MEMORANDUM

To: Mayor and Members of the City Council

From: Rich Olson, City Manager

Date: January 13, 2020

Subj: **Smart Metering Program – Update on Additional Questions from Council**

During the January 9, 2020 Finance Committee meeting, members of the City Council requested staff provide additional information on the proposed Smart Meter Project. This memo will address those questions and provide additional information, which staff has determined would be beneficial for the City Council to have prior to making a decision. The City's net position in the Electric Fund is $25,422,741.00; the City's cash balance is $7,199,205.00 (undesignated revenue available for spending). At the present time, the amount of the outstanding debt in the Electric Fund is $855,816.00. This debt is directly related to costs for installing the second delivery point. This debt will be paid off in 2023. The net position in the Water and Sewer Fund is $48,043,597.00. The cash balance in the Water and Sewer Fund is $1,438,907.00. The amount of outstanding debt as of July 1, 2019 was $1,067,268.00. Included in the FY2019-2020 budget is the issuance of $2,988,705.00 in new debt. Of this amount, $1,500,000.00 is included for the Smart Meter Project.

A question was posed: how long will it take to do a meter change out? For residential electrical meters, the changeover process will take approximately five minutes, while the commercial electrical meters will take an estimated 15 minutes. A typical water meter installation will take less than 30 minutes, and for larger commercial water meters, 2-inch or greater, the swap will take approximately one hour. If other related service work to the piping is needed, additional time will be needed for the change out. If a problem arises with the change out of the water meter, City staff or our UMS contractors can bypass the meter and still provide water to the structure if needed. If the stop valve does not work, it will take additional time. City staff has completed our analysis on the amount we annually write-

City Manager's Office
P. O. Box 347 • 306 E. Colonial Avenue • Elizabeth City, NC 27907
Phone: 252-337-6864 • Facsimile: 252-335-2503

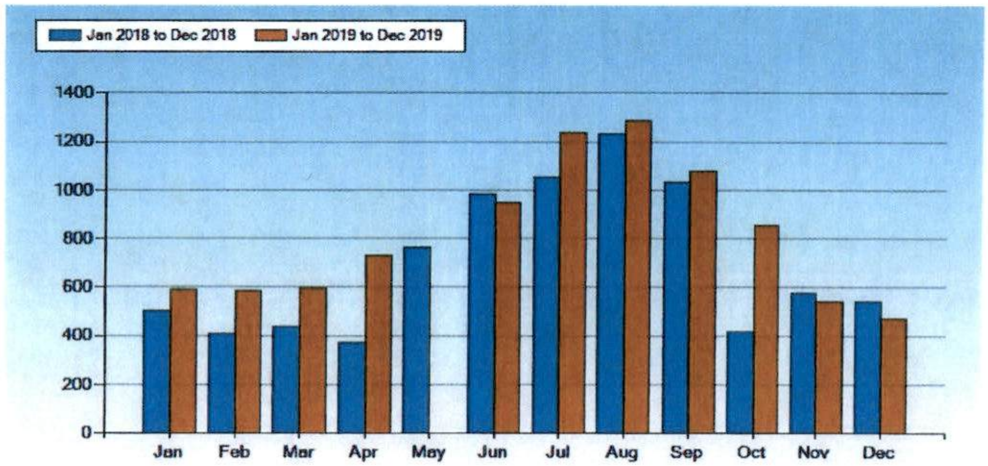
off for customer leak adjustments. Over the last three years, we have written off $95,000.00 annually. These write offs were pursuant to the City Council's long established policy. The Badger System will allow us to detect these leaks earlier and staff believes we will see a substantial reduction in the amount of money we write off for these adjustments. This figure has not been included in our cost analysis. The ROI for the Electric Smart Meter is four years. To determine the ROI for the Water Smart Metering Program, my analysis provided two ROIs. The ROI for just the meter change out is 3.5 years. As part of the meter replacement work, improvement to the meter box and associated pipes may need to be done. In most cases, these repairs would need to be done with or without a meter change out. However, once you factor this additional cost of $1,777,436.00, the ROI is six years. As stated during our presentation, the Water Smart Metering Project will require Local Government Commission (LGC) approval. Staff would like to have our item placed on their February 5, 2020 agenda. However, the following LGC meeting will be March 3, 2020, if the project is delayed beyond the March 3, 2020 meeting; the City will be required to rebid financing for the project.

Additionally, the Council requested a sampling of the Nexgrid Pilot project data, and screen shots of client and customer portals. Attached, is a copy of an earlier electric presentation delivered to the Council showing pilot project data and client portal screenshots. Also included are two client portal screenshots for the Badger Pilot and images from the Tyler Technologies customer portal. The Tyler Technologies screenshots represents images a typical residential customer would see regarding their usage history (by type), payments, and other unique account preferences. The Council has received formal presentation of the portals – client and utility customer – prior to initiating each pilot and signing on to the Tyler Technologies Incode 10 software.

View Consumption For Electric (Metered)

Consumption for Electric (Metered)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan 2018 to Dec 2018	503	406	438	373	764	984	1053	1234	1033	416	579	543
Jan 2019 to Dec 2019	593	586	597	731	0	949	1238	1286	1081	856	543	472



