Austin Energy
Focus AL Residential Meter Replacement Project

A. General Information

Project Request Name:	Focus AL Residential Meter Replacement Project
Business Unit Requesting:	ESD, CCS, CAM, CES
Prepared By:	Salvador Lima, William Kelly, Pam Cleveland
Date Prepared:	02/22/2016
Cost Estimate (Capital):	$28,175,000.00
Ongoing Cost (O&M):	
Life Cycle ROI (5yr):	
Strategic Value	High
Proposed Project Start Date:	August 2016
Estimated In-Production Date:	September 2020
Estimated Completion Date:	September 2020

B. Project Description

Austin Energy (AE) has ~245,000 Landis+Gyr (L+G) Focus AL residential meters in its service territory. These meters, initialed procured and installed from 2006 to 2009, were used as a cost effective solution to propagate and complete Automated Meter Reading throughout the AE service territory and help transition AE into Advanced Metering Infrastructure (AMI). As AE's Advanced Metering Infrastructure (AMI) needs have matured, the Focus AL has been identified as a legacy hardware product that no longer meets the utility's or the city's goals for advanced metering. Compounded by the fact that the Focus AL product has been beset by functional display problems – a display that does not impact the integrity of the metrology but can cause problems validating the meter read information easily via the LCD display. A random sampling of 1.5% of the AL Meter population performed by Revenue Measurement & Control (RMC) reported that nearly 52% of the meters visited had either a faded or blank display. Austin Energy has worked with the manufacturer, Landis+Gyr, on an agreement to provide financial relief to AE for this product, but the desired, suitable replacement, the Landis +Gyr Focus AXR-SD meter, is a technological upgrade and will require additional funding to fulfill.

C. Business Opportunity/Need/Problem/Issue

The primary concern is the lack of integrity that the Focus AL meter potentially provides in Meter to Cash assurance. The LCD burn out/brown out issue causes a lack of validation of the following requirements:

Public Utility Commission of Texas (PUCT) Electric Substantive Rule: **25.123. Meter Readings.**

(a) **Meter unit indication.** Each meter shall indicate clearly the kilowatt-hours or other units of service for which a charge is made to the customer.

America National Standard Institute (ANCI) C12.10 for "Physical Aspect of Watthour Meters" Section 3.8:

"All displays on the meter that are essential for billing purposes shall be readable from the front of the meter."

Without the ability to validate the read on the face of the meter, we are potentially under-performing according to this industry standard and PUCT requirement.

D. Alternatives Considered

1) Do nothing option
   - A recent audit showed that over 50% of all residential Focus AL meters visited during a random sampling exhibited partially faded or completely faded displays.
   - Meter failures will continue to increase with the aging population and daily operational cost will continue to increase.
   - Limited functionality from the meters and AMI system as a whole.
   - Residential metering customer satisfaction will continue to erode.
2) Replace and refurbish existing Focus AL meter
   - Create a removal program to rotate all Focus AL meters from the field and replace with a refurbished Focus AL meter.
   - Field replacement services cost will be the same as Options 3 and 4.
   - Cycle all Focus AL meters through the meter shop to package and return meters to manufacturer through existing Return to Manufacturer Authorization (RMA) process for repair.
   - Estimated cost to include field work, work order processing, and shop work is approximately $8M
   - Customer impact very high
   - Feature set will still be limited to 10 year old technology.
   - Meters will be at end-of-life at the end of the rotation program.
3) Replace Focus AL meters with different manufacturer of the same platform
   - Field replacement services cost will be the same as options 2 and 4.
   - Remote meter firmware changes or meter re-programming functions would not be available and any defect fixes or enhancements would require a field visit.
   - Retirement fee (approximately $4.2M) would not be waived by AMI network provider

(L+G)

- Meters will not have full functionality and features that come standard on Focus AL meter. (e.g. net metering capabilities)

