NAVIGANT

Protect the environment and reduce greenhouse gases 3

I like using new technologies 4

It was free 5

Other, specify 6

Don't know .... 98 [SINGLE SELECTION]

3. When you received the display, did you expect to save money on your electric bill?

        Yes...1 [CONTINUE TO Q4]

        ....

        No..2 [SKIP TO Q5]

        (DO NOT READ) Don't know ....98 [SKIP TO Q5]

        (DO NOT READ) Refused ....99 [SKIP TO Q5]

[IF Q3=1, CONTINUE. OTHERWISE, SKIP TO Q5]

4. On average, how much money did you expect to save on your electricity bill each month? (USE 98 FOR DON'T KNOW AND 99 FOR REFUSED.)

        _____ [ENTER WHOLE DOLLAR AMOUNTS]

5. Have you noticed a decrease in your electric bill since you began using the display?

        Yes.. 1 [CONTINUE TO Q6]

        No.. 2 [SKIP TO Q7]

        Too soon to tell .... 3 [SKIP TO Q7]

        (DO NOT READ) Don't Know....................................... 98 [SKIP TO Q7]

        (DO NOT READ) Refused .... 99 [SKIP TO Q7]

[IF Q5=2,3, 98 or 99, SKIP TO Q7. OTHERWISE, CONTINUE.]

6. How much has your monthly bill decreased? (USE 98 FOR DON'T KNOW AND 99 FOR REFUSED. CLARIFY IF NEEDED, DECREASE IS AVERAGE DECREASE IN A MONTH)

        _____ [ENTER WHOLE DOLLAR AMOUNTS]

7. Since you began using your display, do you feel you have more, less, or the same amount of control over your energy use?

        More control 1

        Less control 2

NAVIGANT

The same amount of control 3

(DO NOT READ) Don't Know 98

8. How comfortable are you in using your display to see all the information that is available on it? Do you ... (READ LIST)?

Feel very comfortable 1

Feel somewhat comfortable 2

Don't feel comfortable 3

(DO NOT READ) Don't know 98

Now I would like you to rate the usefulness of some MySmart Display features. For each feature, please tell me if you find the feature Very Useful, Somewhat Useful, or Not Very Useful.

[RANDOMIZE LIST]

How would you rate the usefulness of the [INSERT FEATURE] feature? Would you say it is ... (READ LIST)

	Very Useful	Somewhat Useful	Not Very Useful	(DO NOT READ) Don't Know
9) Daily cost	3	2	1	98
10) Daily consumption	3	2	1	98
11) Alerts	3	2	1	98
12) Billing detail	3	2	1	98
13) Estimated bill	3	2	1	98

14. How would you rate the accuracy of the display's estimated bill amount? Would you say it is ... (READ LIST)?

Very accurate 4
Somewhat accurate 3
Somewhat inaccurate.. 2
Very inaccurate... 1
(DO NOT READ) Don't know 98
(DO NOT READ) Refused 99

15. How much do you think you know about being energy efficient in your home? Would you say you... (READ LIST. ACCEPT ONE)?

don't know much about being energy efficient in your home 1

NAVIGANT

know a little bit about being energy efficient in your home 2

know quite a lot about being energy efficient in your home 3

know everything you need to know about being energy
efficient in your home 4

(DO NOT READ) Don't know 98

16. Since you began using the MySmart display, what **additional** steps have you taken to reduce your electricity use? (DO NOT READ LIST. ACCEPT MULTIPLE RESPONSES.)

Turn air conditioning down 1
Turn air conditioning down when I leave home 2
Turn air conditioning off 3
Turn lights off 4
Turn TV(s) off 5
Turn computer off 6
Turn printer off 7
Unplug chargers for phones and other devices 8
Shut down or "sleep" option for electronics when not in use 9
Don't run electric dryer 10
Don't wash clothes 11
Line dry washed clothing 12
Lower water heater temperature 13
Use only warm (or cold) water for washing clothes 14
Don't cook on electric stove/oven 15
Had my home weatherized 16
Other, specify 17
Don't know .... 98[SINGLE
SELECTION]
None .... 18[SINGLE
SELECTION]

17. When you first signed up to receive the display, did you have any concerns about your participation in the program? (DO NOT READ LIST. ACCEPT MULTIPLE RESPONSES.)

I don't/didn't have any concerns .... 1 [SINGLE
SELECTION]
It will/would be hard to understand 2
It will/would requires too much time to operate 3
It will/would be difficult to use 4
My utility bill will/would go up 5
I will/would not realize any benefits from participating 6
The utility will/would have too much information about my
personal information or habits 7

NΛVIGANT

The utility will/could share information about my personal
information or habits 8
Other, specify 9
Don't know .... 98 **[SINGLE**

SELECTION]

[FOR Q17=10, RECODE TO Q17=1]

18. Based on your original expectations, how satisfied are you with the display so far? Are you...
(READ LIST. SELECT ONE)?
Completely satisfied 5
Somewhat satisfied 4
Neither satisfied nor dissatisfied 3
Somewhat dissatisfied 2
Completely dissatisfied 1
(DO NOT READ) Refused 99
(DO NOT READ) Don't know 98

[IF Q18 = 1 or 2, CONTINUE TO 18B, OTHERWISE SKIP TO Q19]

18B. Why are you dissatisfied with the display? **[RECORD VERBATIM]**

19. Based on your experience with the MySmart Display so far, would you say your satisfaction
with KCP&L has... (READ LIST)?

Increased 1

Stayed the same 2

Decreased 3

(DO NOT READ) Don't know 98

(DO NOT READ) Refused 99

TOU (TIME OF USE) QUESTIONS

20. Are you on KCP&L's Time of Use rate plan? (INTERVIEWER: IF RESPONDENT ASKS WHAT
THE TIME OF USE RATE PLAN IS, USE THIS PAT RESPONSE: "THE TIME OF USE RATE
PLAN OFFERS LOWER COST ENERGY RATES DURING OFF-PEAK HOURS DURING THE
MONTHS OF MAY TO SEPTEMBER.")

Yes 1

No .... 2 **[SKIP TO Q26]**

Don't know .... 98 **[SKIP TO Q26]**

Refused .... 99 **[SKIP TO Q26]**

[IF Q20=1, CONTINUE. OTHERWISE, SKIP TO Q26]

NAVIGANT

TIME INTRO. Now I would like you to think about changes in your electric usage since joining the Time of Use rate plan. For each time period I read, please tell me if you are using less electricity during this period, there is no change, or you are using more electricity during this period.

From the hours of [INSERT TIME PERIOD], would you say ...?

	You are using **LESS** electricity during this time period	There is **NO CHANGE** in your electric usage during this time period	You are using **MORE** electricity during this time period	(DO NOT READ) Don't Know
21) 7am to 11am	3	2	1	98
22) 11am to 3pm	3	2	1	98
23) 3pm to 7pm	3	2	1	98
24) 7pm to 11pm	3	2	1	98

25.   Based on your original expectations, how satisfied are you with the Time of Use rate plan so far? Are you... (READ LIST. SELECT ONE)?

       Completely satisfied 5
       Somewhat satisfied 4
       Neither satisfied nor dissatisfied 3
       Somewhat dissatisfied 2
       Completely dissatisfied 1
       (DO NOT READ) Refused 99
       (DO NOT READ) Don't know 98

PORTAL QUESTIONS

26.   Do you have an ID and password that allows you to view your electric usage through KCP&L's MySmart Portal? (INTERVIEWER: IF RESPONDENT ASKS WHAT THE MY SMART PORTAL IS, USE THIS PAT RESPONSE: "MYSMART PORTAL IS AN ONLINE FEATURE ACCESSED FROM THE KCP&L PAYMENT WEBSITE. WITH MYSMART PORTAL, YOU CAN VIEW YOUR ESTIMATED MONTHLY BILL, SET ENERGY SAVINGS GOALS, GET ENERGY SAVING TIPS, AND COMPARE YOUR ENERGY USAGE COMPARED TO OTHER HOMES IN YOUR COMMUNITY.")

       Yes 1
       No .... 2 [SKIP TO Q37]
       Don't know .... 98 [SKIP TO Q37]
       Refused .... 99 [SKIP TO Q37]

NΛVIGANT

27. How often have you looked at the MySmart Portal in the last month? (DO NOT READ LIST. ACCEPT SINGLE RESPONSE.)

Just once 1

Two to five times... 2

Six to 15 times.. 3

16 times or more.. 4

Zero/None.. 5
Don't know .... 98 [SKIP TO Q37]
Refused .... 99 [SKIP TO Q37]

[IF Q27=5, CONTINUE. IF Q27=1-4, SKIP TO Q28. IF Q27=98 OR 99, SKIP TO Q37]

27a.   Have you ever used the MySmart Portal?

Yes 1

No.. 2 [SKIP TO Q37]

28.   What actions do you typically take when you use the portal?

    [RECORD VERBATIM]

FEATURE INTRO. Now I would like you to rate the usefulness of some MySmart Portal features. For each feature, please tell me if you think it is Very Useful, Somewhat Useful, or Not Very Useful.

[RANDOMIZE LIST]
For the feature [INSERT FEATURE], would you say it is very useful, somewhat useful, or not very useful?

	Very Useful	Somewhat Useful	Not Very Useful	(DO NOT READ) Don't Know
29) Energy-Saving Tips	3	2	1	98
30) Energy Expert	3	2	1	98
31) Set an energy savings goal	3	2	1	98
32) Bill estimate	3	2	1	98
33) Amount of bill to date	3	2	1	98
34) Hourly energy usage charts	3	2	1	98

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NAVIGANT

35) MySmart Portal in general	3	2	1	98

36. Based on your original expectations, how satisfied are you with the MySmart Portal so far? Are you... (READ LIST. SELECT ONE)?

Completely satisfied 5
Somewhat satisfied 4
Neither satisfied nor dissatisfied 3
Somewhat dissatisfied.. 2
Completely dissatisfied 1
(DO NOT READ) Refused 99
(DO NOT READ) Don't know 98

[IF Q36 = 1 or 2, CONTINUE, OTHERWISE SKIP TO Q37]

36B. Why are you dissatisfied with the MySmart Portal?
[RECORD VERBATIM]

SMARTGRID PROJECT

In addition to introducing new technologies to the SmartGrid demonstration area, KCP&L has partnered with local businesses and organizations to help with economic development. In doing so, KCP&L has been able to hire project leads and installers that live and work within the local community. KCP&L also opened a dedicated SmartGrid office at 4600 Paseo that allows customers to pick-up SmartGrid products and get additional information from a live person. This is all part of KCP&L's commitment to the SmartGrid demonstration project and its customers in this area.

37. How aware were you of KCP&L's involvement in the SmartGrid project that I just described? Were you... (READ LIST. SELECT ONE)?

Completely aware 5
Somewhat aware 4
Neither aware nor unaware... 3
Somewhat unaware 2
Completely unaware 1
(DO NOT READ) Refused 99
(DO NOT READ) Don't know 98

38. How important is it to you that KCP&L provides these additional benefits to the customers in the SmartGrid demonstration area? Is it... (READ LIST. SELECT ONE)?

Extremely important.. 5
Somewhat important 4
Neither important nor unimportant... 3
Somewhat unimportant 2
Extremely unimportant 1
(DO NOT READ) Refused 99

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NAVIGANT

(DO NOT READ) Don't know 98

39. Based on your participation in KCP&L's SmartGrid program so far, how satisfied are you with KCP&L? Are you... (READ LIST. SELECT ONE)?
    Completely satisfied 5
    Somewhat satisfied 4
    Neither satisfied nor dissatisfied 3
    Somewhat dissatisfied 2
    Completely dissatisfied 1
    (DO NOT READ) Refused 99
    (DO NOT READ) Don't know 98

40. Do you have any suggestions on ways that KCP&L could improve the program?
    [RECORD VERBATIM]
    [PROGRAMMER: ALLOW A NO COMMENT CHECK BOX.]

41. Do you have any other comments on the program as you've experienced it so far?
    [RECORD VERBATIM]
    [PROGRAMMER: ALLOW A NO COMMENT CHECK BOX.]

42. What is the highest level of education completed by any head of household in the home? (DO NOT READ LIST. SELECT ONE)
    Elementary (grades 1-8) 6
    Some high school (grades 9-12) 5
    High school graduate 4
    Some college/trade/vocational school 3
    College graduate 2
    Postgraduate college 1
    (DO NOT READ) Don't know 98
    (DO NOT READ) Refused 99

43. Please stop me when I read your age range. Are you...(READ LIST)?

    Under 21 years old 1
    21 – 29 2
    30 – 39 3
    40 – 49 4
    50 – 64 5
    65 years old or older 6
    Don't Know (DO NOT READ) 98
    Refused (DO NOT READ) 99

44. (RECORD GENDER. VERIFY, IF NECESSARY.)
    Male 1

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NAVIGANT

Female 2
Refused3

45. What kind of home do you live in? [READ LIST. ACCEPT SINGLE RESPONSE]
Single-family home.. 1
Single family attached, such as a townhouse 2
Multi-family home, such as a duplex, apartment, or condo 3
Mobile home 4
Other (Specify) 5
Don't Know (DO NOT READ).. 98
Refused (DO NOT READ)... 99

46.   Do you own or rent your residence?
Own 1
Rent 2
Other (Specify) 3
Don't Know 98
Refused 99

CLOSING: Those are all of the questions I have for you today. Thank you very much for your time.

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Appendix S   Build Metrics

S.1   Baseline 2010

SMARTGRID.GOV

Project: DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing: build_baseline — Baseline Build Metrics Report 2010
Period: Start: Jan 1, 2010   End: Dec 31, 2010   Submission Due Date: October 31, 2011

AMI System Descriptions

Meter Data Management System

Meter Data Analysis

Other Meter Feature

Other Meter Feature

Other Meter Feature

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SMARTGRID.GOV

Project: DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing: build_baseline — Baseline Build Metrics Report 2010
Period: Start: Jan 1, 2010   End: Dec 31, 2010   Submission Due Date: October 31, 2011

AMI Enterprise Integration Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Billing System

Customer Information System

Outage Management System

Distribution Management System

Other Enterprise System

Additional Project Descriptions

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SMARTGRID.GOV

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Filing	build_baseline Baseline Build Metrics Report 2010
Period	Start: Jan 1, 2010 End: Dec 31, 2010 Submission Due Date: October 31, 2011

Customer Device Descriptions

Other Device

Other Device

Other Device

Additional Project Descriptions

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SMARTGRID.GOV

Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline Baseline Build Metrics Report 2010
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Pricing Programs - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Flat Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate: forecasted number of customers with access	#					
Flat Rate: forecasted number of customers enrolled	#					
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Flat Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Flat Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Tiered Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate: forecasted number of customers with access	#					
Tiered Rate: forecasted number of customers enrolled	#					
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Tiered Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Tiered Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Time of Use Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐

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SMARTGRID.GOV

Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)			
Filing	build_baseline	Baseline Build Metrics Report 2010		
Period	Start: Jan 1, 2010	End: Dec 31, 2010	Submission Due Date:	October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Time of Use Rate: forecasted number of customers with access	#					
Time of Use Rate: forecasted number of customers enrolled	#					
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Time of Use Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Time of Use Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Real-time Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing: forecasted number of customers with access	#					
Real-time Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Critical Peak Pricing: forecasted number of customers with access	#					
Real-time Pricing with Critical Peak Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Peak-Time Rebate: forecasted number of customers with access	#					
Real-time Pricing with Peak-Time Rebate: forecasted number of customers enrolled	#					
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Variable Peak Pricing: forecasted number of customers with access	#					
Variable Peak Pricing: forecasted number of customers enrolled	#					
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Pre-pay Pricing: forecasted number of customers with access	#					
Pre-pay Pricing: forecasted number of customers enrolled	#					

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Filing	build_baseline	Baseline Build Metrics Report 2010		
Period	Start: Jan 1, 2010	End: Dec 31, 2010	Submission Due Date:	October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Net Metering: is the pricing program available?	yes/	no	☐	☐	☐	☐
Net Metering: forecasted number of customers with access	#					
Net Metering: forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Rate Decoupling is implemented?	yes/	no	☐			

Rate Plan Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Flat Rate

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Electric Distribution System Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distribution Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Portion of system with SCADA	%	0	0	0	0
Portion of system with Distribution Automation (DA)	%	0	0	0	0
Automated Feeder Switches: forecasted number of devices installed	#	0	0	0	0
Automated Capacitors: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Automated Regulators: forecasted number of devices installed	#	0	0	0	0
Feeder Monitors: forecasted number of devices installed	#	0	0	0	0
Remote Fault Indicators: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Transformer Monitors (line): forecasted number of devices installed	#	0	0	0	0
Smart Relays: forecasted number of devices installed	#	0	0	0	0
Fault Current Limiter: forecasted number of devices installed	#	0	0	0	0
Other devices installed	#				
Other devices installed	#				
Other devices installed	#				

DA Applications in Operation	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/no	☐	☐	☐	☐
Voltage Optimization: is this application in operation?	yes/no	☐	☐	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/no	☐	☐	☐	☐
Microgrids: is this application in operation?	yes/no	☐	☐	☐	☐
Other DA Application: is this application in operation?	yes/no	☐	☐	☐	☐

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Implemented Distribution Management Integration	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
AMI: is integration complete? (estimated time frame when integration is complete)	yes/no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/no	☐	☐	☐	☐
Transmission Management System: is integration complete? (estimated time frame when integration is complete)	yes/no	☐	☐	☐	☐
Distributed Energy Resources: is integration complete? (estimated time frame when integration is complete)	yes/no	☐	☐	☐	☐
Other Systems: is integration complete? (estimated time frame when integration is complete)	yes/no	☐	☐	☐	☐

Distribution Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

SCADA	KCP&L has a transmission level EMS that monitors and controls all urban substations, including the project area which is fed by the Midtown substation. At the Midtown substation, the EMS reaches down to the heads of each circuit.
Portion of system with SCADA	100% of the project area has SCADA.
Portion of system with DA	

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S.2   Baseline 2011

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Customer Device Descriptions

Other Device

Other Device

Other Device

Additional Project
Descriptions

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Pricing Programs - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Flat Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate: forecasted number of customers with access	#					
Flat Rate: forecasted number of customers enrolled	#					
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Flat Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Flat Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Tiered Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate: forecasted number of customers with access	#					
Tiered Rate: forecasted number of customers enrolled	#					
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Tiered Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Tiered Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Time of Use Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐

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Filing	build_baseline Baseline Build Metrics Report 2011
Period	Start: Jan 1, 2011 End: Dec 31, 2011 Submission Due Date: October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Time of Use Rate: forecasted number of customers with access	#					
Time of Use Rate: forecasted number of customers enrolled	#					
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Time of Use Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Time of Use Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Real-time Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing: forecasted number of customers with access	#					
Real-time Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Critical Peak Pricing: forecasted number of customers with access	#					
Real-time Pricing with Critical Peak Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Peak-Time Rebate: forecasted number of customers with access	#					
Real-time Pricing with Peak-Time Rebate: forecasted number of customers enrolled	#					
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Variable Peak Pricing: forecasted number of customers with access	#					
Variable Peak Pricing: forecasted number of customers enrolled	#					
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Pre-pay Pricing: forecasted number of customers with access	#					
Pre-pay Pricing: forecasted number of customers enrolled	#					

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Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Net Metering: is the pricing program available?	yes/	no	☐	☐	☐	☐
Net Metering: forecasted number of customers with access	#					
Net Metering: forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Rate Decoupling is implemented?	yes/	no	☐			

Rate Plan Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Flat Rate

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Rate Plan Descriptions

Pre-paid Rate

Net Metering Rate

Other program

Other program

Other program

Additional Program Descriptions

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Distributed Energy Resources - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distributed Energy and Renewable Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Distributed generation: forecasted number of units	#	0	0	0	0
Distributed generation: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Distributed generation: estimated total energy delivered	* kWh	0	0	0	0
Energy storage: forecasted number of units	#	0	0	0	0
Energy storage: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Energy storage: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: forecasted number of units	#	0	0	0	0
Plug-in electric vehicles charging points: installed capacity	kW	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
DER/DG interconnection equipment: forecasted number of units	#				

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Project

Distributed Generation Interface Description

Additional Program Descriptions

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Electric Distribution System Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level i.e. it should not include assets that were installed prior to the SGDP project. It should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distribution Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Portion of system with SCADA	%	0	0	0	0
Portion of system with Distribution Automation (DA)	%	0	0	0	0
Automated Feeder Switches: forecasted number of devices installed	#	0	0	0	0
Automated Capacitors: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Automated Regulators: forecasted number of devices installed	#	0	0	0	0
Feeder Monitors: forecasted number of devices installed	#	0	0	0	0
Remote Fault Indicators: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Transformer Monitors (line): forecasted number of devices installed	#	0	0	0	0
Smart Relays: forecasted number of devices installed	#	0	0	0	0
Fault Current Limiter: forecasted number of devices installed	#	0	0	0	0
Other devices installed:	#				
Other devices installed	#				
Other devices installed	#				

DA Applications in Operation	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐	☐	☐

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Implemented Distribution Management Integration	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
AMI: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Transmission Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Distributed Energy Resources: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Other Systems: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐

Distribution Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

SCADA	

Portion of system with SCADA	

Portion of system with DA	

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Distribution Device Descriptions

DA devices

DA communications
network

Other device

Other device

Other device

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Distribution Application Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

FLISR

Voltage Optimization

Feeder Peak Load
Management

Microgrids

Other DA Applications

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S.3   Baseline 2012

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Customer Systems Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Customer Systems	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
In-Home display: forecasted devices installed	#	0	0	0	0
Direct load control devices: forecasted devices installed	#	0.0	0.0	0.0	0.0
Programmable communicating thermostats: forecasted devices installed	#	0	0	0	0
Smart appliances: forecasted devices installed	#	0	0	0	0
Energy management devices/systems: forecasted devices installed	#	0.0	0.0	0.0	0.0
Other devices installed	#				
Other devices installed	#				
Other devices installed	#				

Web Portal	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Web portal: Is portal in production?	yes/ no	☐	☐	☐	☐
Forecasted number of customers with access	#				
Forecasted number of customers with active accounts	#				

Customer Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

In-Home Displays	

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Customer Device Descriptions

Direct Load Control Devices	
Programmable Communicating Thermostats	
Smart Appliances	
Energy Mgmt Systems	
Web Portal	
Home Area Network	

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Customer Device Descriptions

Other Device

Other Device

Other Device

Additional Project Descriptions

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Pricing Programs - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Flat Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate: forecasted number of customers with access	#					
Flat Rate: forecasted number of customers enrolled	#					
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Flat Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Flat Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Tiered Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate: forecasted number of customers with access	#					
Tiered Rate: forecasted number of customers enrolled	#					
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Tiered Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Tiered Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Time of Use Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐

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Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Time of Use Rate: forecasted number of customers with access	#					
Time of Use Rate: forecasted number of customers enrolled	#					
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Time of Use Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Time of Use Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Real-time Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing: forecasted number of customers with access	#					
Real-time Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Critical Peak Pricing: forecasted number of customers with access	#					
Real-time Pricing with Critical Peak Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Peak-Time Rebate: forecasted number of customers with access	#					
Real-time Pricing with Peak-Time Rebate: forecasted number of customers enrolled	#					
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Variable Peak Pricing: forecasted number of customers with access	#					
Variable Peak Pricing: forecasted number of customers enrolled	#					
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Pre-pay Pricing: forecasted number of customers with access	#					
Pre-pay Pricing: forecasted number of customers enrolled	#					

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Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Net Metering: is the pricing program available?	yes/	no	☐	☐	☐	☐
Net Metering: forecasted number of customers with access	#					
Net Metering: forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Rate Decoupling is implemented?	yes/	no	☐			

Rate Plan Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Flat Rate

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Rate Plan Descriptions

Pre-paid Rate

Net Metering Rate

Other program

Other program

Other program

Additional Program
Descriptions

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Distributed Energy Resources - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distributed Energy and Renewable Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Distributed generation: forecasted number of units	#	0	0	0	0
Distributed generation: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Distributed generation: estimated total energy delivered	* kWh	0	0	0	0
Energy storage: forecasted number of units	#	0	0	0	0
Energy storage: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Energy storage: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: forecasted number of units	#	0	0	0	0
Plug-in electric vehicles charging points: installed capacity	kW	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
DER/DG interconnection equipment: forecasted number of units	#				

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Project

Distributed Generation
Interface Description

Additional Program
Descriptions

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Electric Distribution System Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distribution Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Portion of system with SCADA	%	0	0	0	0
Portion of system with Distribution Automation (DA)	%	0	0	0	0
Automated Feeder Switches: forecasted number of devices installed	#	0	0	0	0
Automated Capacitors: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Automated Regulators: forecasted number of devices installed	#	0	0	0	0
Feeder Monitors: forecasted number of devices installed	#	0	0	0	0
Remote Fault Indicators: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Transformer Monitors (line): forecasted number of devices installed	#	0	0	0	0
Smart Relays: forecasted number of devices installed	#	0	0	0	0
Fault Current Limiter: forecasted number of devices installed	#	0	0	0	0
Other devices installed:	#				
Other devices installed	#				
Other devices installed	#				

DA Applications in Operation	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐	☐	☐

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Implemented Distribution Management Integration	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
AMI: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Transmission Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Distributed Energy Resources: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Other Systems: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐

Distribution Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

SCADA

Portion of system with SCADA

Portion of system with DA

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S.4 Baseline 2013

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AMI Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

AMI End Points Installed	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
End Points (meters) forecasted to be installed and operational	#	0	0	0	0
Portion of customers with AMI residential	#	0	0	0	0
Portion of customers with AMI commercial	#	0	0	0	0
Portion of customers with AMI industrial	#	0	0	0	0

Implemented Meter Features	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Reading interval for residential meters	minutes	0	0	0	0
Reading interval for commercial meters	minutes	0	0	0	0
Reading interval for industrial meters	minutes	0	0	0	0
Remote Connect/Disconnect: is feature implemented? (estimated time frame when feature is operational)	yes/ no	☐	☐	☐	☐
Remote Connect/Disconnect: forecasted number of meters with feature	#				
Outage Reporting: is feature implemented? (estimated time frame when feature is operational)	yes/ no	☐	☐	☐	☐
Outage Reporting: forecasted number of meters with feature implemented	#				
Power Quality Measurement: is feature implemented? (estimated time frame when feature is operational)	yes/ no	☐	☐	☐	☐
Power Quality Measurement: forecasted number of meters with feature	#				
Tamper Detection: is feature implemented? (estimated time frame when feature is operational)	yes/ no	☐	☐	☐	☐
Tamper Detection: forecasted number of meters with feature implemented	#				
Other feature implemented	yes/ no	☐	☐	☐	☐
Other feature: forecasted number of meters with feature implemented	#				
Other feature implemented	yes/ no	☐	☐	☐	☐
Other feature: forecasted number of meters with feature implemented	#				

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Implemented Meter Features	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Other feature implemented	yes/ no	☐	☐	☐	☐
Other feature: forecasted number of meters with feature implemented	#				

Implemented Enterprise Integration	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Billing System: is integration complete? (estimated time frame when integration is complete)	yes/ no	☐	☐	☐	☐
Customer Information System: is integration complete? (estimated time frame when integration is complete)	yes/ no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/ no	☐	☐	☐	☐
Distribution Management System: is integration complete? (estimated time frame when integration is complete)	yes/ no	☐	☐	☐	☐
Other Enterprise Systems: is integration complete? (estimated time frame when integration is complete)	yes/ no	☐	☐	☐	☐

AMI System Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Backhaul Network	
Meter Communication	
Headend System	

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline Baseline Build Metrics Report 2013
Period	Start: Jan 1, 2013 End: Dec 31, 2013 Submission Due Date: October 31, 2011

Customer Device Descriptions

Other Device

Other Device

Other Device

Additional Project
Descriptions

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline Baseline Build Metrics Report 2013
Period	Start: Jan 1, 2013 End: Dec 31, 2013 Submission Due Date: October 31, 2011

Pricing Programs - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Flat Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate: forecasted number of customers with access	#					
Flat Rate: forecasted number of customers enrolled	#					
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Flat Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Flat Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Tiered Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate: forecasted number of customers with access	#					
Tiered Rate: forecasted number of customers enrolled	#					
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Tiered Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Tiered Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Time of Use Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)		
Filing	build_baseline	Baseline Build Metrics Report 2013	
Period	Start: Jan 1, 2013 End: Dec 31, 2013	Submission Due Date:	October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Time of Use Rate: forecasted number of customers with access	#					
Time of Use Rate: forecasted number of customers enrolled	#					
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Time of Use Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Time of Use Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Real-time Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing: forecasted number of customers with access	#					
Real-time Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Critical Peak Pricing: forecasted number of customers with access	#					
Real-time Pricing with Critical Peak Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Peak Time Rebate: forecasted number of customers with access	#					
Real-time Pricing with Peak-Time Rebate: forecasted number of customers enrolled	#					
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Variable Peak Pricing: forecasted number of customers with access	#					
Variable Peak Pricing: forecasted number of customers enrolled	#					
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Pre-pay Pricing: forecasted number of customers with access	#					
Pre-pay Pricing: forecasted number of customers enrolled	#					

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)		
Filing	build_baseline	Baseline Build Metrics Report 2013	
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Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Net Metering: is the pricing program available?	yes/	no	☐	☐	☐	☐
Net Metering: forecasted number of customers with access	#					
Net Metering: forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available [ ]	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Rate Decoupling is implemented?	yes/	no	☐			

Rate Plan Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Flat Rate

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Rate Plan Descriptions

Flat Rate with Critical Peak Pricing

Flat Rate with Peak Time Rebate

Tiered Rate

Tiered Rate with Critical Peak Pricing

Tiered Rate with Peak Time Rebate

Time of Use Rate

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
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Rate Plan Descriptions

Time of Use Rate with Critical Peak Pricing

Time of Use Rate with Peak Time Rebate

Real-Time Rate

Real-time Rate with Critical Peak Pricing

Real-time Rate with Peak Time Rebate

Variable Peak Pricing

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
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Rate Plan Descriptions

Pre-paid Rate

Net Metering Rate

Other program

Other program

Other program

Additional Program Descriptions

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline	Baseline Build Metrics Report 2013	
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Distributed Energy Resources - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distributed Energy and Renewable Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Distributed generation: forecasted number of units	#	0	0	0	0
Distributed generation: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Distributed generation: estimated total energy delivered	* kWh	0	0	0	0
Energy storage: forecasted number of units	#	0	0	0	0
Energy storage: estimated installed capacity	kW	0.0	0.0	0.0	0.0
Energy storage: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: forecasted number of units	#	0	0	0	0
Plug-in electric vehicles charging points: installed capacity	kW	0.0	0.0	0.0	0.0
Plug-in electric vehicles charging points: estimated total energy delivered	* kWh	0.0	0.0	0.0	0.0
DER/DG interconnection equipment: forecasted number of units	#				

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Project

Distributed Generation Interface Description

Additional Program Descriptions

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Filing	build_baseline	Baseline Build Metrics Report 2013
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Electric Distribution System Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distribution Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Portion of system with SCADA	%	0	0	0	0
Portion of system with Distribution Automation (DA)	%	0	0	0	0
Automated Feeder Switches: forecasted number of devices installed	#	0	0	0	0
Automated Capacitors: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Automated Regulators: forecasted number of devices installed	#	0	0	0	0
Feeder Monitors: forecasted number of devices installed	#	0	0	0	0
Remote Fault Indicators: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Transformer Monitors (line): forecasted number of devices installed	#	0	0	0	0
Smart Relays: forecasted number of devices installed	#	0	0	0	0
Fault Current Limiter: forecasted number of devices installed	#	0	0	0	0
Other devices installed:	#				
Other devices installed	#				
Other devices installed	#				

DA Applications in Operation	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐	☐	☐

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Implemented Distribution Management Integration	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
AMI: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Transmission Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Distributed Energy Resources: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Other Systems: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐

Distribution Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

SCADA

Portion of system with SCADA

Portion of system with DA

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline Baseline Build Metrics Report 2013
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Distribution Device Descriptions

DA devices

DA communications network

Other device

Other device

Other device

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline Baseline Build Metrics Report 2013
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Distribution Application Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

FLISR

Voltage Optimization

Feeder Peak Load Management

Microgrids

Other DA Applications

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S.5   Baseline 2014

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline	Baseline Build Metrics Report 2014	
Period	Start: Jan 1, 2014	End: Dec 31, 2014	Submission Due Date: October 31, 2011

Customer Device Descriptions

Other Device

Other Device

Other Device

Additional Project Descriptions

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline	Baseline Build Metrics Report 2014	
Period	Start: Jan 1, 2014	End: Dec 31, 2014	Submission Due Date: October 31, 2011

Pricing Programs - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level (i.e. it should not include assets that were installed prior to the SGDP project, it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Flat Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate: forecasted number of customers with access	#					
Flat Rate: forecasted number of customers enrolled	#					
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Flat Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Flat Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Flat Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Tiered Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate: forecasted number of customers with access	#					
Tiered Rate: forecasted number of customers enrolled	#					
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Tiered Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Tiered Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Tiered Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Time of Use Rate: is the pricing program available?	yes/	no	☐	☐	☐	☐

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline	Baseline Build Metrics Report 2014	
Period	Start: Jan 1, 2014	End: Dec 31, 2014	Submission Due Date: October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Time of Use Rate: forecasted number of customers with access	#					
Time of Use Rate: forecasted number of customers enrolled	#					
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Critical Peak Pricing: forecasted number of customers with access	#					
Time of Use Rate with Critical Peak Pricing: forecasted number of customers enrolled	#					
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Time of Use Rate with Peak-Time Rebate: forecasted number of customers with access	#					
Time of Use Rate with Peak-Time Rebate: forecasted number of customers enrolled	#					
Real-time Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing: forecasted number of customers with access	#					
Real-time Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Critical Peak Pricing: forecasted number of customers with access	#					
Real-time Pricing with Critical Peak Pricing: forecasted number of customers enrolled	#					
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐	☐	☐
Real-time Pricing with Peak-Time Rebate: forecasted number of customers with access	#					
Real-time Pricing with Peak-Time Rebate: forecasted number of customers enrolled	#					
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Variable Peak Pricing: forecasted number of customers with access	#					
Variable Peak Pricing: forecasted number of customers enrolled	#					
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐	☐	☐
Pre-pay Pricing: forecasted number of customers with access	#					
Pre-pay Pricing: forecasted number of customers enrolled	#					

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline	Baseline Build Metrics Report 2014	
Period	Start: Jan 1, 2014	End: Dec 31, 2014	Submission Due Date: October 31, 2011

Implemented Rate Plans	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Net Metering: is the pricing program available?	yes/	no	☐	☐	☐	☐
Net Metering: forecasted number of customers with access	#					
Net Metering: forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Other program available	yes/	no	☐	☐	☐	☐
Other programs forecasted number of customers with access	#					
Other programs forecasted number of customers enrolled	#					
Rate Decoupling is implemented?	yes/	no	☐			

Rate Plan Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

Flat Rate

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline — Baseline Build Metrics Report 2014
Period	Start: Jan 1, 2014 End: Dec 31, 2014 Submission Due Date: October 31, 2011

Electric Distribution System Assets - Build Metrics Baseline

All data should be cumulative. All data reported should be at the project level i.e. it should not include assets that were installed prior to the SGDP project. it should only include assets that would have been installed had the SGDP award not been granted).