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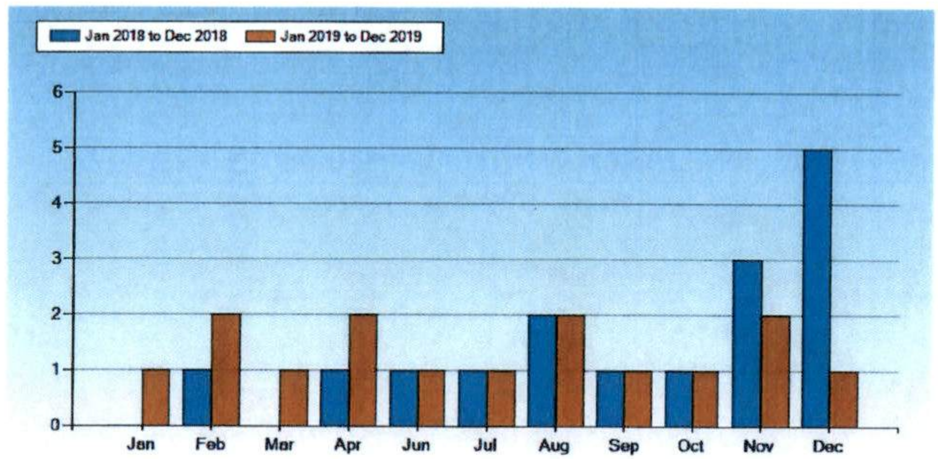
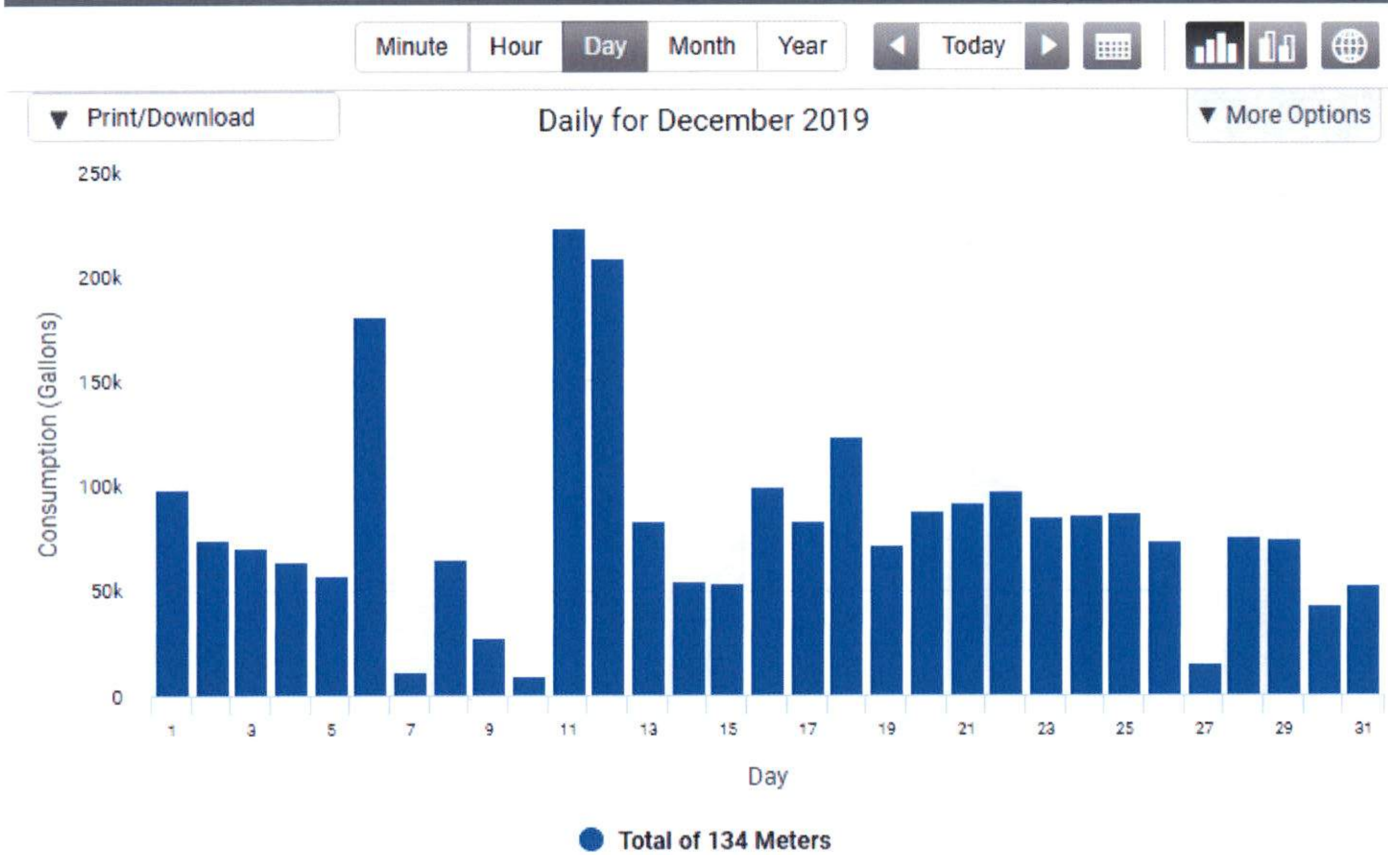
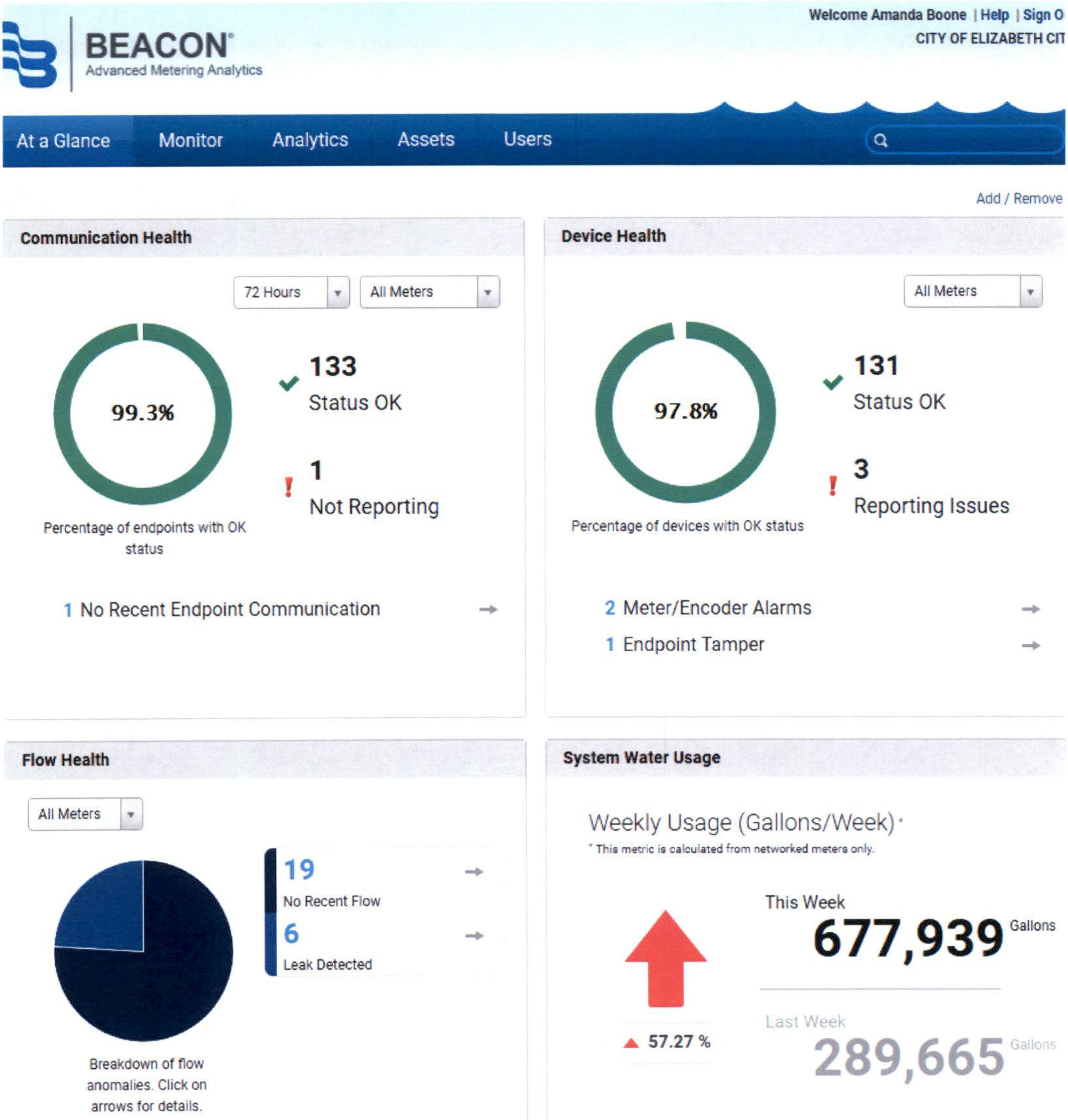
Consumption for Water (Metered)