4) Replace existing Focus AL meters with new meters with greater functionality and better align with Austin Energy Key Strategic Initiatives.
   - Field replacement services will be the same as Options 2 and 3.
   - Meters will be at a significantly discounted price point than meters in Option 3.
   - Remote meter firmware changes or meter re-programing would be available which would reduce operating cost and some defect fixes or enhancements would not require a field visit
   - Retirement fee would be waived, (approximately $4.2M), only if Focus AXR-SD meter platforms are installed

E. Proposed Solution

Option 4:

Initiate a five (5) year replacement strategy to include funding of $28,175,000.00 over five (5) years to purchase Landis+Gyr Focus AXR-SD meters at a significantly discounted price from the manufacturer. Assign an AE project manager, and perform field replacement activities utilizing in-house resources from Revenue Measurement and Control (RMC). Start deployment actives by replacing approximately 60,000 meters per year for 5 years starting August 2016. Measure the initial success of the phase 1 by tracking AMI system performance, revenue generation, and operational cost reductions.

F. Alignment with Austin Energy's Strategic Goals/Objectives

System Reliability – Focus AXR-SD meters provide interval data and enhanced outage and restoration flags, as well as additional diagnostic information and tamper detection.

Exceptional Customer Satisfaction – Remote Disconnection and Reconnection allows for less wait time between payment and reconnection.

Economic Development – Ability to collect interval data from all 400k + residential and light commercial meters in the service territory allows for enhanced research and analysis on grid load and provides ability to model rates for customers based upon factual, real consumptive data collected and not on figurative, modeled data.

G. Justification/Anticipated Benefits

Enhance Customer Service: This will be achieved by enhancing our outage reporting and service disconnection/reconnection times, increased identification or meter defect identification and eventual resolution and the potential to reduce estimated bills.

Reduce Electricity Theft: The meters currently used at AE have significantly limited capability to report Alarms or Events. By replacing these meters with a meter that will have alarms and

events capability, energy theft can be greatly reduced hence reducing lost revenue. This includes both, recovery of revenue and prevention of future potential revenue loss. Utility theft will be more readily detected using the replacement meters and Command Center, allowing for a more rapid identification and action to stop it. Utilities that have gone through a similar system change on the commercial metering platform have seen first year annual savings of over $640K due to the reduction in theft.

Support Greater Customer Choice and Control: Installing new meters will also provide the utility the ability to combine meter programs into a standard program allowing more choices for new billing rates and structures that encourage conservation during peak periods.

Retirement Fees Waived: If the Focus AL meters are gradually replaced through the existing maintenance program or through a project utilizing a different meter manufacturer, a communication module retirement fee and a termination convenience fee will be charged by the network provider, Landis+Gyr. If the meters are replaced with Focus AXR-SD meters as part of a project, the retirement and termination convenience fees would be waived. This equates to approximately $4.2 million dollars in savings over the 5 years the project is expected to take.

H. Organizational Impact

Meter Replacement Services:

In-house resources from Revenue Measurement and Control will be utilized in the following fashion over a 5 year period to exchange all Landis+Gyr Focus AL meters:

1. Resource allocation
   5 FTE dedicated to the project (Meter Maintenance)
   5 FTE Current Diversion (2 hours of overtime per employee daily M-F)

2. Replacement forecast (day, week & month)
   Day – 250
   Week – 1250
   Month – 5000

Meter Monitoring & Maintenance Program:

Post installation of the more advanced Focus AXR-SD meter, the term 'meter maintenance' will need to take on a new form at Austin Energy. The meter population will be entirely electronic with an additional communications device on board, and accurate field validation of meter accuracy, program, software, firmware and functionality will be required. The challenges associated with supporting the newly deployed advanced meter population will likewise require a new look at existing resources skill sets. The introduction of the new smart meter platform will require an overhaul of the existing meter maintenance methodology and redesign of the in-service test plan.

The new model will require the assessment of existing processes and resources, reallocation and organization, shifting of responsibilities, possible supplemental resources, and extensive training. The challenge will be handling the magnitude of the changes in process.