Implemented Distribution Devices	Units	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Portion of system with SCADA	%	0	0	0	0
Portion of system with Distribution Automation (DA)	%	0	0	0	0
Automated Feeder Switches: forecasted number of devices installed	#	0	0	0	0
Automated Capacitors: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Automated Regulators: forecasted number of devices installed	#	0	0	0	0
Feeder Monitors: forecasted number of devices installed	#	0	0	0	0
Remote Fault Indicators: forecasted number of devices installed	#	0.0	0.0	0.0	0.0
Transformer Monitors (line): forecasted number of devices installed	#	0	0	0	0
Smart Relays: forecasted number of devices installed	#	0	0	0	0
Fault Current Limiter: forecasted number of devices installed	#	0	0	0	0
Other devices installed	#				
Other devices installed	#				
Other devices installed	#				

DA Applications in Operation	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐	☐	☐

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_baseline — Baseline Build Metrics Report 2014
Period	Start: Jan 1, 2014 End: Dec 31, 2014 Submission Due Date: October 31, 2011

Implemented Distribution Management Integration	Units		Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
AMI: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Outage Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Transmission Management System: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Distributed Energy Resources: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐
Other Systems: is integration complete? (estimated time frame when integration is complete)	yes/	no	☐	☐	☐	☐

Distribution Device Descriptions

Please enter the information only once for project and specify the year and quarter that the metric is first planned to be installed and operational. Please report the Quarter this equipment is first planned to become operational.

SCADA

Portion of system with SCADA

Portion of system with DA

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S.6   2011 Q3

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_quarterly	Build Metrics Quarterly Report Quarter 3, 2011
Period	Start: Jul 1, 2011	End: Sep 30, 2011	Submission Due Date: October 31, 2011

AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing ARM – MDA interfaces. AMI>>MDA provides daily midnight read and interval meter readings (DataRaker).	The project AMI was incorporated into the existing ARM – MDA interfaces. AMI>>MDA provides daily midnight read and interval meter readings (DataRaker).
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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Project	DE-OE0000221 Kansas City Power & Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_quarterly	Build Metrics Quarterly Report Quarter 3, 2011
Period	Start: Jul 1, 2011	End: Sep 30, 2011	Submission Due Date: October 31, 2011

AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS>>AMI daily account/meter synchronization. AMI>>CIS daily meter readings CIS>>AMI daily to-date use calculation and of monthly bill	AMI is integrated with enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS>>AMI daily account/meter synchronization. AMI>>CIS daily meter readings CIS>>AMI daily to-date use calculation and of monthly bill
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR – OMS interfaces. AMI>>OMS meter outage alerts and OMS>>AMI meter "ping" functions to verify power restoration	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR – OMS interfaces. AMI>>OMS meter outage alerts and OMS>>AMI meter "ping" functions to verify power restoration
Distribution Management System	Not yet integrated	Not yet integrated
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker)	Data Mining and Analysis Tool (DataRaker)
Additional Project Descriptions	N/A	

AMI Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	343,373	343,373
Communications Equipment	$	99,281	99,281
AMI Smart Meters	$	2,010,845	2,010,845

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$	0	0

Other Costs Description: N/A

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	828	828
Direct Load Control Devices: devices installed	#	0.0	0.0
Programmable Communicating Thermostats: devices installed	#	0	51,875
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed	#	0	0
Other Devices installed	#	0	0
Other Devices installed	#	0	0

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	11,760	11,760
Customers with active accounts	#	780	780

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Not yet installed	Not yet installed
Programmable Communicating Thermostats	Not yet installed	Honeywell PCTs with one-way paging communications
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energy Management Portal	Tendril Energy Management Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device	N/A	N/A
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	220,542	220,542
Web Portals	$	279,500	279,500
In-Home Displays	$	110,863	110,863
Direct Load Control Devices	$	0	0
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	0	0
Cost of other devices installed	$	0	0

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Customer System Installed Costs

Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$	0	0
Cost of other devices installed	$	0	0
Other Costs	$	35,993	35,993

Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement

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Pricing Programs - Build Metrics

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Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			540,841
Flat Rate: number of customers enrolled	#			540,798
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			300,073
Tiered Rate: number of customers enrolled	#			300,026
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	☐	■
Time of Use Rate: number of customers with access	#			841,416

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#			429
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			2,453
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			154
Net Metering: number of customers enrolled	#			154
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple Flat rates that occur during both summer and winter.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing Tiered Rates. A majority of those are declining block rates.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new TOU rate will be piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing TOU rates
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing Net Metering rates
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	1	1
Distributed generation: installed capacity	kW	3	3
Distributed generation: total energy delivered	* kWh	0	0
Energy storage: number of units	#	0	0
Energy storage: installed capacity	kW	0.0	0.0
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	1	11
Plug-in electric vehicles charging points: installed capacity	kW	3	73
Plug-in electric vehicles charging points: total energy delivered	* kWh	0.0	425
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters.

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Additional Project Descriptions: kWh on the residential PV system and EV charger (120V) installed has not been measured directly up to this point but future systems will include direct usage measurement.

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	0	0
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	0	0
Distributed Generation Equipment	$	18,368	18,368
Stationary Electric Storage Equipment	$	0	0
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$	0	0

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

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Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	0	75
Automated Feeder Switches: number of devices installed	#	0	94
Automated Capacitors: number of devices installed	#	0.0	1,822
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	0.0	222
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	35	2,250
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#	0	0
Other devices installed	#	0	0
Other devices installed	#	0	0

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area	ABB Network Manager (EMS).
Portion of system with SCADA	Distribution SCADA will be installed in the project area	The ABB Network Manager (EMS) communicates to 70% of distribution feeders but only 15% are capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 75% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	L+G AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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AMI Assets - Build Metrics

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AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	12,252	12,252
Portion of customers with AMI residential	#	11,092	11,092
Portion of customers with AMI commercial	#	1,160	1,160
Portion of customers with AMI industrial	#	0	0

Implemented Meter Features	Units		Project	System
Reading interval for residential meters	minutes		15	15
Reading interval for commercial meters	minutes		15	15
Reading interval for industrial meters	minutes		0	0
Remote Connect/Disconnect: is feature implemented?	yes/	no	☐	☐
Remote Connect/Disconnect: number of meters with feature implemented	#			
Outage Reporting: is feature implemented?	yes/	no	■	■
Outage Reporting: number of meters with feature implemented	#		12,252	12,252
Power Quality Measurement: is feature implemented?	yes/	no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#			
Tamper Detection: is feature implemented?	yes/	no	■	■
Tamper Detection: number of meters with feature implemented	#		12,252	12,252
Other feature implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented	yes/	no	☐	☐

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Implemented Meter Features	Units		Project	System
Other feature: number of meters with feature implemented	#			

Implemented Enterprise Integration	Units		Project	System
Billing System: is integration complete?	yes/	no	■	■
Customer Information System: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Distribution Management System: is integration complete?	yes/	no	☐	☐
Other Enterprise Systems: is integration complete?	yes/	no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Fiber and Wireless Raven radio with network carrier	Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter	eMeter

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including, meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including, meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	Not yet integrated	Not yet integrated
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	402,273	402,273
Communications Equipment	$	103,669	103,669
AMI Smart Meters	$	2,021,042	2,021,042

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AMI Installed Costs (Build Metrics Quarterly Report Quarter 4, 2011)

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AMI Installed Costs	Units	Project Funded	Cost Share
Other Costs	$	0	0
Other Costs Description	N/A		

Customer Systems Assets - Build Metrics

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Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	626	626
Direct Load Control Devices: devices installed	#	2	2
Programmable Communicating Thermostats: devices installed	#	1	52,633
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway	#	1	1
Other Devices installed	#	0	0
Other Devices installed	#	0	0

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/no	■	■
Customers with access	#	11,892	11,892
Customers with active accounts	#	984	984

Customer System Descriptions	Project	System
In-Home Displays	Tendril inSight	Tendril inSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device / HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	273,933	273,933
Web Portals	$	514,622	514,622
In-Home Displays	$	119,329	119,329
Direct Load Control Devices	$	79,622	79,622
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	33,750	33,750
Cost of other devices installed HAN Gateway	$	13,981	13,981

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Implemented Rate Plans

Implemented Rate Plans	Units		Project	System
Time of Use Rate: number of customers enrolled	#		0	333
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#		0	0
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#		0	0
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#		0	0
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#		0	0
Real-time Pricing: is the pricing program available?	yes/	no	☐	☑
Real-time Pricing: number of customers with access	#		0	
Real-time Pricing: number of customers enrolled	#		0	9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#		0	0
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#		0	0
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#		0	0
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#		0	0
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#		0	0
Variable Peak Pricing: number of customers enrolled	#		0	0
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#		0	0
Pre-pay Pricing: number of customers enrolled	#		0	0
Net Metering: is the pricing program available?	yes/	no	☐	☑

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Implemented Rate Plans

Implemented Rate Plans	Units		Project	System
Net Metering: number of customers with access	#		0	
Net Metering: number of customers enrolled	#		0	188
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#		0	0
Other programs: number of customers enrolled	#		0	0
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#		0	0
Other programs: number of customers enrolled	#		0	0
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#		0	0
Other programs: number of customers enrolled	#		0	0
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate will be piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	2	87
Distributed generation: installed capacity	kW	102.4	893.4
Distributed generation: total energy delivered	* kWh	3,646	37,441
Energy storage: number of units	#	0	0
Energy storage: installed capacity	kW	0.0	0.0
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	1	11
Plug-in electric vehicles charging points: installed capacity	kW	4	74
Plug-in electric vehicles charging points: total energy delivered	* kWh		556
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.

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Additional Project Descriptions: kWh for Demo Home PV is not yet accessible and kWh for Demo Home EVSE (110V) not currently measured independently. Grid-connected battery system (1MW) not yet interconnected.

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	0	0
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	347,868	347,868
Distributed Generation Equipment	$	0	0
Stationary Electric Storage Equipment	$	0	0
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$	0	0

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

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Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	0	75
Automated Feeder Switches: number of devices installed	#	0	94
Automated Capacitors: number of devices installed	#	0.0	1,972
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	0.0	222
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	35	2,250
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed N/A	#	0	0
Other devices installed N/A	#	0	0
Other devices installed N/A	#	0	0

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 75% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	$	0	0
Substation Monitors	$	577,849	577,849
Automated Feeder Switches	$	58,971	58,971
Capacitor Automation Equipment	$	0	0
Regulator Automation Equipment	$	0	0
Fault Current Limiter Equipment	$	0	0
Cost of other devices installed N/A	$	0	0
Cost of other devices installed N/A	$	0	0
Cost of other devices installed N/A	$	0	0
Other Costs	$	0	0

Other Cost Description: N/A

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AMI Assets - Build Metrics

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AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,034	13,034
Portion of customers with AMI: residential	#	11,886	11,886
Portion of customers with AMI: commercial	#	1,168	1,168
Portion of customers with AMI: industrial	#	0	0

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		
Remote Connect/Disconnect: is feature implemented?	yes/ no	☐	☐
Remote Connect/Disconnect: number of meters with feature implemented	#		
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,034	13,034
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,034	13,034
Other feature: implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	■	■
Customer Information System: is integration complete?	yes/ no	■	■
Outage Management System: is integration complete?	yes/ no	■	■
Distribution Management System: is integration complete?	yes/ no	☐	☐
Other Enterprise Systems: is integration complete?	yes/ no	■	■

AMI System Descriptions	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$	0	0
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	642	642
Direct Load Control Devices: devices installed	#	15	15
Programmable Communicating Thermostats: devices installed	#	7	52,861
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway device	#	7	7
Other Devices installed	#		
Other Devices installed	#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	11,896	11,896
Customers with active accounts	#	1,106	1,106

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	79,683	79,683
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			156,760
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			687,611
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	☐	■
Time of Use Rate: number of customers with access	#			

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate will be piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	2	105
Distributed generation: installed capacity	kW	102.4	1,299.4
Distributed generation: total energy delivered	* kWh	24,155	89,358
Energy storage: number of units	#	0	0
Energy storage: installed capacity	kW	0.0	0.0
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	1	11
Plug-in electric vehicles charging points: installed capacity	kW	4	74
Plug-in electric vehicles charging points: total energy delivered	* kWh	13	1,808
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	0	0
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	0	0
Distributed Generation Equipment	$	347,868	347,868
Stationary Electric Storage Equipment	$	0	0
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$	0	0

Other Cost Description   N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	0	75
Automated Feeder Switches: number of devices installed	#	0	94
Automated Capacitors: number of devices installed	#	0.0	1,972
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	0.0	222
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	58	2,250
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed N/A	#		
Other devices installed N/A	#		
Other devices installed N/A	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area.	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 75% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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Voltage Optimization	Voltage Optimization has not been implemented yet.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	Feeder Peak Load Management has not been implemented yet.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	Not integrated yet	Not integrated yet
Outage Management	Not integrated yet	Not integrated yet

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	Not integrated yet	Not integrated yet
Distribution Management System	Not integrated yet	Not integrated yet
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	207,371	207,371
Distribution Management System	$	0	0
Communications Equipment and SCADA	$	0	0

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AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,269	13,269
Portion of customers with AMI residential	#	12,066	12,066
Portion of customers with AMI commercial	#	1,203	1,203
Portion of customers with AMI industrial	#	0	0

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		
Remote Connect/Disconnect: is feature implemented?	yes/ no	☐	☐
Remote Connect/Disconnect: number of meters with feature implemented	#		
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,269	13,269
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,269	13,269
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	■	■
Customer Information System: is integration complete?	yes/ no	■	■
Outage Management System: is integration complete?	yes/ no	■	■
Distribution Management System: is integration complete?	yes/ no	☐	☐
Other Enterprise Systems: is integration complete?	yes/ no	■	■

AMI System Descriptions	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	Not yet integrated	Not yet integrated
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	1,325,012	1,325,012
Communications Equipment	$	107,117	107,117
AMI Smart Meters	$	2,063,148	2,063,148

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$	0	0

Other Costs Description	N/A

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems

	Units	Project	System
In-Home display: devices installed	#	666	666
Direct Load Control Devices: devices installed	#	24	24
Programmable Communicating Thermostats: devices installed	#	30	51,655
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway	#	11	11
Other Devices installed	#		
Other Devices installed	#		

Web Portal

	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	11,675	11,675
Customers with active accounts	#	1,322	1,322

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device — HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	289,084	289,084
Web Portals	$	580,762	580,762
In-Home Displays	$	122,183	122,183
Direct Load Control Devices	$	79,622	79,622
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	217,721	217,721
Cost of other devices installed HAN Gateway	$	76,447	76,447

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Customer System Installed Costs

Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	188,867	188,867
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

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Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			542,079
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			300,783
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,066	

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Implemented Rate Plans	Units		Project	System
Time of Use Rate: number of customers enrolled	#		25	486
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			8
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			286
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions		
	Project	**System**
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	2	276
Distributed generation: installed capacity	kW	102.4	4,305.7
Distributed generation: total energy delivered	* kWh	46,025	
Energy storage: number of units	#	0	0
Energy storage: installed capacity	kW	0.0	0.0
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	1	11
Plug-in electric vehicles charging points: installed capacity	kW	4	74
Plug-in electric vehicles charging points: total energy delivered	* kWh	0.0	1,710
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data. We cannot determine the total energy delivered since we only have net kWh numbers, not total generation behind customer meters.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	0	0
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	0	0
Distributed Generation Equipment	$	348,137	348,137
Stationary Electric Storage Equipment	$	0	0
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$		

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	0	75
Automated Feeder Switches: number of devices installed	#	0	96
Automated Capacitors: number of devices installed	#	0.0	2,072
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	0.0	222
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	62	2,273
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed: N/A	#		
Other devices installed: N/A	#		
Other devices installed: N/A	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area.	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 75% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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Voltage Optimization	Voltage Optimization has not been implemented yet.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	Feeder Peak Load Management has not been implemented yet.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	Not integrated yet	Not integrated yet
Outage Management	Not integrated yet	Not integrated yet

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	Not integrated yet	Not integrated yet
Distribution Management System	Not integrated yet	Not integrated yet
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	228,002	228,002
Distribution Management System	$	0	0
Communications Equipment and SCADA	$	0	0

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AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,217	13,217
Portion of customers with AMI residential	#	12,016	12,016
Portion of customers with AMI commercial	#	1,201	1,201
Portion of customers with AMI industrial	#	0	0

Implemented Meter Features	Units		Project	System
Reading interval for residential meters	minutes		15	15
Reading interval for commercial meters	minutes		15	15
Reading interval for industrial meters	minutes			
Remote Connect/Disconnect: is feature implemented?	yes/	no	☐	☐
Remote Connect/Disconnect: number of meters with feature implemented	#			
Outage Reporting: is feature implemented?	yes/	no	■	■
Outage Reporting: number of meters with feature implemented	#		13,217	13,217
Power Quality Measurement: is feature implemented?	yes/	no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#			
Tamper Detection: is feature implemented?	yes/	no	■	■
Tamper Detection: number of meters with feature implemented	#		13,217	13,217
Other feature implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented	yes/	no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units		Project	System
Billing System: is integration complete?	yes/	no	■	■
Customer Information System: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Distribution Management System: is integration complete?	yes/	no	☐	☐
Other Enterprise Systems: is integration complete?	yes/	no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	Not yet integrated	Not yet integrated
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	1,723,180	1,723,180
Communications Equipment	$	113,606	113,606
AMI Smart Meters	$	2,112,803	2,112,803

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AMI Installed Costs	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	656	656
Direct Load Control Devices: devices installed	#	63	63
Programmable Communicating Thermostats: devices installed	#	81	53,373
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed	HAN Gateway	#	30	30
Other Devices installed		#		
Other Devices installed		#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	11,681	11,681
Customers with active accounts	#	1,807	1,807

Customer System Descriptions	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	304,096	304,096
Web Portals	$	485,105	485,105
In-Home Displays	$	144,633	144,633
Direct Load Control Devices	$	86,869	86,869
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	228,833	228,833
Cost of other devices installed HAN Gateway	$	167,382	167,382

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Customer System Installed Costs

Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	264,353	264,353
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			542,210
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			300,522
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,016	

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#		88	494
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			8
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			351
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	2	338
Distributed generation: installed capacity	kW	102.4	5,528.7
Distributed generation: total energy delivered	* kWh	41,661	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	1	11
Plug-in electric vehicles charging points: installed capacity	kW	4	74
Plug-in electric vehicles charging points: total energy delivered	* kWh	0.0	1,634
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$		
Communications Equipment	$		
DER/DG Interconnection Equipment	$		
Renewable DER	$	380,743	380,743
Distributed Generation Equipment	$		
Stationary Electric Storage Equipment	$	3,757,159	3,757,159
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$		

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	0	80
Automated Feeder Switches: number of devices installed	#	0	96
Automated Capacitors: number of devices installed	#	29	2,122
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	0.0	229
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed N/A	#		
Other devices installed N/A	#		
Other devices installed N/A	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Project	DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_quarterly	Build Metrics Quarterly Report Quarter 3, 2012
Period	Start: Jul 1, 2012	End: Sep 30, 2012	Submission Due Date:	October 31, 2012

Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area.	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Period	Start: Jul 1, 2012	End: Sep 30, 2012	Submission Due Date:	October 31, 2012

Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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	Project	System
Voltage Optimization	Voltage Optimization has not been implemented yet.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	Feeder Peak Load Management has not been implemented yet.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	Not integrated yet	Not integrated yet
Outage Management	Not integrated yet	Not integrated yet

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	Not integrated yet	Not integrated yet
Distribution Management System	Not integrated yet	Not integrated yet
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	283,294	283,294
Distribution Management System	$		
Communications Equipment and SCADA	$		

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AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,415	13,415
Portion of customers with AMI residential	#	12,182	12,182
Portion of customers with AMI commercial	#	1,233	1,233
Portion of customers with AMI industrial	#	0	0

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		
Remote Connect/Disconnect: is feature implemented?	yes/ no	☐	☐
Remote Connect/Disconnect: number of meters with feature implemented	#		
Outage Reporting: is feature implemented?	yes/ no	▣	▣
Outage Reporting: number of meters with feature implemented	#	13,415	13,415
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	▣	▣
Tamper Detection: number of meters with feature implemented	#	13,415	13,415
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	▣	▣
Customer Information System: is integration complete?	yes/ no	▣	▣
Outage Management System: is integration complete?	yes/ no	▣	▣
Distribution Management System: is integration complete?	yes/ no	☐	☐
Other Enterprise Systems: is integration complete?	yes/ no	▣	▣

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	Not yet integrated	Not yet integrated
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs		Units	Project Funded	Cost Share
Back Office Systems		$	1,813,054	1,813,054
Communications Equipment		$	113,746	113,746
AMI Smart Meters		$	2,112,395	2,112,395

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device — HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	311,120	311,120
Web Portals	$	495,739	495,739
In-Home Displays	$	145,667	145,667
Direct Load Control Devices	$	86,869	86,869
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	249,507	249,507
Cost of other devices installed HAN Gateway	$	187,269	187,269

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	271,965	271,965
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			157,082
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			687,464
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,182	

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#		88	330
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			452
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate will be piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	3	436
Distributed generation: installed capacity	kW	107.4	7,307.8
Distributed generation: total energy delivered	* kWh	19,275	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	4	14
Plug-in electric vehicles charging points: installed capacity	kW	47	155
Plug-in electric vehicles charging points: total energy delivered	* kWh	102	1,866
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$		
Communications Equipment	$		
DER/DG Interconnection Equipment	$		
Renewable DER	$	377,938	377,938
Distributed Generation Equipment	$		
Stationary Electric Storage Equipment	$	3,776,477	3,776,477
PEVs and Charging Stations	$	3,846	3,846
Other Costs	$		

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	50	85
Automated Feeder Switches: number of devices installed	#	0	97
Automated Capacitors: number of devices installed	#	29	2,302
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	7	236
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed: N/A	#		
Other devices installed: N/A	#		
Other devices installed: N/A	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area.	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 75% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A
Other device N/A	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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	Period	Start: Jan 1, 2013	End: Mar 31, 2013	Submission Due Date:	April 30, 2013

AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,463	13,463
Portion of customers with AMI: residential	#	12,222	12,222
Portion of customers with AMI: commercial	#	1,241	1,241
Portion of customers with AMI: industrial	#		

Implemented Meter Features	Units		Project	System
Reading interval for residential meters	minutes		15	15
Reading interval for commercial meters	minutes		15	15
Reading interval for industrial meters	minutes			
Remote Connect/Disconnect: is feature implemented?	yes/	no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#		13,463	13,463
Outage Reporting: is feature implemented?	yes/	no	■	■
Outage Reporting: number of meters with feature implemented	#		13,463	13,463
Power Quality Measurement: is feature implemented?	yes/	no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#			
Tamper Detection: is feature implemented?	yes/	no	■	■
Tamper Detection: number of meters with feature implemented	#		13,463	13,463
Other feature: implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature: implemented	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature: implemented	yes/	no	☐	☐

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Implemented Meter Features	Units		Project	System
Other feature: number of meters with feature implemented	#			

Implemented Enterprise Integration	Units		Project	System
Billing System: is integration complete?	yes/	no	■	■
Customer Information System: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Distribution Management System: is integration complete?	yes/	no	☐	☐
Other Enterprise Systems: is integration complete?	yes/	no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Customer Systems

	Units	Project	System
In-Home display: devices installed	#	628	628
Direct Load Control Devices: devices installed	#	117	117
Programmable Communicating Thermostats: devices installed	#	107	53,767
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway	#	52	52
Other Devices installed	#		
Other Devices installed	#		

Web Portal

	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	12,012	12,012
Customers with active accounts	#	1,871	1,871

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Filing	build_quarterly	Build Metric Quarterly Report Quarter 1, 2013
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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	384,288	384,288
Web Portals	$	701,593	701,593
In-Home Displays	$	148,860	148,860
Direct Load Control Devices	$	86,869	86,869
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	313,292	313,292
Cost of other devices installed HAN Gateway	$	202,578	202,578

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	295,172	295,172
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			160,945
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak Time Rebate: number of customers enrolled	#			
Tiered Rate is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			686,732
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,222	

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Implemented Rate Plans	Units		Project	System
Time of Use Rate: number of customers enrolled	#		61	330
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	▣
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering is the pricing program available?	yes/	no	☐	▣

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Implemented Rate Plans	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			579
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	3	571
Distributed generation: installed capacity	kW	107.4	10,303.8
Distributed generation: total energy delivered	* kWh	17,616	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	0.0	0.0
Plug-in electric vehicles charging points: number of units	#	6	16
Plug-in electric vehicles charging points: installed capacity	kW	76	184
Plug-in electric vehicles charging points: total energy delivered	* kWh	397	2,362
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Interfaces currently limited to measuring data.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$		
Communications Equipment	$		
DER/DG Interconnection Equipment	$		
Renewable DER	$	471,706	471,706
Distributed Generation Equipment	$		
Stationary Electric Storage Equipment	$	3,782,304	3,782,304
PEVs and Charging Stations	$	51,479	51,479
Other Costs	$		

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	0	10.5
Portion of system with Distribution Automation (DA)	%	60	85
Automated Feeder Switches: number of devices installed	#	0	97
Automated Capacitors: number of devices installed	#	29	2,322
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	25	254
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	☐	☐
Outage Management System: is integration complete?	yes/	no	☐	☐
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA will be installed in the project area.	ABB Network Manager (EMS)
Portion of system with SCADA	Distribution SCADA will be installed in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA has not been implemented yet.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 85% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	DA devices have not yet been installed and/or integrated.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system.

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Period	Start: Jan 1, 2013	End: Mar 31, 2013	Submission Due Date:	April 30, 2013

Distribution Device Description

	Project	System
DA communications network	DA network has not been installed yet.	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	FLISR has not yet been implemented	FLISR has not yet been implemented

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	Project	System
Voltage Optimization	Voltage Optimization has not been implemented yet.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	Feeder Peak Load Management has not been implemented yet.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	Not integrated yet	Not integrated yet
Outage Management	Not integrated yet	Not integrated yet

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	Not integrated yet	Not integrated yet
Distribution Management System	Not integrated yet	Not integrated yet
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	303,123	303,123
Distribution Management System	$	0	0
Communications Equipment and SCADA	$	0	0

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Project: DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing: build_quarterly   Build Metrics Quarterly Report Quarter 2, 2013
Period: Start: Apr 1, 2013   End: Jun 30, 2013   Submission Due Date: July 31, 2013

AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,448	13,448
Portion of customers with AMI: residential	#	12,202	12,202
Portion of customers with AMI: commercial	#	1,246	1,246
Portion of customers with AMI: industrial	#		

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		
Remote Connect/Disconnect: is feature implemented?	yes/ no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#	13,448	13,448
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,448	13,448
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,448	13,448
Other feature: implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	☐	☐

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Period: Start: Apr 1, 2013   End: Jun 30, 2013   Submission Due Date: July 31, 2013

Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	■	■
Customer Information System: is integration complete?	yes/ no	■	■
Outage Management System: is integration complete?	yes/ no	■	■
Distribution Management System: is integration complete?	yes/ no	■	■
Other Enterprise Systems: is integration complete?	yes/ no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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Filing	build_quarterly	Build Metrics Quarterly Report Quarter 2, 2013
Period	Start: Apr 1, 2013	End: Jun 30, 2013	Submission Due Date:	July 31, 2013

AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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Filing	build_quarterly	Build Metrics Quarterly Report Quarter 2, 2013
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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,520,579	2,326,688
Communications Equipment	$	188,317	173,831
AMI Smart Meters	$	2,254,965	2,081,506

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		

Other Costs Description	N/A

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Customer Systems Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	625	625
Direct Load Control Devices: devices installed	#	122	122
Programmable Communicating Thermostats: devices installed	#	103	53,894
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway	#	57	57
Other Devices installed	#		
Other Devices installed	#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	11,805	11,805
Customers with active accounts	#	1,927	1,927

Customer System Descriptions		
	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	338,659	312,608
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			543,606
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			301,573
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,202	

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#		131	559
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			742
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCP&L has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer information systems and control devices.	KCP&L has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCP&L has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,354,388	2,173,281
Communications Equipment	$		
DER/DG Interconnection Equipment	$		
Renewable DER	$	586,354	541,250
Distributed Generation Equipment	$		
Stationary Electric Storage Equipment	$	3,975,805	3,669,973
PEVs and Charging Stations	$	56,651	52,293
Other Costs	$		

Other Cost Description   N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	60	85
Automated Feeder Switches: number of devices installed	#	5	102
Automated Capacitors: number of devices installed	#	29	2,332
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	25	254
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☐	☐
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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	Project	System
Voltage Optimization	As part of the project, the DMS enables voltage optimization across project circuits. This will improve power factor as well as enable voltage conservation.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	As part of the project, the DMS enables dynamic feeder load transfer across project circuits. This will reduce outages on project feeders, reduce stress on critical assets, and improve maintenance.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	DMS is integrated with project AMI.	DMS is integrated with project AMI.
Outage Management	DMS is integrated with project OMS.	DMS is integrated with project OMS.

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	DMS is integrated with project DERM.	DMS is integrated with project DERM.
Distribution Management System	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	380,929	351,827
Distribution Management System	$	2,733,807	2,523,514
Communications Equipment and SCADA	$	647,675	597,854

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Filing	build_quarterly	Build Metrics Quarterly Report Quarter 3, 2013
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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCPL enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,294,074	2,117,807
Communications Equipment	$	119,308	110,130
AMI Smart Meters	$	2,249,422	2,076,390

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AMI Installed Costs	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Customer Systems		Units	Project	System
In-Home display: devices installed		#	625	625
Direct Load Control Devices: devices installed		#	129	129
Programmable Communicating Thermostats: devices installed		#	109	53,192
Smart Appliances: devices installed		#	0	0
Energy Management Devices/Systems: devices installed		#	0.0	0.0
Other Devices installed	HAN Gateway	#	59	59
Other Devices installed		#		
Other Devices installed		#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/no	■	■
Customers with access	#	11,869	11,869
Customers with active accounts	#	2,040	2,040

Customer System Descriptions	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	344,807	318,284
Other Cost Description	Program delivery costs including KCPL labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			544,218
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			302,264
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,188	

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Period	Start: Jul 1, 2013	End: Sep 30, 2013	Submission Due Date:	October 31, 2013

Implemented Rate Plans

	Units	Project	System
Time of Use Rate: number of customers enrolled	#	131	554
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#		
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#		
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/ no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#		
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#		
Real-time Pricing: is the pricing program available?	yes/ no	☐	■
Real-time Pricing: number of customers with access	#		
Real-time Pricing: number of customers enrolled	#		9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#		
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#		
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/ no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#		
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#		
Variable Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Variable Peak Pricing: number of customers with access	#		
Variable Peak Pricing: number of customers enrolled	#		
Pre-pay Pricing: is the pricing program available?	yes/ no	☐	☐
Pre-pay Pricing: number of customers with access	#		
Pre-pay Pricing: number of customers enrolled	#		
Net Metering is the pricing program available?	yes/ no	☐	■

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Implemented Rate Plans

	Units	Project	System
Net Metering: number of customers with access	#		
Net Metering: number of customers enrolled	#		955
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Rate Decoupling is implemented?	yes/ no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCPL has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCPL has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer systems and devices.	KCPL has multiple existing residential and C&I TOU Rates. We are not able to to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCPL has multiple existing RTP rates for commercial and industrial customers. We are not able to to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCPL has multiple existing residential and C&I Net Metering Rates. We are not able to to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	7	936
Distributed generation: installed capacity	kW	137.57	17,808.54
Distributed generation: total energy delivered	* kWh	45,625	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	8,912	8,912
Plug-in electric vehicles charging points: number of units	#	9	20
Plug-in electric vehicles charging points: installed capacity	kW	119	234
Plug-in electric vehicles charging points: total energy delivered	* kWh	1,033	4,156
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Additional Project
Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,364,927	2,183,009
Communications Equipment	$	0	
DER/DG Interconnection Equipment	$	0	
Renewable DER	$	586,519	541,403
Distributed Generation Equipment	$	0	0
Stationary Electric Storage Equipment	$	4,012,656	3,703,991
PEVs and Charging Stations	$	56,711	52,349
Other Costs	$		

Other Cost Description   N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	60	85
Automated Feeder Switches: number of devices installed	#	5	102
Automated Capacitors: number of devices installed	#	29	2,332
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	25	254
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	■	■
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCPL has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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AMI Assets - Build Metrics

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AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,417	13,417
Portion of customers with AMI residential	#	12,192	12,192
Portion of customers with AMI commercial	#	1,225	1,225
Portion of customers with AMI industrial	#	0	0

Implemented Meter Features	Units		Project	System
Reading interval for residential meters	minutes		15	15
Reading interval for commercial meters	minutes		15	15
Reading interval for industrial meters	minutes		0	0
Remote Connect/Disconnect: is feature implemented?	yes/	no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#		13,417	13,417
Outage Reporting: is feature implemented?	yes/	no	■	■
Outage Reporting: number of meters with feature implemented	#		13,417	13,417
Power Quality Measurement: is feature implemented?	yes/	no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#			
Tamper Detection: is feature implemented?	yes/	no	■	■
Tamper Detection: number of meters with feature implemented	#		13,417	13,417
Other feature implemented [ ]	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented [ ]	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented [ ]	yes/	no	☐	☐

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Implemented Meter Features	Units		Project	System
Other feature: number of meters with feature implemented	#			

Implemented Enterprise Integration	Units		Project	System
Billing System: is integration complete?	yes/	no	■	■
Customer Information System: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Distribution Management System: is integration complete?	yes/	no	■	■
Other Enterprise Systems: is integration complete?	yes/	no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,337,739	2,157,913
Communications Equipment	$	119,308	110,130
AMI Smart Meters	$	2,249,422	2,076,390

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems		Units	Project	System
In-Home display: devices installed		#	620	620
Direct Load Control Devices: devices installed		#	132	132
Programmable Communicating Thermostats: devices installed		#	115	53,824
Smart Appliances: devices installed		#	0	0
Energy Management Devices/Systems: devices installed		#	0.0	0.0
Other Devices installed	HAN Gateway	#	61	61
Other Devices installed		#		
Other Devices installed		#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	12,036	12,036
Customers with active accounts	#	2,109	2,109

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device — HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	440,110	408,255
Web Portals	$	940,651	868,293
In-Home Displays	$	155,669	143,894
Direct Load Control Devices	$	90,344	83,395
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	362,999	335,076
Cost of other devices installed HAN Gateway	$	221,524	204,484

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	387,262	357,473
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	☑
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			161,699
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	☑
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			687,854
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	☑	☑
Time of Use Rate: number of customers with access	#		12,192	

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#		127	332
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Filing	build_quarterly Build Metrics Quarterly Report Quarter 4, 2013
Period	Start: Oct 1, 2013 End: Dec 31, 2013 Submission Due Date: January 31, 2014

Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			1,180
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCP&L has multiple existing residential and C&I Net Metering Rates. We are not able to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	7	1,161
Distributed generation: installed capacity	kW	137.57	22,329.517
Distributed generation: total energy delivered	* kWh	23,853	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	8,292	8,292
Plug-in electric vehicles charging points: number of units	#	10	22
Plug-in electric vehicles charging points: installed capacity	kW	133	263
Plug-in electric vehicles charging points: total energy delivered	* kWh	1,692	6,352
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,364,927	2,183,009
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	586,519	541,403
Distributed Generation Equipment	$	0	0
Stationary Electric Storage Equipment	$	4,017,121	3,708,112
PEVs and Charging Stations	$	85,224	60,207
Other Costs	$		

Other Cost Description   N/A

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Electric Distribution System Assets - Build Metrics

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Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	100	85
Automated Feeder Switches: number of devices installed	#	20	117
Automated Capacitors: number of devices installed	#	29	2,342
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	96	325
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☑	☑
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCP&L has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	$	25,866	23,876
Substation Monitors	$	1,238,783	1,141,646
Automated Feeder Switches	$	684,943	632,255
Capacitor Automation Equipment	$	72,302	66,740
Regulator Automation Equipment	$	0	0
Fault Current Limiter Equipment	$	0	0
Cost of other devices installed	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	368,136	339,818

Other Cost Description: KCP&L labor charges across various devices types.