	Jan	Feb	Mar	Apr	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan 2018 to Dec 2018	0	1	0	1	1	1	2	1	1	3	5
Jan 2019 to Dec 2019	1	2	1	2	1	1	2	1	1	2	1



Total 2,533,519 Gallons





Welcome Amanda Boone | Help | Sign O
CITY OF ELIZABETH CIT
BEACON®
Advanced Metering Analytics
At a Glance
Monitor
Analytics
Assets
Users
Add / Remove
Communication Health
72 Hours
All Meters
99.3%
133
Status OK
1
Not Reporting
Percentage of endpoints with OK status
1 No Recent Endpoint Communication
Device Health
All Meters
97.8%
131
Status OK
3
Reporting Issues
Percentage of devices with OK status
2 Meter/Encoder Alarms
1 Endpoint Tamper
Flow Health
All Meters
19
No Recent Flow
6
Leak Detected
Breakdown of flow anomalies. Click on arrows for details.
System Water Usage
Weekly Usage (Gallons/Week)*
* This metric is calculated from networked meters only.
This Week
677,939 Gallons
57.27 %
Last Week
289,665 Gallons

MEMORANDUM

To: Mayor and Members of the City Council

From: Rich Olson, City Manager
Angela Cole, Assistant City Manager

Date: January 10, 2020

Re: Presentation / Consideration – Nexgrid and Beacon Meters Smart Grid Implementation

BACKGROUND:

Advanced Metering Infrastructure (AMI) refers to systems that measure, collect, analyze energy usage, and communicate with metering devices such as electricity meters, gas meters, LCS, and water meters, either on request or on a schedule. These systems include hardware, software, communications, consumer energy displays and controllers, customer portals, meter data management software, and utility billing systems.

Government utilities are turning toward AMI systems as part of larger "smart grid" initiatives. AMI differs from traditional automatic meter reading (AMR) in that it enables two-way communications with the meter. AMI two-way meter communications allows commands to be sent toward the home for multiple purposes, including time-based pricing information, demand-response actions, or remote service disconnects/reconnects. Wireless technologies are critical elements of the network, aggregating a mesh configuration of up to thousands of meters for back haul to the utility's IT center of operations.

The network between the meter devices and billing / operations systems allows collection and distribution of information to customers, utility distribution / supply, and utility customer service. This enables the City to participate in demand response services. Since deregulation, time-of-use rates, and market-driven pricing, utilities have been looking for a means to match consumption with generation. Non-smart meters only measure total consumption, providing no information of when the resource (water, gas or electricity) was consumed. Smart meters provide a way of measuring this site-specific information, allowing utility companies to charge different prices for consumption according to the time of day and the season TOU rates. Likewise, smart metering offers potential benefits to households. Consumers can use real-time information provided by the smart grid system to change their normal consumption patterns to take advantage of lower prices. Pricing can be used to curb growth of peak demand consumption, saving the City a considerable amount of money.

City staff has been working on the development of AMI in Elizabeth City for almost 10 years. The Public Utilities Department facilitates the distribution of two utilities – water and electric. The Electric Division will be migrating to AMI hardware and mesh networking created by Nexgrid Solutions. The meter devices are the enhanced Aclara i210+c and KV2C meters for commercial customers; they will be enhanced by the AMI technology and the Verizon telecommunications network, making the two-way communication and data collection possible. The smart water metering technology is offered by Badger Meter. The technology specifically being considered is the Beacon Advanced Metering Analytics (AMA) system accompanied by the Orion Cellular LTE (long-term evolution) Endpoints and E-Series Ultrasonic Meters.

The integrated system of smart meters, communications network, and data management systems will improve the City's service delivery and service experience, all while saving the customers money. This AMI has already been introduced and supported in many other communities – small-, mid-, and large sized cities – across the nation. Within the northeastern region of North Carolina and for the member cities of the North Carolina Eastern Municipal Power Agency (NCEMPA) the incorporation of the technology has multiplied. In the last three years, the City's impediments have been varied, but with forward vision of the City Council, we have remained committed to implementing our AMI project. In February 2015, the City Council authorized staff to implement the Nexgrid AMI FAN Pilot, to include both water and electric utilities. Staff had planned to run the pilot for only a year; however, the utility billing migration deferred our being able to assess and evaluate the success of the pilot. The City Council authorized staff to extend our agreement with Nexgrid during their August 22, 2016 Work Session. During the intervening period, staff has continued to work with Nexgrid and ElectriCities representatives to evaluate electric meter and load management devices appropriate for the Elizabeth City project. Although the Nexgrid AMI offers both an electric and water solution, the smart metering for the water utility has been separated from the Nexgrid electric project. During the May 9, 2019 Regular Meeting, staff presented information regarding the Badger smart meter products and specifically Beacon. After considering the matter, Council directed staff to install the new technology at each of the Council members' houses and any locations where the meter was stopped or broken as part of the regular maintenance.

In addition to receiving several presentations exhibiting the data generated by each pilot, staff also previously provided to Council demonstrations of the existing and new meter devices, rate analysis reports, distribution system updates and usage reports for both utilities. Utility-specific reports, like water consumption and load management reports have been showcased during Regular, Work Session, and Budgetary meetings of the Council. Staff has also advised the Council that the City's water meters have exceeded their useful life expectancy, which could negatively affect meter accuracy. However, meter accuracy is essential to ensuring accurate billings. The aging meters tend to underreport consumption. Smart AMI technology aside, the inventory of existing water meters must be replaced in order to maintain system integrity.

The City's team of utility, system and information technology, and public administration have researched, vetted, and negotiated an AMI solution for Elizabeth City that will harness smart technology to better utilize staff resources, accurately measure services and protect our natural resources.

ANALYSIS

<u>Smart Metering Program – Water</u>

- Replacement of all approximately 8,000 water ultrasonic meters equipped with a cellular transmitter
- Rehabilitation of all water meter installations, including backflow prevention
- 15 minute interval meter reads
- Increase staff capabilities in system-wide leak tracking
- Customer access to meter information via a secure web portal
- User information to include: urgent message notification functions for incidents such as leak detection, customer configurable consumption thresholds and text message alerts

<u>Smart Metering Program – Electric</u>

- Installation of the ecoNet communication gateway and repeaters
- Replacement of all approximately 13,580 residential and commercial electric meters, along with a wireless mesh communication network
- Quarter hour meter reads
- Increase staff capabilities in outage tracking and restoration management and system balancing.
- Future load management capabilities and specialization
- Customer access to meter information and usage history via a secure intelaHome or Tyler portal
- Consumer information to include: urgent message notification functions for high usage and low account balance, past due / disconnection notification, customer configurable consumption thresholds and text message / call alerts

<u>Financing – Water</u>

During the City Council meeting of November 25, 2019, the City Council approved staff to request and negotiate contracts associated with the smart metering project for water AMI. We requested financing proposal for the meter and project deployment. The following proposals have been received:

Entity Name	Fixed Rate	Fees	Total Payments Including Fees
Bank of America	2.0656%	----	$5,510,760.00
BB&T	2.08%	----	$5,514,618.54
BciCapital (City National)	No Bid		
First Citizens Bank	No Bid		
PNC Bank Public Finance	No Bid		
Southern Bank & Trust Co.	No Bid		
Towne Bank	2.44%	$1,500.00	$5,622,468.00
Wells Fargo	No Bid		
Xenith Bank	No Bid		

The City received three very competitive proposals from Bank of America, BB&T, and Towne Bank; total interest to be paid over the ten years will be $535,760.

