

GRU BUSINESS CASE

Presented by:
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Agenda

- > Review AMI Project Scope
- > Discuss Assumption Set
- > Validate and Adjust Business Inputs
- > Verify GRU-specific Benefits
- > Review Typical AMI Project Costs
- > AMI Implementation Options
- > Discuss ROI by Option

Key Components of a Successful AMI Project



Assumptions: Infrastructure Replacement

Electric Meters

- > Replace all 95,983 (2S meters have disconnects)
- > Current inventory: 25 percent electronic, 75 percent electromechanical

Gas Meters

- > Replace 2,717
- > Remaining 33,348 can accept a gas module

Water Meters

- > Replace 65,794
- > 6,858 have pigtails, can accept module

Water Meters (2" or greater)

- > Total count: 1,073
- > Replace 50 percent
- > Retrofit 50 percent

Water Meter Lids

- > All need to be drilled
- > Current inventory: 50 percent composite and 50 percent cast iron

Assumptions: Other

- > IPv6 technology: 48 collectors required (based on GRU sourced map)
 - > 200 outlying endpoints
 - > All other gas and water meters in close proximity to electric meters
- > Project implementation duration: Two (2) years
- > GRU purchase strategy: Direct purchase of AMI infrastructure with standard supplier warranty
- > Legacy application upgrade costs: Not included
- > AMI project costs estimates: Derived from various sources
- > Prepay: 5 percent customer participation

Business Case Inputs

- > Build, Own and Operate / Hosted / Managed Service
 - > Project and ongoing IT resources
 - > IT software: applications, licenses, ongoing support, upgrades
 - > IT hardware: servers, redundant data centers, disaster recovery
 - > Hosted or managed service: four (4) year period after implementation
- > Integrations (requirements, design, build, test)
 - > AMI - MDM
 - > MDM – CIS (SAP)
 - > MDM – OMS
 - > IVR – OMS
 - > Prepay – MDM
 - > Prepay – CIS(SAP)

Business Case Inputs

- > Project management
- > Business process/change management and training
- > Mass meter install vendor (with warehouse and oversight)
- > Cyber security – assessment, remediation, and monitoring
- > Attrition and re-assignment
- > AMI project implementation costs contingency: 10 percent
 - > Accounts for items such as:
 - > Meter quantity variance
 - > RFP preparation
 - > Cost of capital

Major Benefits - Annual

| | Annual Benefit |
|---|--------------------|
| Electric meter accuracy | \$3,317,064 |
| Water meter accuracy | \$2,344,926 |
| Meter reading efficiency | \$1,792,128 |
| Meter replacement budget deferral | \$909,000 |
| Disconnect, reconnect and transfer efficiency | \$599,912 |
| Revenue protection | \$300,469 |
| Transformer sizing | \$175,633 |
| Back office billing efficiency | \$98,587 |
| Back office bill complaints efficiency | \$75,436 |
| Pre-pay cash flow benefit | \$54,258 |
| Total annual savings benefit | \$9,667,413 |

AMI Implementation Project Costs

| | |
|---|---------------------|
| Project management and mass install oversight | \$725,000 |
| Business process, change management and training | \$140,000 |
| Mass meter install vendor Note: customer meter box repairs not included | \$5,800,000 |
| AMI collectors and field equipment plus 10 percent for spares | \$753,500 |
| AMI electric meters plus 10 percent for spares | \$10,994,500 |
| AMI water meters, retrofits and modules plus 10 percent for spares | \$15,345,000 |
| AMI gas meters and modules plus 10 percent for spares | \$2,585,000 |
| Prepay integrations with MDM and CIS | \$130,000 |
| AMI - CIS integration | \$100,000 |
| OMS - IVR integration | \$50,000 |
| Consumer outreach | \$130,000 |
| Fiber infrastructure extensions Note: required for mesh solution only | \$TBD |
| Subtotal | \$36,753,000 |
| Contingency 10 percent | \$3,675,300 |
| Tax (6.5 percent of 4 percent of subtotal) | \$95,558 |
| Base project cost (Exc. additional costs of each option) | \$40,523,858 |

Typical Variables of AMI Implementation Options

| Features | Own/Operate | Hosted | Managed Service |
|---------------------------------------|---|---|---|
| Advanced Analytics | Limited – via contractor or consultant | Limited – via contractor or consultant | Available option |
| Operational Support | Internal – or via calls with separate vendors | Internal – or via calls with separate vendors | 8x5 end-to-end IT support |
| Consumer Portal | Internal – or via separate vendors | Internal – or via separate vendors | Included |
| Data Storage | Utility | Yes, but with limitations | Scalable data storage in Level 3 certified facility |
| Service Level Agreements (SLA) | N/A | N/A | End-to-end IT SLAs |