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AMI Assets - Build Metrics

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AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,498	35,974
Portion of customers with AMI residential	#	12,266	32,220
Portion of customers with AMI commercial	#	1,232	3,754
Portion of customers with AMI industrial	#		

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		
Remote Connect/Disconnect: is feature implemented?	yes/ no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#	13,049	15,641
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,498	35,974
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,498	35,974
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented	yes/ no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	☐	☐
Customer Information System: is integration complete?	yes/ no	☐	☐
Outage Management System: is integration complete?	yes/ no	☐	☐
Distribution Management System: is integration complete?	yes/ no	☐	☐
Other Enterprise Systems: is integration complete?	yes/ no	☐	☐

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems		Units	Project	System
In-Home display: devices installed		#	620	620
Direct Load Control Devices: devices installed		#	132	132
Programmable Communicating Thermostats: devices installed		#	115	53,824
Smart Appliances: devices installed		#		
Energy Management Devices/Systems: devices installed		#		
Other Devices installed	HAN Gateway	#	61	61
Other Devices installed		#		
Other Devices installed		#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	12,036	12,036
Customers with active accounts	#	2,109	2,109

Customer System Descriptions		
	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device / HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	440,885	408,255
Web Portals	$	940,730	868,293
In-Home Displays	$	155,669	143,894
Direct Load Control Devices	$	90,344	83,395
Smart Appliances	$		
Programmable Communicating Thermostats	$	378,220	335,076
Cost of other devices installed HAN Gateway	$	228,218	204,484

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	389,053	357,473
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

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Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			162,021
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			689,583
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,266	

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Implemented Rate Plans	Units		Project	System
Time of Use Rate: number of customers enrolled	#		116	332
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing is the pricing program available?	yes/	no	☐	▣
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering is the pricing program available?	yes/	no	☐	▣

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Implemented Rate Plans	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			1,554
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCP&L has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer information systems and control devices.	KCP&L has multiple existing residential and C&I TOU Rates. We are not able to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCP&L has multiple existing RTP rates for commercial and industrial customers. We are not able to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCP&L has multiple existing residential and C&I Net Metering Rates. We are not able to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	9	1,464
Distributed generation: installed capacity	kW	176.44	28,257.32
Distributed generation: total energy delivered	* kWh	29,486	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	39,394	39,394
Plug-in electric vehicles charging points: number of units	#	19	47
Plug-in electric vehicles charging points: installed capacity	kW	133	299
Plug-in electric vehicles charging points: total energy delivered	* kWh	1,943	7,073
DER/DG interconnection equipment: number of units	#		

* *Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.*

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,584,927	2,183,009
Communications Equipment	$		
DER/DG Interconnection Equipment	$		
Renewable DER	$	853,967	541,403
Distributed Generation Equipment	$		
Stationary Electric Storage Equipment	$	4,017,121	3,708,112
PEVs and Charging Stations	$	71,089	60,207
Other Costs	$		

Other Cost Description   N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	100	85
Automated Feeder Switches: number of devices installed	#	20	117
Automated Capacitors: number of devices installed	#	29	2,342
Automated Regulators: number of devices installed	#		
Feeder Monitors: number of devices installed	#		
Remote Fault Indicators: number of devices installed	#	96	325
Transformer Monitors (line): number of devices installed	#		
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#		
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☒	☒
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCP&L has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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	Project	System
Voltage Optimization	As part of the project, the DMS enables voltage optimization across project circuits. This will improve power factor as well as enable voltage conservation.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	As part of the project, the DMS enables dynamic feeder load transfer across project circuits. This will reduce outages on project feeders, reduce stress on critical assets, and improve maintenance.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	DMS is integrated with project AMI.	DMS is integrated with project AMI.
Outage Management	DMS is integrated with project OMS.	DMS is integrated with project OMS.

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	DMS is integrated with project DERM.	DMS is integrated with project DERM.
Distribution Management System	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	371,604	343,106
Distribution Management System	$	4,338,858	3,436,891
Communications Equipment and SCADA	$	959,422	885,621

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Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	$	25,917	23,876
Substation Monitors	$	1,239,319	1,141,646
Automated Feeder Switches	$	686,212	632,255
Capacitor Automation Equipment	$	72,436	66,740
Regulator Automation Equipment	$		
Fault Current Limiter Equipment	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	372,099	339,818

Other Cost Description   KCP&L labor charges across various devices types.

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AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,358	82,442
Portion of customers with AMI: residential	#	12,119	73,372
Portion of customers with AMI: commercial	#	1,239	8,870
Portion of customers with AMI: industrial	#	0	200

Implemented Meter Features	Units		Project	System
Reading interval for residential meters	minutes		15	15
Reading interval for commercial meters	minutes		15	15
Reading interval for industrial meters	minutes			15
Remote Connect/Disconnect: is feature implemented?	yes/	no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#		12,551	17,336
Outage Reporting: is feature implemented?	yes/	no	■	■
Outage Reporting: number of meters with feature implemented	#		13,358	82,442
Power Quality Measurement: is feature implemented?	yes/	no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#			
Tamper Detection: is feature implemented?	yes/	no	■	■
Tamper Detection: number of meters with feature implemented	#		13,358	82,442
Other feature implemented [ ]	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented [ ]	yes/	no	☐	☐
Other feature: number of meters with feature implemented	#			
Other feature implemented [ ]	yes/	no	☐	☐

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units		Project	System
Billing System: is integration complete?	yes/	no	■	■
Customer Information System: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Distribution Management System: is integration complete?	yes/	no	■	■
Other Enterprise Systems: is integration complete?	yes/	no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,337,739	2,157,913
Communications Equipment	$	119,308	110,130
AMI Smart Meters	$	2,249,422	2,076,390

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Customer Systems	Units	Project	System
In-Home display: devices installed	#	618	618
Direct Load Control Devices: devices installed	#	132	132
Programmable Communicating Thermostats: devices installed	#	112	53,824
Smart Appliances: devices installed	#		
Energy Management Devices/Systems: devices installed	#		
Other Devices installed HAN Gateway	#	61	61
Other Devices installed	#		
Other Devices installed	#		

Web Portal	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	12,036	12,036
Customers with active accounts	#	2,109	2,109

Customer System Descriptions		
	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	389,796	357,473
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			546,795
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			303,048
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,119	

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Implemented Rate Plans

	Units		Project	System
Time of Use Rate: number of customers enrolled	#		113	548
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	▣
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	▣

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Implemented Rate Plans

	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			1,913
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available [ ]	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCP&L has multiple existing residential and C&I Net Metering Rates. We are not able to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources – Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	9	1,882
Distributed generation: installed capacity	kW	176.44	37,154
Distributed generation: total energy delivered	* kWh	41,405	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	49,754	49,754
Plug-in electric vehicles charging points: number of units	#	19	47
Plug-in electric vehicles charging points: installed capacity	kW	133	299
Plug-in electric vehicles charging points: total energy delivered	* kWh	1,848	7,454
DER/DG interconnection equipment: number of units	#		

* *Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.*

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,585,382	2,183,009
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	654,039	541,403
Distributed Generation Equipment	$	0	0
Stationary Electric Storage Equipment	$	4,017,121	3,708,112
PEVs and Charging Stations	$	71,089	60,207
Other Costs	$		

Other Cost Description: N/A

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	100	85
Automated Feeder Switches: number of devices installed	#	20	117
Automated Capacitors: number of devices installed	#	29	2,342
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	96	325
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	☑	☑
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCP&L has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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Voltage Optimization	As part of the project, the DMS enables voltage optimization across project circuits. This will improve power factor as well as enable voltage conservation.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	As part of the project, the DMS enables dynamic feeder load transfer across project circuits. This will reduce outages on project feeders, reduce stress on critical assets, and improve maintenance.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	DMS is integrated with project AMI.	DMS is integrated with project AMI.
Outage Management	DMS is integrated with project OMS.	DMS is integrated with project OMS.

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	DMS is integrated with project DERM.	DMS is integrated with project DERM.
Distribution Management System	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	372,159	343,106
Distribution Management System	$	4,338,858	3,436,891
Communications Equipment and SCADA	$	959,422	885,621

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Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	S	25,930	23,876
Substation Monitors	S	1,244,388	1,141,646
Automated Feeder Switches	S	688,646	632,255
Capacitor Automation Equipment	S	72,481	66,740
Regulator Automation Equipment	S	0	0
Fault Current Limiter Equipment	S	0	0
Cost of other devices installed	S		
Cost of other devices installed	S		
Cost of other devices installed	S		
Other Costs	S	375,251	339,818

Other Cost Description: KCP&L labor charges across various devices types.

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AMI Assets - Build Metrics

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AMI End Points Installed	Units	Project	System
End Points (meters) installed and operational	#	13,427	150,073
Portion of customers with AMI: residential	#	12,204	132,584
Portion of customers with AMI: commercial	#	1,223	17,113
Portion of customers with AMI: industrial	#	0	376

Implemented Meter Features	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		15
Remote Connect/Disconnect: is feature implemented?	yes/ no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#	13,014	23,052
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,427	150,073
Power Quality Measurement: is feature implemented?	yes/ no	□	□
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,427	150,073
Other feature: implemented	yes/ no	□	□
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	□	□
Other feature: number of meters with feature implemented	#		
Other feature: implemented	yes/ no	□	□

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Implemented Meter Features	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration	Units	Project	System
Billing System: is integration complete?	yes/ no	■	■
Customer Information System: is integration complete?	yes/ no	■	■
Outage Management System: is integration complete?	yes/ no	■	■
Distribution Management System: is integration complete?	yes/ no	■	■
Other Enterprise Systems: is integration complete?	yes/ no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,337,739	2,157,913
Communications Equipment	$	119,308	110,130
AMI Smart Meters	$	2,252,704	2,076,390

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

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Customer Systems Assets - Build Metrics

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Implemented Customer Systems

	Units	Project	System
In-Home display: devices installed	#	616	616
Direct Load Control Devices: devices installed	#	131	131
Programmable Communicating Thermostats: devices installed	#	112	53,824
Smart Appliances: devices installed	#		
Energy Management Devices/Systems: devices installed	#		
Other Devices installed HAN Gateway	#	61	61
Other Devices installed	#		
Other Devices installed	#		

Web Portal

	Units	Project	System
Web portal: Is portal in production?	yes/ no	■	■
Customers with access	#	12,036	12,036
Customers with active accounts	#	2,109	2,109

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device — HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	441,625	408,255
Web Portals	$	940,730	868,293
In-Home Displays	$	155,669	143,894
Direct Load Control Devices	$	90,344	83,395
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	378,345	335,076
Cost of other devices installed HAN Gateway	$	228,510	204,484

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	390,761	357,473
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

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Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			548,284
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			303,257
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,204	

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Implemented Rate Plans

	Units	Project	System
Time of Use Rate: number of customers enrolled	#	102	536
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#		
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#		
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/ no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#		
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#		
Real-time Pricing: is the pricing program available?	yes/ no	☐	☑
Real-time Pricing: number of customers with access	#		
Real-time Pricing: number of customers enrolled	#		9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#		
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#		
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/ no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#		
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#		
Variable Peak Pricing: is the pricing program available?	yes/ no	☐	☐
Variable Peak Pricing: number of customers with access	#		
Variable Peak Pricing: number of customers enrolled	#		
Pre-pay Pricing: is the pricing program available?	yes/ no	☐	☐
Pre-pay Pricing: number of customers with access	#		
Pre-pay Pricing: number of customers enrolled	#		
Net Metering is the pricing program available?	yes/ no	☐	☑

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Implemented Rate Plans

	Units	Project	System
Net Metering: number of customers with access	#		
Net Metering: number of customers enrolled	#		2,269
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Other program available	yes/ no	☐	☐
Other programs: number of customers with access	#		
Other programs: number of customers enrolled	#		
Rate Decoupling is implemented?	yes/ no	☐	

Rate Plan Descriptions

	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCP&L has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer information systems and control devices.	KCP&L has multiple existing residential and C&I TOU Rates. We are not able to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCP&L has multiple existing RTP rates for commercial and industrial customers. We are not able to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCP&L has multiple existing residential and C&I Net Metering Rates. We are not able to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

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Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	9	2,295
Distributed generation: installed capacity	kW	176.11	45,234.431
Distributed generation: total energy delivered	* kWh	57,919	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	46,110	46,110
Plug-in electric vehicles charging points: number of units	#	19	57
Plug-in electric vehicles charging points: installed capacity	kW	133	371
Plug-in electric vehicles charging points: total energy delivered	* kWh	2,261	7,705
DER/DG interconnection equipment: number of units	#		

* Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCP&L has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 80% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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Voltage Optimization	As part of the project, the DMS enables voltage optimization across project circuits. This will improve power factor as well as enable voltage conservation.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	As part of the project, the DMS enables dynamic feeder load transfer across project circuits. This will reduce outages on project feeders, reduce stress on critical assets, and improve maintenance.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	DMS is integrated with project AMI.	DMS is integrated with project AMI.
Outage Management	DMS is integrated with project OMS.	DMS is integrated with project OMS.

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Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	DMS is integrated with project DERM.	DMS is integrated with project DERM.
Distribution Management System	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	372,159	343,106
Distribution Management System	$	4,338,858	3,436,891
Communications Equipment and SCADA	$	959,422	885,621

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Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	$	26,079	23,876
Substation Monitors	$	1,244,388	1,141,646
Automated Feeder Switches	$	690,574	632,255
Capacitor Automation Equipment	$	72,896	66,740
Regulator Automation Equipment	$		
Fault Current Limiter Equipment	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	377,579	339,818

Other Cost Description   KCP&L labor charges across various devices types.

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AMI Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

AMI End Points Installed

	Units	Project	System
End Points (meters) installed and operational	#	13,483	231,571
Portion of customers with AMI residential	#	12,259	207,674
Portion of customers with AMI commercial	#	1,224	23,399
Portion of customers with AMI industrial	#	0	498

Implemented Meter Features

	Units	Project	System
Reading interval for residential meters	minutes	15	15
Reading interval for commercial meters	minutes	15	15
Reading interval for industrial meters	minutes		15
Remote Connect/Disconnect: is feature implemented?	yes/ no	■	■
Remote Connect/Disconnect: number of meters with feature implemented	#	13,003	26,904
Outage Reporting: is feature implemented?	yes/ no	■	■
Outage Reporting: number of meters with feature implemented	#	13,483	231,571
Power Quality Measurement: is feature implemented?	yes/ no	☐	☐
Power Quality Measurement: number of meters with feature implemented	#		
Tamper Detection: is feature implemented?	yes/ no	■	■
Tamper Detection: number of meters with feature implemented	#	13,483	231,571
Other feature implemented [ ]	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented [ ]	yes/ no	☐	☐
Other feature: number of meters with feature implemented	#		
Other feature implemented [ ]	yes/ no	☐	☐

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Implemented Meter Features

	Units	Project	System
Other feature: number of meters with feature implemented	#		

Implemented Enterprise Integration

	Units	Project	System
Billing System: is integration complete?	yes/ no	■	■
Customer Information System: is integration complete?	yes/ no	■	■
Outage Management System: is integration complete?	yes/ no	■	■
Distribution Management System: is integration complete?	yes/ no	■	■
Other Enterprise Systems: is integration complete?	yes/ no	■	■

AMI System Descriptions

	Project	System
Backhaul Network	Hybrid of Fiber and Wireless Raven radio with network carrier	Hybrid of Fiber and Wireless Raven radio with network carrier
Meter Communication Network	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers	Landis+Gyr Gridstream RF 900MHz - Collectors and Routers
Headend System	Landis+Gyr Command Center	Landis+Gyr Command Center
Meter Data Management System	eMeter/Siemens	eMeter/Siemens

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AMI System Descriptions

	Project	System
Meter Data Analysis	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.	The project AMI was incorporated into the existing AMR – MDA interfaces. AMI daily register reads and 15-min interval reads are loaded into MDA (DataRaker) on a daily basis.
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A
Other Meter Feature	N/A	N/A

AMI Enterprise Integration Descriptions

	Project	System
Billing System	AMI is integrated with enterprise Oracle CIS.	AMI is integrated with enterprise Oracle CIS.

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AMI Enterprise Integration Descriptions

	Project	System
Customer Information System	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.	AMI is integrated with KCP&L enterprise Oracle CIS. The project AMI was incorporated into the existing AMR – CIS interfaces. CIS daily account/meter synchronization. AMI provides CIS daily register meter reads for direct billing. CIS daily billing cycle-to-date usage info and bill prediction pushed to IHDs via AMI Network.
Outage Management System	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.	AMI is integrated with enterprise OMS. An additional project OMS (redundant) will also be implemented in conjunction with a DMS. The project AMI was incorporated into the existing AMR to enterprise OMS interfaces including meter outage alerts and meter "ping" functionality to verify power restoration.
Distribution Management System	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.	DMS is integrated with multiple project and legacy systems including AMI, DERM, OMS, and energy storage.
Other Enterprise Systems	Data Mining and Analysis Tool (DataRaker) covered by the MDA	Data Mining and Analysis Tool (DataRaker) covered by the MDA
Additional Project Descriptions	N/A	

AMI Installed Costs

	Units	Project Funded	Cost Share
Back Office Systems	$	2,337,739	2,157,913
Communications Equipment	$	119,308	110,130
AMI Smart Meters	$	2,252,704	2,076,390

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AMI Installed Costs

	Units	Project Funded	Cost Share
Other Costs	$		
Other Costs Description	N/A		

Customer Systems Assets - Build Metrics

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Implemented Customer Systems

	Units	Project	System
In-Home display: devices installed	#	616	616
Direct Load Control Devices: devices installed	#	131	131
Programmable Communicating Thermostats: devices installed	#	112	53,824
Smart Appliances: devices installed	#	0	0
Energy Management Devices/Systems: devices installed	#	0.0	0.0
Other Devices installed HAN Gateway	#	61	61
Other Devices installed	#		
Other Devices installed	#		

Web Portal

	Units	Project	System
Web portal: is portal in production?	yes/ no	■	■
Customers with access	#	12,036	12,036
Customers with active accounts	#	2,109	2,109

Customer System Descriptions

	Project	System
In-Home Displays	Tendril InSight	Tendril InSight

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Customer System Descriptions

	Project	System
Direct Load Control Devices	Tendril Volt	Tendril Volt
Programmable Communicating Thermostats	Tendril Setpoint	Tendril Setpoint and Honeywell PCTs
Smart Appliances	N/A	N/A
Energy Mgmt Systems	N/A	N/A
Web Portal	Tendril Energize Web Portal	Tendril Energize Web Portal
Home Area Network	Zigbee SEP 1.0	Zigbee SEP 1.0

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Customer System Descriptions

	Project	System
Other Device HAN Gateway	Tendril Transport Gateway	Tendril Transport Gateway
Other Device	N/A	N/A
Other Device	N/A	N/A
Additional Project Descriptions	N/A	

Customer System Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	441,625	408,255
Web Portals	$	940,730	868,293
In-Home Displays	$	155,669	143,894
Direct Load Control Devices	$	90,344	83,395
Smart Appliances	$	0	0
Programmable Communicating Thermostats	$	378,345	335,076
Cost of other devices installed HAN Gateway	$	228,510	204,484

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Customer System Installed Costs	Units	Project Funded	Cost Share
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	390,761	357,473
Other Cost Description	Program delivery costs including KCP&L labor for program administration, analysis, and customer engagement as well as vendor travel expenses.		

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Pricing Programs - Build Metrics

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Implemented Rate Plans	Units		Project	System
Flat Rate: is the pricing program available?	yes/	no	☐	■
Flat Rate: number of customers with access	#			
Flat Rate: number of customers enrolled	#			162,409
Flat Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Critical Peak Pricing: number of customers with access	#			
Flat Rate with Critical Peak Pricing: number of customers enrolled	#			
Flat Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Flat Rate with Peak-Time Rebate: number of customers with access	#			
Flat Rate with Peak-Time Rebate: number of customers enrolled	#			
Tiered Rate: is the pricing program available?	yes/	no	☐	■
Tiered Rate: number of customers with access	#			
Tiered Rate: number of customers enrolled	#			694,691
Tiered Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Critical Peak Pricing: number of customers with access	#			
Tiered Rate with Critical Peak Pricing: number of customers enrolled	#			
Tiered Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Tiered Rate with Peak-Time Rebate: number of customers with access	#			
Tiered Rate with Peak-Time Rebate: number of customers enrolled	#			
Time of Use Rate: is the pricing program available?	yes/	no	■	■
Time of Use Rate: number of customers with access	#		12,259	

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Implemented Rate Plans	Units		Project	System
Time of Use Rate: number of customers enrolled	#		102	341
Time of Use Rate with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Critical Peak Pricing: number of customers with access	#			
Time of Use Rate with Critical Peak Pricing: number of customers enrolled	#			
Time of Use Rate with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Time of Use Rate with Peak-Time Rebate: number of customers with access	#			
Time of Use Rate with Peak-Time Rebate: number of customers enrolled	#			
Real-time Pricing: is the pricing program available?	yes/	no	☐	■
Real-time Pricing: number of customers with access	#			
Real-time Pricing: number of customers enrolled	#			9
Real-time Pricing with Critical Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Critical Peak Pricing: number of customers with access	#			
Real-time Pricing with Critical Peak Pricing: number of customers enrolled	#			
Real-time Pricing with Peak-Time Rebate: is the pricing program available?	yes/	no	☐	☐
Real-time Pricing with Peak-Time Rebate: number of customers with access	#			
Real-time Pricing with Peak-Time Rebate: number of customers enrolled	#			
Variable Peak Pricing: is the pricing program available?	yes/	no	☐	☐
Variable Peak Pricing: number of customers with access	#			
Variable Peak Pricing: number of customers enrolled	#			
Pre-pay Pricing: is the pricing program available?	yes/	no	☐	☐
Pre-pay Pricing: number of customers with access	#			
Pre-pay Pricing: number of customers enrolled	#			
Net Metering: is the pricing program available?	yes/	no	☐	■

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Implemented Rate Plans	Units		Project	System
Net Metering: number of customers with access	#			
Net Metering: number of customers enrolled	#			2,336
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Other program available	yes/	no	☐	☐
Other programs: number of customers with access	#			
Other programs: number of customers enrolled	#			
Rate Decoupling is implemented?	yes/	no	☐	

Rate Plan Descriptions	
	Project	System
Flat Rate	N/A	KCP&L has multiple residential and C&I Flat Rates that occur during both summer and winter. We are not able to calculate an accurate number for how many customers have access.
Flat Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Flat Rate with Peak Time Rebate	N/A	N/A
Tiered Rate	N/A	KCP&L has multiple existing residential and C&I Tiered Rates. A majority of those are declining block rates. We are not able to calculate an accurate number for how many customers have access.
Tiered Rate with Critical Peak Pricing	N/A	N/A
Tiered Rate with Peak Time Rebate	N/A	N/A
Time of Use Rate	A new residential TOU rate is being piloted as part of this project to augment the evaluation of customer information systems and control devices.	KCP&L has multiple existing residential and C&I TOU Rates. We are not able to calculate an accurate number for how many customers have access.
Time of Use Rate with Critical Peak Pricing	N/A	N/A

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Rate Plan Descriptions

	Project	System
Time of Use Rate with Peak Time Rebate	N/A	N/A
Real-Time Rate	N/A	KCP&L has multiple existing RTP rates for commercial and industrial customers. We are not able to calculate an accurate number for how many customers have access.
Real-time Rate with Critical Peak Pricing	N/A	N/A
Real-time Rate with Peak Time Rebate	N/A	N/A
Variable Peak Pricing	N/A	N/A
Pre-paid Rate	N/A	N/A

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Rate Plan Descriptions

	Project	System
Net Metering Rate	N/A	KCP&L has multiple existing residential and C&I Net Metering Rates. We are not able to calculate an accurate number for how many customers have access.
Other program	N/A	N/A
Other program	N/A	N/A
Other program	N/A	N/A
Additional Project Descriptions	N/A	

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Distributed Energy Resources - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Distributed Energy Resources	Units	Project	System
Distributed generation: number of units	#	9	2,361
Distributed generation: installed capacity	kW	176.11	46,055.126
Distributed generation: total energy delivered	* kWh	28,311	
Energy storage: number of units	#	1	1
Energy storage: installed capacity	kW	1,000	1,000
Energy storage: total energy delivered	* kWh	45,645	45,645
Plug-in electric vehicles charging points: number of units	#	19	57
Plug-in electric vehicles charging points: installed capacity	kW	133	371
Plug-in electric vehicles charging points: total energy delivered	* kWh	3,738	10,049
DER/DG interconnection equipment: number of units	#		

* *Energy delivered should be reported just for the quarter being reported, not cumulative for the project to-date.*

Distributed Energy Resource Descriptions

	Project	System
Distributed Generation Interface Description	All DG installed is non-dispatchable utility-owned PV that is being metered separately. All project EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.	Non-dispatchable utility-owned DG and EV Chargers. All EV chargers are installed behind customer meters. Most interfaces currently limited to measuring data. EV chargers may be remotely deactivated to curtail load.

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Additional Project Descriptions

Distributed Energy Resources' Installed Costs	Units	Project Funded	Cost Share
DER Interface Control Systems	$	2,585,472	2,183,009
Communications Equipment	$	0	0
DER/DG Interconnection Equipment	$	0	0
Renewable DER	$	668,165	541,403
Distributed Generation Equipment	$	0	0
Stationary Electric Storage Equipment	$	4,017,795	3,708,112
PEVs and Charging Stations	$	71,089	60,207
Other Costs	$		
Other Cost Description	N/A		

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Electric Distribution System Assets - Build Metrics

All data should be cumulative. Project data pertains to the assets or programs that are funded by the ARRA and Recipient Cost Share. System data should include both project data and any like assets or programs that are deployed in the entire service territory. The system value should be equal to or greater than the project value.

Implemented Distribution Devices	Units	Project	System
Portion of system with SCADA	%	100	10.5
Portion of system with Distribution Automation (DA)	%	100	85
Automated Feeder Switches: number of devices installed	#	20	117
Automated Capacitors: number of devices installed	#	29	2,342
Automated Regulators: number of devices installed	#	0	3
Feeder Monitors: number of devices installed	#	0	0
Remote Fault Indicators: number of devices installed	#	96	325
Transformer Monitors (line): number of devices installed	#	0	0
Smart Relays: number of devices installed	#	63	2,277
Fault Current Limiter: number of devices installed	#	0	0
Other devices installed	#		
Other devices installed	#		
Other devices installed	#		

DA Applications in Operation	Units		Project	System
Fault Location, Isolation, and Service Restoration (FLISR): is this application in operation?	yes/	no	☐	☐
Voltage Optimization: is this application in operation?	yes/	no	■	■
Feeder Peak Load Management: is this application in operation?	yes/	no	☐	☐
Microgrids: is this application in operation?	yes/	no	☐	☐
Other DA Application: is this application in operation?	yes/	no	☐	☐

ENERGY Master Updated: April 8, 2011   Schema Version   1.2

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SMARTGRID.GOV

Project	DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_quarterly	Build Metrics Quarterly Report Quarter 4, 2014
Period	Start: Oct 1, 2014	End: Dec 31, 2014	Submission Due Date:	January 31, 2015

Distribution Management System Integration

	Units		Project	System
AMI: is integration complete?	yes/	no	■	■
Outage Management System: is integration complete?	yes/	no	■	■
Transmission Management System: is integration complete?	yes/	no	☐	☐
Distributed Energy Resources: is integration complete?	yes/	no	☐	☐
Other Systems: is integration complete?	yes/	no	☐	☐

Distribution Device Description

	Project	System
SCADA	Distribution SCADA in conjunction with project DMS/OMS, includes a Tropos wireless network to reach devices outside the substation.	ABB Network Manager (EMS) across system plus project Distribution SCADA.
Portion of system with SCADA	Distribution SCADA has been deployed to all field devices in the project area.	The ABB Network Manager (EMS) communicates with 70% of feeder breakers, but only 15% of those have communications capable of supporting Smart Grid functionality.
Portion of system with DA	DA capabilities are installed on all project circuits.	KCP&L has locally automated devices such as capacitors, voltage monitors, faulted circuit indicators, and reclosers across the distribution system. 85% represents an estimate of coverage based on number of circuits with one or more of these devices.
DA devices	There is a mix of communicating and automated capacitors, faulted circuit indicators, and reclosers across the project area.	There is a mix of locally automated capacitors, voltage monitors, faulted circuit indicators, and reclosers across distribution system.

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Project	DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
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Period	Start: Oct 1, 2014	End: Dec 31, 2014	Submission Due Date:	January 31, 2015

Distribution Device Description

	Project	System
DA communications network	Tropos GridCom wireless IP mesh network	Landis+Gyr AMR system and Telemetric/Sensus cellular-based system.
Other device	N/A	N/A
Other device	N/A	N/A
Other device	N/A	N/A

Distribution Application Descriptions

	Project	System
FLISR	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.	As part of the project, the DMS enables FLISR across project circuits. This will reduce outages and outage response time, and improve overall system performance.

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Project	DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
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Period	Start: Oct 1, 2014	End: Dec 31, 2014	Submission Due Date: January 31, 2015

	Project	System
Voltage Optimization	As part of the project, the DMS enables voltage optimization across project circuits. This will improve power factor as well as enable voltage conservation.	A Dynamic Voltage Control (DVC) system exists on 203 buses within metropolitan Kansas City. This system is able to dynamically reduce voltage through load tap changers to achieve voltage changes in coordination with locally controlled cap banks.
Feeder Peak Load Management	As part of the project, the DMS enables dynamic feeder load transfer across project circuits. This will reduce outages on project feeders, reduce stress on critical assets, and improve maintenance.	System peak loads are curtailed through utilization of the DVC system and existing PCT program operated by Honeywell.
Microgrids	N/A	N/A
Other DA Applications	N/A	N/A

Distribution Management Integration Descriptions

	Project	System
AMI	DMS is integrated with project AMI.	DMS is integrated with project AMI.
Outage Management	DMS is integrated with project OMS.	DMS is integrated with project OMS.