The City Council is recommended to adopt a resolution authorizing financing with Bank of America. Since we are retiring the debt over a longer period, the City must request approval from the Local Government Commission (LGC). In order to submit application to the LGC, the Council must first hold a public hearing, as well as adopt a resolution for financing. The next LGC meeting will be held on February 5, 2020; therefore, if the Council calls for a Public Hearing during its January 13th, 2020 meeting, it could be held on January 27th, 2020, and submitted in time for their February consideration.

<u>Financing – Electric</u>

The City Council included $2.25 million in the FY 2019-2020 budget to implement the Nexgrid AMI strategy. During the City Council meeting of November 25, 2019, the City Council approved staff to request and negotiate contracts associated with the smart metering project for electric AMI. We requested financing proposal for the hardware (meter) project component. The following proposals have been received:

Entity Name	Fixed Rate	Fees	Total Payments Including Fees
Bank of America	No Bid		
BB&T	1.89%	----	$2,729,455.87
BciCapital (City National)	No Bid		
First Citizens Bank	2.31%		$2,752,940.76
PNC Bank Public Finance	No Bid		
Southern Bank & Trust Co.	No Bid		
Towne Bank	2.27%	$1,500.00	$2,756,425.20
Wells Fargo	No Bid		
Xenith Bank	No Bid		

The City received three proposals from BB&T, First Citizens Bank, and Towne Bank; total interest to be paid over the five years will be $129,455.87.

The City Council is recommended to adopt a resolution authorizing financing with BB&T.

Return on Investment

City staff's primary objectives when evaluating a smart meter program is does it make economic sense? This is the best determined by looking at the return on investment (ROI). Staff, along with the help of outside services, has developed the return on investment projections for each project. The City Council needs to remember that we purchase our power through NCEMPA, while we produce our water through our treatment plant process. This is the primary reason we have substantially different ROI for each project.

Due to the excellent interest rates, the City received 1.89% for Electric and 2.06% for water. Staff has been able to do a financial analysis for both projects. The Smart Water Meter project indicates a positive cash flow of $195,998.00 in year one of the project. Over the 10-year period that the debt is issued, there is a cumulative savings of $2,648,493.00. Attached as Exhibit "A" is the financial analysis to support these numbers.

The Electrical Smart Metering project has an ROI of four years. (Exhibit B) These savings are directly associated with a reduction of the demand charges we will be paying NCEMPA. The City should experience a savings of $804,733.00 per year, while our debt payment cost will be $545,891.00 per year. The ROI can be decreased substantially by increasing the City's Load Management Switch Replacement Program.

Based on the City's existing rate plan neither the Electrical or Water Smart Meter Projects will require the City to increase our electrical rates or water rates.

Contracts & Agreements – Water

There are two contractual agreements exclusive to the smart water meter project:

1) the Beacon AMA Managed Solution Master Agreement, and 2) the Utility Management Services (UMI) Master Services Agreement. The agreement with Beacon is a services contract, establishing terms for the hosted, on demand, web based service website (or customer portal) accessible to its customers to provide metering and water usage service information. Per the agreement the information will be communicated via a cellular network. The UMS Agreement facilitates the installation of the Badger meters and integration into the Beacon AMA system and the City's Incode 10 utility billing software. Specifically, UMS will furnish all software, labor, integration and the other related services to manage the design, build and integration of a cellular metering system. The third obligation relates to the City's agreement with Tyler Technologies, our utility billing software provider. The City will be required to execute a purchase order with Tyler Technologies for every meter included within the mass meter swap. The water integration includes an estimated 8,000 water meters. The existing service agreement the City has with Tyler will be updated to reflect the reoccurring customer service portal access for all utility customers – both water and electric.

All elements accounted for, the Badger AMI System Implementation Project is estimated to cost $4,517,891.33, plus a 10% contingency ($444,087.11), for a project total of $4,961,948.44. Total annual fees would be estimated at $79,392,96. The City would debt finance the entire project , or $4,961,948,44. The estimated budgetary impact is $633,525.00 for the next 10 years.

The Elizabeth City Beacon AMI Project – Price Estimates (Exhibit C) spreadsheet enumerates the project summary described above, and is attached hereto. City staff expects the water project implementation to take a total of six to nine months to complete. Once LGC approval and financing is secured and authorizations provided by the City Council, staff anticipates beginning this project on or about April 1st and being completed in the fall of 2020.

Contract Summary for the Water Metering Integration						
Vendor	Type of Agreement	Product or Service Rendered	Duration (of the Agreement)	Contract Amount	Reoccurring Amount	Additional Comments or Highlights
Badger	Product	Meters, backbone hardware, and smart devices	One-time purchase	$2,029,366.00	N/A	
Various Vendors	Product	Misc. hardware	One-time purchase	1,136,578.63	N/A	
Beacon (AT&T)	End User Agreement	Web-based Software Platform	Initially five years, renewable annually	N/A	$79,392.96	
Utility Management Services	Master Services	Project Management and Installation Services	Nine months	$1,260,326.50	N/A	
Tyler Technologies	Purchase Order (Service)	Mass Meter Change Out (MMCO)	Annual subscription	$0.50 per meter	N/A	

Contracts & Agreements – Electric

Full implementation of the Nexgrid electric AMI system will require the execution of nine agreements, which have been reviewed by the City Attorney. Additionally, are the billing system integration and customer portal access with Tyler Technologies. There are two agreements the City will execute with Nexgrid: 1) the hardware contract for to include the Aclara meters, ecoNets, repeaters, handheld devices and antenna; and 2) the service and product licensing contract granting the City and customers access to the web based intelaHome portal. The City will be charged annual fees by Nexgrid relating to the Professional Services and Support Agreement. This agreement governs terms and coverage related to faulty meters, system disruption, transmitting of data, cyber security, etc. The service contract includes training for Electric Distribution and Customer Service personnel. In order to activate our Nexgrid pilot project, the City has already executed very similar agreements with the technology company. Still the new agreements have been reviewed, updated and negotiated for terms and level of service expectations. In total, including product shipping, the hardware expense is $2,484,573.00.[1] The PSSA contract value is $31,770.00; this is a reoccurring cost.

The third contract essential to the Nexgrid implementation is a reoccurring service agreement with Verizon Wireless. This component links the meter and Nexgrid hardware to the City's communication network. Verizon is supplying the sim cards to insert into the DIGI routers that the City will purchase from ElectriCities. Much like a mobile phone, the sim card is necessary for the device to receive and transmit data. The reoccurring element functions much like a mobile phone plan. This project element is a change from staff's November presentation to the Council. The technology and services offered by Verizon represent a better cost option and reliability over and above the inventory of radios and antenna initially proposed. The Verizon Wireless agreement is negotiated in keeping with the City's existing business plan we already have; the annual cost for sim card and plan is $6,720.00.