Additional Project Costs: Build, Own and Operate Model

| | |
|---|--------------------|
| AMI IT hardware | \$158,000 |
| Cyber security | \$200,000 |
| AMI software applications | \$1,040,000 |
| AMI - MDM, MDM - OMS, MDM - CIS integrations | \$745,000 |
| Disaster recovery data center (Level 3) – Year 2 | \$184,000 |
| Consumer portal or added functionality to existing utility portal | \$30,000 |
| Data analytics platform <i>Price ranges from basic reports from MDM (\$50K) to robust model with a data warehouse (\$300K)</i> | \$275,000 |
| Total | \$2,632,000 |

Annual Recurring Costs: Build, Own and Operate Model

| | |
|--|--------------------|
| AMI communications | \$100,000 |
| AMI ongoing support and upgrades | \$240,000 |
| Additional AMI GRU IT staff (3.5 fully burdened FTE's) | \$590,000 |
| Disaster recovery data center (Level 3) | \$184,000 |
| Prepay service (utility or customer) | \$40,000 |
| Total | \$1,154,000 |

Additional Project and Annual Recurring Costs Hosted Model

| Project Costs | |
|---|--------------------|
| Data analytics platform <i>Price ranges from basic reports from MDM (\$50K) to robust model with a data warehouse (\$300K)</i> | \$275,000 |
| Consumer portal or added functionality to existing utility portal | \$30,000 |
| Hosted service: 51,025 meters @ \$.40 meter/month <i>Note: Assumes 25 percent of meters are deployed in year 1, fee incurred in year 2</i> | \$244,921 |
| Total | \$549,921 |
| Annual Recurring Costs | |
| Hosted service: 204,101meters @ \$.40 meter/month | \$979,684 |
| AMI communication cost | \$100,000 |
| Additional storage once limit is exceeded (timing TBD) | \$_____ |
| Additional AMI GRU IT staff (3.5 fully burdened FTE's) | \$590,000 |
| Prepay service (utility or customer) | \$40,000 |
| Annual recurring Total | \$1,709,684 |

Additional Project and Annual Recurring Costs Managed Service Model

| Project Costs | |
|---|--------------------|
| Hosted service: 51,025 meters @ \$.50 meter/month <i>Note: Assumes 25 percent of meters are deployed in year 1, fee incurred in year 2</i> | \$306,151 |
| Total | \$306,151 |
| Annual Recurring Costs | |
| Hosted service: 204,101 meters @ \$.50 meter/month | \$1,224,606 |
| AMI communication cost (might be \$0 as part of service) | \$100,000 |
| Analytics: 204,101 meters @ \$.20 meter/month (start year 3) | \$489,842 |
| Prepay service (utility or customer) | \$40,000 |
| Annual recurring total | \$1,854,448 |

Return on Investment: Build, Own and Operate Model

| | |
|--|---------------------|
| Year 1 benefits | \$909,000 |
| Year 2 benefits | \$4,099,818 |
| Years 3 thru 6 annual benefits (\$9,667,413/year) | \$38,669,652 |
| Total benefits for years 1 thru 6 | \$43,678,470 |
| Cost Summary of Build, Own and Operate Model | |
| AMI implementation project costs | \$40,523,858 |
| Additional Build, Own and Operate specific project costs | \$2,632,000 |
| Recurring costs for years 3 thru 6 (\$1,154,000/year) | \$4,616,000 |
| Total 6-Year AMI cost | \$47,771,858 |
| Simple pay back after 2-year implementation | 53 months |

Return on Investment: Hosted Model

| | |
|---|---------------------|
| Year 1 benefits | \$909,000 |
| Year 2 benefits | \$4,099,818 |
| Years 3 thru 6 annual benefits (\$9,667,413/year) | \$38,669,652 |
| Total benefits for years 1 thru 6 | \$43,678,470 |
| Cost Summary of Hosted Model | |
| AMI implementation project costs | \$40,523,858 |
| Additional hosted model specific project costs | \$549,921 |
| Recurring costs for years 3 thru 6 (\$1,709,684/year) | \$6,838,736 |
| Total 6-Year AMI cost | \$47,912,515 |
| Simple pay back after 2-year implementation | 53 months |

Return on Investment: Managed Service Model

| | |
|---|---------------------|
| Year 1 benefits | \$909,000 |
| Year 2 benefits | \$4,099,818 |
| Years 3 thru 6 annual benefits (\$9,667,413/year) | \$38,669,652 |
| Total benefits for years 1 thru 6 | \$43,678,470 |
| Cost Summary of Managed Service Model | |
| AMI implementation project costs | \$40,523,858 |
| Additional managed service specific project costs | \$306,151 |
| Recurring costs for years 3 thru 6 (\$1,854,448/year) | \$7,417,792 |
| Total 6-Year AMI cost | \$48,247,801 |
| Simple pay back after 2-year implementation | 54 months |

Leidos Points of Contact

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Appendix

Details of the Specific Benefits

Meter Accuracy Benefit

AMI will produce additional margins because more accurate solid-state meters will replace electromechanical meters during AMI deployment.