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SMARTGRID.GOV

Project	DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing	build_quarterly	Build Metrics Quarterly Report Quarter 4, 2014
Period	Start: Oct 1, 2014	End: Dec 31, 2014	Submission Due Date: January 31, 2015

Distribution Management Integration Descriptions

	Project	System
Transmission Management	N/A	N/A
DER Systems	DMS is integrated with project DERM.	DMS is integrated with project DERM.
Distribution Management System	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.	DMS consisting of D-SCADA and DNA provided by Siemens and OMS and user interface provided by Intergraph.
Other Systems	N/A	N/A
Additional Project Descriptions	N/A	

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Back Office Systems	$	372,159	343,106
Distribution Management System	$	4,338,858	3,436,891
Communications Equipment and SCADA	$	959,422	885,621

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Project   DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing   build_quarterly   Build Metrics Quarterly Report Quarter 4, 2014
Period   Start: Oct 1, 2014   End: Dec 31, 2014   Submission Due Date: January 31, 2015

Distribution Systems Installed Costs	Units	Project Funded	Cost Share
Feeder Monitor/Indicator	$	26,079	23,876
Substation Monitors	$	1,244,388	1,141,646
Automated Feeder Switches	$	690,574	632,255
Capacitor Automation Equipment	$	72,896	66,740
Regulator Automation Equipment	$	0	0
Fault Current Limiter Equipment	$	0	0
Cost of other devices installed	$		
Cost of other devices installed	$		
Cost of other devices installed	$		
Other Costs	$	377,579	339,818

Other Cost Description   KCP&L labor charges across various devices types.

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SMARTGRID.GOV

Project   DE-OE0000221 Kansas City Power and Light (Green Impact Zone SmartGrid Demonstration)
Filing   build_quarterly   Build Metrics Quarterly Report Quarter 4, 2014
Period   Start: Oct 1, 2014   End: Dec 31, 2014   Submission Due Date: January 31, 2015

Submit   Print Form

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Appendix T   Impact Metrics

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T.1 Winter 2011 (2011 Q4 – 2012 Q1)

Project Name	KCPL Green Impact Zone Smart Grid Demonstration	PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMI
Project ID	DE-OE0000221	
Reporting Period	SUMMER 2011	

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	N/A		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	N/A		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	37.7781459		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	20.7070172		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters- Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	17.0711287		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters- Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	January 12, 2012 / 18:00:00		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	0		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	0		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	0	0	
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	0		
Meter Operations Cost	Meter Operations Cost	$	Monthly: ($19,357.76)		
Truck Rolls	Truck Rolls Avoided (mirror)	#	0		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	0		
SAIFI	SAIFI	Index	0.876860519		
SAIDI	SAIDI	Index	62.15812107		
CAIDI	CAIDI	Index	70.88712486		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13,034		
CO2 Emissions	CO2 Emissions: AMI, Vehicle	tons		0	
CO2 Emissions	CO2 Emissions: AMI, Generation or Supply	tons		0	
CO2 Emissions	Avoided CO2 Emissions: AMI, Vehicle (mirror)	tons	0		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	0		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	0		
Meter Data Completeness	Meter Data Completeness	%	97.46%		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	97.71%		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration |
| Project ID | DE-DE0000221 |

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Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER	2014 WINTER	2015 SUMMER
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A	0							
Meter Operations Cost	Meter Operations Cost	$	N/A	0							
Truck Rolls	Truck Rolls Avoided (mi/mo!)	#	N/A	0							
CO2 Emissions	CO2 Emissions: AMI, Vehicle	tons	N/A	0							
CO2 Emissions	CO2 Emissions: AMI, Generation or Supply	tons	N/A	0							

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER	2014 WINTER	2015 SUMMER
END	END	END									

T.2   Summer 2012 (2012 Q2 – 2012 Q3)

Project Name	KCPL Green Impact Zone Smart Grid Demonstration				
Project ID	DE-OE0000221				
Reporting Period	SUMMER 2011				

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Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	N/A		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	N/A		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	52.5041705		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	28.6925985		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters- Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	23.811572		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters- Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	N/A		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	N/A		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	N/A		
Meter Operations Cost	Meter Operations Cost	$	Monthly: $19,357.76		
Truck Rolls	Truck Rolls Avoided (mirror)	#	0		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	0		
SAIFI	SAIFI	Index	1.537186956		
SAIDI	SAIDI	Index	202.409547		
CAIDI	CAIDI	Index	131.6752957		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13,217		
CO2 Emissions	CO2 Emissions: AMI, Vehicle	tons		Optional	
CO2 Emissions	CO2 Emissions: AMI, Generation or Supply	tons		Optional	
CO2 Emissions	Avoided CO2 Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Meter Data Completeness	Meter Data Completeness	%	98.28%		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	98.44%		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration |
| Project ID | DE-OE0000221 |

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Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#			N/a				
Meter Operations Cost	Meter Operations Cost	$			N/a				
Truck Rolls	Truck Rolls Avoided (mirror)	#			0				
CO2 Emissions	CO2 Emissions: AMI, Vehicle	tons			0				
CO2 Emissions	CO2 Emissions: AMI, Generation or Supply	tons			0				

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

T.3   Winter 2012 (2012 Q4 – 2013 Q1)

Project Name	KCPL Green Impact Zone Smart Grid Demonstration				
Project ID	DE-OE000221				
Reporting Period	SUMMER 2011				

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Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Small field truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage – Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	40.1986082		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	21.9240876		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters- Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	18.2745206		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters- Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	1/31/2013 19:00		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	N/A		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	N/A		
Meter Operations Cost	Meter Operations Cost	$	167090.1		Last period, we mistakenly reported monthly cost increase. This is 6-month aggregate service cost to read meters. Not a very useful metric as this is a consistent recurring cost for a service from a vendor. We do not have actual expense numbers that can be tracked accurately for our small pilot area.
Truck Rolls	Truck Rolls Avoided (mirror)	#	2,851		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	45,616		Assuming 16 miles round trip per truck roll based on distance from Dotson service center.
SAIFI	SAIFI	Index	0.95038253		
SAIDI	SAIDI	Index	155.8434388		
CAIDI	CAIDI	Index	163.9796965		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13,463		
CO2 Emissions	Avoided CO2 Emissions: AMI, Vehicle (mirror)	tons	27.12631467		8.92 × 10-3 metric tons CO2/gallon of gasoline (http://www.epa.gov/cleaenergy/energy-resources/refs.html) Assuming 15 miles/gallon
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Meter Data Completeness	Meter Data Completeness	%	98.53%		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	98.33%		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration | | PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEASE CONT |
| Project ID | DE-OE0000221 | | |

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Meter Operations Cost	Meter Operations Cost	$				50943.54			
Truck Rolls	Truck Rolls Avoided (mirror)	#				0			

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type Distribution	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Bucket Truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO – SPP North		
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes	0		
Distribution feeder load	Aggregated Average Real Load	MW	Optional		
Distribution feeder load	Aggregated Average Reactive Load	MVAR	Optional		
Distribution feeder load	Hourly Load Curves (Real Load)	MW	This will be reported using a separate sheet	This will be reported using a separate sheet	
Distribution feeder load	Hourly Load Curves (Reactive Load)	MVAR	This will be reported using a separate sheet	This will be reported using a separate sheet	
Deferred Distribution Capacity Investment	Total Capital Cost	$	0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$	0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$	0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$	0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$	0		
Deferred Distribution Capacity Investment	Amount of Time Deferred	years	0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years	0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years	0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years	0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years	0		
Deferred Distribution Capacity Investment	Description of Deferral	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text	N/A		
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#	0		
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#	5		
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#	0		
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#	0		
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#	0		
Equipment Failure Incidents	Other Major Distribution Equipment A: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment B: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Description	Text	N/A		
Equipment Failure Incidents	Transformers: Reasons for Failures (Distribution)	Text	N/A		

Equipment Failure Incidents	Feeders: Reasons for Failures (Distribution)	Text	4 x Vegetation (Trees); 1 x Failure Wear	1 event cause was MANUAL, but appears to be equivalent to vegetation event
Equipment Failure Incidents	Other Major Distribution Equipment A: Reasons for Failures	Text	N/A	
Equipment Failure Incidents	Other Major Distribution Equipment B: Reasons for Failures	Text	N/A	
Equipment Failure Incidents	Other Major Distribution Equipment C: Reasons for Failures	Text	N/A	
Distribution losses	Avoided distribution losses: Total Cumulative MWh of Avoided Losses (mirror)	MWh	0	
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#	0	
SAIFI	SAIFI	Index	0.95038253	
SAIDI	SAIDI	Index	155.8434388	
CAIDI	CAIDI	Index	163.9796965	
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13463	
Major Event Information	Major Event Information: Infrastructure involved	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 2	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 3	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 4	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 5	Text	N/A	
Major Event Information	Major Event Information: Cause of the event	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 2	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 3	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 4	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 5	Text	N/A	
Major Event Information	Major Event Information: Number of customers affected	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 2	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 3	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 4	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 5	#	0	

Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 2	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 3	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 4	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 5	#	0		
Major Event Information	Major Event Information: Total restoration time	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 2	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 3	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 4	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 5	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 2	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 3	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 4	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 5	hours	0		
Major Event Information	Major Event Information: Other information	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 2	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 3	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 4	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 5	Text	N/A		
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles	0		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons	0		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons	0		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration | | | PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEAS | | | | | | |
| Project ID | DE-OE0000221 | | | | | | | | | |

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#				0			
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#				0			
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes				0			
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes				0			
Distribution feeder load	Aggregated Average Real Load	MW				0			
Distribution feeder load	Aggregated Average Reactive Load	MVAR				0			
Deferred Distribution Capacity Investment	Total Capital Cost	$				0			
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$				0			
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$				0			
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$				0			
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$				0			
Deferred Distribution Capacity Investment	Amount of Time Deferred	years				0			
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years				0			
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years				0			
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years				0			
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years				0			
Deferred Distribution Capacity Investment	Description of Deferral	Text				N/A			
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text				N/A			
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text				N/A			
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text				N/A			
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text				N/A			
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#				0			
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#				0			
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#				0			
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#				0			
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#				0			
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#				0			
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles				0			
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons				0			
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons				0			

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	2012 WINTER

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Annual Storage Dispatch	Total electricity discharged from storage system; repeat for each unique storage system model/design	kWh	0		
Average Energy Storage Efficiency	Roundtrip efficiency of the demonstration storage system; repeat for each unique storage system model/design	%	TBD		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

T.4   *Summer 2013 (2013 Q2 – 2013 Q3)*

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEM

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Small field truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	50.3600307		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	26.9170366		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters- Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	23.4429941		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters- Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	8/30/2013 16:00		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	N/A		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	N/A		
Meter Operations Cost	Meter Operations Cost	$	167090.1		
Truck Rolls	Truck Rolls Avoided (mirror)	#	4139		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	66224		Assuming 16 miles round trip per truck roll based on distance from Dotson service center.
SAIFI	SAIFI	Index	2.670661803		
SAIDI	SAIDI	Index	255.4922355		
CAIDI	CAIDI	Index	95.66626341		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13433		
CO2 Emissions	Avoided CO2 Emissions: AMI, Vehicle (mirror)	tons	39.38120533		8.92×10^{-3} metric tons CO2/gallon of gasoline (http://www.epa.gov/cleanenergy/energy-resources/refs.html) Assuming 15 miles/gallon
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Meter Data Completeness	Meter Data Completeness	%	98.55		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	98.11		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

Project Name	KCPL Green Impact Zone Smart Grid Demonstration	PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEASE CONT
Project ID	DE-OE0000221	

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Meter Operations Cost	Meter Operations Cost	S					50943.54		
Truck Rolls	Truck Rolls Avoided (mirror)	#					0		

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type Distribution	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Bucket Truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO – SPP North		
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes	0		
Distribution feeder load	Aggregated Average Real Load	MW	Optional		
Distribution feeder load	Aggregated Average Reactive Load	MVAR	Optional		
Distribution feeder load	Hourly Load Curves (Real Load)	MW	This will be reported using a separate sheet	This will be reported using a separate sheet	
Distribution feeder load	Hourly Load Curves (Reactive Load)	MVAR	This will be reported using a separate sheet	This will be reported using a separate sheet	
Deferred Distribution Capacity Investment	Total Capital Cost	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years	N/A		
Deferred Distribution Capacity Investment	Description of Deferral	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text	N/A		
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#	0		
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#	12		Cables & OH Wires
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#	1		Switch
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment A: Description	Text	Switch		
Equipment Failure Incidents	Other Major Distribution Equipment B: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Description	Text	N/A		
Equipment Failure Incidents	Transformers: Reasons for Failures (Distribution)	Text	N/A		
Equipment Failure Incidents	Feeders: Reasons for Failures (Distribution)	Text	Failure Wear		

Equipment Failure Incidents	Other Major Distribution Equipment A: Reasons for Failures	Text	Failure Wear
Equipment Failure Incidents	Other Major Distribution Equipment B: Reasons for Failures	Text	N/A
Equipment Failure Incidents	Other Major Distribution Equipment C: Reasons for Failures	Text	N/A
Distribution losses	Avoided distribution losses: Total Cumulative MWh of Avoided Losses (mirror)	MWh	0
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#	0
SAIFI	SAIFI	Index	2.670661803
SAIDI	SAIDI	Index	255.4922355
CAIDI	CAIDI	Index	95.66626341
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13433
Major Event Information	Major Event Information: Infrastructure involved	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 2	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 3	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 4	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 5	Text	N/A
Major Event Information	Major Event Information: Cause of the event	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 2	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 3	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 4	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 5	Text	N/A
Major Event Information	Major Event Information: Number of customers affected	#	0
Major Event Information	Major Event Information: Number of customers affected Instance 2	#	0
Major Event Information	Major Event Information: Number of customers affected Instance 3	#	0
Major Event Information	Major Event Information: Number of customers affected Instance 4	#	0
Major Event Information	Major Event Information: Number of customers affected Instance 5	#	0
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology	#	0
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 2	#	0

Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 3	#	0			
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 4	#	0			
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 5	#	0			
Major Event Information	Major Event Information: Total restoration time	hours	0			
Major Event Information	Major Event Information: Total restoration time Instance 2	hours	0			
Major Event Information	Major Event Information: Total restoration time Instance 3	hours	0			
Major Event Information	Major Event Information: Total restoration time Instance 4	hours	0			
Major Event Information	Major Event Information: Total restoration time Instance 5	hours	0			
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology	hours	0			
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 2	hours	0			
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 3	hours	0			
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 4	hours	0			
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 5	hours	0			
Major Event Information	Major Event Information: Other information	Text	N/A			
Major Event Information	Major Event Information: Other information Instance 2	Text	N/A			
Major Event Information	Major Event Information: Other information Instance 3	Text	N/A			
Major Event Information	Major Event Information: Other information Instance 4	Text	N/A			
Major Event Information	Major Event Information: Other information Instance 5	Text	N/A			
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles	0			
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons	Optional			
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons	Optional			

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

Project Name	KCPL Green Impact Zone Smart Grid Demonstration	PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEAS
Project ID	DE-OE0000221	

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#					0		
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#					0		
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes					0		
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes					0		
Distribution feeder load	Aggregated Average Real Load	MW					0		
Distribution feeder load	Aggregated Average Reactive Load	MVAR					0		
Deferred Distribution Capacity Investment	Total Capital Cost	$					0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$					0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$					0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$					0		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$					0		
Deferred Distribution Capacity Investment	Amount of Time Deferred	years					0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years					0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years					0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years					0		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years					0		
Deferred Distribution Capacity Investment	Description of Deferral	Text					N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text					N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text					N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text					N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text					N/A		
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#					0		
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#					0		
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#					0		
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#					0		
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#					0		
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#					0		
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles					0		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons					0		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons					0		

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	2013 SUMMER

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Annual Storage Dispatch	Total electricity discharged from storage system; repeat for each unique storage system model/design	kWh	12760		
Average Energy Storage Efficiency	Roundtrip efficiency of the demonstration storage system; repeat for each unique storage system model/design	%	29.04		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

T.5   Winter 2013 (2013 Q4 – 2014 Q1)

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Small field truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	45.2065747		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	25.9730479		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters - Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	19.2335268		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters - Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	1/6/2014 18:00		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	Optional		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	Optional		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	N/A		
Meter Operations Cost	Meter Operations Cost	$	167090.1		
Truck Rolls	Truck Rolls Avoided (mirror)	#	3366		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	53856		Assuming 16 miles round trip per truck roll based on distance from Dotson service center.
SAIFI	SAIFI	Index	1.153726478		
SAIDI	SAIDI	Index	75.26078182		
CAIDI	CAIDI	Index	65.23277679		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13498		
CO2 Emissions	Avoided CO2 Emissions: AMI, Vehicle (mirror)	tons	32.026368		8.92×10^{-3} metric tons CO2/gallon of gasoline (http://www.epa.gov/cleanenergy/energy-resources/refs.html) Assuming 15 miles/gallon
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Meter Data Completeness	Meter Data Completeness	%	99.01		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	99.14		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

Project Name	KCPL Green Impact Zone Smart Grid Demonstration		PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEASE CONT
Project ID	DE-OE0000221		

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Meter Operations Cost	Meter Operations Cost	S						50943.54	
Truck Rolls	Truck Rolls Avoided (mirror)	#						0	

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMF

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type Distribution	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Bucket Truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes	0		
Distribution feeder load	Aggregated Average Real Load	MW	Optional		
Distribution feeder load	Aggregated Average Reactive Load	MVAR	Optional		
Distribution feeder load	Hourly Load Curves (Real Load)	MW	This will be reported using a separate sheet	This will be reported using a separate sheet	
Distribution feeder load	Hourly Load Curves (Reactive Load)	MVAR	This will be reported using a separate sheet	This will be reported using a separate sheet	
Deferred Distribution Capacity Investment	Total Capital Cost	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years	N/A		
Deferred Distribution Capacity Investment	Description of Deferral	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text	N/A		
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#	1		
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#	1		OH Wire
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment A: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment B: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Description	Text	N/A		
Equipment Failure Incidents	Transformers: Reasons for Failures (Distribution)	Text	Failure Wear		
Equipment Failure Incidents	Feeders: Reasons for Failures (Distribution)	Text	Failure Wear		

Equipment Failure Incidents	Other Major Distribution Equipment A: Reasons for Failures	Text	N/A	
Equipment Failure Incidents	Other Major Distribution Equipment B: Reasons for Failures	Text	N/A	
Equipment Failure Incidents	Other Major Distribution Equipment C: Reasons for Failures	Text	N/A	
Distribution losses	Avoided distribution losses: Total Cumulative MWh of Avoided Losses (mirror)	MWh	0	
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#	0	
SAIFI	SAIFI	Index	1.153726478	
SAIDI	SAIDI	Index	75.26078182	
CAIDI	CAIDI	Index	65.23277679	
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13498	
Major Event Information	Major Event Information: Infrastructure involved	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 2	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 3	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 4	Text	N/A	
Major Event Information	Major Event Information: Infrastructure involved Instance 5	Text	N/A	
Major Event Information	Major Event Information: Cause of the event	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 2	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 3	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 4	Text	N/A	
Major Event Information	Major Event Information: Cause of the event Instance 5	Text	N/A	
Major Event Information	Major Event Information: Number of customers affected	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 2	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 3	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 4	#	0	
Major Event Information	Major Event Information: Number of customers affected Instance 5	#	0	
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology	#	0	
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 2	#	0	

Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 3	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 4	#	0		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 5	#	0		
Major Event Information	Major Event Information: Total restoration time	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 2	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 3	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 4	hours	0		
Major Event Information	Major Event Information: Total restoration time Instance 5	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 2	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 3	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 4	hours	0		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 5	hours	0		
Major Event Information	Major Event Information: Other information	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 2	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 3	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 4	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 5	Text	N/A		
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles	0		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons	Optional		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons	Optional		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration | | PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEAS |
| Project ID | DE-OE0000221 | | |

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#							0
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#							0
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes							0
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes							0
Distribution feeder load	Aggregated Average Real Load	MW							0
Distribution feeder load	Aggregated Average Reactive Load	MVAR							0
Deferred Distribution Capacity Investment	Total Capital Cost	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$							0
Deferred Distribution Capacity Investment	Amount of Time Deferred	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years							0
Deferred Distribution Capacity Investment	Description of Deferral	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text						N/A	
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#							0
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#							0
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#							0
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#							0
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#							0
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#							0
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles							0
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons							0
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons							0

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	2013 WINTER

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Annual Storage Dispatch	Total electricity discharged from storage system; repeat for each unique storage system model/design	kWh	47686	███████	
Average Energy Storage Efficiency	Roundtrip efficiency of the demonstration storage system; repeat for each unique storage system model/design	%	53.98	███████	

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

T.6 Summer 2014 (2014 Q2 – 2014 Q3)

Project Name	KCPL Green Impact Zone Smart Grid Demonstration				
Project ID	DE-OE000221				
Reporting Period	SUMMER 2011				

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type AMI	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Small field truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Usage	8760 data	This will be reported using a separate sheet	This will be reported using a separate sheet	
Hourly Customer Electricity Usage	Hourly Customer Electricity Usage: Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Residential Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Commercial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Usage	kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Monthly Customer Electricity Usage	Monthly Customer Electricity Usage - Industrial Rate	$/kWh	This will be reported using a separate sheet	This will be reported using a separate sheet	
Peak Load and Mix	Peak Load - Total Amount (AMI)	MW	49.4753562		
Peak Load and Mix	Peak Load - Customer Class A (AMI) (Optional)	MW	26.9865111		
Peak Load and Mix	Peak Load - Customer Class A Description (AMI) (Optional)	Text	AMI Meters - Residential		
Peak Load and Mix	Peak Load - Customer Class B (AMI) (Optional)	MW	22.4888451		
Peak Load and Mix	Peak Load - Customer Class B Description (AMI) (Optional)	Text	AMI Meters - Commercial		
Peak Load and Mix	Peak Load - Customer Class C (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class C Description (AMI) (Optional)	Text	N/A		
Peak Load and Mix	Peak Load - Customer Class D (AMI) (Optional)	MW	N/A		
Peak Load and Mix	Peak Load - Customer Class D Description (AMI) (Optional)	Text	N/A		

Peak Load and Mix	Peak Load - Date and Time (AMI)	Date/Time	8/25/2014 17:00		
Peak Load and Mix	Peak Load Mix - Direct Load Control Available (AMI)	MW	Optional		
Peak Load and Mix	Peak Load Mix - Direct Load Control Dispatched at Peak (Optional) (AMI)	MW	Optional		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Identified	#	N/A		
Number of Meter Tamper Detections	Number of Meter Tamper Detections: # Confirmed (Optional)	#	N/A		
Meter Operations Cost	Meter Operations Cost	$	167090.1		
Truck Rolls	Truck Rolls Avoided (mirror)	#	4043		
Meter Operations Vehicle Miles	Meter Operations Vehicle Miles Avoided (mirror)	miles	64688		Assuming 16 miles round trip per truck roll based on distance from Dotson service center.
SAIFI	SAIFI	Index	2.331273		
SAIDI	SAIDI	Index	235.4554		
CAIDI	CAIDI	Index	100.9986		
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13427		
CO_2 Emissions	Avoided CO_2 Emissions: AMI, Vehicle (mirror)	tons	38.46779733		8.92×10^{-3} metric tons CO_2/gallon of gasoline (http://www.epa.gov/cleanenergy/energy-resources/refs.html) Assuming 15 miles/gallon
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided SOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Pollutant Emissions (SOx, NOx, PM-2.5)	Avoided NOx Emissions: AMI, Vehicle (mirror)	tons	Optional		
Meter Data Completeness	Meter Data Completeness	%	99.27		
Meters Reporting Daily	Meters Reporting Daily (% of necessary data points reported)	%	99.22		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration | | PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEASE CONT |
| Project ID | DE-OE0000221 | | |

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Meter Operations Cost	Meter Operations Cost	$							50943.54
Truck Rolls	Truck Rolls Avoided (mirror)	#							0

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	SUMMER 2011

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMP

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Vehicle Type Distribution	What type of vehicle is dispatched (or would have been dispatched) on the majority of the miles (or avoided miles) reported?	Drop Down	Bucket Truck		
EPA eGRID Region	What geographic subregion is your project located in (see the Geographic Subregion Map for reference)?	Drop Down	SPNO - SPP North		
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#	0		
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes	0		
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes	0		
Distribution feeder load	Aggregated Average Real Load	MW	Optional		
Distribution feeder load	Aggregated Average Reactive Load	MVAR	Optional		
Distribution feeder load	Hourly Load Curves (Real Load)	MW	This will be reported using a separate sheet	This will be reported using a separate sheet	
Distribution feeder load	Hourly Load Curves (Reactive Load)	MVAR	This will be reported using a separate sheet	This will be reported using a separate sheet	
Deferred Distribution Capacity Investment	Total Capital Cost	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$	N/A		
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years	N/A		
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years	N/A		
Deferred Distribution Capacity Investment	Description of Deferral	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text	N/A		
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text	N/A		
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#	0		
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#	3		Cables
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment A: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment B: Description	Text	N/A		
Equipment Failure Incidents	Other Major Distribution Equipment C: Description	Text	N/A		
Equipment Failure Incidents	Transformers: Reasons for Failures (Distribution)	Text	N/A		
Equipment Failure Incidents	Feeders: Reasons for Failures (Distribution)	Text	Failure Wear		

Equipment Failure Incidents	Other Major Distribution Equipment A: Reasons for Failures	Text	N/A
Equipment Failure Incidents	Other Major Distribution Equipment B: Reasons for Failures	Text	N/A
Equipment Failure Incidents	Other Major Distribution Equipment C: Reasons for Failures	Text	N/A
Distribution losses	Avoided distribution losses: Total Cumulative MWh of Avoided Losses (mirror)	MWh	N/A
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#	N/A
SAIFI	SAIFI	Index	2.331273
SAIDI	SAIDI	Index	235.4554
CAIDI	CAIDI	Index	100.9986
SAIDI and SAIFI	Total number of customers served used in SAIDI and SAIFI calculation	#	13427
Major Event Information	Major Event Information: Infrastructure involved	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 2	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 3	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 4	Text	N/A
Major Event Information	Major Event Information: Infrastructure involved Instance 5	Text	N/A
Major Event Information	Major Event Information: Cause of the event	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 2	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 3	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 4	Text	N/A
Major Event Information	Major Event Information: Cause of the event Instance 5	Text	N/A
Major Event Information	Major Event Information: Number of customers affected	#	N/A
Major Event Information	Major Event Information: Number of customers affected Instance 2	#	N/A
Major Event Information	Major Event Information: Number of customers affected Instance 3	#	N/A
Major Event Information	Major Event Information: Number of customers affected Instance 4	#	N/A
Major Event Information	Major Event Information: Number of customers affected Instance 5	#	N/A
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology	#	N/A
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 2	#	N/A

Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 3	#	N/A		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 4	#	N/A		
Major Event Information	Major Event Information: Number of customers that would have been affected without SGDP/RDSI DA technology Instance 5	#	N/A		
Major Event Information	Major Event Information: Total restoration time	hours	N/A		
Major Event Information	Major Event Information: Total restoration time Instance 2	hours	N/A		
Major Event Information	Major Event Information: Total restoration time Instance 3	hours	N/A		
Major Event Information	Major Event Information: Total restoration time Instance 4	hours	N/A		
Major Event Information	Major Event Information: Total restoration time Instance 5	hours	N/A		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology	hours	N/A		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 2	hours	N/A		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 3	hours	N/A		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 4	hours	N/A		
Major Event Information	Major Event Information: Total restoration time without SGDP/RDSI DA technology Instance 5	hours	N/A		
Major Event Information	Major Event Information: Other information	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 2	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 3	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 4	Text	N/A		
Major Event Information	Major Event Information: Other information Instance 5	Text	N/A		
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles	N/A		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons	Optional		
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons	Optional		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

| Project Name | KCPL Green Impact Zone Smart Grid Demonstration |
| Project ID | DE-OE0000221 |

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMPLATE PLEAS

Metric	Metric Qualifier	Unit	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
Distribution feeder or equipment overload incidents	Feeder Line: Number of Incidents	#							0
Distribution feeder or equipment overload incidents	Substation Transformer: Number of Incidents	#							0
Distribution feeder or equipment overload incidents	Feeder Line: Average duration of incident	minutes							0
Distribution feeder or equipment overload incidents	Substation Transformer: Average duration of incident	minutes							0
Distribution feeder load	Aggregated Average Real Load	MW							0
Distribution feeder load	Aggregated Average Reactive Load	MVAR							0
Deferred Distribution Capacity Investment	Total Capital Cost	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 2	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 3	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 4	$							0
Deferred Distribution Capacity Investment	Total Capital Cost Instance 5	$							0
Deferred Distribution Capacity Investment	Amount of Time Deferred	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 2	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 3	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 4	years							0
Deferred Distribution Capacity Investment	Amount of Time Deferred Instance 5	years							0
Deferred Distribution Capacity Investment	Description of Deferral	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 2	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 3	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 4	Text						N/A	
Deferred Distribution Capacity Investment	Description of Deferral Instance 5	Text						N/A	
Equipment Failure Incidents	Transformers: Number of Failures (Distribution)	#							0
Equipment Failure Incidents	Feeders: Number of Failures (Distribution)	#							0
Equipment Failure Incidents	Other Major Distribution Equipment A: Number of Failures	#							0
Equipment Failure Incidents	Other Major Distribution Equipment B: Number of Failures	#							0
Equipment Failure Incidents	Other Major Distribution Equipment C: Number of Failures	#							0
Truck Rolls (Distribution)	Truck Rolls Avoided (Distribution) (mirror)	#							0
Distribution Operations Vehicle Miles	Avoided Distribution Operations Vehicle Miles (mirror)	miles							0
CO2 Emissions	Avoided CO2 Emissions: Distribution, Vehicle (mirror)	tons							0
CO2 Emissions	Avoided CO2 Emissions: Distribution, Reduced Losses or Reduction in Load (mirror)	tons							0

Custom Metrics

Metric Name		Units	2011 SUMMER	2011 WINTER	2012 SUMMER	2012 WINTER	2013 SUMMER	2013 WINTER	2014 SUMMER
END	END	END							

Project Name	KCPL Green Impact Zone Smart Grid Demonstration
Project ID	DE-OE0000221
Reporting Period	2014 SUMMER

PLEASE DO NOT UNPROTECT THE SHEET FOR ANY REASON. IF THERE IS AN ISSUE WITH THE TEMF

Metric	Metric Qualifier	Unit	Project Value	System Value	Comments
Annual Storage Dispatch	Total electricity discharged from storage system; repeat for each unique storage system model/design	kWh	95864		
Average Energy Storage Efficiency	Roundtrip efficiency of the demonstration storage system; repeat for each unique storage system model/design	%	69.34		

Custom Metrics

Metric Name		Units	Project Value	System Value	Comments
END	END	END			

Appendix U   Smart Grid Computational Tool Analysis

U.1 Project Characterization Module (PCM)

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | **Function 6** | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Automated Feeder and Line Switching

☑ Reduces truck rolls

☑ Reduces manual labor hours associated with restoration

☑ Reduces fault location isolation service restoration (FLISR) time

☑ Reduces manual labor hours associated with line switching

Previous   Previous Tab   Exit   Next Tab

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | **Function 7** | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Automated Islanding and Reconnection

☑ Enables islanding or alternative power supply

☐ Reduces the number of crews needed to restore power

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15

Automated Voltage and VAR Control

☐ Improves system power factor and voltage reducing the amount of voltage ancillary service required

☑ Optimizes voltage and VAR levels to reduce T&D losses

☐ Reduces emissions from carbon based fuel due to losses

☐ Reduces manual labor hours associated with capacitor switching and/or regulator operation

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15

Diagnosis & Notification of Equipment Condition

☐ Reduces truck rolls

☑ Improves detection of pending failure

☐ Enables targeted maintenance

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Real-Time Load Measurement & Management

☑ Enables load management

☐ Improves load models and forecasts

☑ Reduces truck rolls

☑ Optimizes load shape through direct load control to reduce electricity losses

☑ Identifies abnormal customer electricity consumption

☑ Following major damage to the system, detects the individual outages more precisely and quickly to reduce restoration time

☑ Reduces manual meter operations

☑ Enables faster restoration time

☑ Reduces fault location isolation service restoration (FLISR) time

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Real-time Load Transfer

☑ Shifts loads among circuits to avoid overloading feeders or equipment

☑ Optimizes load shape by reconfiguring system to reduce electricity losses

☑ Reduces emissions from carbon based fuel due to losses

☑ Enables real-time feeder reconfiguration to restore service to a portion of customers quickly after a major event

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Customer Electricity Use Optimization

☑ Shifts demand from peak time to reduce distribution peak load

☐ Shifts demand from peak time to reduce transmission peak load

☑ Shifts demand from peak time to reduce generation peak capacity required

☐ Shifts demand from peak time to reduce required ancillary services related to peak load

☑ Optimizes load shape through customer pricing and incentives to reduce electricity losses

☑ Reduces emissions from carbon based fuel due to losses

☐ Decreases loading on congested transmission pathways

☑ Provides customer with information which encourages alternate usage patterns or conservation resulting in reduced costs

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Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | Function 15 |

Storing Electricity for Later Use

☑ Provides electricity at peak time to reduce distribution peak load

☑ Provides electricity at peak time to reduce generation peak capacity required

☐ Provides electricity at peak time to reduce transmission peak load

☑ Enables load following/smoothing allowing generators to remain in their optimum operating zone and avoid the dispatch of less efficient generation

☐ Provides electricity at peak time to reduce ancillary services related to peak load

☑ Provides electricity during times when price of "grid power" exceeds cost of providing electricity with the storage asset

☐ Acts as an uninterruptible power supply during a momentary outage

☐ Utilizes uninterrupted power supply capability to enable load to ride through voltage sags and swell

☑ Enables islanding or alternative power supply

☐ Decreases loading on congested transmission pathways

☐ Optimizes net load shape to reduce electricity losses

☑ Reduces emissions from carbon based fuel due to losses

☑ PEVs used as energy storage assets reduce gasoline consumption.