I. Technology Migration

Meter Asset Management System (MAMS) for AMI:

Meter asset management is a critical and often overlooked requirement of a true Advanced Metering Infrastructure. The Customer Information System (CIS) is not and should not be the system of record for smart meters. Asset management for AMI meters and metering assets includes the complete lifecycle management and configuration management of meters and other assets and should be a separate part of the enterprise architecture.

At a minimum a proper Meter Asset Management System (MAMS) should include the following: Receipt, Sample Test, Inventory, Transport/Distribute, Program, Install, Configure, Firmware Upgrade, Periodic Test & Maintenance, Remove, Test & Repair, Re-use & Retire. The ideal MAMS would include information from the time the meter is ordered, through the manufacturing process, arrival at the customer facility, installation, test results, etc. through its retirement, in addition to the minimum capabilities.

Proper selection and implementation of and asset and configuration management system will unlock the full benefits of the smart meters and AMI system.

J. Risk

Risks	Mitigation Strategies
• **Technology risk** – The meter technology is outdated by the end of the exchange project	• The agreement in place is applicable to next generation meters from L+G as well.
• **Financial risk** – migration lasts longer than anticipated, requiring additional resource commitments	• Alternate RMC EUMSI's and Meter Service Reps can be utilized as needed to supplement
• **Operational risk** – Alternate departmental priorities emerge that supercede the exchange project	• Alternate RMC EUMSI's and Meter Service Reps can be utilized as needed to supplement

K. Project Assumptions

The following assumptions apply to this initiative:

1. Budget approval for acquisition of Focus AXR-SD Meters directly related to the project
2. Product Availability throughout the duration of the project
3. Resource availability, both in the office and in the field
4. System stability on all fronts – CC&B, AMI, MDMS, MWM

L. Project Constraints

Constraints include:

- Budget – approval to acquire meters using sole source agreement
- The availability field resources to start the project and keep up with demand
- Meter Supply Chain – Market's ability to meet meter supply chain requirements, and interdependencies with other vendors.

M. Major Project Milestones

The following are the major project milestones identified at this time:

- Internal AE Approval of Agreement in principal with L+G
- Council approval of sole source agreement with L+G
- Funds Assigned
- Initial Meter Order placed for project
- Project Initiation – EST. August 2016
- Project Completion – EST. September 2020

N. Cost Estimate

Option 1 – Do Nothing, End-of-Life Technology:

The associated costs with Option 1 include an increasing number of truck rolls to visit the meters in the field and potentially replace the meters on a one for one basis with a meter from the same family and incur the module retirement fee ($26.29/meter in 2016). An additional cost would be having ten year old technology in the field.

Option 2 – Life extension, outdated Technology:

The associated costs with Option 2 include rolling a truck to each meter in the population to exchange the meter with a refurbished meter of the same family. The removed meters are "refurbished" using the RMA process with the manufacturer and returned to Austin Energy to be reinstalled in the field at a different location. The "refurbishment" and RMA process take additional time and manpower with the end result being out dated technology being installed on services in the Austin Energy service area.

Replacement and Repair Costs	Total Meters	Replacement Cost (RMC Truck Roll)	Total
Focus AL	245,000	$ 27.00	$ 6,615,000.00
Administration			$ 1,225,000.00
Total			**$ 7,840,000.00**

Project Cost	
Total Material Cost	$ -
Total Labor Cost	$ 7,840,000.00
Total Project Cost	**$ 7,840,000.00**

Option 3 – Replacement with meters of the same platform with limited features:

Material Cost	2016	2017	2018	2019	2020	Total
Meters	25,000	60,000	60,000	60,000	40,000	245,000
Cost/Meter	$ 135.00	$ 135.00	$ 135.00	$ 135.00	$ 135.00	
Meter Retirement Fee	$ 26.29	$ 21.90	$ 17.52	$ 13.14	$ 8.76	$ 4,161,250.00
AL Credit	$ -	$ -	$ -	$ -	$ -	
Total Cost/Meter	$ 161.29	$ 156.90	$ 152.52	$ 148.14	$ 143.76	
Total Hardware Cost	**$4,032,250.00**	**$9,414,000.00**	**$9,151,200.00**	**$8,888,400.00**	**$5,750,400.00**	**$ 37,236,250.00**

