0
Siemens	\$0	\$0	\$0	\$0	\$0
Exergonix	\$1,413,069	\$0	\$0	\$0	\$0
OATI	\$403,402	\$0	\$0	\$0	\$0
All Vendor In-Kind	\$2,498,595	\$0	\$0	\$66,358	\$66,358
KCPL Share	\$4,511,246	\$1,799,651	\$363,867	\$1,633,179	\$3,796,697
DOE Share	\$5,378,296	\$1,799,651	\$363,867	\$1,633,179	\$3,796,697
All Project Costs	\$12,388,137	\$3,599,303	\$727,734	\$3,266,358	\$7,593,395

* Preliminary Numbers

Major Vendor Contract Status (12/31/2010)

Vendor	Master CPA	Requisition	Statement of Work	Contract Approval	Purchase Orders
L&G	Done	Approved	Complete	Approved	Initial POs issued
Tendril	Done	Approved	Complete	Approved	Initial POs issued
Intergraph	Done	Approved	Complete	Approved	Initial Pos Issued
Siemens	Done	Approved	Complete	Routing	
OATI	Done	Approved	Purchasing Review	Pending	
Exergonix	Legal Review	Approved	Purchasing Review	Pending	

2011 Project Milestones

No.	Task	Milestone	PMP Scheduled Complete	Target Completion Date **
7	7.8	Project Integration Architecture & Design Document	01/03/2011	3/31/2011
9	8.4.7.2	Residential AMI Meter Deployment Complete	12/31/2010	02/28/2011
10	8.5.3	SmartMeter System Commissioned	01/17/2011	3/31/2011
11	9.4	Consumer Interval Baseline Data Complete	09/30/2011	12/29/2011
15	11.1	AMI-FAN Enhanced Security Implementation	01/18/2011	06/30/2011
16	11.4.5	MDM Implementation	07/1/2011	09/30/2011
18	14.4.4	Deploy Home EMS Portal	TBD`	12/31/2011
27	15.2.4	Deploy DR (AMI) Thermostats	TBD	12/31/2011
** As all vendor contracts have not been completed some completion dates may fluctuate				

2011 Project Objectives & Plans

- Complete vendor contract negotiations and revise WBS accordingly
- Complete all functional, interoperability, security technical designs
- Complete consumer historical usage baseline data collection
- Develop operational procedures for collection of system benefits and metrics data for interim Technology Assessments & Metrics reporting.
- **SmartDistribution** - Begin Systems implementation and integration activities. This will involve the DMS components (InService, OMS, DNA, D-SCADA) and GIS; the SmartSubstation DCADA controller; and the DERM component of SmartGeneration.
- **SmartMetering** - Complete SmartMeter deployment, implement MDM and upgrade AMI infrastructure with enhanced security.
- **SmartEnd-USE** – Continue Education and Outreach Activities, continue deployment of IHD, begin installation of DR PCTs, and develop the HAN gateway configuration that will be deployed.

2011 Planned Deliverables & Reporting

■ Reports

- Project Kick-Off Meeting (Jan)
- Revised Cyber Security and Interoperability Plans (tbd)
- Revised Benefits & Metrics Reporting Plan (tbd)
- PMP Updates (semi-annual) April & October
- Project Integration Architecture & Design Document – March
- Smart Metering Implementation Report - May

■ Reporting

- DOE Proj. Progress Report (Monthly) – January - December
- DOE SF-425 Financial Report (Quarterly) – January, April, July, & October
- ARRA Reporting (Quarterly) – January, April, July, & October
- SmartGrid Build Metrics Reporting (Quarterly) January, April, July, October
- Interim TPR and Impact Metrics – (Semi-Annual) beginning October

Discussion