Previous   Previous Tab   Exit   Next Tab   Next

Mechanisms describe specifically how each function will be realized. In this page the applicable mechanisms for each enabled function should be selected. The combination of the functions and mechanisms determine which benefits the project may yield. Each tab in this page represents one of the enabled functions of this project. Please navigate to all enabled tabs and select all applicable mechanisms for each function. Be sure to navigate to all enabled tabs before proceeding to the next page.

Function 1 | Function 2 | Function 3 | Function 4 | Function 5 | Function 6 | Function 7 | Function 8 | Function 9 | Function 10 | Function 11 | Function 12 | Function 13 | Function 14 | **Function 15**

Distributed Production of Electricity

☑ Generates electricity at peak time to reduce distribution peak load

☑ Generates electricity at peak time to reduce generation peak capacity required

☐ Generates electricity at peak time to reduce transmission peak load

☑ Enables more efficient generation mix to be dispatched by reducing the amount of central generation required during peak times

☐ Generates electricity at peak time to reduce required ancillary service related to peak load

☑ Reduces emissions from carbon based fuel due to losses and/or meets load with renewable sources

☑ Provides electricity during times when price of "grid power" exceeds cost of producing with the DG asset

☐ Optimizes net load shape to reduce electricity losses

☑ Enables islanding or alternative power supply

☐ Decreases loading on congested transmission pathways

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The benefits in black font below represent the benefits this project could yield. For further explanation of the benefit click the button to the right of the benefit.

Optimized Generator Operation	Explanation	Reduced Electricity Losses	Explanation
Deferred Generation Capacity Investments	Explanation	Reduced Electricity Cost	Explanation
Reduced Ancillary Service Cost	Explanation	Reduced Sustained Outages	Explanation
Reduced Congestion Cost	Explanation	Reduced Major Outages	Explanation
Deferred Transmission Capacity Investments	Explanation	Reduced Restoration Cost	Explanation
Deferred Distribution Capacity Investments	Explanation	Reduced Momentary Outages	Explanation
Reduced Equipment Failures	Explanation	Reduced Sags and Swells	Explanation
Reduced T&D Equipment Maintenance Cost	Explanation	Reduced CO2 Emissions	Explanation
Reduced T&D Operations Cost	Explanation	Reduced SOx, NOx, and PM-2.5 Emissions	Explanation
Reduced Meter Reading Cost	Explanation	Reduced Oil Usage (not monetized)	Explanation
Reduced Electricity Theft	Explanation	Reduced Wide-scale Blackouts	Explanation

| Previous | | | Proceed to Function-Benefit Chart |

Verify the Output of the PCM

Directions: Below is a chart that summarizes the output of the PCM. Along the top of the chart are listed all of the smart grid functions that a project could enable, along the side are listed all of the benefits that a project could yield. Based on your inputs in the PCM this chart has been populated with the benefits that your project may yield along with the functions that will lead to the benefits. Therefore, this chart should graphically summarize the objectives and expected benefits of your project. If the chart does adequately summarize your project click the blue button on the left to proceed to the next phase of the tool. If the chart does not adequately summarize your project click the button to the right to return to the PCM entry screens and adjust your inputs accordingly.

> **Function-Benefit Chart is**
> *CORRECT*
> Proceed to the Data Input Module (DIM)

> **Function-Benefit Chart is**
> *INCORRECT*
> Return to Initial Project Characterization Module (PCM)

Benefits			Delivery — Fault Current Limiting	Wide Area Monitoring, Visualization, and Control	Dynamic Capability Rating	Power Flow Control	Adaptive Protection	Automated Feeder and Line Switching	Automated Islanding and Reconnection	Automated Voltage and VAR Control	Diagnosis & Notification of Equipment Condition	Enhanced Fault Protection	Real-Time Load Measurement & Management	Real-time Load Transfer	Use — Customer Electricity Use Optimization	Other — Moving Electricity for Later Use	Distributed Production of Electricity
Economic	Improved Asset Utilization	Optimized Generator Operation															YES
		Deferred Generation Capacity Investments													YES	YES	YES
		Reduced Ancillary Service Cost															
		Reduced Congestion Cost															
	T&D Capital Savings	Deferred Transmission Capacity Investments															YES
		Deferred Distribution Capacity Investments										YES	YES		YES	YES	YES
		Reduced Equipment Failures									YES						
	T&D O&M Savings	Reduced T&D Equipment Maintenance Cost											YES				
		Reduced T&D Operations Cost					YES										
		Reduced Meter Reading Cost											YES				
	Theft Reduction	Reduced Electricity Theft											YES				
	Energy Efficiency	Reduced Electricity Losses								YES			YES	YES	YES		
	Electricity Cost Savings	Reduced Electricity Cost													YES	YES	YES
Reliability	Power Interruptions	Reduced Sustained Outages						YES	YES		YES		YES			YES	YES
		Reduced Major Outages							YES				YES	YES			
		Reduced Restoration Cost						YES			YES		YES				
	Power Quality	Reduced Momentary Outages															
		Reduced Sags and Swells															
Environmental	Air Emissions	Reduced CO2 Emissions						YES					YES	YES	YES	YES	YES
		Reduced SOx, NOx, and PM-2.5 Emissions						YES					YES	YES	YES	YES	YES
Security	Energy Security	Reduced Oil Usage (not monetized)						YES					YES			YES	
		Reduced Wide-scale Blackouts															

U.2 Data Input Module (DIM)

Data Input Module (DIM) Main Page

Instructions

Welcome to the Data Input Module (DIM) phase of the Smart Grid Computational Tool. The DIM will help you navigate through the process of entering the required data. Its main purpose is to ensure that all the required data is entered in the proper format so that the benefits can be analyzed successfully. The DIM uses the project benefits identified by the IPSM to determine and present only a relevant subset of all possible tool inputs to the user. Once all required project data is entered the DIM will send the data to the next phase of the tool for analysis and calculation.

Progress through the DIM by clicking on the **blue buttons** below. Each button corresponds to a step in the DIM. The first three steps prompt the user to enter three different types of data: load curve and tariff data, benefit calculation input data, and project cost data. The fourth step allows the user to review their inputs before proceeding to the next module. The final step exits the DIM and brings the user to the Computational Module which uses the inputs provided by this module to calculate the benefits of the project.
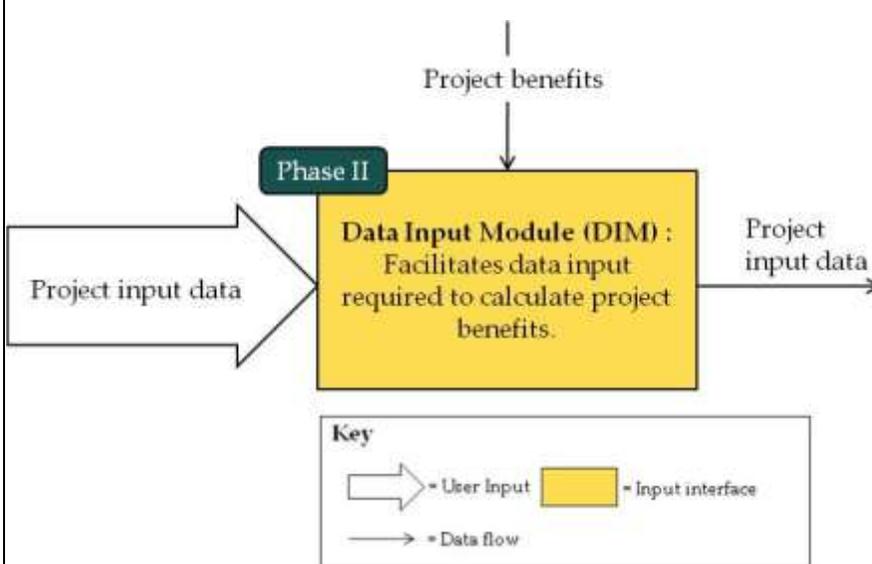
Organization Name	KCPL
Project Name	SmartGrid Demo
NERC Region	6. SPP
Project Start Year	2013

Step I: Enter Number of Customers and Electricity Tariff Data

Step II: Enter Benefit Calculation Input Data and Escalation Factors

Step III: Enter Project Cost Data

Step IV: Review DIM Cost and Benefit Calculation Inputs

Step V: Proceed to the Computational Module (CM) Module to complete Costs and Benefits Calculations

DIM Step I : Number of Customers, and Electricity Tariff Data

Directions: In the outlined section below the user should enter the appropriate electricity tariff and customer population data. The user should refer to the detailed directions in the section below for instruction on how to enter data. If pasting data from another source into these tables please use the "Paste Value" function to avoid changing cell formatting or pasting formulas. Once all data has been entered click the button below to finish this step and return to the DIM Main Page. After finishing this step a new page will become visible which contains all of the data entered in this step, the user can view this page to review all data entered in

---

Finish Electricity Tariff and Customer Data Entry and Return to Main Page.

In this section the user should enter electricity tariff rates and information about the number of customers served. For Table 1 at least one energy rate must be entered for each customer class and at least one demand charge must be entered for the commercial and industrial customer class. If there is no demand charge for a certain customer class a zero should be entered in the Average Demand Charge column of Table 1. Similarly for Table 2, a number must be entered for at least one sub-class for each customer class; if there are no customers served for a certain class a zero should be entered. Once the appropriate data has been entered in Tables 1 and 2 click the "Submit Rate and Number of Customers Served Data" button below to submit and store the entries.

Table 1: Electricity Rates by Customer Class in 2014

	Average Energy Rate ($/kWh)	Average Demand Charge ($/kW-month)
Residential Customer Class		
Residential Rate Sub-Class 1	$ 0.108	$ -
Residential Rate Sub-Class 2		
Residential Rate Sub-Class 3		
Residential Rate Sub-Class 4		
Residential Rate Sub-Class 5		
Average Residential Rate	0.10837	0
Commercial Customer Class		
Commercial Rate Sub-Class 1	$ 0.057	$ 2.650
Commercial Rate Sub-Class 2		
Commercial Rate Sub-Class 3		
Commercial Rate Sub-Class 4		
Commercial Rate Sub-Class 5		
Average Commercial Rate	0.05692	2.65
Industrial Customer Class		
Industrial Sub-Class 1	$ 0.057	$ 2.650
Industrial Sub-Class 2		
Industrial Sub-Class 3		
Industrial Sub-Class 4		
Industrial Sub-Class 5		
Average Industrial Rate		2.65
Average Retail Electricity Rate	0.082645	1.766666667

Table 2: Number of Customeres Served by Class in 2014

	Customers Served
Residential Customer Class	
Residential Rate Sub-Class 1	12,204
Residential Rate Sub-Class 2	
Residential Rate Sub-Class 3	
Residential Rate Sub-Class 4	
Residential Rate Sub-Class 5	
All Residential Classes	12,204
Commercial Customer Class	
Commercial Rate Sub-Class 1	1,223
Commercial Rate Sub-Class 2	
Commercial Rate Sub-Class 3	
Commercial Rate Sub-Class 4	
Commercial Rate Sub-Class 5	
All Commercial Classes	1,223
Industrial Customer Class	
Industrial Sub-Class 1	-
Industrial Sub-Class 2	
Industrial Sub-Class 3	
Industrial Sub-Class 4	
Industrial Sub-Class 5	
All Industrial Classes	-
All Customer Classes	13,427

Submit Rate and Number of Customers Served Data

DIM Step II: Enter Benefit Calculation Input Data, Escalation Factors

Directions: The Smart Grid Computational Tool can calculate costs and benefits of the smart grid project out to the year 2040. In order to complete this analysis escalation factors are applied to the inputs that have been entered. On this page the user can choose to use default escalation factors or they can enter their own escalation factors in the "Value" column. If pasting data from another source into this table please use the "Paste Value" function to avoid changing cell formatting or pasting formulas. To view a list of inputs affected by an escalation factor click the blue buttons in the "Inputs Affected" column. Additionally, the user can set the year in which project benefits decline to zero. If no values are entered in the "Value" column the default values will be used. After reviewing and/or entering all factors click the button below the chart to return to the DIM Main Page.

Escalation Factor	Description	Inputs Affected	Value	Default Value
Population Growth Factor	This escalation factor represents the customer population growth of the service area that the project impacts.	View List of Inputs		0.40%
Load Growth Factor	This escalation factor represents the electricity load growth of the service area that the project impacts.	View List of Inputs		1.80%
Economic Inflation Factor	This escalation factor represents the approximate economic inflation in the area that the project is located.	View List of Inputs		2.10%
Energy Price Factor	This escalation factor represents the approximate inflation rate of costs related to energy (i.e. whole sale electricity price, cost of ancillary services, congestion costs).	View List of Inputs Affected		1.40%
Final year of benefits	This parameter represents the final year that project will yield benefits; after this year all benefits will decline to zero. This parameter could be defined by the useful lifetime of smart grid assets installed.	This parameter affects all benefit calculations. This year determines when the benefits (calculated by determining the delta between project and baseline inputs) of the project decline to zero.		2038

Return to DIM Main Page

DIM Step III: Enter Project Cost Data

Directions: In this page the user can enter project cost information. This information will be used to complete a simple net present value cost benefit analysis. The user can enter total costs, initial and final spending years, and the interest rate and the tool will amortize the cost evenly over the spending period. Or the user can enter a customized cost schedule. If pasting data from another source into these tables please use the "Paste Value" function to avoid changing cell formatting or pasting formulas. When the cost information has been entered click the blue button at the bottom to submit and store the entries.

Project Start Year	yr	2013
Discount Rate	%	7%
Use Custom Cost Schedule	Yes/No	Yes
Initial Year of Project Spending	yr	
Final Year of Project Spending	yr	
Total Capital Cost of Project	$	
Interest Rate	%	
Yearly Amortized Payment	$	#DIV/0!

Custom Cost Schedule

Year	2011	2012	2013	2014	2015
Capital ($)	$ -	$ -	$ 4,111,423	$ 4,125,813	$ 4,140,505

Finish Cost Data Entry and Return to Main Page

2016	2017	2018	2019	2020	2021	2022	2023
$ 4,155,506	$ 4,170,822	$ 4,186,459	$ 4,202,425	$ 4,218,726	$ 4,235,369	$ 4,252,362	$ 4,269,712

2024	2025	2026	2027	2028	2029	2030	2031
$ 4,287,426	$ 4,305,512	$ 4,323,978	$ 4,342,831	$ 4,362,081	$ 4,381,735	$ 4,401,801	$ 4,422,289

2032	2033	2034	2035	2036	2037	2038
$ 4,443,207	$ 4,464,565	$ 4,486,371	$ 4,508,635	$ 4,531,366	$ 4,554,575	$ 4,578,271

DIM Step IV: Review PDIM Cost and Benefit Calculation Inputs

The tables below contain the benefit calculation inputs and project cost data that will be fed into the next phase of the Smart Grid Computational Tool. The purpose of this page is to give the user the opportunity to review the data before proceeding to the next phase of the tool. If the user finds data that has been entered erroneously, or if the user wishes to edit an entry they should navigate to the appropriate step in the DIM to do so.

Finish Reviewing DIM Inputs and Return to Main Page

Input Name	Unit	Baseline 2013	Baseline 2014	Baseline 2015	Baseline 2016	Baseline 2017	2013	2014	2015	2016	2017
Annual Generation Cost	$	0	0	0	0	0	-112244	-124488	-124488	-124488	-124488
Energy Storage Use at Annual Peak Time	MW	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.8	0.8	0.8
Distributed Generation Use at Annual Peak Time	MW	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.1	0.1
Price of Capacity at Annual Peak	$/MW	95700	95700	95700	95700	95700	95700	95700	95700	95700	95700
Total Customer Peak Demand	MW	0.0	0.0	0.0	0.0	0.0	-0.3	-0.6	-0.6	-0.6	-0.6
Capital Carrying Charge of Distribution Upgrade	$	0	0	0	0	0	0	338743	0	0	0
Distribution Investment Time Deferred	yrs	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Capital Replacement of Failed Equipment	$	0	0	0	0	0	0	-1250000	0	0	0
Portion Caused by Lack of Condition Diagnosis	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Transmission Operations Cost	$	0	0	0	0	0	0	0	0	0	0
Distribution Feeder Switching Operations	$	0	0	0	0	0	0	0	0	0	0
Distribution Capacitor Switching Operations	$	0	0	0	0	0	0	0	0	0	0
Other Distribution Operations Cost	$	0	0	0	0	0	-450.625	-901.25	-901.25	-901.25	-901.25
Meter Operations Cost	$	0	0	0	0	0	-86283.5	-172567	-172567	-172567	-172567
Number of Meter Tamper Detections - Residential	#	0	0	0	0	0	5	10	10	10	10
Number of Meter Tamper Detections - Commercial	#	0	0	0	0	0	0	0	0	0	0
Number of Meter Tamper Detections - Industrial	#	0	0	0	0	0	0	0	0	0	0
Average Annual Customer Electricity Usage - Residential	kWh	7982	7982	7982	7982	7982	7982	7982	7982	7982	7982
Average Annual Customer Electricity Usage - Commercial	kWh	89715	89715	89715	89715	89715	89715	89715	89715	89715	89715
Average Annual Customer Electricity Usage - Industrial	kWh	0	0	0	0	0	0	0	0	0	0
Distribution Feeder Load	MVA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distribution Losses	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transmission Line Load	MVA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transmission Losses	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Average Price of Wholesale Energy	$/kWh	0.03321	0.03321	0.03321	0.03321	0.03321	0.03321	0.03321	0.03321	0.03321	0.03321
Total Residential Electricity Cost	$	0	0	0	0	0	-90036.5	-180073	-180073	-180073	-180073
Total Commercial Electricity Cost	$	0	0	0	0	0	-50899.5	-101799	-101799	-101799	-101799
Total Industrial Electricity Cost	$	0	0	0	0	0	0	0	0	0	0
SAIDI (Impacted Feeders or Lines)	Index	3.03	3.03	3.03	3.03	3.03	2.50	1.97	1.97	1.97	1.97
Total Residential Customers Served by Impacted Feeders or Lines	#	12204	12204	12204	12204	12204	12204	12204	12204	12204	12204
Total Commercial Customers Served by Impacted Feeders or Lines	#	1223	1223	1223	1223	1223	1223	1223	1223	1223	1223
Total Industrial Customers Served by Impacted Feeders or Lines	#	0	0	0	0	0	0	0	0	0	0
Outage Time of Major Outage - Residential	hr	0	0	0	0	0	0	0	0	0	0
Number of Customers Affected by Major Outage - Residential	#	0	0	0	0	0	0	0	0	0	0
Outage Time of Major Outage - Commercial	hr	0	0	0	0	0	0	0	0	0	0
Number of Customers Affected by Major Outage - Commercial	#	0	0	0	0	0	0	0	0	0	0
Outage Time of Major Outage - Industrial	hr	0	0	0	0	0	0	0	0	0	0
Number of Customers Affected by Major Outage - Industrial	#	0	0	0	0	0	0	0	0	0	0
Value of Service - Residential	$/kWh	2.27	2.32	2.37	2.42	2.47	2.27	2.32	2.37	2.42	2.47
Value of Service - Commercial	$/kWh	97.30	99.34	101.43	103.56	105.73	97.30	99.34	101.43	103.56	105.73
Value of Service - Industrial	$/kWh	17.33	17.70	18.07	18.45	18.83	17.33	17.70	18.07	18.45	18.83
Average Hourly Load Not Served During Outage per Customer - Residential	kW	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Average Hourly Load Not Served During Outage per Customer - Commercial	kW	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
Average Hourly Load Not Served During Outage per Customer - Industrial	kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of Outage Events	# of events	0	0	0	0	0	-38.5	-77	-77	-77	-77
Restoration Cost per Event	$/event	260	265.46	271.03466	276.7263879	282.537642	260	265.46	271.03466	276.7263879	282.537642
Number of Feeder Switching or Maintenance Operations Completed	# of events	0	0	0	0	0	-38.5	-77	-77	-77	-77
Average Miles Traveled per Switching or Maintenance Operation	miles/event	20	20	20	20	20	20	20	20	20	20
Average Fuel Efficiency for Feeder Service Vehicle	miles/gallon	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33
Number of Meter Reading Operations	# of events	0	0	0	0	0	-8375	-8375	-8375	-8375	-8375
Average Miles Traveled per meter read	miles/event	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Average Fuel Efficiency for Real-Time Load Measurement/Management Service Vehicle	miles/gallon	11.83	11.83	11.83	11.83	11.83	11.83	11.83	11.83	11.83	11.83
kWh of Electricity Consumed by PEVs	kWh	0	0	0	0	0	14293	28586	28586	28586	28586
Electricity to Fuel Conversion Factor	gallons/kWh	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
CO2 Emissions per Gallon of Fuel	tons/gallon	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
CO2 Emissions	tons	0	0	0	0	0	-1629.75	-3259.5	-3259.5	-3259.5	-3259.5
Value of CO2	$/ton	20	20	20	20	20	20	20	20	20	20
Sox Emissions per Gallon of Gas	tons/gallon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOx Emissions per Gallon of Gas	tons/gallon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PM-2.5 per Gallon of Gas	tons/gallon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SOx Emissions	tons	0	0	0	0	0	-2.3105	-4.621	-4.621	-4.621	-4.621
NOx Emissions	tons	0	0	0	0	0	-1.738	-3.475	-3.475	-3.475	-3.475
PM-2.5 Emissions	tons	0	0	0	0	0	-0.01852	-0.03703	-0.03703	-0.03703	-0.03703
Value of SOx	$/ton	520	520	520	520	520	520	520	520	520	520
Value of NOx	$/ton	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Value of PM-2.5	$/ton	36000	36000	36000	36000	36000	36000	36000	36000	36000	36000

Cost Schedule						
Year		**Total**	**2011**	**2012**	**2013**	
Yearly Capital Expenditure ($)		$ 112,463,764	$ -	$ -	$ 4,111,423	
Present Value of Yearly Capital Expenditure ($)		$ 53,695,656	$ -	$ -	$ 4,111,423	

2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
$ 4,125,813	$ 4,140,505	$ 4,155,506	$ 4,170,822	$ 4,186,459	$ 4,202,425	$ 4,218,726	$ 4,235,369
$ 3,854,335	$ 3,613,542	$ 3,388,001	$ 3,176,736	$ 2,978,833	$ 2,793,439	$ 2,619,753	$ 2,457,028

2022	**2023**	**2024**	**2025**	**2026**	**2028**	**2029**	**2030**
$ 4,252,362	$ 4,269,712	$ 4,287,426	$ 4,305,512	$ 4,323,978	$ 4,362,081	$ 4,381,735	$ 4,401,801
$ 2,304,565	$ 2,161,709	$ 2,027,847	$ 1,902,406	$ 1,784,850	$ 1,571,418	$ 1,474,633	$ 1,383,911

2031	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
$ 4,422,289	$ 4,443,207	$ 4,464,565	$ 4,486,371	$ 4,508,635	$ 4,531,366	$ 4,554,575	$ 4,578,271
$ 1,298,867	$ 1,219,141	$ 1,144,396	$ 1,074,317	$ 1,008,607	$ 946,991	$ 889,210	$ 835,022

The tables below summarize the Assents, Functions, Mechanisms, and benefits that this project leveraged and enabled. Items that are highlighted in green indicate that the item was installed or enabled as part of the smart grid project under analysis. The table in the middle illustrates the various pathways that resulted in the benefits that the project yields. Note that certain benefits may be enabled by multiple pathways; however, the results of the analysis calculate the total benefit stream and does not parse out the benefits according to each pathway that might have lead to it. The right most table shows the unique list of benefits that the project yields.

Proceed to CM Main Page →

Function + Mechanism (Leads To) → Benefit

Assets of Project

- Advanced Interrupting Switch
- AMI/Smart Meters
- Controllable Regulating Inverter
- Customer EMS/Display/Portal
- Distribution Automation
- Distribution Management System
- Enhanced Fault Detection Technology
- Equipment Health Sensor
- Flexible Alternating Current Transmission System (FACTS) Device
- Fault Current Limiter
- Loading Monitor
- Microgrid Controller
- Phase Angle Regulating Transformer
- Phasor Measurement Technology
- Smart Appliances and Equipment (Customer)
- Software - Advanced Analysis/Visualization
- Two-way Communications (high bandwidth)
- Vehicle to Grid Charging Station
- Very Low Impedance (High Temperature Superconducting) cables
- Enabled Energy Resources

Functions / Mechanisms / Benefits

Functions	Mechanisms	Benefits
Adaptive Protection	Reduces likelihood of a missed relay coordination which can reduce the size or likelihood of an outage. Allows the reconfiguration of relay settings which can enable the partial restoration of service	Reduced Restoration Cost
	Reduces likelihood of a missed relay coordination which can reduce the size or likelihood of an outage. Allows the reconfiguration of relay settings which can enable the partial restoration of service	Reduced Sustained Outages
Automated Feeder and Line Switching	Reduces truck rolls	Reduced CO2 Emissions
	Reduces truck rolls	Reduced Oil Usage (not monetized)
	Reduces manual labor hours associated with restoration	Reduced Restoration Cost
	Reduces truck rolls	Reduced SOx, NOx, and PM-2.5 Emissions
	Reduces fault location isolation service restoration (FLISR) time	Reduced Sustained Outages
	Reduces manual labor hours associated with line switching	Reduced T&D Operations Cost
Automated Islanding and Reconnection	Enables islanding or alternative power supply	Reduced Major Outages
	Reduces the number of crews needed to restore power	Reduced Restoration Cost
	Enables islanding or alternative power supply	Reduced Sustained Outages
Automated Voltage and VAR Control	Improves system power factor and voltage reducing the amount of voltage; ancillary service required	Reduced Ancillary Service Cost
	Reduces emissions from carbon based fuel due to losses	Reduced CO2 Emissions
	Optimizes voltage and VAR levels to reduce T&D losses	Reduced Electricity Losses
	Reduces emissions from carbon based fuel due to losses	Reduced SOx, NOx, and PM-2.5 Emissions
	Reduces manual labor hours associated with capacitor switching and/or regulator operation	Reduced T&D Operations Cost
Customer Electricity Use Optimization	Shifts demand from peak time to reduce distribution peak load	Deferred Distribution Capacity Investments
	Shifts demand from peak time to reduce generation peak capacity required	Deferred Generation Capacity Investments
	Shifts demand from peak time to reduce transmission peak load	Deferred Transmission Capacity Investments
	Shifts demand from peak time to reduce required ancillary services related to peak load	Reduced Ancillary Service Cost
	Reduces emissions from carbon based fuel due to losses	Reduced CO2 Emissions
	Decreases loading on congested transmission pathways	Reduced Congestion Cost
	Provides customer with information which encourages alternate usage patterns or conservation resulting in reduced costs	Reduced Electricity Cost
	Optimizes load shape through customer pricing and incentives to reduce electricity losses	Reduced Electricity Losses
	Reduces emissions from carbon based fuel due to losses	Reduced SOx, NOx, and PM-2.5 Emissions
Diagnosis & Notification of Equipment Condition	Reduces truck rolls	Reduced CO2 Emissions
	Improves detection of pending failure	Reduced Equipment Failures
	Reduces truck rolls	Reduced Oil Usage (not monetized)
	Improves detection of pending failure	Reduced Restoration Cost
	Reduces truck rolls	Reduced SOx, NOx, and PM-2.5 Emissions
	Improves detection of pending failure	Reduced Sustained Outages
		Reduced T&D Equipment Maintenance Cost
Distributed Production of Electricity	Generates electricity at peak time to reduce distribution peak load	Deferred Distribution Capacity Investments
	Generates electricity at peak time to reduce generation peak capacity required	Deferred Generation Capacity Investments
	Generates electricity at peak time to reduce transmission peak load	Deferred Transmission Capacity Investments
	Enables more efficient generation mix to be dispatched by reducing the amount of central generation required during peak times	Optimized Generator Operation
	Generates electricity at peak time to reduce required ancillary services related to peak load	Reduced Ancillary Service Cost
	Reduces emissions from carbon based fuel due to losses and/or meets load with renewable sources	Reduced CO2 Emissions
	Decreases loading on congested transmission pathways	Reduced Congestion Cost
	Provides electricity during times when price of "grid power" exceeds cost of producing with the DG asset	Reduced Electricity Cost
	Decreases loss due to losses on transmission and distribution system	Reduced Electricity Losses
	Reduces emissions from carbon based fuel due to losses and/or meets load with renewable sources	Reduced SOx, NOx, and PM-2.5 Emissions
	Enables islanding or alternative power supply	Reduced Sustained Outages
Dynamic Capability Rating	Increases utilization of equipment capability	Deferred Distribution Capacity Investments
	Increases utilization of equipment capability	Deferred Transmission Capacity Investments
	Increases utilization of equipment capability	Reduced Congestion Cost
	Limits ratings based on conditions to avoid overload and equipment damage	Reduced Equipment Failures
	Improves operational awareness	Reduced Wide-scale Blackouts
Enhanced Fault Protection	Reduces stress on equipment through faster fault detection or reduced refining	Reduced Equipment Failures
	Reduces or eliminates reclosing for fault clearing	Reduced Momentary Outages
	Detects and clears hard-to-detect faults more precisely and quickly to reduce scope of outage	Reduced Restoration Cost
	Detects and Clears high impedance faults more precisely and quickly to reduce the frequency and severity of voltage fluctuations they can cause	Reduced Sags and Swells
	Detects and clears hard-to-detect faults more precisely and quickly to reduce scope of outage	Reduced Sustained Outages
Fault Current Limiting	Prevents fault currents from exceeding the levels of the equipment	Deferred Transmission Capacity Investments
	Reduces stress on equipment	Reduced Equipment Failures
Power Flow Control	Diverts power so as to avoid overloading lines or equipment	Deferred Transmission Capacity Investments
	Reduces emissions from carbon based fuel due to losses	Reduced CO2 Emissions
	Controls power flow around congested system elements	Reduced Congestion Cost
	Optimizes power flow to reduce system losses	Reduced Electricity Losses
	Reduces emissions from carbon based fuel due to losses	Reduced SOx, NOx, and PM-2.5 Emissions
Real-Time Load Measurement & Management	Enables load management	Deferred Distribution Capacity Investments
	Improves load forecasts and forecasts	Reduced Ancillary Service Cost
	Reduces truck rolls	Reduced CO2 Emissions
	Optimizes load shape through direct load control to reduce electricity losses	Reduced Electricity Losses
	Identifies abnormal customer electricity consumption	Reduced Electricity Theft
	Following major damage to the system, detects the individual outages more precisely and quickly to reduce restoration time	Reduced Major Outages
	Reduces manual meter operations	Reduced Meter Reading Cost
	Reduces truck rolls	Reduced Oil Usage (not monetized)
	Enables faster restoration time	Reduced Restoration Cost
	Reduces truck rolls	Reduced SOx, NOx, and PM-2.5 Emissions
	Reduces fault location isolation service restoration (FLISR)	Reduced Sustained Outages
Real-time Load Transfer	Shifts loads among circuits to avoid overloading feeders or equipment	Deferred Distribution Capacity Investments
	Optimizes load shape by reconfiguring system to reduce electricity losses	Reduced Electricity Losses
	Enables real-time feeder reconfiguration to restore service to a portion of customers quickly after a major event	Reduced Major Outages
	Reduces emissions from carbon based fuel due to losses	Reduced CO2 Emissions
	Reduces emissions from carbon based fuel due to losses	Reduced SOx, NOx, and PM-2.5 Emissions
Storing Electricity for Later Use	Provides electricity at peak time to reduce distribution peak load	Deferred Distribution Capacity Investments
	Provides electricity at peak time to reduce generation peak capacity required	Deferred Generation Capacity Investments
	Provides electricity at peak time to reduce transmission peak load	Deferred Transmission Capacity Investments
	Enables load following/smoothing allowing generators to remain in their optimum operating zone and avoid the dispatch of less efficient generation	Optimized Generator Operation
	Provides electricity at peak time to reduce ancillary services related to peak load	Reduced Ancillary Service Cost
	Reduces emissions from carbon based fuel due to losses	Reduced CO2 Emissions
	Decreases loading on congested transmission pathways	Reduced Congestion Cost
	Provides electricity during times when price of "grid power" exceeds cost of providing electricity with the storage asset	Reduced Electricity Cost
	Optimizes load shape to reduce electricity losses	Reduced Electricity Losses
	Acts as an uninterruptible power supply during a momentary outage	Reduced Momentary Outages
	Utilizes uninterrupted power supply capacity to enable load to ride through voltage sags and swell	Reduced Sags and Swells
	Reduces emissions from carbon based fuel due to losses	Reduced SOx, NOx, and PM-2.5 Emissions
	Enables islanding or alternative power supply	Reduced Sustained Outages
	PEVs used as energy storage assets reduce gasoline consumption.	Reduced Oil Usage (not monetized)

Unique Benefit List

- Optimized Generator Operation
- Deferred Generation Capacity Investments
- Reduced Ancillary Service Cost
- Reduced Congestion Cost
- Deferred Transmission Capacity Investments
- Deferred Distribution Capacity Investments
- Reduced Equipment Failures
- Reduced T&D Equipment Maintenance Cost
- Reduced T&D Operations Cost
- Reduced Meter Reading Cost
- Reduced Electricity Theft
- Reduced Electricity Losses
- Reduced Electricity Cost
- Reduced Sustained Outages
- Reduced Major Outages
- Reduced Restoration Cost
- Reduced Momentary Outages
- Reduced Sags and Swells
- Reduced CO2 Emissions
- Reduced SOx, NOx, and PM-2.5 Emissions
- Reduced Oil Usage (not monetized)
- Reduced Wide-scale Blackouts

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U.3   Computational Module (CM)

Computational Module (CM) Main Page

Instructions

Welcome to the Computational Module (CM) phase of the Smart Grid Computational Tool. The CM is the calculation engine of the tool, it crunches the numbers and generates the output. The CM also allows the user to complete a sensitivity analysis if desired. Before running the CM the user can review their inputs and the first five years of projected inputs using the tables below. If the user wishes to change any inputs they can return to the PDIM by clicking the arrow to the right of this directions box.