Labor Cost	2016	2017	2018	2019	2020	Total
Meters	25,000	60,000	60,000	60,000	40,000	245,000
Exchange Cost/Meter	$ 27.00	$ 27.00	$ 27.00	$ 27.00	$ 27.00	
Total Labor Cost	**$ 675,000.00**	**$1,620,000.00**	**$1,620,000.00**	**$1,620,000.00**	**$1,080,000.00**	**$6,615,000.00**

Project Cost	
Total Material Cost	$ 37,236,250.00
Total Labor Cost	$ 6,615,000.00
Total Project Cost	**$ 43,851,250.00**

Option 4 – Replacement of Focus AL meters with new meters with more functionality and features that better align to Austin Energy's Strategic Initiatives:

Material Cost	2016	2017	2018	2019	2020	Total
Meters	25,000	60,000	60,000	60,000	40,000	245,000
Cost/Meter	$ 135.00	$ 135.00	$ 135.00	$ 135.00	$ 135.00	
Meter Retirement Fee--WAIVED	~~$ 26.29~~	~~$ 21.90~~	~~$ 17.52~~	~~$ 13.14~~	~~$ 8.76~~	~~$ 4,161,250.00~~
AL Credit	$ (20.00)	$ (20.00)	$ (20.00)	$ (20.00)	$ (20.00)	$ (4,900,000.00)
Total Cost/Meter	$ 115.00	$ 115.00	$ 115.00	$ 115.00	$ 115.00	
Total Hardware Cost	**$ 2,875,000.00**	**$ 6,900,000.00**	**$ 6,900,000.00**	**$ 6,900,000.00**	**$ 4,600,000.00**	**$ 28,175,000.00**

Labor Cost	2016	2017	2018	2019	2020	Total
Meters	25,000	60,000	60,000	60,000	40,000	245,000
Exchange Cost/Meter	$ 27.00	$ 27.00	$ 27.00	$ 27.00	$ 27.00	
Total Labor Cost	**$ 675,000.00**	**$1,620,000.00**	**$1,620,000.00**	**$1,620,000.00**	**$1,080,000.00**	**$6,615,000.00**

Project Cost	
Total Material Cost	$ 28,175,000.00
Total Labor Cost	$ 6,615,000.00
Total Project Cost	**$ 34,790,000.00**

- The Focus AXR-SD meters have a service disconnect which allows disconnects and reconnects to occur in the office, eliminating truck rolls. The estimated annual savings after full implementation of the Focus AXR-SD meters for reduced truck rolls for disconnect, reconnect, disconnect for non-payment and turn-on field activities is $2,511,280.65.

- There is also a potential reduction in truck rolls due to the capability of over the air programming of the meters.

O. Cost Benefit Analysis (ROI Calculation Summary)

Based on the Costs associated with the various options, Option 4 provides the best overall value.

Option 4:

	Tampering One Time Savings (6 month back bill)	Recurring Revenue Increase (10 year)	Total Revenue Impact Over 10 Years
Estimated Revenue Increase	$ 500,000.00	$ 1,000,000.00	$ 1,500,000.00

	Eliminated Truck Rolls for RMC for Disconnect and Reconnect Field Activities (DCN NPAY, RCNT, TURN ON, DISCONNECT, etc.)	Remote Meter Reprogramming for CMO	Total Estimated Cost Savings
10 year Operational Cost Savings	$ 25,112,806.47	$ 3,600,000.00	$ 28,712,806.47

10 Year Savings and Increased Revenue Projection $ 30,212,806.47

General Assumptions:

Lost revenue and revenue increase projections are calculated using similar project forecast when all Focus AL metering sites are visited and issues are addressed.