Annual Benefit from Meter Accuracy

\$5,661,990

| | |
|---|--------------|
| Energy Sales Volume | |
| Annual MWh sales to residential customers | 123,003,583 |
| Annual MWh sales to C&I customers - All customers | 147,201,010 |
| Residential Revenue | |
| Avg accuracy improvement by deploying AMI w/ solid-state meters which accounts for 75% of the electric meters | 1.50% |
| Est annual increase in revenue margins | \$1,845,054 |
| Commercial and Industrial Revenue | |
| Avg accuracy improvement by deploying AMI w/ solid-state meters | 1.00% |
| Est annual increase in revenue margins | \$1,472,010 |
| Water Meter Accuracy | |
| Annual revenue from all water accounts and wastewater | \$37,221,043 |
| Percentage of water accounts with meters greater than 5 years old | 90.00% |
| Est increase in reading accuracy due to new metering assets | 7.00% |
| Est annual increase in revenue (21x22x23) | \$2,344,926 |

Meter Reading Efficiency Benefit

AMI will eliminate the costs associated with manual meter reading and related activities.

Annual Benefit from Remote Meter Reading

\$1,792,128

| | Elec, Gas, & Water Annual Benefit |
|--|-----------------------------------|
| Labor and Vehicle Rates | |
| Avg meter reader labor rate per hour (plus \$20 truck) | \$43.08 |
| Annual working hours | 2,080 |
| Meter Reading Volume | |
| Avg total no. of meters read monthly | 204,101 |
| Avg no. of meters read monthly by utility staff | 204,101 |
| Avoided Labor Costs | |
| No. of meter reading FTEs - Utility | 20.00 |
| Annual FTE-hours for meter reading - Utility (18 × Annual Scheduled Hrs) | 41,600 |
| Est percent of meter reading avoided w/ AMI - Utility and Contractor. | 100% |
| Annual avoided FTE-hours w/ AMI - Utility (14 × 15) | 41,600 |
| Annual avoided cost of FTE-hours - Utility (2 × 16) | \$1,792,128 |

Note: FTE quantities do not include Crew Leaders or Supervisor

Meter Replacement Deferral

- > Full AMI deployment reduces the annual meter replacement budget for upcoming years.
 - > Annual meter replacement deferral electric \$909,000

Disconnect, Reconnect, Transfer Efficiency Benefit

An AMI system with remote service switches will reduce field costs associated with connects, disconnects, and/or account transfers.

Annual Benefit from Remote Disconnects and Connects

\$599,912

| | Annual Benefit |
|--|----------------|
| Labor Rates and Volume | |
| Avg field tech labor rate C-15 (includes \$20.00 truck) | \$61.03 |
| Connect and Disconnect Volume | |
| No. of annual connect, disconnect and account transfer service orders | 125,420 |
| Est percent of connect, disconnect and account transfer service orders avoided | 95% |
| Avoided Annual Labor Costs | |
| Est FTE-hours per connect, disconnect and account transfer order (includes travel) | 0.330 |
| Annual FTE-hours on connect, disconnect and account transfers (10 × 21) | 41,388.60 |
| Annual FTE-hours avoided. (11 × 22) | 39,319.17 |
| Annual avoided cost of FTE-hours. (6 × 23) | \$2,399,649 |

Note: Assume 25% of total annual benefit since GRU anticipates minimal personnel attrition and turnover in the field services department. FTE quantities do not include Department Supervision

Revenue Protection Benefit

An AMI system will detect tampering reducing annual uncollectible/theft balances expensed as year-end bad debts.

Revenue Protection on Standard Billing

\$300,469

| | Annual Benefit |
|--|----------------|
| Annual Retail Revenue - Residential, Gen Svc, and Small C&I | |
| Annual retail revenue (residential, small C&I, GS) | \$332,337,428 |
| Annual no. of accounts (residential, small C&I, GS) | 204,101 |
| Avg retail revenue / account / day | \$4.46 |
| Annual Uncollectible Account Data | |
| Annual bad debt expense (residential, small C&I, GS) | \$608,408 |
| Annual no. of bad debt accounts (residential, small C&I, GS) | 3,062 |
| Avg annual uncollectible amount expensed / account | \$198.73 |
| Avg no. of usage days w/ avg. uncollectible amount expensed | 37 |
| Avoided Uncollectible Account Expenses | |
| No. of days before a past due account can be disconnected w/ AMI | 15 |
| Avoided usage days on past due accounts w/ AMI | 22 |
| Avoided uncollectible expense per account | \$98.14 |
| Avoided uncollectible expenses for all accounts | \$300,469 |