Running the CM with Reference Inputs - To run the CM with the inputs that were entered in the DIM phase, simply click the button in the "Reference Case" section that says "Run CM with Reference Case Inputs". The CM will take about 20 seconds to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Reference Case Results" button.

Running the a Sensitivity Analysis - Before running a sensitivity analysis the CM should be run with the reference case inputs by following the directions above. To run a sensitivity analysis first change the High and Low sensitivity ranges of the desired inputs by using the toggles that are to the right of every input. After all of the desired sensitivity ranges have been set click the button in the "Sensitivity Analysis" section that says "Run CM with Sensitivity Case Inputs". The CM will take about a minute to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Sensitivity Results" button. All of the sensitivity ranges can be reset to 100% by clicking the button above the toggle switches that says "Reset all values to 100%".

Go Back to the DIM Main Page

Reference Case

Run CM with Reference Case Inputs   View Reference Case Results
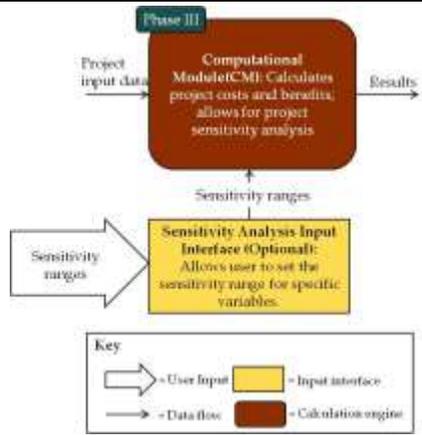
Sensitivity Analysis

Run CM with Sensitivity Case Inputs   View Sensitivity Results

Reset all values to 100%

Input Name	Unit	Low	Reference	High	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
			Select % using toggle		Reference Case Values (project)					Projections -->				-->
Annual Generation Cost	$	100%	100%	100%	(112,244)	(124,488)	(124,488)	(124,488)	(124,488)	(128,472)	(132,583)	(136,825)	(141,204)	(145,722)
Energy Storage Use at Annual Peak Time	MW	100%	100%	100%	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9
Distributed Generation Use at Annual Peak Time	MW	100%	100%	100%	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Price of Capacity at Annual Peak	$/MW	100%	100%	100%	95,700	95,700	95,700	95,700	95,700	97,040	98,398	99,776	101,173	102,589
Total Customer Peak Demand	MW	100%	100%	100%	(0.3)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)
Capital Carrying Charge of Distribution Upgrade	$	100%	100%	100%	-	338,743	-	-	-	-	-	-	-	-
Distribution Investment Time Deferred	yrs	100%	100%	100%	-	5.0	-	-	-	-	-	-	-	-
Capital Replacement of Failed Equipment	$	100%	100%	100%	-	(1,250,000)	-	-	-	-	-	-	-	-
Portion Caused by Lack of Condition Diagnosis	%	100%	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Transmission Operations Cost	$	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Distribution Feeder Switching Operations	$	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Distribution Capacitor Switching Operations	$	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Other Distribution Operations Cost	$	100%	100%	100%	(451)	(901)	(901)	(901)	(901)	(920)	(939)	(959)	(979)	(1,000)
Meter Operations Cost	$	100%	100%	100%	(86,284)	(172,567)	(172,567)	(172,567)	(172,567)	(176,191)	(179,891)	(183,669)	(187,526)	(191,464)
Number of Meter Tamper Detections - Residential	#	100%	100%	100%	5	10	10	10	10	10	10	10	10	10
Number of Meter Tamper Detections - Commercial	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Meter Tamper Detections - Industrial	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Average Annual Customer Electricity Usage - Residential	kWh	100%	100%	100%	7,982	7,982	7,982	7,982	7,982	8,126	8,272	8,421	8,572	8,727
Average Annual Customer Electricity Usage - Commercial	kWh	100%	100%	100%	89,715	89,715	89,715	89,715	89,715	91,330	92,974	94,647	96,351	98,085
Average Annual Customer Electricity Usage - Industrial	kWh	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Distribution Feeder Load	MVA	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Distribution Losses	%	100%	100%	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transmission Line Load	MVA	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Transmission Losses	%	100%	100%	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Average Price of Wholesale Energy	$/kWh	100%	100%	100%	0	0	0	0	0	0	0	0	0	0
Total Residential Electricity Cost	$	100%	100%	100%	(90,037)	(180,073)	(180,073)	(180,073)	(180,073)	(183,314)	(186,614)	(189,973)	(193,393)	(196,874)
Total Commercial Electricity Cost	$	100%	100%	100%	(50,900)	(101,799)	(101,799)	(101,799)	(101,799)	(103,631)	(105,497)	(107,396)	(109,329)	(111,297)
Total Industrial Electricity Cost	$	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
SAIDI (Impacted Feeders or Lines)	Index	100%	100%	100%	2.496	1.966	1.966	1.966	1.966	1.966	1.966	1.966	1.966	1.966
Total Residential Customers Served by Impacted Feeders or Lines	#	100%	100%	100%	12,204	12,204	12,204	12,204	12,204	12,204	12,204	12,204	12,204	12,204
Total Commercial Customers Served by Impacted Feeders or Lines	#	100%	100%	100%	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223
Total Industrial Customers Served by Impacted Feeders or Lines	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Outage Time of Major Outage - Residential	hr	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Affected by Major Outage - Residential	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Outage Time of Major Outage - Commercial	hr	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Affected by Major Outage - Commercial	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Outage Time of Major Outage - Industrial	hr	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Affected by Major Outage - Industrial	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Value of Service - Residential	$/kWh	100%	100%	100%	2	2	2	2	2	3	3	3	3	3
Value of Service - Commercial	$/kWh	100%	100%	100%	97	99	101	104	106	108	110	113	115	117
Value of Service - Industrial	$/kWh	100%	100%	100%	17	18	18	18	19	19	20	20	20	21
Average Hourly Load Not Served During Outage per Customer - Residential	kW	100%	100%	100%	1	1	1	1	1	1	1	1	1	1
Average Hourly Load Not Served During Outage per Customer - Commercial	kW	100%	100%	100%	10	10	10	10	10	10	11	11	11	11
Average Hourly Load Not Served During Outage per Customer - Industrial	kW	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Outage Events	# of events	100%	100%	100%	(39)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)
Restoration Cost per Event	$/event	100%	100%	100%	260	265	271	277	283	288	295	301	307	313
Number of Feeder Switching or Maintenance Operations Completed	# of events	100%	100%	100%	(39)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)
Average Miles Traveled per Switching or Maintenance Operation	miles/event	100%	100%	100%	20	20	20	20	20	20	20	20	20	20
Average Fuel Efficiency for Feeder Service Vehicle	miles/gallon	100%	100%	100%	6	6	6	6	6	6	6	6	6	6
Number of Meter Reading Operations	# of events	100%	100%	100%	(8,375)	(8,375)	(8,375)	(8,375)	(8,375)	(8,409)	(8,442)	(8,476)	(8,510)	(8,544)
Average Miles Traveled per meter read	miles/event	100%	100%	100%	2	2	2	2	2	2	2	2	2	2
Average Fuel Efficiency for Real-Time Load Measurement/Management Service Vehicle	miles/gallon	100%	100%	100%	12	12	12	12	12	12	12	12	12	12
kWh of Electricity Consumed by PEVs	kWh	100%	100%	100%	14,293	28,586	28,586	28,586	28,586	28,700	28,815	28,930	29,046	29,162
Electricity to Fuel Conversion Factor	gallons/kWh	100%	100%	100%	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
CO_2 Emissions per Gallon of Fuel	tons/gallon	100%	100%	100%	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
CO_2 Emissions	tons	100%	100%	100%	(1,630)	(3,260)	(3,260)	(3,260)	(3,260)	(3,260)	(3,260)	(3,260)	(3,260)	(3,260)
Value of CO_2	$/ton	100%	100%	100%	20	20	20	20	20	20	21	21	22	22
Sox Emissions per Gallon of Gas	tons/gallon	100%	100%	100%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOx Emissions per Gallon of Gas	tons/gallon	100%	100%	100%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PM-2.5 per Gallon of Gas	tons/gallon	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
SOx Emissions	tons	100%	100%	100%	(2)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
NOx Emissions	tons	100%	100%	100%	(2)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
PM-2.5 Emissions	tons	100%	100%	100%	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Value of SOx	$/ton	100%	100%	100%	520	520	520	520	520	531	542	553	565	577
Value of NOx	$/ton	100%	100%	100%	3,000	3,000	3,000	3,000	3,000	3,063	3,127	3,193	3,260	3,329
Value of PM-2.5	$/ton	100%	100%	100%	36,000	36,000	36,000	36,000	36,000	36,756	37,528	38,316	39,121	39,942
Number of Customers Residential Rate Sub-Class 1	#	100%	100%	100%	12,204	12,253	12,302	12,351	12,400	12,450	12,500	12,550	12,600	12,650
Number of Customers Residential Rate Sub-Class 2	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Residential Rate Sub-Class 3	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Residential Rate Sub-Class 4	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Residential Rate Sub-Class 5	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers All Residential Classes	#	100%	100%	100%	12,204	12,253	12,302	12,351	12,400	12,450	12,500	12,550	12,600	12,650
Number of Customers Commercial Rate Sub-Class 1	#	100%	100%	100%	1,223	1,228	1,233	1,238	1,243	1,248	1,253	1,258	1,263	1,268
Number of Customers Commercial Rate Sub-Class 2	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Commercial Rate Sub-Class 3	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Commercial Rate Sub-Class 4	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Commercial Rate Sub-Class 5	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers All Commercial Classes	#	100%	100%	100%	1,223	1,228	1,233	1,238	1,243	1,248	1,253	1,258	1,263	1,268
Number of Customers Industrial Sub-Class 1	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Industrial Sub-Class 2	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Industrial Sub-Class 3	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Industrial Sub-Class 4	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers Industrial Sub-Class 5	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-
Number of Customers All Industrial Classes	#	100%	100%	100%	-	-	-	-	-	-	-	-	-	-

Reference Case Output: Annual and Cumulative Results Tables

The tables below display the annual and cumulative project benefits and costs. The benefits are organized and totaled by category and sub-category. The total gross benefit, total cost, and net benefit are also displayed at the bottom of each chart. All values are expressed in nominal dollars.

RETURN TO CM MAIN PAGE

(scroll down for Cumulative Benefit)

ANNUAL Benefit ($) — REFERENCE SCENARIO (Annual)

CUMULATIVE Benefit — REFERENCE SCENARIO (Cumulative)

Reference Case Output: Cumulative Benefits by Category and Sub-Category

The pie charts below show the proportional breakdown of cumulative gross benefits, economic benefits, and reliability benefits by category and sub-category. The tables to the left of each chart displays the data that each chart summarizes. All dollar values are expressed in nominal dollars.

Cumulative Gross Benefits 2013 - 2040
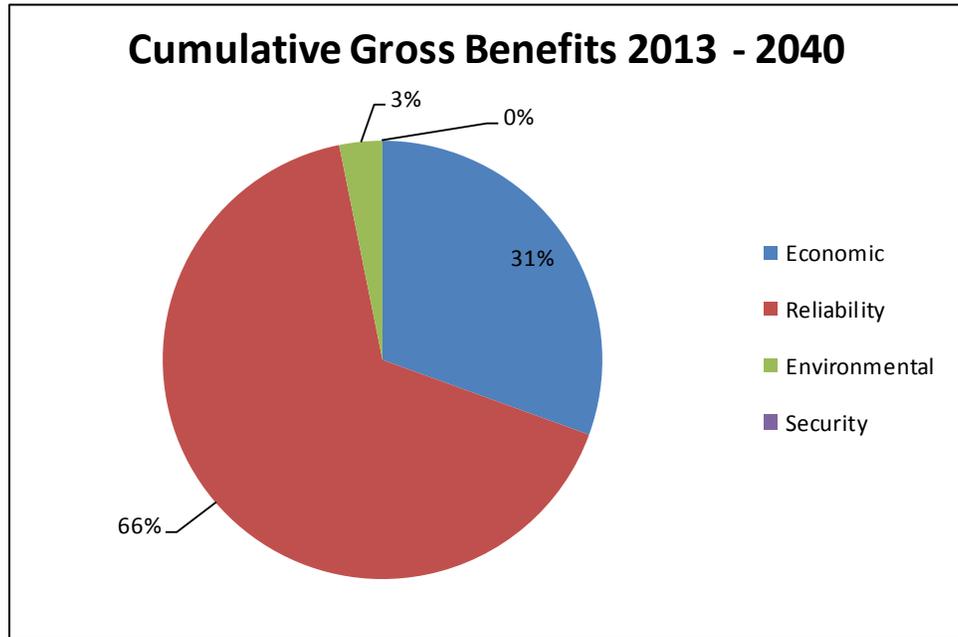
Cumulative Gross Benefits 2013 - 2040		
Economic	$	24,629,720
Reliability	$	53,452,464
Environmental	$	2,552,834
Security	$	-
Total	**$**	**80,635,019**

Cumulative Economic Benefits 2013 - 2040

Legend:
- Improved Asset Utilization
- T&D Capital Savings
- T&D O&M Savings
- Reduced Electricity Theft
- Reduced Electricity Losses
- Reduced Electricity Costs
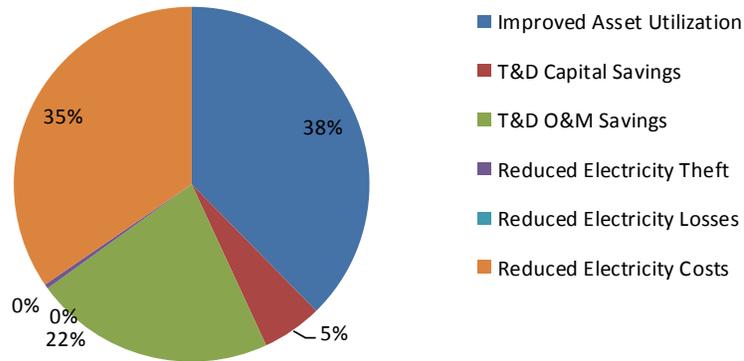
Cumulative Economic Benefits 2013 - 2040		
Improved Asset Utilization	$	9,271,353
T&D Capital Savings	$	1,347,714
T&D O&M Savings	$	5,395,439
Reduced Electricity Theft	$	101,966
Reduced Electricity Losses	$	-
Reduced Electricity Costs	$	8,513,248
Total	$	24,629,720

Cumulative Reliability Benefits 2013 - 2040

Legend:
- Reduced Sustained Outages
- Reduced Major Outages
- Reduced Restoration Cost
- Reduced Momentary Outages
- Reduced Sags and Swells
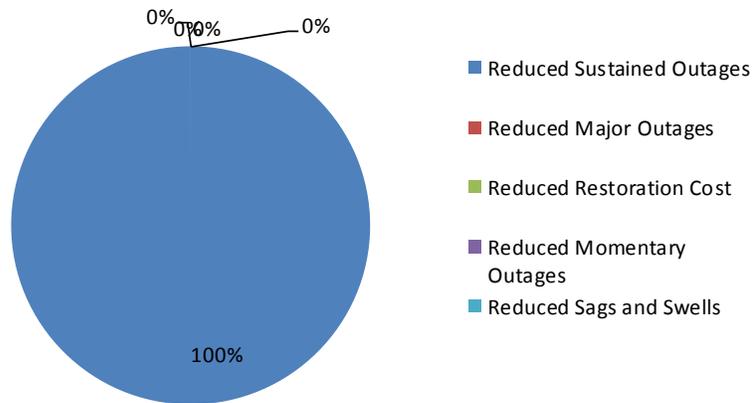
Cumulative Reliability Benefits 2013 - 2040		
Reduced Sustained Outages	$	53,450,501
Reduced Major Outages	$	-
Reduced Restoration Cost	$	1,964
Reduced Momentary Outages	$	-
Reduced Sags and Swells	$	-
Total	$	53,452,464

Reference Case Output: Present Value Cost and Benefit Analysis

The table and graphs below summarize the present value of costs, benefits, and the net present value of the project. These results are displayed on an annual basis as well as on a cumulative basis.

	Total	2011	2012	Start Year of the Project 2013	2014
Annual Cost	$ (112,463,764)	$ -	$ -	$ (4,111,423)	$ (4,125,813)
Annual Benefit	$ 80,635,019	$ -	$ -	$ 1,142,518	$ 3,497,443
Annual Present Value (PV) Cost	$ (53,695,656)	$ -	$ -	$ (4,111,423)	$ (3,854,335)
Annual PV Benefit	$ 34,818,577	$ -	$ -	$ 1,142,518	$ 3,267,311
Annual PV of Net Benefit	$ (18,877,079)	$ -	$ -	$ (2,968,905)	$ (587,023)
Cumulative PV Cost		$ -	$ -	$ (4,111,423)	$ (7,965,758)
Cumulative PV Benefit		$ -	$ -	$ 1,142,518	$ 4,409,829
Cumulative PV of Net Benefit		$ -	$ -	$ (2,968,905)	$ (3,555,929)

2015	2016	2017	2018	2019	2020	2021	2022
$ (4,140,505)	$ (4,155,506)	$ (4,170,822)	$ (4,186,459)	$ (4,202,425)	$ (4,218,726)	$ (4,235,369)	$ (4,252,362)
$ 2,178,024	$ 2,206,862	$ 2,236,242	$ 2,311,618	$ 2,389,693	$ 2,470,566	$ 2,554,342	$ 2,641,129
$ (3,613,542)	$ (3,388,001)	$ (3,176,736)	$ (2,978,833)	$ (2,793,439)	$ (2,619,753)	$ (2,457,028)	$ (2,304,565)
$ 1,900,826	$ 1,799,263	$ 1,703,249	$ 1,644,809	$ 1,588,478	$ 1,534,177	$ 1,481,829	$ 1,431,358
$ (1,712,715)	$ (1,588,738)	$ (1,473,486)	$ (1,334,024)	$ (1,204,960)	$ (1,085,576)	$ (975,200)	$ (873,207)
$ (11,579,300)	$ (14,967,301)	$ (18,144,036)	$ (21,122,869)	$ (23,916,308)	$ (26,536,061)	$ (28,993,089)	$ (31,297,655)
$ 6,310,655	$ 8,109,919	$ 9,813,168	$ 11,457,977	$ 13,046,455	$ 14,580,633	$ 16,062,461	$ 17,493,820
$ (5,268,644)	$ (6,857,382)	$ (8,330,868)	$ (9,664,892)	$ (10,869,853)	$ (11,955,428)	$ (12,930,628)	$ (13,803,835)

2023	2024	2025	2026	2027	2028	2029	2030
$ (4,269,712)	$ (4,287,426)	$ (4,305,512)	$ (4,323,978)	$ (4,342,831)	$ (4,362,081)	$ (4,381,735)	$ (4,401,801)
$ 2,731,039	$ 2,824,187	$ 2,920,696	$ 3,020,690	$ 3,124,299	$ 3,231,659	$ 3,342,910	$ 3,458,197
$ (2,161,709)	$ (2,027,847)	$ (1,902,406)	$ (1,784,850)	$ (1,674,677)	$ (1,571,418)	$ (1,474,633)	$ (1,383,911)
$ 1,382,695	$ 1,335,771	$ 1,290,520	$ 1,246,879	$ 1,204,788	$ 1,164,189	$ 1,125,026	$ 1,087,245
$ (779,013)	$ (692,076)	$ (611,886)	$ (537,971)	$ (469,889)	$ (407,229)	$ (349,607)	$ (296,666)
$ (33,459,363)	$ (35,487,210)	$ (37,389,616)	$ (39,174,466)	$ (40,849,143)	$ (42,420,560)	$ (43,895,193)	$ (45,279,104)
$ 18,876,515	$ 20,212,286	$ 21,502,806	$ 22,749,685	$ 23,954,473	$ 25,118,663	$ 26,243,688	$ 27,330,933
$ (14,582,848)	$ (15,274,924)	$ (15,886,810)	$ (16,424,780)	$ (16,894,669)	$ (17,301,898)	$ (17,651,505)	$ (17,948,171)

2031	2032	2033	2034	2035	2036	2037	2038
$ (4,422,289)	$ (4,443,207)	$ (4,464,565)	$ (4,486,371)	$ (4,508,635)	$ (4,531,366)	$ (4,554,575)	$ (4,578,271)
$ 3,577,671	$ 3,701,490	$ 3,829,816	$ 3,962,818	$ 4,100,672	$ 4,243,560	$ 4,391,672	$ 4,545,203
$ (1,298,867)	$ (1,219,141)	$ (1,144,396)	$ (1,074,317)	$ (1,008,607)	$ (946,991)	$ (889,210)	$ (835,022)
$ 1,050,795	$ 1,015,626	$ 981,692	$ 948,945	$ 917,344	$ 886,844	$ 857,406	$ 828,991
$ (248,072)	$ (203,515)	$ (162,704)	$ (125,371)	$ (91,263)	$ (60,147)	$ (31,804)	$ (6,031)
$ (46,577,971)	$ (47,797,112)	$ (48,941,508)	$ (50,015,825)	$ (51,024,432)	$ (51,971,423)	$ (52,860,633)	$ (53,695,656)
$ 28,381,728	$ 29,397,354	$ 30,379,046	$ 31,327,992	$ 32,245,335	$ 33,132,179	$ 33,989,586	$ 34,818,577
$ (18,196,243)	$ (18,399,757)	$ (18,562,462)	$ (18,687,833)	$ (18,779,096)	$ (18,839,244)	$ (18,871,048)	$ (18,877,079)

Annual PV Cost Benefit Graph

Cumulative PV Cost Benefit Graph
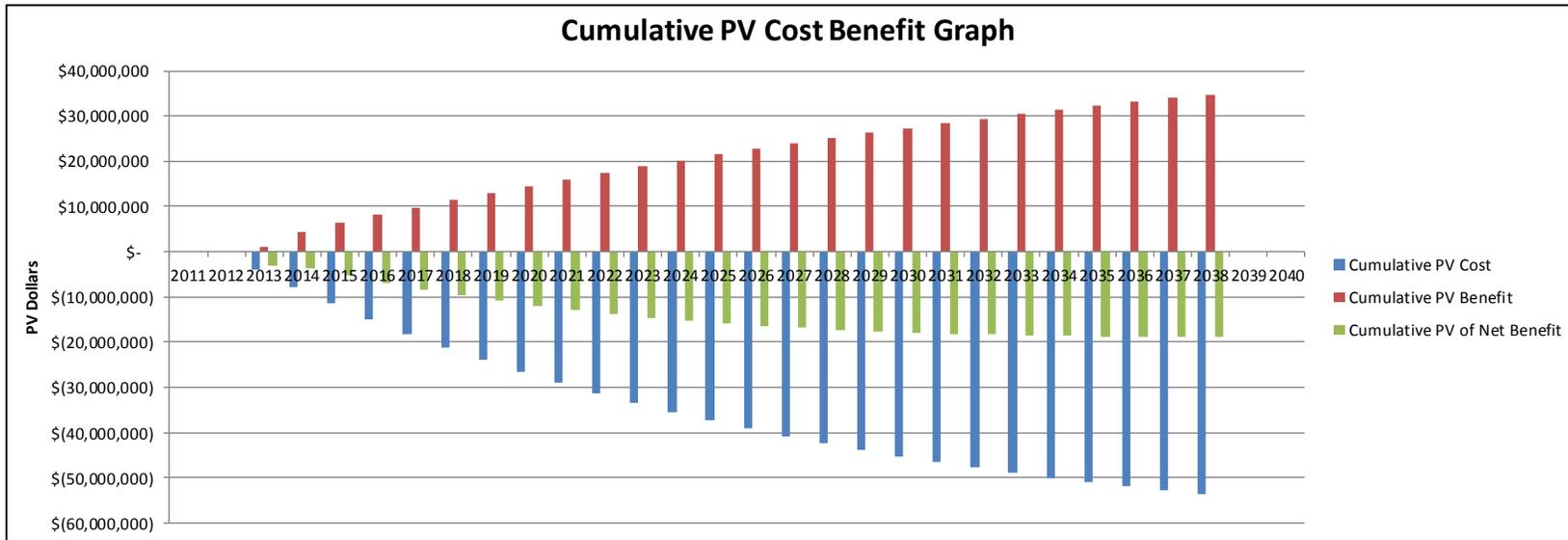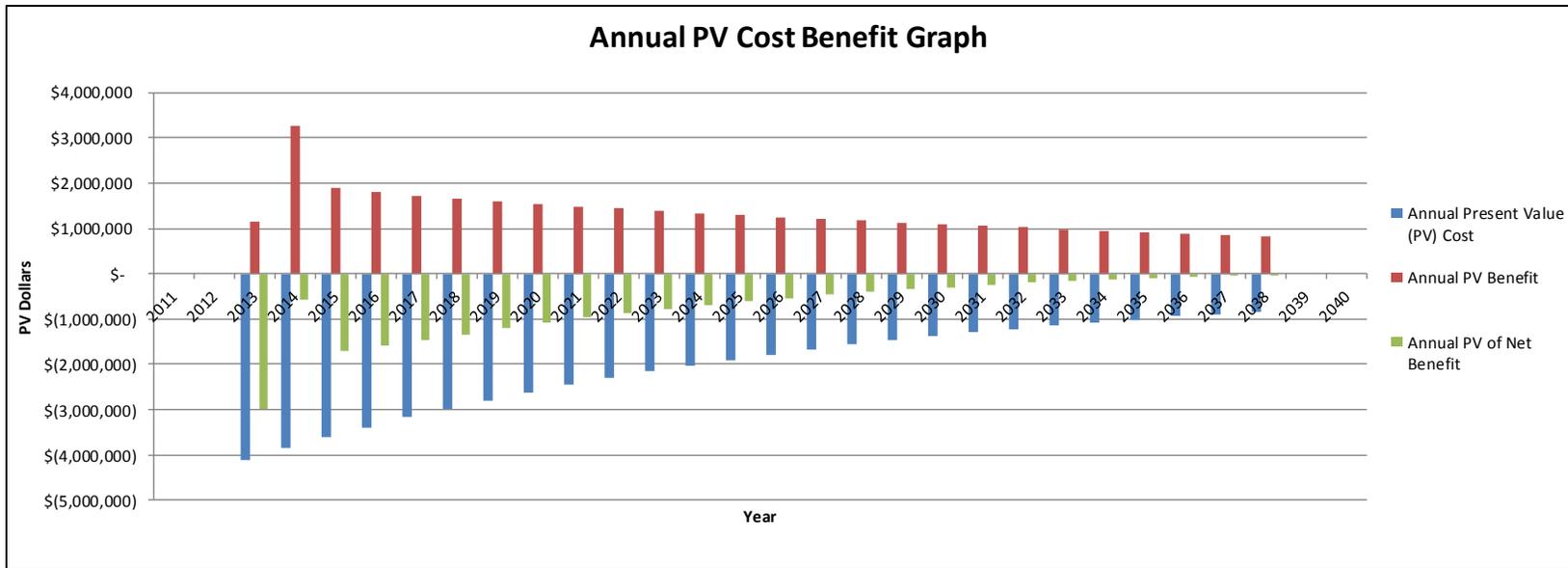
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Appendix V Energy Storage Computational Tool Analysis – Grid

V.1   Asset Characterization Module (ACM)

U.S. Department of Energy Storage Computational Tool (ESCT)
Version 1.2

Purpose of Tool: ESCT guides the user through an analysis to calculate the benefits of an energy storage deployment, compare costs and benefits, and gain a clearer understanding of the value of energy storage technology in terms of monetary benefit. Furthermore, the ESCT can be used to analyze how the costs and benefits vary given different scenarios and assumptions.

Explanation of Output: The output of the ESCT consists of charts, graphs and tables that summarize the benefits and costs of an energy storage deployment. The benefits are monetized and calculated from actual or estimated metrics collected in the first five years of a project lifetime. Based on up to five years of data benefits can be projected out to 40 years in the future. The output also includes charts, graphs and tables that summarize the results of a sensitivity analysis. The user is able to set a high and low sensitivity range for each input in the tool and the output shows how the benefits are affected by variability of the inputs.

Directions: The ESCT is designed to be user-friendly and easy to navigate. However, it will be useful to review the overall methodology of the tool before beginning a new analysis. The diagram below illustrates the tool architecture and the analysis methodology. The tool is divided into three distinct phases: the Asset Characterization Module (ACM), the Data Input Module (DIM), and the Computational Module (CM). The first phase, the ACM, collects information about the deployment such as characteristics of the energy storage technology, cost information, and the applications the deployment will be used for. From this input, the ACM determines a list of benefits that the project could yield. These potential project benefits are then fed into the second phase of the tool, the DIM. The DIM uses the list of benefits to determine the inputs required to calculate the benefits. The DIM then helps the user navigate through the process of entering the required data. The DIM's main purpose is to ensure that all the required data is entered in the proper format so that the benefits can be analyzed successfully. The input data is then fed into the final phase, the CM. The CM is the calculation engine of the tool, it crunches the numbers and generates the output. The CM also allows the user to carry out a sensitivity analysis if desired.

To start a new analysis, click the blue button below and follow the directions that appear in each phase of the tool.

Module 1

Asset Location, Market and Applications

Asset Characterization Module: Characterizes how the storage asset will be used. Determines benefits the project will yield.

Energy storage benefits

Module 2

Project Data

Data Input Module: Facilitates the data input required to calculate the energy storage benefits.

Project Data

Module 3

Computational Module: Calculates and projects storage benefits; carries out sensitivity analysis.

Results

Sensitivity ranges

Sensitivity Ranges

Sensitivity Analysis Input Interface (Optional): Allows the user to set the sensitivity range for specific variables (e.g. value of CO_2).

Key

⇒ = User Input

→ = Data flow

= Input Interface

= Calculation engine

Begin the ESCT

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Location, Market, Owner, Energy Storage Technology

On this form please indicate the following:
1) The physical location of the energy storage deployment project,
2) The regulatory structure in which the storage deployment will operate in,
3) The owner of the storage device,
4) The type of storage technology the deployment utilizes.

Location

- (•) Generation and Transmission — [Definition]
- ( ) Distribution — [Definition]
- ( ) End-User — [Definition]

Market

- (•) Regulated — [Definition]
- ( ) Deregulated — [Definition]

Owner

- (•) Utility — [Definition]
- ( ) Non-Utility Merchant/Independent Power Producer — [Definition]
- ( ) End-User — [Definition]

What type of storage technology does the deployment utilize? [Battery, Lithium Ion ▼]

[Exit]   [Next]

Parameters   ✕

Please enter all of the system parameters for the energy storage deployment.

What is the total nameplate power output (kW)?	1,000	kW	Use Default Value	Definition
What is the total nameplate energy storage capacity (kWh)?	2,000	kWh	Use Default Value	Definition
What is the response time of the energy storage device(s) deployed?	0.001	seconds	Use Default Value	
What is the nameplate round-trip efficiency of the energy storage device(s) deployed?	75.06	%	Use Default Value	
What is the nameplate cycle life (cycles) of the energy storage device(s) deployed?	4,500	cycles	Use Default Value	Definition
What is the average or expected year over year demand growth of the electric system?	1.8	%	Use Default Value	
Does the energy storage device(s) deployed have reactive power capabilities?	Yes ▼		Use Default Value	
Please indicate the NERC Region in which the energy storage deployment is located.	SPP North ▼			

Previous   Exit   Next

Cost Parameters   ✕

Please enter the cost parameters for the energy storage deployment.

What is the expected lifetime (years) of this deployment?	10	years	Use Default Value	
Please enter the average inflation rate (%) that will be used in the economic calculations.	2.1	%	Use Default Value	Definition
Please enter the discount rate (%) that will be used in the net present value analysis.	6.584	%	Use Default Value	Definition
Please enter the total installed cost ($) of the deployment.	2,950,000	$	Use Default Value	
Please enter the fixed charge rate (%) that will be used to annualize the cost of the deployment.	17.441	%	Use Default Value	
Please enter the average yearly operating and maintenance costs ($/year) not related to energy. These costs may include may include fixed and variable operations and maintenance costs as well as replacement costs.	21,000	$/year	Use Default Value	
If you would prefer to enter a custom operating and maintenance cost schedule please check the box to the right.	☐			
Please enter the expected decommissioning and disposal costs ($) in current nominal dollars.	147,500	$	Use Default Value	
Please enter the initial year (20xx) of this analysis.	2013	Year		

Previous   Exit   Next

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Choose Primary Application

Please choose the primary application for this energy storage deployment. The primary application describes how the energy storage deployment will be used for the majority of the year. It is assumed that the primary application will yield the highest value to the owner in terms of benefits.

Application	
⦿ Electric Energy Time-shift	Definition
○ Electric Supply Capacity	Definition
○ Load Following	Definition
○ Area Regulation	Definition
○ Electric Supply Reserve Capacity	Definition
○ Voltage Support	Definition
○ Transmission Support	Definition
○ Transmission Congestion Relief	Definition
○ Transmission & Distribution (T&D) Upgrade Deferral	Definition
○ Substation On-site Power	Definition
○ Time-of-use (TOU) Energy Cost Management	Definition
○ Demand Charge Management	Definition
○ Electric Service Reliability	Definition
○ Electric Service Power Quality	Definition
○ Renewables Energy Time-shift	Definition
○ Renewables Capacity Firming	Definition
○ Wind Generation Grid Integration - Short Duration	Definition
○ Wind Generation Grid Integration - Long Duration	Definition

Previous   Exit   Next

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Choose First Secondary Application

If applicable, please choose a second secondary application for this energy storage deployment. Secondary applications describe the ways in which the energy storage unit will be used when not being used for the primary application. There are a subset of applications that are especially appropriate given the primary application being pursued and given the technical characteristics of the energy storage technology. These synergistic applications are highlighted in blue.