The City has negotiated with ElectriCities for the DIGIs cellular gateway hardware, programming and setup. This is a required smart grid element as it establishes and reinforces the communication backbone. Sister cities of Kinston, Ayden and Smithfield are using this technology. City facilities with internet access, will have a static IP and have a few locations backbone setup similar to the current Nexgrid pilot. For all remaining areas, the City will use cellular DIGIs. The City's Electric Distribution already has some DIGIs they are using for SCADA. The one-time cost is $6,750.00 for 15 units, and their setup. Again, the cellular service for the DIGIs will be provided by Verizon Wireless and priced separately.

Also included in project contracting are service agreements for meter and meter base hardware installation. The lowest bid for meter and ecoNet device installation was from NexGen Utility Solutions; their quote is $374,628.00. NexGen is a device installation

[1] The Load Management Switch (3relay) included in the Hardware section of the *Elizabeth City Nexgrid AMI Project – Price Estimates* spreadsheet is considered an operations expenditure and is not included in the total amount to be financed.

vendor, also specializing in technical resources for energy utilities; the company implements, builds and supports many types of utility infrastructure, including smart grid, wireless communications systems, wireline telecommunications. The contract obligates NexGen to install approximately 13,500 electric meters and other related technology components within a six month period, beginning in early 2020.

As with the utility conversion project, City staff strongly supports the idea of engaging a project manager to facilitate the integration. ElectriCities offers project management expertise at a rate of $110.00 per hour. Other member cities using this service offering from ElectriCities have asserted its value. If the City chooses to hire the outside project manager, the individual would report to the City at least once a week, providing the following assistance to our AMI project:

- Assistance with vendor management for Nexgrid and other third parties that are part of the AMI project
- Assistance in establishing project schedule and budget
- Help maintain project schedule and budget
- Monitoring contract performance of third parties
- Assistance with establishing processes for meter change outs, data exchange, integrations, etc.
- Providing project updates to entire team throughout project.

ElectriCities is completing a similar electric and water AMI installation project with the Town of Ayden, estimating a minimum of 500 hours dedicated to project management. The ElectriCities estimate for project management and assistance is $55,000.00. Also included (and required) with the Nexgrid on-site participation is payment for their travel expenses. The project includes $5,000.00 for Nexgrid personnel travel and lodging.

Another segment of the Nexgrid system implementation includes utility billing system integration and portal access annual fees. Tyler Technologies will charge the City 50¢ per meter for the mass meter change out. Again, the City estimates 13,580 meters, resulting in $6,790.00 payable to Tyler Technologies for each electric meter that is replaced. (The 50¢ charge also applies to the 8,000 each water meters that must be replaced.) Elizabeth City Utility customers will be able to access their account information, usage data, make payments, establish usage, tampering and leak alerts via a universal customer portal maintained by Tyler Technologies. The portal would also be available to City Customer Service representatives. This one-stop portal will enhance our level of service to residential and commercial consumers. Tyler Technologies can make the portal available at an annual cost of $34,003.00 for both the electric and water utilities together.[2]

[2] The Tyler Technologies portal will receive the meter (water and electric) data the City pushes to its servers and in turn create a dashboard for the consumer / customer to view their respective utility usage in the form of chart or data table, as well as make customer-specific account preferences. Separately, Nexgrid and Badger offer customer portals with their product. Both are relatively user-friendly; however, each will require a separate account set-up and login for the Elizabeth City Utility customer, for three Elizabeth City Utility-related logins. CSRs will also have to login to separate portals to explain usage options and data to the customer. Tyler will not allow Nexgrid and Beacon from the existing customer portal without the add-on feature.

Finally, the City will be charged $1,500.00 monthly or $18,000.00 annually for the storage of its AMI data ElectriCities. At the recommendation of the City's Director of Information Technologies Matthew Simpson, the Elizabeth City Utility will store all customer usage data at one of the ElectriCities secure facilities (rather than a virtual cloud server). The reoccurring cost escalates 5% annually; and although a rather substantial cost, many local governments that have been hacked and had their data compromised or even held for ransom, advocate for the additional security that data storage centers can give. The City must expand its current (pilot program) agreement with ElectriCities to include the entire system of smart meters.

All elements accounted for, the Nexgrid AMI System Implementation Project is estimated to cost $3,162,748.00, plus a 5% contingency ($158,137.00), for a project sum of $3,320,886.00. Total Annual Fees would be an estimated $69,793.00. The City would debt finance the hardware assets associated with the project, or $2,600,000.00. The load management switches, various fees (installation, project management and annual), and billing system integration charges would be paid from the Electric Distribution (enterprise) Fund budget. The estimated budgetary impact is $615,684, which is $545,891.00 in debt and $69,793.00 in fees.

The *Elizabeth City Nexgrid AMI Project – Price Estimates* (Exhibit D) spreadsheet enumerates the project summary described above, and is attached hereto.

City staff expects the electric project implementation to take a total of six to eight months to complete. Once financing is secured and authorizations provided by the City Council, staff anticipates starting the project on or about March 1, completing by early Fall 2020.

Vendor	Type of Agreement	Product or Service Rendered	Duration (of the Agreement)	Contract Amount	Reoccurring Amount
Nexgrid	Master Service / End User	Portal Access / Software	Annual subscription	$31,770.00	$31,770.00
Nexgrid	Product	Meters, backbone hardware, and smart devices	One-time purchase	$2,469,322.50	N/A
ElectriCities	Service	Project Management	6 months, until installation is complete	$55,000.00	N/A
ElectriCities	Product	DIGI cellular router	One-time purchase	$6,750.00	N/A
ElectriCities	Service	Data Hosting	Initially three years, with annual renewal	$18,000.00	Escalates 5% annually
Verizon Wireless	Product / Service	Sim cards / Data Plan	Ongoing	$6,720.00	$6,720.00
NexGen Solutions	Service	Meter and hardware installation	6 months, until installation is complete	$206,595.00	N/A
Tyler Technologies	Purchase Order (Service)	Technical support / Mass Meter Change Out (MMCO)	6 months, until installation is complete	.50 per meter	N/A
Tyler Technologies	Software	Customer Portal Access	Annual subscription	$34,753.00	$34,753.00

FINANCIAL:

The Finance Committee received an overview on this item during their January 9, 2020 meeting and requested additional information will be worked into the official Work Session Presentation. It was the general consensus of the Finance Committee to move this item forward to the Special Called Work Session.

STAFF RECOMMENDATION:

By motion, take the following actions:

- Approve Contracts and Orders for Electric Metering Integration including:
  - Nexgrid Master Service / End User Agreement for Portal Access / Software
  - Nexgrid Product Agreement for Meters, Backbone Hardware, and Smart Devices
  - ElectriCities Service Agreement for Project Management
  - ElectriCities Product Agreement for DIGI celluar router
  - ElectriCities Service Agreement for Data Hosting
  - Verizon Wireless Product / Service Agreement to SIM Cards and Data Plans
  - NexGen Solutions Service Agreement for Meter and Hardware Installation
  - Tyler Technologies Purchase Order for MMCO Support
  - Tyler Technologies Software Agreement for Customer Portal Access
- Approve Contracts for Water Metering Integration, including:
  - Beacon End User Agreement for Web-based Platform Software
  - Utility Management Services Master Services Agreement for Project Management and Installation Services
  - Tyler Technologies MMCO Service

Additionally, recommend that the City Council adopt a resolution authorizing financing for Electric Metering Integration with BB&T for $2,729,455.87; adopt a resolution authorizing financing for Water Metering Integration with Bank of America for $5,510,760.00; and further recommend that the City Council call for a Public Hearing to be held on January 27, 2020, directly following the public comment period, for the purpose of gathering public input on LGC financing for the Water Metering Integration Project.