Transformer Sizing Benefit

Transformer Right Sizing saves a minimum of 0.5% of purchased power costs

**Annual Benefit from
Transformer Sizing**

\$175,633

| | |
|--|---------------|
| Annual Electric Revenue | \$270,204,593 |
| Purchased Power/Revenue | 13% |
| Estimated Annual Purchased Power Cost | \$35,126,597 |
| % Savings from Transformer Right Sizing | 0.50% |
| \$ Savings from Transformer Right Sizing | \$175,632.99 |

Note: Assumes only taking action on the extraordinary outliers of under utilized and over utilized transformers

Back Office Billing Efficiency Benefit

AMI will reduce back office QA/QC costs associated with exceptions, unavailable, estimated, or requested reads, meter failures and possible theft.

Billing QA/QC Exceptions –
Back Office
\$98,587

| | Electric Annual Benefit | Gas Annual Benefit | Water Annual Benefit | Total Annual Benefit |
|--|-------------------------|--------------------|----------------------|----------------------|
| Labor & Vehicle Rates | | | | |
| Avg office labor rate per hour (incl overhead) | \$32.02 | \$32.02 | \$32.02 | |
| Meter Volume | | | | |
| Avg annual no. of meters in-service | 95,983 | 36,126 | 71,992 | 204,101 |
| Billing QA/QC Exception Volume | | | | |
| Annual FTE-hours on back office billing QA/QC exception activities | 1300 | 1300 | 1300 | 0 |
| Annual no. of service orders to investigate billing QA/QC exceptions | 3036 | 2000 | 2000 | 7036 |
| Est annual no. of AMI meter failure or unavailable read svc orders | 480 | 181 | 360 | 1020.5025 |
| Est annual no. of AMI meter tamper alarm svc orders | 288 | 108 | 108 | 504.705 |
| Est annual no. of billing QA/QC exception svc orders avoided | 2,268 | 1,711 | 1,532 | 5510.7925 |
| Avoided Billing QA/QC Exception Labor | | | | |
| Avg FTE-hours per billing QA/QC exception service order | 0.42819499 | 0.65 | 0.65 | 1.72819499 |
| Annual FTE-hours avoided | 971 | 1,112 | 996 | 3078.9312 |
| Annual avoided cost of FTE-hours | \$31,098 | \$35,611 | \$31,879 | \$98,587 |

Back Office Bill Complaints Benefit

AMI will reduce the duration of calls related to bill complaints and questions because customers are provided accurate data on their energy usage.

Annual Benefit from Bill Complaints

\$75,436

| | Electric Annual Benefit |
|--|-------------------------|
| Labor Rates | |
| Avg office labor rate | \$32.02 |
| Call Volume | |
| Total annual no. of calls to the utility | 706,773 |
| Est percent of total calls that are related to bill complaints and questions | 2.0% |
| Annual calls related to bill complaints and questions | 14,135 |
| Avoided Labor Costs | |
| Est time reduction per call (min.) related to bill complaints and questions | 10.00 |
| Annual FTE-hours avoided | 2,356 |
| Annual avoided cost on FTE-hours | \$75,436 |

Prepay Cash Flow Benefit

AMI improves cash flow by providing a pre-pay billing service option to participating customers.

Annual Prepay benefit
\$54,257

| | Electric Annual Benefit | Water Annual Benefit | Total Annual Benefit |
|--|-------------------------|----------------------|----------------------|
| Utility's preferred WACC or cost of debt | 2.00% | 2.00% | |
| Annual Retail Revenue - Residential, Gen Svc, and Small C&I | | | |
| Annual retail revenue (residential, small C&I, GS). | \$270,204,593 | \$39,180,045 | |
| Annual no. of accounts (residential, small C&I, GS) | 95,983 | 71,992 | |
| Avg daily retail revenue / account / day | \$7.71 | \$1.49 | |
| Est percent of accounts on prepay service | 5% | 5% | |
| Cash Flow Improvement - Pre-Pay Service | | | |
| Avg no. of days of service between normal billing dates | 30 | 30 | |
| Avg no. of days between billing date and payment | 20 | 20 | |
| Avg no. of days for pre-pay service | 14 | 14 | |
| Est no. of accounts on prepay service | 4,800 | 3,600 | |
| Est daily account revenue on prepay service . | \$37,021 | \$5,368 | |
| Cash flow improvement | \$2,369,337 | \$343,534 | |
| Earnings on improved cash flow | \$47,386.73 | \$6,870.69 | \$54,257 |