○ Electric Energy Time-shift	Definition	○ Time-of-use (TOU) Energy Cost Management	Definition
● **Electric Supply Capacity**	Definition	○ Demand Charge Management	Definition
○ Load Following	Definition	○ Electric Service Reliability	Definition
○ Area Regulation	Definition	○ Electric Service Power Quality	Definition
○ Electric Supply Reserve Capacity	Definition	● **Renewables Energy Time-shift**	Definition
○ Voltage Support	Definition	○ Renewables Capacity Firming	Definition
○ Transmission Support	Definition	○ Wind Generation Grid Integration - Short Duration	Definition
● **Transmission Congestion Relief**	Definition	● **Wind Generation Grid Integration - Long Duration**	Definition
● **Transmission & Distribution (T&D) Upgrade Deferral**	Definition	○ No Secondary Applications	
○ Substation On-site Power	Definition		

Previous   Exit   Next

Choose Second Secondary Application

If applicable, please choose a second secondary application for this energy storage deployment. Secondary applications describe the ways in which the energy storage unit will be used when not being used for the primary application. There are a subset of applications that are especially appropriate given the primary application being pursued and given the technical characteristics of the energy storage technology. These synergistic applications are highlighted in blue.

○ Electric Energy Time-shift	Definition	○ Time-of-use (TOU) Energy Cost Management	Definition
○ Electric Supply Capacity	Definition	○ Demand Charge Management	Definition
○ Load Following	Definition	○ Electric Service Reliability	Definition
○ Area Regulation	Definition	○ Electric Service Power Quality	Definition
○ Electric Supply Reserve Capacity	Definition	● **Renewables Energy Time-shift**	Definition
○ Voltage Support	Definition	○ Renewables Capacity Firming	Definition
○ Transmission Support	Definition	○ Wind Generation Grid Integration - Short Duration	Definition
● **Transmission Congestion Relief**	Definition	● **Wind Generation Grid Integration - Long Duration**	Definition
● **Transmission & Distribution (T&D) Upgrade Deferral**	Definition	○ No Secondary Applications	
○ Substation On-site Power	Definition		

Previous   Exit   Next

V.2   Data Input Module (DIM)

Data Input Module

Use the table below to enter the project data that will be used to calculate benefits. For each input the user must enter data for at least one project year before being able to submit entries and complete this step. When all data has been entered click the blue button at the bottom of the table to submit and store the data entries. If pasting data from another source into this table please use the "Paste Value" function to avoid changing cell formatting or pasting formulas. If the user does not have measured data to enter, they can leverage default values for most of the inputs. However, if default values are used the user should take care in interpreting the results since the default values tend to be general estimates, and the actual values for the user's project may vary greatly. Furthermore, default values do not take into account situations in which energy storage deployments are being used for multiple applications, rather they assume the storage is being used for a single application for an entire year. Therefore, if multiple applications are being pursued and default values are being used, the user must ensure that the default amount of energy discharge for each application is realistic considering that the storage is being used for more than one application throughout the year.

Return to the Asset Characterization Module (ACM)

Input Name	Units	Input Definition	Default Values	Values 100	101	102	103	104
Total Energy Discharged for Arbitrage	MWh	The total amount of energy discharged from the energy storage device and used for arbitrage purposes over a year.	Enter Custom	$ -	$ -	$ -	$ -	$ -
Total Energy Discharged for Energy Time-Shift	MWh	The total amount of energy discharged from the energy storage device for the purposes of shifting energy from an off-peak time to an on-peak time. This may allow a utility to decrease their costs by offsetting the need to run less efficient, more expensive peaking units.	Enter Custom	267	267	267	267	267
Average Variable Peak Generation Costs	$/MWh	The average variable generation costs for marginal generation units used to meet peak demand.	Enter Custom	$ 41	$ 41	$ 41	$ 41	$ 41
Average Variable Off-Peak Generation Costs	$/MWh	The average variable generation costs for base load generation units.	Enter Custom	$ 23	$ 23	$ 23	$ 23	$ 23
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average CO2 emissions factor for marginal generation units used to meet peak demand.	Use Default	1,151	1,151	1,151	1,151	1,151
CO2 Emissions Factor for Base Generation	lbs/MWh	The characteristic or average CO2 emissions factor for base load generation units.	Use Default	2,251	2,251	2,251	2,251	2,251
SOx Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average SOx emissions factor for marginal generation units used to meet peak demand.	Use Default	0.012	0.012	0.012	0.012	0.012
SOx Emissions Factor for Base Generation	lbs/MWh	The characteristic or average SOx emissions factor for base load generation units.	Use Default	6.67	6.67	6.67	6.67	6.67
NOx Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average NOx emissions factor for marginal generation units used to meet peak demand.	Use Default	1.41	1.41	1.41	1.41	1.41
NOx Emissions Factor for Base Generation	lbs/MWh	The characteristic or average NOx emissions factor for base load generation units.	Use Default	3.73	3.73	3.73	3.73	3.73
PM Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average PM emissions factor for marginal generation units used to meet peak demand.	Use Default	0.040	0.040	0.040	0.040	0.040
PM Emissions Factor for Base Generation	lbs/MWh	The characteristic or average PM emissions factor for base load generation units.	Use Default	0.200	0.200	0.200	0.200	0.200
Value of CO2	$/ton	The anticipated or current market price of carbon emissions.	Use Default	$ 20	$ 20	$ 20	$ 20	$ 20
Value of SOx	$/ton	The anticipated or current market price of SOx emissions.	Use Default	$ 520	$ 520	$ 520	$ 520	$ 520
Value of NOx	$/ton	The anticipated or current market price of NOx emissions.	Use Default	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000
Value of PM	$/ton	The anticipated or current market price of PM emissions.	Use Default	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000
Generation Capacity Deferred	MW	The size of the generation investment deferred as a result of installing energy storage. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	-	1	-	-	-
Capital Cost of Deferred Generation Capacity	$/MW	The base overnight capital cost of the deferred generation investment. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	$ -	$ 1,227,000	$ -	$ -	$ -
Yearly O&M Costs of Deferred Generation Capacity	$/MW-year	The expected fixed yearly operations and maintenance costs of the deferred generation investment. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	$ -	$ 14,000	$ -	$ -	$ -
Annual Fixed Charge Rate for Generation Capital Investment	%	The rate used to convert capital plant installed cost into an annuity equivalent (payment) representing annual carrying charges for capital equipment. It includes consideration of interest and equity return rates, annual interest payments and return of debt principal, dividends and return of equity principal, income taxes, and property taxes. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	10	10	10	10	10
Initial Year of Generation Deferral	year	The first year that generation is deferred. Enter the value in 20XX format. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	0	2014	0	0	0
Final year of Generation Deferral	year	The last year that generation is deferred. Enter the value in 20XX format. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	0	2023	0	0	0
Transmission Capacity Deferred	kVA	The size of the transmission investment deferred as a result of installing energy storage. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	-	500	-	-	-
Annual Fixed Charge Rate for Transmission Capital Investment	%	The rate used to convert capital transmission installed cost into an annuity equivalent (payment) representing annual carrying charges for capital equipment. It includes consideration of interest and equity return rates, annual interest payments and return of debt principal, dividends and return of equity principal, income taxes, and property taxes. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	10	10	10	10	10
Capital Cost of Deferred Transmission Capacity	$/kVA	The base overnight capital cost of the deferred transmission investment. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	$ -	$ 319	$ -	$ -	$ -
Yearly O&M Costs of Deferred Transmission Capacity	$/year	The expected fixed yearly operations and maintenance costs of the deferred transmission investment. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Use Default	$ -	-	-	-	-
Initial Year of Transmission Deferral	year	The first year that transmission is deferred. Enter the value in 20XX format. Please only enter a single value per deferral in the initial year of deferral. If there is no deferral in a given year, leave that entry cell blank.	Enter Custom	0	2014	0	0	0
Final year of Transmission Deferral	year	The last year that transmission is deferred. Enter the value in 20XX format.	Enter Custom	0	2023	0	0	0
END			END					

Finish Data Entry

Review Benefit Calculation Inputs

The table below contains the benefit calculation inputs that will be fed into the next phase of the Energy Storage Computational Tool. The purpose of this page is to give the user the opportunity to review the data before proceeding to the next phase of the tool. If the user finds data that has been entered erroneously, or if the user wishes to edit an entry they should navigate to back to the DIM and make the appropriate changes.

Input Name	Units	Entered Data					Projected Data				
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total Energy Discharged for Arbitrage	MWh	-	-	-	-	-	-	-	-	-	-
Total Energy Discharged for Energy Time-Shift	MWh	267	267	267	267	267	267	267	267	267	267
Average Variable Peak Generation Costs	$/MWh	$ 41	$ 41	$ 41	$ 41	$ 41	42	43	44	45	46
Average Variable Off-Peak Generation Costs	$/MWh	$ 23	$ 23	$ 23	$ 23	$ 23	23	24	24	25	25
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	1,150.808500	1,150.808500	1,150.808500	1,150.808500	1,150.808500	1,151	1,151	1,151	1,151	1,151
CO2 Emissions Factor for Base Generation	lbs/MWh	2,251.176500	2,251.176500	2,251.176500	2,251.176500	2,251.176500	2,251	2,251	2,251	2,251	2,251
SOx Emissions Factor for Generation on the Margin	lbs/MWh	0.012200	0.012200	0.012200	0.012200	0.012200	0	0	0	0	0
SOx Emissions Factor for Base Generation	lbs/MWh	6.670700	6.670700	6.670700	6.670700	6.670700	7	7	7	7	7
NOx Emissions Factor for Generation on the Margin	lbs/MWh	1.411100	1.411100	1.411100	1.411100	1.411100	1	1	1	1	1
NOx Emissions Factor for Base Generation	lbs/MWh	3.731100	3.731100	3.731100	3.731100	3.731100	4	4	4	4	4
PM Emissions Factor for Generation on the Margin	lbs/MWh	0.040000	0.040000	0.040000	0.040000	0.040000	0	0	0	0	0
PM Emissions Factor for Base Generation	lbs/MWh	0.200000	0.200000	0.200000	0.200000	0.200000	0	0	0	0	0
Value of CO2	$/ton	$ 20	$ 20	$ 20	$ 20	$ 20	$ 20	$ 21	$ 21	$ 22	$ 22
Value of SOx	$/ton	$ 520	$ 520	$ 520	$ 520	$ 520	$ 531	$ 542	$ 553	$ 565	$ 577
Value of NOx	$/ton	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,063	$ 3,127	$ 3,193	$ 3,260	$ 3,329
Value of PM	$/ton	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,756	$ 37,528	$ 38,316	$ 39,121	$ 39,942
Generation Capacity Deferred	MW	-	1	-	-	-	-	-	-	-	-
Capital Cost of Deferred Generation Capacity	$/MW	$ -	$ 1,227,000	$ -	$ -	$ -	-	-	-	-	-
Yearly O&M Costs of Deferred Generation Capacity	$/MW-year	$ -	$ 14,000	$ -	$ -	$ -	-	-	-	-	-
Annual Fixed Charge Rate for Generation Capital Investment	%	10	10	10	10	10	10	10	10	10	10
Initial Year of Generation Deferral	year	0	2014	0	0	0	-	-	-	-	-
Final year of Generation Deferral	year	0	2023	0	0	0	-	-	-	-	-
Transmission Capacity Deferred	kVA	-	500	-	-	-	-	-	-	-	-
Annual Fixed Charge Rate for Transmission Capital Investment	%	10	10	10	10	10	10	10	10	10	10
Capital Cost of Deferred Transmission Capacity	$/kVA	$ -	$ 319	$ -	$ -	$ -	-	-	-	-	-
Yearly O&M Costs of Deferred Transmission Capacity	$/year	-	-	-	-	-	-	-	-	-	-
Initial Year of Transmission Deferral	year	0	2014	0	0	0	-	-	-	-	-
Final year of Transmission Deferral	year	0	2023	0	0	0	-	-	-	-	-

V.3   Computational Module (CM)

Computational Module (CM) Main Page

Instructions

Welcome to the Computational Module (CM) phase of the Energy Storage Computational Tool (ESCT). The CM is the calculation engine of the tool, it crunches the numbers and generates the output. The CM also allows the user to complete a sensitivity analysis if desired.

Running the CM with Reference Inputs - To run the CM with the inputs that were entered in the DIM phase, simply click the button in the "Reference Case" section that says "Run CM with Reference Case Inputs". The CM will take about 20 seconds to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Reference Case Results" button.

Running the a Sensitivity Analysis - Before running a sensitivity analysis the CM should be run with the reference case inputs by following the directions above. To run a sensitivity analysis first change the High and Low sensitivity ranges of the desired inputs by using the toggles that are to the right of every input. After all of the desired sensitivity ranges have been set click the button in the "Sensitivity Analysis" section that says "Run CM with Sensitivity Case Inputs". The CM will take about a 40 seconds to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Sensitivity Results" button. All of the sensitivity ranges can be reset to 100% by clicking the button above the toggle switches that says "Reset all values to 100%".

Go Back to the DIM

Reference Case

Run CM with Reference Case Inputs

View Reference Case Results

Sensitivity Analysis

Run CM with Sensitivity Case Inputs

View Sensitivity Results

Reset all values to 100%

Input Name	Unit	Select % using toggle			2013 Values		
		Low	Reference	High	Low	Reference	High
Total Energy Discharged for Arbitrage	MWh	100%	100%	100%	$ -	$ -	$ -
Total Energy Discharged for Energy Time-Shift	MWh	100%	100%	100%	267	267	267
Average Variable Peak Generation Costs	$/MWh	100%	100%	100%	$ 41	$ 41	$ 41
Average Variable Off-Peak Generation Costs	$/MWh	100%	100%	100%	$ 23	$ 23	$ 23
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	1,151	1,151	1,151
CO2 Emissions Factor for Base Generation	lbs/MWh	100%	100%	100%	2,251	2,251	2,251
SOx Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	0.012	0.012	0.012
SOx Emissions Factor for Base Generation	lbs/MWh	100%	100%	100%	6.67	6.67	6.67
NOx Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	1.41	1.41	1.41
NOx Emissions Factor for Base Generation	lbs/MWh	100%	100%	100%	3.73	3.73	3.73
PM Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	0.040	0.040	0.040
PM Emissions Factor for Base Generation	lbs/MWh	100%	100%	100%	0.200	0.200	0.200
Value of CO2	$/ton	100%	100%	100%	$ 20	$ 20	$ 20
Value of SOx	$/ton	100%	100%	100%	$ 520	$ 520	$ 520
Value of NOx	$/ton	100%	100%	100%	$ 3,000	$ 3,000	$ 3,000
Value of PM	$/ton	100%	100%	100%	$ 36,000	$ 36,000	$ 36,000
Generation Capacity Deferred	MW	100%	100%	100%	-	-	-
Capital Cost of Deferred Generation Capacity	$/MW	100%	100%	100%	$ -	$ -	$ -
Yearly O&M Costs of Deferred Generation Capacity	$/MW-yea	100%	100%	100%	$ -	$ -	$ -
Annual Fixed Charge Rate for Generation Capital Investment	%	100%	100%	100%	10	10	10
Initial Year of Generation Deferral	year	100%	100%	100%	0	0	0
Final year of Generation Deferral	year	100%	100%	100%	0	0	0
Transmission Capacity Deferred	kVA	100%	100%	100%	-	-	-
Annual Fixed Charge Rate for Transmission Capital Investment	%	100%	100%	100%	10	10	10
Capital Cost of Deferred Transmission Capacity	$/kVA	100%	100%	100%	$ -	$ -	$ -
Yearly O&M Costs of Deferred Transmission Capacity	$/year	100%	100%	100%	$ -	$ -	$ -
Initial Year of Transmission Deferral	year	100%	100%	100%	0	0	0
Final year of Transmission Deferral	year	100%	100%	100%	0	0	0

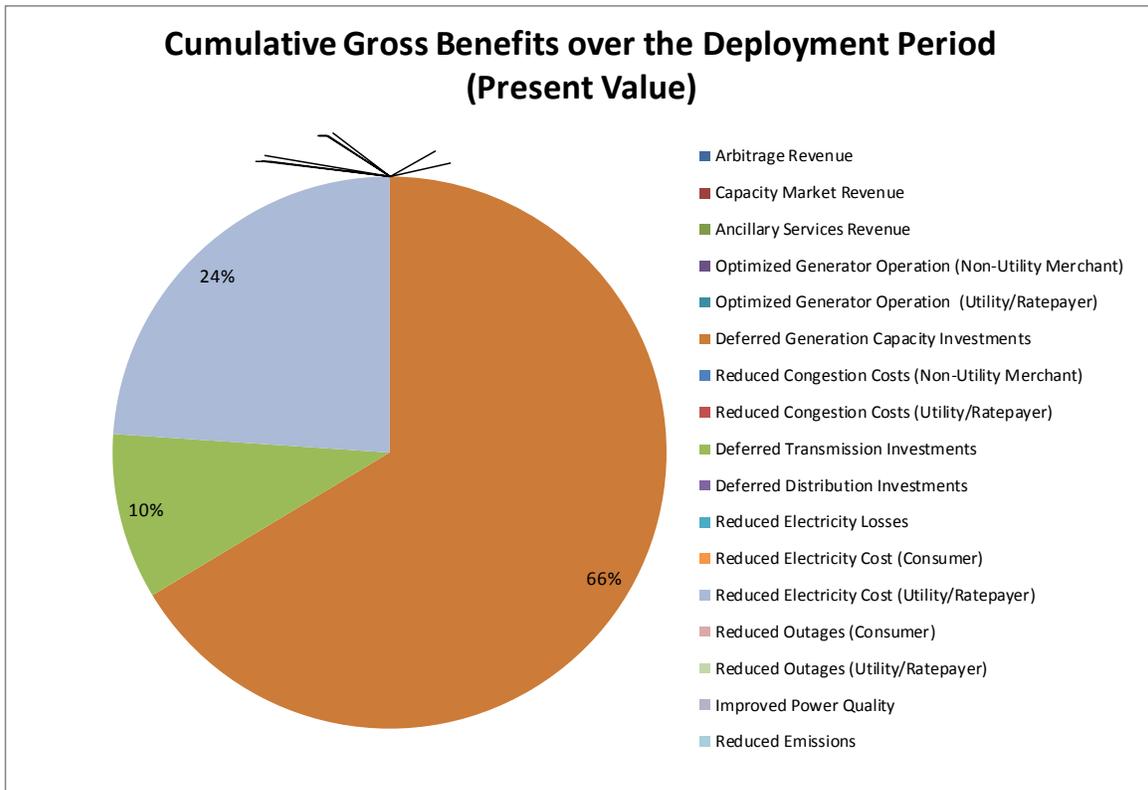**Reference Case Output: Annual and Cumulative Results Tables**

The tables below display the annual and cumulative project benefits and costs. The benefits are organized by category. The total gross benefit, total cost, and net benefit are also displayed at the bottom of each chart. All values are present value terms. To calculate additional benefits navigate to the additional benefits worksheets from the Additional Benefits tab.

Annual Benefit and Cost Table

Category	Benefits	Additional Benefits - Total Present Value over the Deployment Period	+ Primary and Secondary Benefits - Total Present Value over the Deployment Period	= Total Benefit - Present Value over the Deployment Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Market Revenue	Arbitrage Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Capacity Market Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Ancillary Services Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Improved Asset Utilization	Optimized Generator Operation (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Optimized Generator Operation (Utility/Ratepayer)	$ -	$ -	$ -											
	Deferred Generation Capacity Investments	$ -	$ 106,500	$ 106,500	$ -	$ 106,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
T&D Capital Savings	Deferred Transmission Investments	$ -	$ 15,600	$ 15,600	$ -	$ 15,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Distribution Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Energy Efficiency	Reduced Electricity Losses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electricity Cost Savings	Reduced Electricity Cost (Consumer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Electricity Cost (Utility/Ratepayer)	$ -	$ 38,400	$ 38,400	$ 5,000	$ 4,700	$ 4,300	$ 4,100	$ 3,800	$ 3,600	$ 3,500	$ 3,300	$ 3,100	$ 3,000
Power Interruptions	Reduced Outages (Consumer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Outages (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Quality	Improved Power Quality	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Air Emissions	Reduced CO2 Emissions	$ -	$ (22,400)	$ (22,400)	$ (2,900)	$ (2,700)	$ (2,600)	$ (2,400)	$ (2,200)	$ (2,100)	$ (2,000)	$ (1,900)	$ (1,800)	$ (1,800)
	Reduced SOx Emissions	$ -	$ (3,600)	$ (3,600)	$ (500)	$ (400)	$ (400)	$ (400)	$ (400)	$ (300)	$ (300)	$ (300)	$ (300)	$ (300)
	Reduced NOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced PM Emissions	$ -	$ (6,000)	$ (6,000)	$ (800)	$ (700)	$ (700)	$ (600)	$ (600)	$ (600)	$ (500)	$ (500)	$ (500)	$ (500)
	Total Gross Benefit	**$ -**	**$ 128,500**	**$ 128,500**	**$ 800**	**$ 123,000**	**$ 600**	**$ 700**	**$ 600**	**$ 600**	**$ 700**	**$ 600**	**$ 500**	**$ 400**

Costs

Costs				2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Capital Cost of Deployment (fixed charge rate)			3,859,700	514,500	480,600	449,000	419,400	391,800	366,000	341,900	319,400	298,400	278,700
Operating and maintenance costs not related to energy (labor for operation, plant maintenance, equipment wear leading to loss-of-life)			157,500	21,000	19,600	18,300	17,100	16,000	14,900	14,000	13,000	12,200	11,400
Decommissioning and Disposal Costs			79,900	-	-	-	-	-	-	-	-	-	79,900
Total Annual Cost of Deployment			**4,097,300**	**535,500**	**500,300**	**467,300**	**436,500**	**407,800**	**381,000**	**355,900**	**332,400**	**310,600**	**370,000**
Total Net Benefit			**(3,968,800)**	**(534,700)**	**(377,300)**	**(466,700)**	**(435,800)**	**(407,200)**	**(380,400)**	**(355,200)**	**(331,800)**	**(310,100)**	**(369,600)**

Cumulative Benefit and Cost Table

Category	Benefits	Additional Benefits - Total Present Value over the Deployment Period	+ Primary and Secondary Benefits - Total Present Value over the Deployment Period	= Total Benefit - Present Value over the Deployment Period	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Market Revenue	Arbitrage Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Capacity Market Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Ancillary Services Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Improved Asset Utilization	Optimized Generator Operation (Non-Utility)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Optimized Generator Operation (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Generation Capacity Investments	$ -	$ 106,500	$ 106,500.00	$ -	$ 106,500	$ 106,500	$ 106,500	$ 106,500	$ 106,500	$ 106,500	$ 106,500	$ 106,500	$ 106,500
	Reduced Congestion Costs (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
T&D Capital Savings	Deferred Transmission Investments	$ -	$ 15,600	$ 15,600.00	$ -	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600
	Deferred Distribution Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Energy Efficiency	Reduced Electricity Losses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electricity Cost Savings	Reduced Electricity Cost (Consumer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Electricity Cost (Utility/Ratepayer)	$ -	$ 38,400	$ 38,400.00	$ 5,000	$ 9,700	$ 14,000	$ 18,100	$ 21,900	$ 25,500	$ 29,000	$ 32,300	$ 35,400	$ 38,400
Power Interruptions	Reduced Outages (Consumer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Outages (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Quality	Improved Power Quality	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Air Emissions	Reduced CO2 Emissions	$ -	$ (22,400)	$ (22,400.00)	$ (2,900)	$ (5,600)	$ (8,200)	$ (10,600)	$ (12,800)	$ (14,900)	$ (16,900)	$ (18,800)	$ (20,600)	$ (22,400)
	Reduced SOx Emissions	$ -	$ (3,600)	$ (3,600.00)	$ (500)	$ (900)	$ (1,300)	$ (1,700)	$ (2,100)	$ (2,400)	$ (2,700)	$ (3,000)	$ (3,300)	$ (3,600)
	Reduced NOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced PM Emissions	$ -	$ (6,000)	$ (6,000.00)	$ (800)	$ (1,500)	$ (2,200)	$ (2,800)	$ (3,400)	$ (4,000)	$ (4,500)	$ (5,000)	$ (5,500)	$ (6,000)
	Total Gross Benefit	**$ -**	**$ 128,500**	**$ 128,500.00**	**$ 800**	**$ 123,800**	**$ 124,400**	**$ 125,100**	**$ 125,700**	**$ 126,300**	**$ 127,000**	**$ 127,600**	**$ 128,100**	**$ 128,500**

Costs

Costs				2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Capital Cost of Deployment (fixed charge rate)			3,859,700.00	514,500	995,100	1,444,100	1,863,500	2,255,300	2,621,300	2,963,200	3,282,600	3,581,000	3,859,700
Operating and maintenance costs not related to energy (labor for operation, plant maintenance, equipment wear leading to loss-			157,500.00	21,000	40,600	58,900	76,000	92,000	106,900	120,900	133,900	146,100	157,500
Decommissioning and Disposal Costs			79,900.00	-	-	-	-	-	-	-	-	-	79,900
Total Annual Cost of Deployment			**4,097,300.00**	**535,500**	**1,035,800**	**1,503,100**	**1,939,600**	**2,347,400**	**2,728,400**	**3,084,300**	**3,416,700**	**3,727,300**	**4,097,300**
Total Net Benefit			**(3,968,800.00)**	**(534,700)**	**(912,000)**	**(1,378,700)**	**(1,814,500)**	**(2,221,700)**	**(2,602,100)**	**(2,957,300)**	**(3,289,100)**	**(3,599,200)**	**(3,968,800)**

Cumulative Gross Benefits over the Deployment Period (Present Value)

Cumulative Gross Benefits over the Deployment Period (Present Value)		Lifetime Benefit per kW of Energy Storage Installed	
Arbitrage Revenue	$ -	$ -	
Capacity Market Revenue	$ -	$ -	
Ancillary Services Revenue	$ -	$ -	
Optimized Generator Operation (Non-Utility Merchant)	$ -	$ -	
Optimized Generator Operation (Utility/Ratepayer)	$ -	$ -	
Deferred Generation Capacity Investments	$ 106,500	$ 107	
Reduced Congestion Costs (Non-Utility Merchant)	$ -	$ -	
Reduced Congestion Costs (Utility/Ratepayer)	$ -	$ -	
Deferred Transmission Investments	$ 15,600	$ 16	
Deferred Distribution Investments	$ -	$ -	
Reduced Electricity Losses	$ -	$ -	
Reduced Electricity Cost (Consumer)	$ -	$ -	
Reduced Electricity Cost (Utility/Ratepayer)	$ 38,400	$ 38	
Reduced Outages (Consumer)	$ -	$ -	
Reduced Outages (Utility/Ratepayer)	$ -	$ -	
Improved Power Quality	$ -	$ -	
Reduced Emissions	$ -	$ -	
Total Gross Benefit	**$ 160,500**	**$ 161**	

Annual Gross Benefits, Costs, and Net Benefits
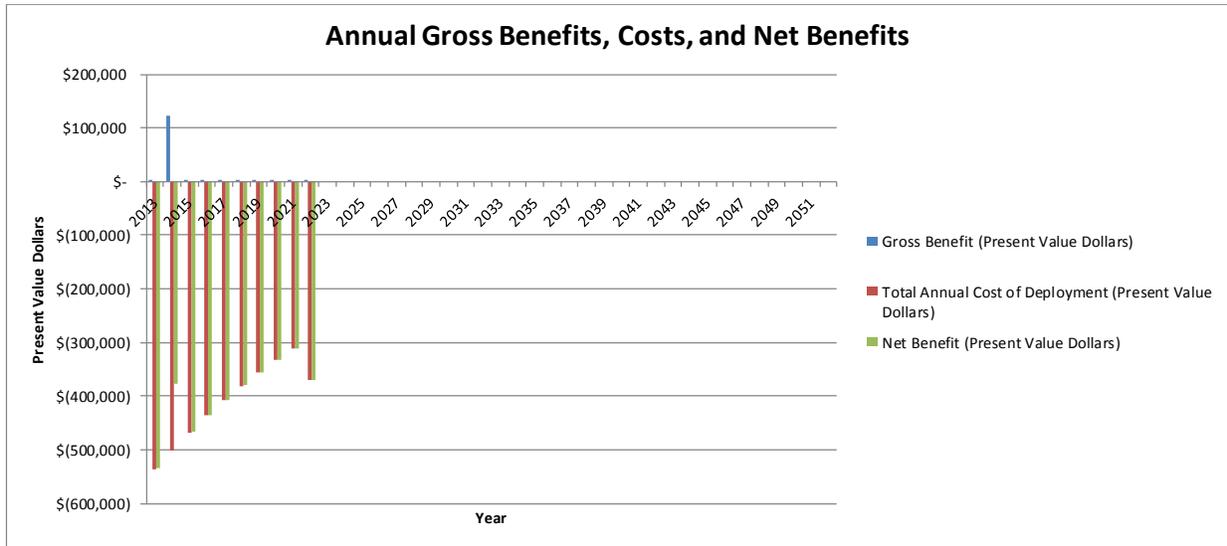
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Gross Benefit (Present Value Dollars)	$ 800	$ 123,000	$ 600	$ 700	$ 600	$ 600	$ 700	$ 600	$ 500	$ 400
Total Annual Cost of Deployment (Present Value Dollars)	$ (535,500)	$ (500,300)	$ (467,300)	$ (436,500)	$ (407,800)	$ (381,000)	$ (355,900)	$ (332,400)	$ (310,600)	$ (370,000)
Net Benefit (Present Value Dollars)	$ (534,700)	$ (377,300)	$ (466,700)	$ (435,800)	$ (407,200)	$ (380,400)	$ (355,200)	$ (331,800)	$ (310,100)	$ (369,600)

Cumulative Gross Benefits, Costs, and Net Benefits
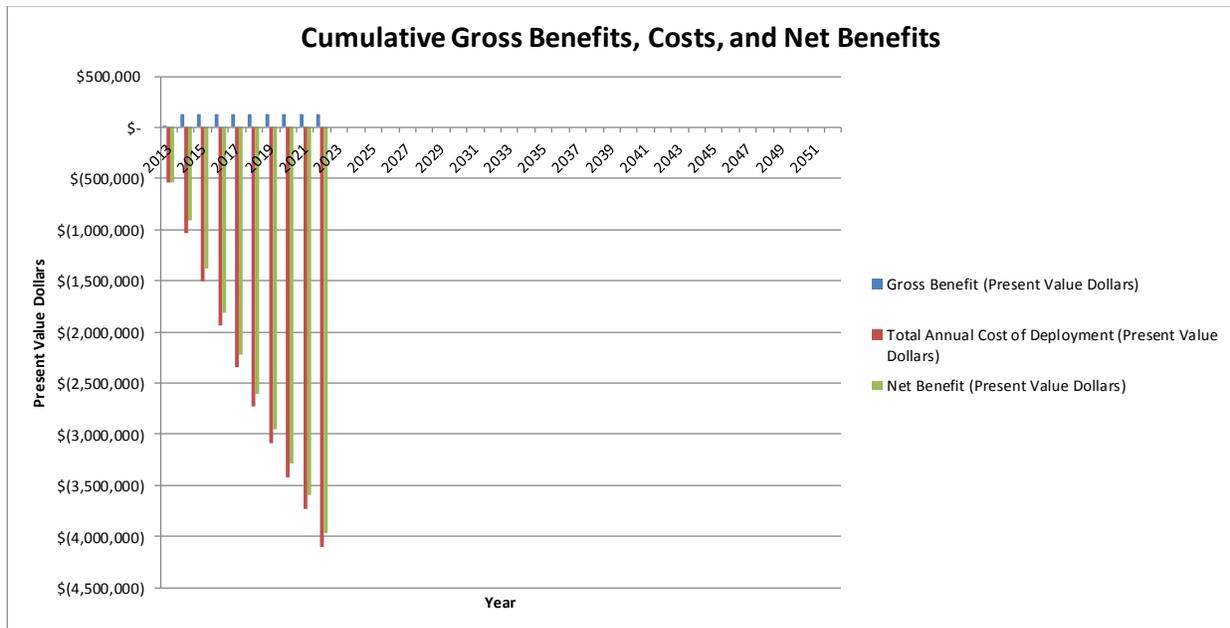
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Cumulative Gross Benefit (Present Value Dollars)	$ 800	$ 123,800	$ 124,400	$ 125,100	$ 125,700	$ 126,300	$ 127,000	$ 127,600	$ 128,100	$ 128,500
Cumulative Cost of Deployment (Present Value Dollars)	$ (535,500)	$ (1,035,800)	$ (1,503,100)	$ (1,939,600)	$ (2,347,400)	$ (2,728,400)	$ (3,084,300)	$ (3,416,700)	$ (3,727,300)	$ (4,097,300)
Cumulative Net Benefit (Present Value Dollars)	$ (534,700)	$ (912,000)	$ (1,378,700)	$ (1,814,500)	$ (2,221,700)	$ (2,602,100)	$ (2,957,300)	$ (3,289,100)	$ (3,599,200)	$ (3,968,800)

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Appendix W   Energy Storage Computational Tool Analysis – Premise

W.1   Asset Characterization Module (ACM)

U.S. Department of Energy Storage Computational Tool (ESCT)
Version 1.2

Purpose of Tool: ESCT guides the user through an analysis to calculate the benefits of an energy storage deployment, compare costs and benefits, and gain a clearer understanding of the value of energy storage technology in terms of monetary benefit. Furthermore, the ESCT can be used to analyze how the costs and benefits vary given different scenarios and assumptions.

Explanation of Output: The output of the ESCT consists of charts, graphs and tables that summarize the benefits and costs of an energy storage deployment. The benefits are monetized and calculated from actual or estimated metrics collected in the first five years of a project lifetime. Based on up to five years of data benefits can be projected out to 40 years in the future. The output also includes charts, graphs and tables that summarize the results of a sensitivity analysis. The user is able to set a high and low sensitivity range for each input in the tool and the output shows how the benefits are affected by variability of the inputs.