RESOLUTION# 2020-1-01
Resolution for Water Smart Metering Project to be Funded by 10-Year Installment Purchase Financing

WHEREAS, during the November 25, 2019 meeting of the City Council, the Council authorized staff to begin requesting and negotiating contracts and financing for the smart water meter project deployment; and

WHEREAS, the total funding required for this project is $5,510,760, which includes interest of $535,760; and

WHEREAS, of the nine banks approached for financing, the City received three bids, the lowest of which was from Bank of America, which had a fixed rate of 2.0656%; and

WHEREAS, the requisite public hearing soliciting input for the purchase was called for during the January 13, 2020 meeting, and held on January 27, 2020, after proper public notice.

NOW THEREFORE, be it resolved by the City Council of the City of Elizabeth City that application shall be made to the Local Government Commission (LGC) approving the 10-year installment purchase financing through Bank of America.

ADOPTED, this the 13th day of January 2020.

Bettie J. Parker
Mayor

April D. Onley
City Clerk

RESOLUTION# 2020-1-02
Resolution for Electric Smart Metering Project to be Funded by Five-Year Installment Purchase Financing

WHEREAS, during the November 25, 2019 meeting of the City Council, the Council authorized staff to begin requesting and negotiating contracts and financing for the smart electric meter project deployment; and

WHEREAS, the total funding required for this project is $2,729,455.87, which includes interest of $129,455.87; and

WHEREAS, of the nine banks approached for financing, the City received three bids, the lowest of which was from BB&T, which had a fixed rate of 1.89%.

NOW THEREFORE, be it resolved by the City Council of the City of Elizabeth City to approve the the five-year installment purchase financing for the Electric Smart Metering Program through BB&T.

ADOPTED, this the 13th day of January 2020.

Bettie J. Parker
Mayor

April D. Onley
City Clerk

Exhibit A

Financial Analysis for City of Elizabeth City, NC

Project Cost =	$ 4,961,948.44	**Water Meters =**	8,168	**Total Meters**	8,168
Annual W&S Revenue =	$9,600,000	O&M Savings ($) =	$267,084	Financed Amount =	$ 4,961,948.44
Improved Meter Acc. (%) =	5.0%	O&M Savings Term =	10 years	AMI Service Term =	10 years
Billable Usage Increase ($) =	$505,263	Budgeted Funds ($) =	$57,176	Interest Rate =	2.060%
Annual Escalation =	0.0%	Budgeted Funds Term =	10 years	AMI Software & Services =	$ 79,392.96

	A	B	C	D = A + B + C	E	F	G = E + F	H = D - G	
Year	Water Usage Increase	O&M Savings	Yearly Budgeted Funds	Total AMI Benefit	AMI Implementation	AMI Software & Services	Yearly Lease P&I Payment	Annual AMI Enhancement	Cumulative AMI Enhancement
1	$505,263	$267,084	$57,176	$829,523	$554,132	$79,393	$633,525	$195,998	$195,998
2	$505,263	$280,438	$57,176	$842,877	$554,132	$79,393	$633,525	$209,352	$405,350
3	$505,263	$294,460	$57,176	$856,899	$554,132	$79,393	$633,525	$223,374	$628,724
4	$505,263	$309,183	$57,176	$871,622	$554,132	$79,393	$633,525	$238,097	$866,821
5	$505,263	$324,642	$57,176	$887,081	$554,132	$79,393	$633,525	$253,556	$1,120,377
6	$505,263	$340,874	$57,176	$903,313	$554,132	$79,393	$633,525	$269,788	$1,390,165
7	$505,263	$357,918	$57,176	$920,357	$554,132	$79,393	$633,525	$286,832	$1,676,997
8	$505,263	$375,814	$57,176	$938,253	$554,132	$79,393	$633,525	$304,728	$1,981,725
9	$505,263	$394,605	$57,176	$957,044	$554,132	$79,393	$633,525	$323,519	$2,305,244
10	$505,263	$414,335	$57,176	$976,774	$554,132	$79,393	$633,525	$343,249	$2,648,493
Total	$5,052,630	$3,359,353	$571,760	$8,983,743	$5,541,320	$793,930	$6,335,250	$2,648,493	

Exhibit B

Current Scenario - Keep LM Switches, Don't Increase Participation											
Item	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Totals**
Demand Rate	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	
% WH Working	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	
% AC Working (25%)	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	
% AC Working (100%)	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	
% HS Working	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	
Total WH Working	3946	3946	3946	3946	3946	3946	3946	3946	3946	3946	
Total 25% AC Working	1686	1686	1686	1686	1686	1686	1686	1686	1686	1686	
Total 100% AC Working	0	0	0	0	0	0	0	0	0	0	
Total HS Working	0	0	0	0	0	0	0	0	0	0	
Total WH Demand Reduced	28411.2	28411.2	28411.2	28411.2	28411.2	28411.2	28411.2	28411.2	28411.2	28411.2	284112
Total AC Demand Reduced	7418.4	7418.4	7418.4	7418.4	7418.4	7418.4	7418.4	7418.4	7418.4	7418.4	74184
Total HS Demand Reduced	0	0	0	0	0	0	0	0	0	0	0
Total Demand Reduced	35829.6	35829.6	35829.6	35829.6	35829.6	35829.6	35829.6	35829.6	35829.6	35829.6	358296
Total Cost Savings ($)	$804,733	$804,733	$804,733	$804,733	$804,733	$804,733	$804,733	$804,733	$804,733	$804,733	$8,047,328
WH Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25% AC Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100% AC Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HS Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Savings	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$804,733**	**$8,047,328**

Assumptions	
Demand Rate	$22.46
Delivery Surcharge	$0.00
Losses	0%
Total Demand Reduced (WH)	7.2
Total Demand Reduced (25% AC)	4.4
Total Demand Reduced (100% AC)	12
Total Demand Reduced (HS)	9
Total WH Controlled	6577
Total 25% AC Controlled	5112
Total 100% AC Controlled	0
Total HS Controlled	0
WH Credit ($/year)	$0.00
25% AC Credit ($/year)	$0.00
100% AC Credit ($/year)	$0.00
HS Credit ($/year)	$0.00