Operational cost savings use the following criteria:

1. Average Revenue Measurement & Control field activities completed per month in FY 2014 is 16670. (Assumption: 1/3 of all electric field activities also have water at the premise.) The following breakdown is for electric only field activities:
    a. Turn On – 24,246 → 2,020 per month
    b. Disconnect – 19,687 → 1,640 per month
    c. Disconnect Non-Pay – 22,673 → 1,889 per month
    d. Reconnect – 19,742 → 1,645 per month
2. Average trip cost for Revenue Measurement & Control is $27.
3. The Complex Metering costs associated with reprogramming meters is based on the average current meter through put in Internal Operations where approximately 1,000 residential meters are reprogrammed and updated in CC&B per month at $30/meter.

10 year Return on Investment is -13.16%
15 year Return on Investment is 30.27%

The breakeven point is 11.51 years.

There are several programs that would benefit from the replacement of the Focus AL meters with the Focus AX meters that are difficult to quantify. Included in this are:

- PrePay Program
- Portal "Interval Data Everywhere" and Load Research
- Volt Var/CVR projects
- Rate Homogenization

P. Funding Source

Identify the source for funding:

CIP ☒ O&M ☐

The CIP project FDU is 3250 1107 C025. As of March 8th, 2016, in eCAPRIS there is $3,750,000 appropriated for spending and the spending plan shows $25,812,506 from FY 2016 thru FY 2020. Based on the per meter cost of $115 and approximately 245,000 meters to be exchanged the total cost associated with purchasing all of the meters to be replaced is $28,175,000.00.

FDUs

FDU	Unit Name	Approp	Encumb	YTD Exp	ITD Exp	Obligated	Balance
3250 1107 C025	Focus Al Meter Replacement	$3,750,000	$0.00	$0.00	$0.00	$0.00	$3,750,000.00
	Totals	$3,750,000	$0.00	$0.00	$0.00	$0.00	$3,750,000.00

Subproject Management

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Future	Total
There is no schedule for this subproject.								
Spending Plan							**Future**	**Total**
Spending Plan Budget	$2,812,506	$5,750,000	$5,750,000	$5,750,000	$5,750,000		$0	$25,812,506
Spending Plan Proj Mgr	$2,812,506	$5,750,000	$5,750,000	$5,750,000	$5,750,000		$0	$25,812,506
Budget Estimate								
Budget Estimate								$28,750,000

Q. Business Case Analysis Team

The following individuals comprise the business case analysis team. They are responsible for the analysis and creation of the Customer Analytics Project business case.

Role	Description	Name/Title
Executive Sponsor	Provide executive support for the project	Dan Smith
Technology Support	Provides all technology support for the project	Heather Turner
Process Improvement	Advises team on process improvement techniques	Michelle McAffee
Project Manager	Manages the business case and project team	William Kelly
Software Support	Provides all software support for the project	William Kelly

R. Approval to Submit

The business case is a document with which approval is granted or denied to move forward with the creation of a project and ask for funding. The signatures below signify approval by the Business Unit to submit the Business Case for Prioritization and Funding Approval.

Name/Title	Signature	Date
Customer—Complex Metering Operations (CMO)		
Pamela Cleveland	Pamela Cleveland	4/5/16
Customer—Advanced Metering Infrastructure (AMI) Manager		
William Kelly		
Customer—Revenue Measurement & Control Manager		
James Harris		
Business Unit Executive—Smart Grid & System Operations Director		
Danny Ee, P.E.		

T. Funding Approval and Signatures

The signatures of the people below indicate an understanding in the purpose and content of this document and approval for funding per the Capital and O&M breakout above.

Project/Sub-Project/FDU Name: 7319.009 Focus AL Meter Replacement

Project Manager Approval: (Signature Required)

Print Name	Signature	Date

Program Manager Approval: (Signature Required)

Print Name	Signature	Date
DANNY EE DIR SGSO		4/5/16

VP/Sr. VP Approval: ($100,000 - $249,999)

Print Name	Signature	Date

Chief Financial Officer Approval ($250,000 or more):

Print Name	Signature	Date

Deputy General Manager Approval ($250,000 or more):

Print Name	Signature	Date

General Manager Approval ($250,000 or more – Expense Not Budgeted):

Print Name	Signature	Date