Directions: The ESCT is designed to be user-friendly and easy to navigate. However, it will be useful to review the overall methodology of the tool before beginning a new analysis. The diagram below illustrates the tool architecture and the analysis methodology. The tool is divided into three distinct phases: the Asset Characterization Module (ACM), the Data Input Module (DIM), and the Computational Module (CM). The first phase, the ACM, collects information about the deployment such as characteristics of the energy storage technology, cost information, and the applications the deployment will be used for. From this input, the ACM determines a list of benefits that the project could yield. These potential project benefits are then fed into the second phase of the tool, the DIM. The DIM uses the list of benefits to determine the inputs required to calculate the benefits. The DIM then helps the user navigate through the process of entering the required data. The DIM's main purpose is to ensure that all the required data is entered in the proper format so that the benefits can be analyzed successfully. The input data is then fed into the final phase, the CM. The CM is the calculation engine of the tool, it crunches the numbers and generates the output. The CM also allows the user to carry out a sensitivity analysis if desired.

To start a new analysis, click the blue button below and follow the directions that appear in each phase of the tool.

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Location, Market, Owner, Energy Storage Technology

On this form please indicate the following:
1) The physical location of the energy storage deployment project,
2) The regulatory structure in which the storage deployment will operate in,
3) The owner of the storage device,
4) The type of storage technology the deployment utilizes.

Location

○ Generation and Transmission   [Definition]

○ Distribution   [Definition]

● End-User   [Definition]

Market

● Regulated   [Definition]

○ Deregulated   [Definition]

Owner

○ Utility   [Definition]

○ Non-Utility Merchant/Independent Power Producer   [Definition]

● End-User   [Definition]

What type of storage technology does the deployment utilize?   [Battory, Lithium Ion ▼]

[Exit]   [Next]

Parameters   ☒

Please enter all of the system parameters for the energy storage deployment.

What is the total nameplate power output (kW)?	6	kW	Use Default Value	Definition
What is the total nameplate energy storage capacity (kWh)?	12	kWh	Use Default Value	Definition
What is the response time of the energy storage device(s) deployed?	0.005	seconds	Use Default Value	
What is the nameplate round-trip efficiency of the energy storage device(s) deployed?	86.45	%	Use Default Value	
What is the nameplate cycle life (cycles) of the energy storage device(s) deployed?	5,000	cycles	Use Default Value	Definition
What is the average or expected year over year demand growth of the electric system?	1.8	%	Use Default Value	
Does the energy storage device(s) deployed have reactive power capabilities?	No ▼		Use Default Value	
Please indicate the NERC Region in which the energy storage deployment is located.	SPP North ▼			

Previous	Exit	Next

Cost Parameters   ☒

Please enter the cost parameters for the energy storage deployment.

What is the expected lifetime (years) of this deployment?	10	years	Use Default Value	
Please enter the average inflation rate (%) that will be used in the economic calculations.	2.1	%	Use Default Value	Definition
Please enter the discount rate (%) that will be used in the net present value analysis.	5	%	Use Default Value	Definition
Please enter the total installed cost ($) of the deployment.	24,000	$	Use Default Value	
Please enter the fixed charge rate (%) that will be used to annualize the cost of the deployment.	15	%	Use Default Value	
Please enter the average yearly operating and maintenance costs ($/year) not related to energy. These costs may include may include fixed and variable operations and maintenance costs as well as replacement costs.	126	$/year	Use Default Value	
If you would prefer to enter a custom operating and maintenance cost schedule please check the box to the right.	☐			
Please enter the expected decommissioning and disposal costs ($) in current nominal dollars.	885	$	Use Default Value	
Please enter the initial year (20xx) of this analysis.	2014	Year		

Previous	Exit	Next

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Choose Primary Application

Please choose the primary application for this energy storage deployment. The primary application describes how the energy storage deployment will be used for the majority of the year. It is assumed that the primary application will yield the highest value to the owner in terms of benefits.

○ Electric Energy Time-shift   Definition

○ Electric Supply Capacity   Definition

○ Load Following   Definition

○ Area Regulation   Definition

○ Electric Supply Reserve Capacity   Definition

○ Voltage Support   Definition

○ Transmission Support   Definition

○ Transmission Congestion Relief   Definition

○ Transmission & Distribution (T&D) Upgrade Deferral   Definition

○ Substation On-site Power   Definition

● Time-of-use (TOU) Energy Cost Management   Definition

○ Demand Charge Management   Definition

○ Electric Service Reliability   Definition

○ Electric Service Power Quality   Definition

○ Renewables Energy Time-shift   Definition

○ Renewables Capacity Firming   Definition

○ Wind Generation Grid Integration - Short Duration   Definition

○ Wind Generation Grid Integration - Long Duration   Definition

Previous   Exit   Next

Choose First Secondary Application

If applicable, please choose a second secondary application for this energy storage deployment. Secondary applications describe the ways in which the energy storage unit will be used when not being used for the primary application. There are a subset of applications that are especially appropriate given the primary application being pursued and given the technical characteristics of the energy storage technology. These synergistic applications are highlighted in blue.

Application		Application	
○ Electric Energy Time-shift	Definition	○ Time-of-use (TOU) Energy Cost Management	Definition
○ Electric Supply Capacity	Definition	○ Demand Charge Management	Definition
○ Load Following	Definition	**◉ Electric Service Reliability**	Definition
○ Area Regulation	Definition	○ Electric Service Power Quality	Definition
○ Electric Supply Reserve Capacity	Definition	◉ Renewables Energy Time-shift	Definition
○ Voltage Support	Definition	○ Renewables Capacity Firming	Definition
○ Transmission Support	Definition	○ Wind Generation Grid Integration - Short Duration	Definition
○ Transmission Congestion Relief	Definition	○ Wind Generation Grid Integration - Long Duration	Definition
○ Transmission & Distribution (T&D) Upgrade Deferral	Definition	○ No Secondary Applications	
○ Substation On-site Power	Definition		

Previous	Exit	Next

Choose Second Secondary Application

If applicable, please choose a second secondary application for this energy storage deployment. Secondary applications describe the ways in which the energy storage unit will be used when not being used for the primary application. There are a subset of applications that are especially appropriate given the primary application being pursued and given the technical characteristics of the energy storage technology. These synergistic applications are highlighted in blue.

Application		Application	
○ Electric Energy Time-shift	Definition	○ Time-of-use (TOU) Energy Cost Management	Definition
○ Electric Supply Capacity	Definition	○ Demand Charge Management	Definition
○ Load Following	Definition	**◉ Electric Service Reliability**	Definition
○ Area Regulation	Definition	○ Electric Service Power Quality	Definition
○ Electric Supply Reserve Capacity	Definition	○ Renewables Energy Time-shift	Definition
○ Voltage Support	Definition	○ Renewables Capacity Firming	Definition
○ Transmission Support	Definition	○ Wind Generation Grid Integration - Short Duration	Definition
○ Transmission Congestion Relief	Definition	○ Wind Generation Grid Integration - Long Duration	Definition
○ Transmission & Distribution (T&D) Upgrade Deferral	Definition	○ No Secondary Applications	
○ Substation On-site Power	Definition		

Previous	Exit	Next

W.2   Data Input Module (DIM)

Data Input Module

Use the table below to enter the project data that will be used to calculate benefits. For each input the user must enter data for at least one project year before being able to submit entries and complete this step. When all data has been entered click the blue button at the bottom of the table to submit and store the data entries. If pasting data from another source into this table please use the "Paste Value" function to avoid changing cell formatting or pasting formulas. If the user does not have measured data to enter, they can leverage default values for most of the inputs. However, if default values are used the user should take care in interpreting the results since the default values tend to be general estimates, and the actual values for the user's project may vary greatly. Furthermore, default values do not take into account situations in which energy storage deployments are being used for multiple applications, rather they assume the storage is being used for a single application for an entire year. Therefore, if multiple applications are being pursued and default values are being used, the user must ensure that the default amount of energy discharge for each application is realistic considering that the storage is being used for more than one application throughout the year.

Return to the Asset Characterization Module (ACM)

Input Name	Units	Input Definition	Default Values	Values 100	101	102	103	104
Average On-Peak Price of Electricity	$/MWh	The average on-peak price of wholesale electricity over a year.	Enter Custom	$ 41	$ 41	$ 41	$ 41	$ 41
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average CO2 emissions factor for marginal generation units used to meet peak demand.	Use Default	1,151	1,151	1,151	1,151	1,151
SOx Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average SOx emissions factor for marginal generation units used to meet peak demand.	Use Default	0.012	0.012	0.012	0.012	0.012
NOx Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average NOx emissions factor for marginal generation units used to meet peak demand.	Use Default	1.41	1.41	1.41	1.41	1.41
PM Emissions Factor for Generation on the Margin	lbs/MWh	The characteristic or average PM emissions factor for marginal generation units used to meet peak demand.	Use Default	0.040	0.040	0.040	0.040	0.040
Value of CO2	$/ton	The anticipated or current market price of carbon emissions.	Use Default	$ 20	$ 20	$ 20	$ 20	$ 20
Value of SOx	$/ton	The anticipated or current market price of SOx emissions.	Use Default	$ 520	$ 520	$ 520	$ 520	$ 520
Value of NOx	$/ton	The anticipated or current market price of NOx emissions.	Use Default	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000
Value of PM	$/ton	The anticipated or current market price of PM emissions.	Use Default	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000
Total Energy Discharged for TOU Energy Cost Management	MWh	Total amount of energy discharged by the energy storage device to provide energy during peak-time so as to avoid paying peak prices.	Enter Custom	3	3	3	3	3
Average On-Peak Retail Price of Electricity	$/MWh	Average on-peak retail price of electricity. This would be the price that was avoided as a result of the energy storage device.	Enter Custom	$ 200	$ 200	$ 200	$ 200	$ 200
Average Off-Peak Retail Price of Electricity	$/MWh	Average off-peak retail price of electricity. This would be the price that was paid for electricity used to charge the energy storage device.	Enter Custom	$ 26	$ 26	$ 26	$ 26	$ 26
Outage Minutes Avoided by Residential Customers	minutes	The total outage minutes avoided by residential customers as a result of energy storage devices being used to provide power during system interruptions.	Enter Custom	476	476	476	476	476
Outage Minutes Avoided by Commercial Customers	minutes	The total outage minutes avoided by commercial customers as a result of energy storage devices being used to provide power during system interruptions.	Enter Custom	-	-	-	-	-
Outage Minutes Avoided by Industrial Customers	minutes	The total outage minutes avoided by industrial customers as a result of energy storage devices being used to provide power during system interruptions.	Enter Custom	-	-	-	-	-
Average Hourly Residential Load Not Served During Outage	kW	The average residential load unserved during outages. This parameter can be estimated by determining the average load of customers whose reliability will be impacted by the energy storage device.	Enter Custom	1.2	1.2	1.2	1.2	1
Average Hourly Commercial Load Not Served During Outage	kW	The average commercial load unserved during outages. This parameter can be estimated by determining the average load of customers whose reliability will be impacted by the energy storage device.	Enter Custom	-	-	-	-	-
Average Hourly Industrial Load Not Served During Outage	kW	The average industrial load unserved during outages. This parameter can be estimated by determining the average load of customers whose reliability will be impacted by the energy storage device.	Enter Custom	-	-	-	-	-
Residential VOS	$/kWh	Represents the true value of the electricity service to the residential customer without regard to the actual cost of providing the service. This input captures the value of service reliability quantified by the willingness of customers to pay for service reliability, taking into account the resources (e.g., income) of the residential customer.	Enter Custom	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3
Commercial VOS	$/kWh	Represents the true value of the electricity service to the commercial customer without regard to the actual cost of providing the service. This input captures the value of service reliability quantified by the willingness of customers to pay for service reliability, taking into account the resources (e.g., income) of the commercial customer or by a firm's expected net revenues associated with the added reliability.	Enter Custom	$ -	$ -	$ -	$ -	$ -
Industrial VOS	$/kWh	Represents the true value of the electricity service to the commercial customer without regard to the actual cost of providing the service. This input captures the value of service reliability quantified by the willingness of customers to pay for service reliability, taking into account the resources (e.g., income) of the commercial customer or by a firm's expected net revenues associated with the added reliability.	Enter Custom	$ -	$ -	$ -	$ -	$ -
Total Renewable Energy Discharged for Arbitrage	MWh	The total amount of renewable energy discharged from the energy storage device and used for arbitrage purposes over a year.	Enter Custom	-	-	-	-	-
Total Renewable Energy Discharged for Energy Time-Shift	MWh	The total amount of renewable energy discharged from the energy storage device for the purposes of shifting energy from an off-peak time to an on-peak time. This may allow an end user to avoid paying peak-prices for electricity or this may allow a utility to decrease their costs by offsetting the need to run less efficient, more expensive peaking units.	Enter Custom	-	-	-	-	-
END			END					

Finish Data Entry

Review Benefit Calculation Inputs

The table below contains the benefit calculation inputs that will be fed into the next phase of the Energy Storage Computational Tool. The purpose of this page is to give the user the opportunity to review the data before proceeding to the next phase of the tool. If the user finds data that has been entered erroneously, or if the user wishes to edit an entry they should navigate to back to the DIM and make the appropriate changes.

Input Name	Units	Entered Data					Projected Data				
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Average On-Peak Price of Electricity	$/MWh	$ 41	$ 41	$ 41	$ 41	$ 41	42	43	44	45	46
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	1,150.808500	1,150.808500	1,150.808500	1,150.808500	1,150.808500	1,151	1,151	1,151	1,151	1,151
SOx Emissions Factor for Generation on the Margin	lbs/MWh	0.012200	0.012200	0.012200	0.012200	0.012200	0	0	0	0	0
NOx Emissions Factor for Generation on the Margin	lbs/MWh	1.411100	1.411100	1.411100	1.411100	1.411100	1	1	1	1	1
PM Emissions Factor for Generation on the Margin	lbs/MWh	0.040000	0.040000	0.040000	0.040000	0.040000	0	0	0	0	0
Value of CO2	$/ton	$ 20	$ 20	$ 20	$ 20	$ 20	$ 20	$ 21	$ 21	$ 22	$ 22
Value of SOx	$/ton	$ 520	$ 520	$ 520	$ 520	$ 520	$ 531	$ 542	$ 553	$ 565	$ 577
Value of NOx	$/ton	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,063	$ 3,127	$ 3,193	$ 3,260	$ 3,329
Value of PM	$/ton	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,000	$ 36,756	$ 37,528	$ 38,316	$ 39,121	$ 39,942
Total Energy Discharged for TOU Energy Cost Management	MWh	3	3	3	3	3	3	3	3	3	3
Average On-Peak Retail Price of Electricity	$/MWh	$ 200	$ 200	$ 200	$ 200	$ 200	205	209	213	218	222
Average Off-Peak Retail Price of Electricity	$/MWh	$ 26	$ 26	$ 26	$ 26	$ 26	27	27	28	29	29
Outage Minutes Avoided by Residential Customers	minutes	476	476	476	476	476	476	476	476	476	476
Outage Minutes Avoided by Commercial Customers	minutes	-	-	-	-	-	-	-	-	-	-
Outage Minutes Avoided by Industrial Customers	minutes	-	-	-	-	-	-	-	-	-	-
Average Hourly Residential Load Not Served During Outage	kW	1.2	1.2	1.2	1.2	1	1	1	1	1	1
Average Hourly Commercial Load Not Served During Outage	kW	-	-	-	-	-	-	-	-	-	-
Average Hourly Industrial Load Not Served During Outage	kW	-	-	-	-	-	-	-	-	-	-
Residential VOS	$/kWh	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	2	2	2	2	3
Commercial VOS	$/kWh	$ -	$ -	$ -	$ -	$ -	-	-	-	-	-
Industrial VOS	$/kWh	$ -	$ -	$ -	$ -	$ -	-	-	-	-	-
Total Renewable Energy Discharged for Arbitrage	MWh	-	-	-	-	-	-	-	-	-	-
Total Renewable Energy Discharged for Energy Time-Shift	MWh	-	-	-	-	-	-	-	-	-	-

W.3   Computational Module (CM)

Computational Module (CM) Main Page

Instructions

Welcome to the Computational Module (CM) phase of the Energy Storage Computational Tool (ESCT). The CM is the calculation engine of the tool, it crunches the numbers and generates the output. The CM also allows the user to complete a sensitivity analysis if desired.

Running the CM with Reference Inputs - To run the CM with the inputs that were entered in the DIM phase, simply click the button in the "Reference Case" section that says "Run CM with Reference Case Inputs". The CM will take about 20 seconds to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Reference Case Results" button.

Running the a Sensitivity Analysis - Before running a sensitivity analysis the CM should be run with the reference case inputs by following the directions above. To run a sensitivity analysis first change the High and Low sensitivity ranges of the desired inputs by using the toggles that are to the right of every input. After all of the desired sensitivity ranges have been set click the button in the "Sensitivity Analysis" section that says "Run CM with Sensitivity Case Inputs". The CM will take about a 40 seconds to complete the analysis. Once the analysis is complete the results can be viewed by clicking the "View Sensitivity Results" button. All of the sensitivity ranges can be reset to 100% by clicking the button above the toggle switches that says "Reset all values to 100%".

Go Back to the DIM

Reference Case

Run CM with Reference Case Inputs   **View Reference Case Results**

Sensitivity Analysis

Run CM with Sensitivity Case Inputs   **View Sensitivity Results**   **Reset all values to 100%**

Input Name	Unit	Select % using toggle			2014 Values		
		Low	Reference	High	Low	Reference	High
Average On-Peak Price of Electricity	$/MWh	100%	100%	100%	$ 41	$ 41	$ 41
CO2 Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	1,151	1,151	1,151
SOx Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	0.012	0.012	0.012
NOx Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	1.41	1.41	1.41
PM Emissions Factor for Generation on the Margin	lbs/MWh	100%	100%	100%	0.040	0.040	0.040
Value of CO2	$/ton	100%	100%	100%	$ 20	$ 20	$ 20
Value of SOx	$/ton	100%	100%	100%	$ 520	$ 520	$ 520
Value of NOx	$/ton	100%	100%	100%	$ 3,000	$ 3,000	$ 3,000
Value of PM	$/ton	100%	100%	100%	$ 36,000	$ 36,000	$ 36,000
Total Energy Discharged for TOU Energy Cost Management	MWh	100%	100%	100%	3	3	3
Average On-Peak Retail Price of Electricity	$/MWh	100%	100%	100%	$ 200	$ 200	$ 200
Average Off-Peak Retail Price of Electricity	$/MWh	100%	100%	100%	$ 26	$ 26	$ 26
Outage Minutes Avoided by Residential Customers	minutes	100%	100%	100%	476	476	476
Outage Minutes Avoided by Commercial Customers	minutes	100%	100%	100%	-	-	-
Outage Minutes Avoided by Industrial Customers	minutes	100%	100%	100%	-	-	-
Average Hourly Residential Load Not Served During Outage	kW	100%	100%	100%	1.2	1.2	1.2
Average Hourly Commercial Load Not Served During Outage	kW	100%	100%	100%	-	-	-
Average Hourly Industrial Load Not Served During Outage	kW	100%	100%	100%	-	-	-
Residential VOS	$/kWh	100%	100%	100%	$ 2.3	$ 2.3	$ 2.3
Commercial VOS	$/kWh	100%	100%	100%	$ -	$ -	$ -
Industrial VOS	$/kWh	100%	100%	100%	$ -	$ -	$ -
Total Renewable Energy Discharged for Arbitrage	MWh	100%	100%	100%	-	-	-
Total Renewable Energy Discharged for Energy Time-Shift	MWh	100%	100%	100%	-	-	-

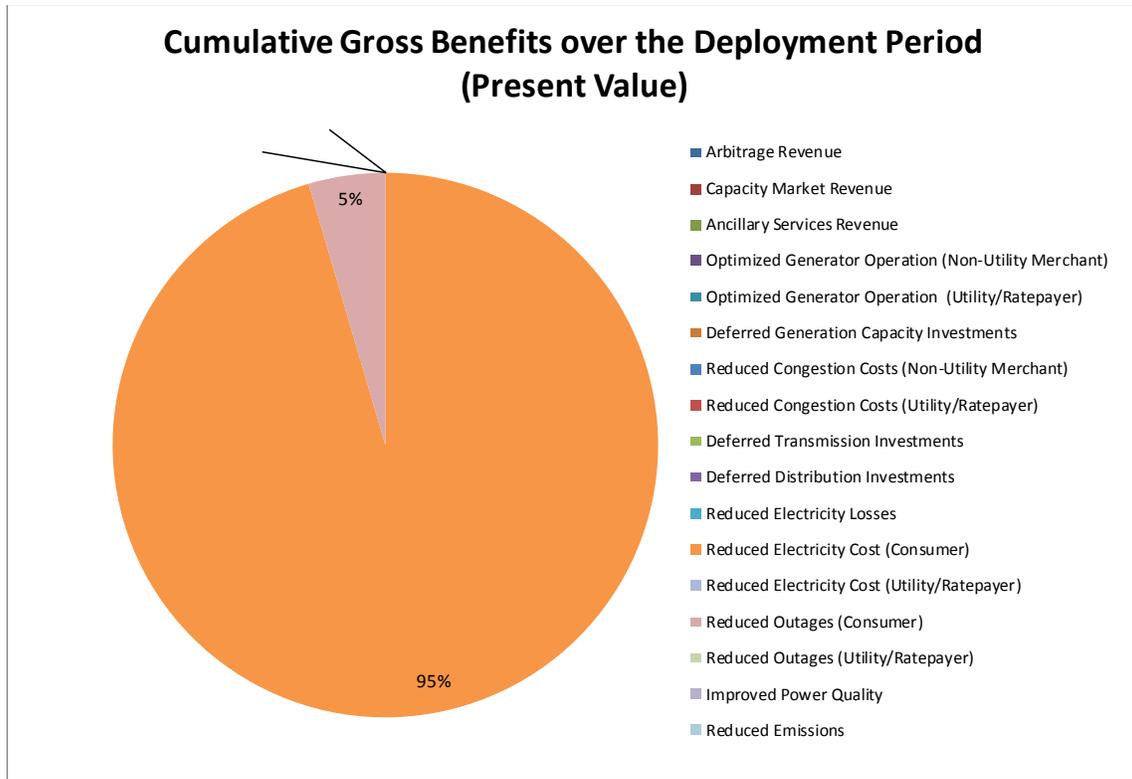**Reference Case Output: Annual and Cumulative Results Tables**

The tables below display the annual and cumulative project benefits and costs. The benefits are organized by category. The total gross benefit, total cost, and net benefit are also displayed at the bottom of each chart. All values are present value terms. To calculate additional benefits navigate to the additional benefits worksheets from the Additional Benefits tab.

Annual Benefit and Cost Table

Category	Benefits	Additional Benefits - Total Present Value over the Deployment Period	+ Primary and Secondary Benefits - Total Present Value over the Deployment Period	= Total Benefit - Present Value over the Deployment Period	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Market Revenue	Arbitrage Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Capacity Market Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Ancillary Services Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Improved Asset Utilization	Optimized Generator Operation (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Optimized Generator Operation (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Generation Capacity Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
T&D Capital Savings	Deferred Transmission Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Distribution Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Energy Efficiency	Reduced Electricity Losses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electricity Cost Savings	Reduced Electricity Cost (Consumer)	$ -	$ 4,200	$ 4,200	500	500	400	400	400	400	400	400	400	400
	Reduced Electricity Cost (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Interruptions	Reduced Outages (Consumer)	$ -	$ 200	$ 200	20	20	20	20	20	20	20	20	20	20
	Reduced Outages (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Quality	Improved Power Quality	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Air Emissions	Reduced CO2 Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced SOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced NOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced PM Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Gross Benefit		**$ -**	**$ 4,400**	**$ 4,400**	**520**	**520**	**420**	**420**	**420**	**420**	**420**	**420**	**420**	**420**

Costs

	Additional Benefits	Primary and Secondary	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Capital Cost of Deployment (fixed charge rate)			$ 28,800	3,600	3,400	3,200	3,100	2,900	2,800	2,600	2,500	2,400	2,300
Operating and maintenance costs not related to energy (labor for operation, plant maintenance, equipment wear leading to loss-of-life)			$ 1,000	100	100	100	100	100	100	100	100	100	100
Decommissioning and Disposal Costs			$ 600										600
Total Annual Cost of Deployment			**$ 30,400**	**3,700**	**3,500**	**3,400**	**3,200**	**3,000**	**2,900**	**2,700**	**2,600**	**2,500**	**2,900**
Total Net Benefit			**$ (26,000)**	**(3,180)**	**(2,980)**	**(2,980)**	**(2,780)**	**(2,580)**	**(2,480)**	**(2,280)**	**(2,180)**	**(2,080)**	**(2,480)**

### Cumulative Benefit and Cost Table

Category	Benefits	Additional Benefits - Total Present Value over the Deployment Period	+ Primary and Secondary Benefits - Total Present Value over the Deployment Period	= Total Benefit - Present Value over the Deployment Period	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Market Revenue	Arbitrage Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Capacity Market Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Ancillary Services Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Improved Asset Utilization	Optimized Generator Operation (Non-Utility	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Optimized Generator Operation (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Generation Capacity Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Non-Utility Merchant)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced Congestion Costs (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
T&D Capital Savings	Deferred Transmission Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Deferred Distribution Investments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Energy Efficiency	Reduced Electricity Losses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Electricity Cost Savings	Reduced Electricity Cost (Consumer)	$ -	$ 4,200	$ 4,200.00	500	1,000	1,400	1,800	2,200	2,600	3,000	3,400	3,800	4,200
	Reduced Electricity Cost (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Interruptions	Reduced Outages (Consumer)	$ -	$ 200	$ 200.00	20	40	60	80	100	120	140	160	180	200
	Reduced Outages (Utility/Ratepayer)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Power Quality	Improved Power Quality	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Air Emissions	Reduced CO2 Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced SOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced NOx Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Reduced PM Emissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Gross Benefit		**$ -**	**$ 4,400**	**$ 4,400.00**	**520**	**1,040**	**1,460**	**1,880**	**2,300**	**2,720**	**3,140**	**3,560**	**3,980**	**4,400**

Costs

			Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Capital Cost of Deployment (fixed charge rate)			$ 28,800.00	3,600	7,000	10,200	13,300	16,200	19,000	21,600	24,100	26,500	28,800
Operating and maintenance costs not related to energy (labor for operation, plant maintenance, equipment wear leading to loss-			$ 1,000.00	100	200	300	400	500	600	700	800	900	1,000
Decommissioning and Disposal Costs			$ 600.00										600
Total Annual Cost of Deployment			**$ 30,400.00**	**3,700**	**7,200**	**10,600**	**13,800**	**16,800**	**19,700**	**22,400**	**25,000**	**27,500**	**30,400**
Total Net Benefit			**$ (26,000.00)**	**(3,180)**	**(6,160)**	**(9,140)**	**(11,920)**	**(14,500)**	**(16,980)**	**(19,260)**	**(21,440)**	**(23,520)**	**(26,000)**

Cumulative Gross Benefits over the Deployment Period (Present Value)

Cumulative Gross Benefits over the Deployment Period (Present Value)		Lifetime Benefit per kW of Energy Storage Installed	
Arbitrage Revenue	$ -	$	-
Capacity Market Revenue	$ -	$	-
Ancillary Services Revenue	$ -	$	-
Optimized Generator Operation (Non-Utility Merchant)	$ -	$	-
Optimized Generator Operation (Utility/Ratepayer)	$ -	$	-
Deferred Generation Capacity Investments	$ -	$	-
Reduced Congestion Costs (Non-Utility Merchant)	$ -	$	-
Reduced Congestion Costs (Utility/Ratepayer)	$ -	$	-
Deferred Transmission Investments	$ -	$	-
Deferred Distribution Investments	$ -	$	-
Reduced Electricity Losses	$ -	$	-
Reduced Electricity Cost (Consumer)	$ 4,200	$	700
Reduced Electricity Cost (Utility/Ratepayer)	$ -	$	-
Reduced Outages (Consumer)	$ 200	$	33
Reduced Outages (Utility/Ratepayer)	$ -	$	-
Improved Power Quality	$ -	$	-
Reduced Emissions	$ -	$	-
Total Gross Benefit	**$ 4,400**	**$**	**733**

Annual Gross Benefits, Costs, and Net Benefits
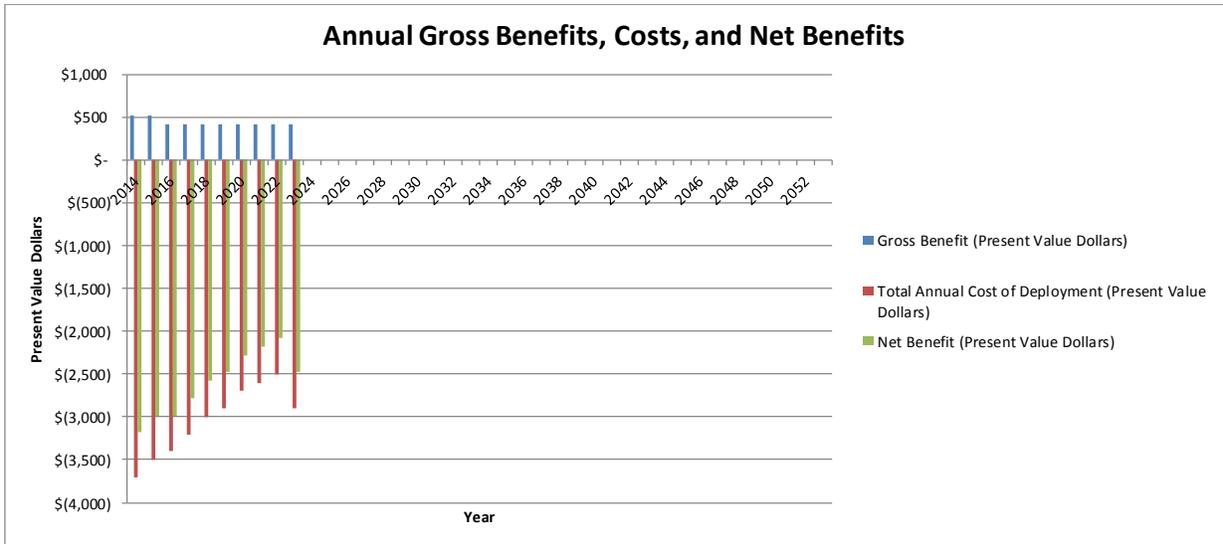
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Gross Benefit (Present Value Dollars)	$ 520	$ 520	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420	$ 420
Total Annual Cost of Deployment (Present Value Dollars)	$ (3,700)	$ (3,500)	$ (3,400)	$ (3,200)	$ (3,000)	$ (2,900)	$ (2,700)	$ (2,600)	$ (2,500)	$ (2,900)
Net Benefit (Present Value Dollars)	$ (3,180)	$ (2,980)	$ (2,980)	$ (2,780)	$ (2,580)	$ (2,480)	$ (2,280)	$ (2,180)	$ (2,080)	$ (2,480)

Cumulative Gross Benefits, Costs, and Net Benefits
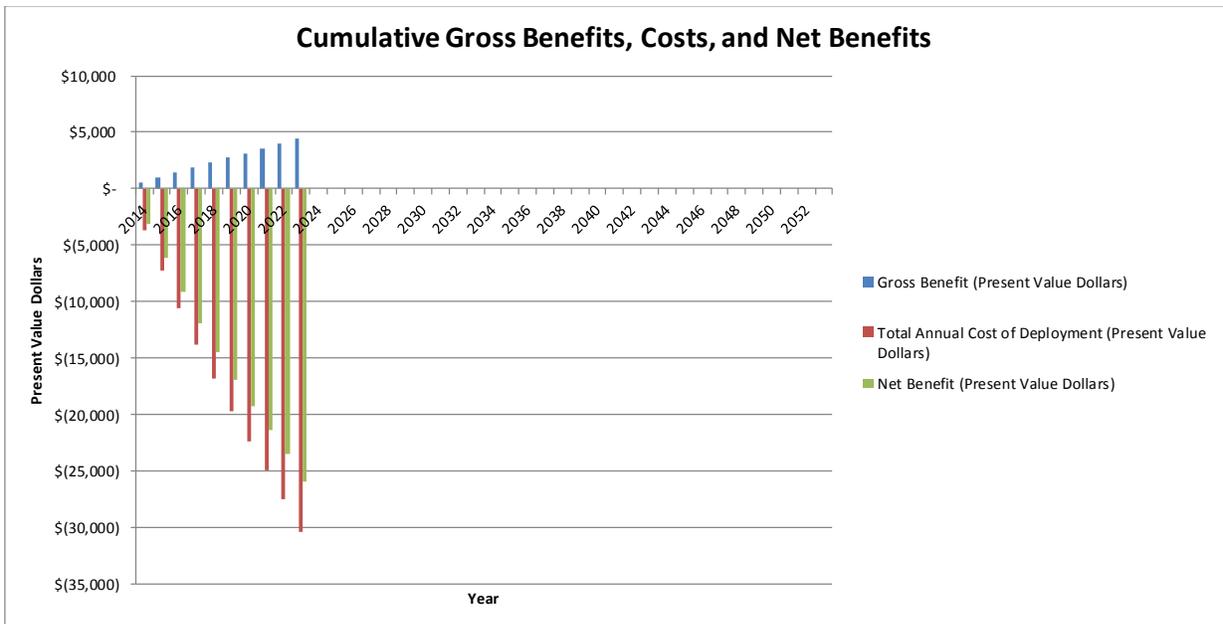
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cumulative Gross Benefit (Present Value Dollars)	$ 520	$ 1,040	$ 1,460	$ 1,880	$ 2,300	$ 2,720	$ 3,140	$ 3,560	$ 3,980	$ 4,400
Cumulative Cost of Deployment (Present Value Dollars)	$ (3,700)	$ (7,200)	$ (10,600)	$ (13,800)	$ (16,800)	$ (19,700)	$ (22,400)	$ (25,000)	$ (27,500)	$ (30,400)
Cumulative Net Benefit (Present Value Dollars)	$ (3,180)	$ (6,160)	$ (9,140)	$ (11,920)	$ (14,500)	$ (16,980)	$ (19,260)	$ (21,440)	$ (23,520)	$ (26,000)

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