Nexgrid Scenario 1 - Replace All Switches											
Item	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Totals**
Demand Rate	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	$22.46	
% WH Working	63%	66%	73%	80%	84%	88%	93%	95%	95%	95%	
% AC Working (25%)	35%	36%	42%	48%	55%	64%	73%	84%	95%	95%	
% AC Working (100%)	35%	36%	42%	48%	55%	64%	73%	84%	95%	95%	
% HS Working	35%	36%	42%	48%	55%	64%	73%	84%	95%	95%	
Total WH Working	4143	4350	4785	5264	5527	5803	6094	6248	6248	6248	
Total 25% AC Working	1771	1859	2138	2459	2828	3252	3740	4302	4856	4856	
Total 100% AC Working	0	0	0	0	0	0	0	0	0	0	
Total HS Working	0	0	0	0	0	0	0	0	0	0	
Total WH Demand Reduced	29829.6	31320	34452	37900.8	39794.4	41781.6	43876.8	44985.6	44985.6	44985.6	393912
Total AC Demand Reduced	7792.4	8179.6	9407.2	10819.6	12443.2	14308.8	16456	18928.8	21366.4	21366.4	141068.4
Total HS Demand Reduced	0	0	0	0	0	0	0	0	0	0	0
Total Demand Reduced	37622	39499.6	43859.2	48720.4	52237.6	56090.4	60332.8	63914.4	66352	66352	534980.4
Total Cost Savings ($)	$844,990	$887,161	$985,078	$1,094,260	$1,173,256	$1,259,790	$1,355,075	$1,435,517	$1,490,266	$1,490,266	$12,015,660
WH Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25% AC Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
100% AC Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HS Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Credits Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Savings	**$844,990**	**$887,161**	**$985,078**	**$1,094,260**	**$1,173,256**	**$1,259,790**	**$1,355,075**	**$1,435,517**	**$1,490,266**	**$1,490,266**	**$12,015,660**

Assumptions	
Demand Rate	$22.46
Delivery Surcharge	$0.00
Losses	0%
Total Demand Reduced (WH)	7.2
Total Demand Reduced (25% AC)	4.4
Total Demand Reduced (100% AC)	12
Total Demand Reduced (HS)	9
Total WH Controlled	6577
Total 25% AC Controlled	5112
Total 100% AC Controlled	0
Total HS Controlled	0
WH Credit ($/year)	$0.00
25% AC Credit ($/year)	$0.00
100% AC Credit ($/year)	$0.00
HS Credit ($/year)	$0.00

Total Savings	**$40,257**	**$82,428**	**$180,345**	**$289,527**	**$368,524**	**$455,058**	**$550,342**	**$630,785**	**$685,533**	**$685,533**	**$3,968,332**

Exhibit C

Elizabeth City Nexgrid AMI Project Outlay

Item	Unit Price	Quantity	Extended	
Hardware				
ecoNet Communication Gateway	$424.94	175	$74,365	
ecoSwitch SL Repeaters (HG)	$141.55	75	$10,616	
ecoSwitch SL Repeaters	$135.30	100	$13,530	
Gateway Mounting Kit	$51.51	50	$2,576	
Antenna	$45.00	50	$2,250	
Antenna Bracket	$37.69	50	$1,885	
Backbone Equipment (Water tower radios, cellular gateways, etc.)	$6,750.00	1	$6,750	*Estimate - not on Nexgrid quote - ~$450/DIGI, 15 DIGIs total.
ecoOne Activation/Setup	$19,500.00	1	$19,500	
Licensing (EDOS, EDS, and ecoSync)	$9,000.00	5	$45,000	
Training	$120.00	48	$5,760	
Aclara i210+c 1S	$200.59	20	$4,012	
Aclara i210+c 2S with RD	$158.00	12000	$1,896,000	
Aclara i210+c 2S 320	$175.59	200	$35,118	
Aclara i210+c 3S	$175.00	210	$36,750	
Aclara i210+c 4S	$175.00	5	$875	
Aclara i210+c 12S 200 RD	$220.03	100	$22,003	
Aclara kv2c 9S	$245.67	800	$196,536	
Aclara kv2c 16S 320	$266.22	200	$53,244	
Aclara kv2c 45S	$255.67	10	$2,557	
Aclara kv2c 6A	$317.89	25	$7,947	
Load Management Switch (1relay)	$149.00	0	$0	
Load Management Switch (3relay)	$159.00	200	$31,800	
Nexgrid Handheld - 5 user licenses	$7,000	1	$7,000	
Handheld devices (iPod Touch or iPhone)	$500	7	$3,500	*Estimate - not on Nexgrid quote
Shipping & Handling	$5,000	1	$5,000	*Estimate - not on Nexgrid quote
Total			**$2,484,573**	
Installation				
LM Switch Installation	$115	0	$0	*Elizabeth City to install LM switches
ecoNet & Communications Installation	$0	0	$0	*Elizabeth City to install all Nexgrid communications equipment.
Backbone Installation	$0	0	$0	*Planning to use DIGIs, so Elizabeth City to install all backbone equipment
Electric Meter Installation - Residential	$ 166,320.00	1	$166,320	
Electric Meter Installation - Commercial	$ 40,275.00	1	$40,275	
A Base Meter Adapters	$76	820	$62,673	*Estimate. Assumed 20 1S and 800 9S.
A Base Meter Swaps - Install	$ 55,360.00	1	$55,360	*Estimate. Assumed 20 1S and 800 9S.
Other Meter Base Repairs	$50,000	1	$50,000	*Estimate
Total			**$374,628**	
Project Management				
ElectriCities Project Management & Assistance	$110	500	$55,000	*Estimating 500 hours at $110/hr. Roughly 1 day/week onsite. Travel expenses are included in rate. Actual hours billed as incurred.
Travel (Nexgrid)	$5,000	1	$5,000	*Estimate
Total			**$60,000**	*Estimate - actual Time & Materials billed as incurred.
Billing System Integration				
Mass Meter Exchange (Tyler Tech)	$0.50	22080	$11,040	
Customer Portal	-	-	-	*Only annual fee applies, see below
Other Integration Costs	TBD	TBD	TBD	
Total			**$11,040**	
Annual Fees				
Nexgrid PSSA	$2.25	14120	$31,770	
ElectriCities Hosting	$1,500	12	$18,000	*Escalates 5% annually. Includes hosting for 2 EDOS, 2 EDS, and 1 ecoSync server.
Tyler Tech Annual Fees	$34,753	1	$34,753	
Annual Cellular Fees	$560	12	$6,720	*Assumes $600/month for Verizon charges
Total			**$91,243**	
Estimated Project Cost	**$2,954,960**			*Includes 1st year of EC hosting and 1st year cellular fees. 1st year of Tyler Tech Smart Meter portal delayed until year 2 in business case.
Contingency (10%)	**$295,496**			
Total Project Costs	**$3,250,456**			
Total Annual Fees	**$91,243**			

Exhibit D

AMI PROGRAM SUMMARY (END-TO-END)	EQUIPMENT	SERVICES	TOTAL
END-TO-END PROGRAM ADMINISTRATION	$ -	$ 136,455.00	$ 136,455.00
METER & METER INSTALLATION SERVICES	$ 2,029,366.00	$ 456,467.50	$ 2,485,833.50
AMI ENDPOINTS, EQUIPMENT AND INSTALLATION SERVICES	$ -	$ 26,546.00	$ 26,546.00
AMI SOFTWARE AND INTEGRATION SERVICES	$ 14,300.00	$ -	$ 14,300.00
AMI PROGRAM SUMMARY (END-TO-END)	$ 2,043,666.00	$ 619,468.50	$ 2,663,134.50
Annual Service Units	$ 79,392.96		

AMI CAPITAL PROGRAM	COST
AMI UPGRADE CAPITAL TOTAL	$ 2,663,134.50
AMI UPGRADE (BONDING AND INSURANCE)	$ 73,236.20
MISC EXTRA WORK	$ 1,777,436.63
CONTINGENCY (10%)	$ 444,057.11
TYLER INTEGRATION	$ 17,000.00
CAPITAL TOTAL	**$ 4,974,864.44**
AMI ANNUAL FEE'S	$ 79,392.96
PROJECT TOTAL	**$ 5,054,257.40**

DESCRIPTION	QTY	EQUIPMENT PROVIDER		UMS SERVICES		COMBINED UNIT	TOTAL
		UNIT	EXTENDED	UNIT	EXTENDED		
OPTIONAL EQUIPEMENT & SERVICES							
Field Labor Rate (Hourly)	0	$ -	$ -	$ 96.00	$ -	$ 96.00	$ -
Cut and Install New Meter Lid	0	$ -	$ -	$ 10.00	$ -	$ 10.00	$ -
Install New Meter Box Lid	7,719	$ 28.16	$ 217,367.04		$ -	$ 28.16	$ 217,367.04
Meter Box Replacement for 1" and under	1,109	$ 26.70	$ 29,610.30	$ 37.00	$ 41,033.00	$ 63.70	$ 70,643.30
Meter Box Reset for 1" and under	3,326	$ -	$ -	$ 55.00	$ 182,930.00	$ 55.00	$ 182,930.00
Install New Meter Box (up to 1.5-2")	99	$ 88.69	$ 8,780.31	$ 55.00	$ 5,445.00	$ 143.69	$ 14,225.31
Installation of Residential Backflow Device	3,214	$ 65.82	$ 211,545.48	$ 55.00	$ 176,770.00	$ 120.82	$ 388,315.48
Install New Curb Stop (up to 1")	1,478	$ 53.03	$ 78,378.34	$ 55.00	$ 81,290.00	$ 108.03	$ 159,668.34
Install New Gate Valve (up to 1")	0	$ -	$ -	$ 55.00	$ -	$ 55.00	$ -
Install New Dual Check Valve (up to 1")	0	$ -	$ -	$ 55.00	$ -	$ 55.00	$ -
Install Pipe Riser (up to 1")	3,326	$ 177.66	$ 590,897.16	$ 40.00	$ 133,040.00	$ 217.66	$ 723,937.16
Replace Existing Gate Valve (up to 1")	0	$ -	$ -	$ 55.00	$ -	$ 55.00	$ -
Replace Existing Direct Connect Meter (up to 1")	370	$ -	$ -	$ 55.00	$ 20,350.00	$ 55.00	$ 20,350.00
Sub Meter GPS	0	$ -	$ -	$ 7.95	$ -	$ 7.95	$ -
SUBTOTAL			$ 1,136,578.63		$ 640,858.00		$ 1,777,436.63

DESCRIPTION	QTY	EQUIPMENT PROVIDER		UMS SERVICES		COMBINED UNIT	TOTAL
		UNIT	EXTENDED	UNIT	EXTENDED		
HOURLY RATES							
Senior Principle	0	$ -	$ -	$ 260.00	$ -	$ 260.00	$ -
Consultant/Engineer	0	$ -	$ -	$ 260.00	$ -	$ 260.00	$ -
Business Analyst	0	$ -	$ -	$ 175.00	$ -	$ 175.00	$ -
Training Specialist	0	$ -	$ -	$ 160.00	$ -	$ 160.00	$ -
Information Technology Technician	0	$ -	$ -	$ 120.00	$ -	$ 120.00	$ -
Electrician	0	$ -	$ -	$ 117.00	$ -	$ 117.00	$ -
Field Installation/Technician	0	$ -	$ -	$ 96.00	$ -	$ 96.00	$ -
Survey Tecnician	0	$ -	$ -	$ 96.00	$ -	$ 96.00	$ -
Blended Daily Rate	0	$ -	$ -	$ 1,750.00	$ -	$ 1,750.00	$ -
SUBTOTAL			$ -		$ -		$ -

	END-TO-END AMI METER, INFRASTRUCTURE & SOFTWARE DEPLOYMENT						
		EQUIPMENT		SERVICES			
DESCRIPTION	QTY	UNIT	EXTENDED	UNIT	EXTENDED	COMBINED UNIT	TOTAL
END-TO-END PROGRAM ADMINISTRATION							
Project Management: Material Configuration, Inventory & Order Mgmt, AMI to MDM Mgmt, MDM to CIS Mgmt, Final Testing & Documentation	1	$ -	$ -	$ 86,880.00	$ 86,880.00	$ 86,880.00	$ 86,880.00
Public Outreach (Platnium): Custom Video, Social Media Campaign, Public Relations Toolbox	1	$ -	$ -	$ 49,575.00	$ 49,575.00	$ 49,575.00	$ 49,575.00
SUBTOTAL			$ -		$ 136,455.00		$ 136,455.00
END-TO-END PROGRAM ADMINISTRATION					$ 136,455.00		
METER & METER INSTALLATION SERVICES							
Project Initiation: Field mobilization, MMCO Setup and Configuration	1	$ -	$ -	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
5/8"x 3/4" Meter Exchange	7,142	$ 209.00	$ 1,492,678.00	$ 43.25	$ 308,891.50	$ 252.25	$ 1,801,569.50
1" Meter Exchange	248	$ 315.00	$ 78,120.00	$ 43.25	$ 10,726.00	$ 358.25	$ 88,846.00
1.5" Meter Exchange	0	$ -	$ -	$ 250.00	$ -	$ 250.00	$ -
2" Meter Exchange	329	$ 882.00	$ 290,178.00	$ 250.00	$ 82,250.00	$ 1,132.00	$ 372,428.00
3" Meter Exchange	0	$ 2,127.00	$ -	$ 550.00	$ -	$ 2,677.00	$ -
4" Meter Exchange	54	$ 2,585.00	$ 139,590.00	$ 750.00	$ 40,500.00	$ 3,335.00	$ 180,090.00
6" Meter Exchange	6	$ 4,800.00	$ 28,800.00	$ 1,100.00	$ 6,600.00	$ 5,900.00	$ 35,400.00
SUBTOTAL			$ 2,029,366.00		$ 456,467.50		$ 2,485,833.50
METER & METER INSTALLATION SERVICES					$ 2,485,833.50		
AMI ENDPOINTS, EQUIPMENT AND INSTALLATION SERVICES							
AMI Transmitter: Orion Cellular Endpoint with Twist Tight Connector	8,168	$ -	$ -	$ 3.25	$ 26,546.00	$ 3.25	$ 26,546.00
Retrofit : AMI Transmitter & Register	0	$ -	$ -	$ 26.50	$ -	$ 26.50	$ -
SUBTOTAL			$ -		$ 26,546.00		$ 26,546.00
AMI ENDPOINTS, EQUIPMENT AND INSTALLATION SERVICES					$ 26,546.00		
AMI SOFTWARE AND INTEGRATION SERVICES							
Onsite Training (Beacon)	1	$ 4,900.00	$ 4,900.00	$ -	$ -	$ 4,900.00	$ 4,900.00
Beacon Engagement Fee	1	$ 9,400.00	$ 9,400.00	$ -	$ -	$ 9,400.00	$ 9,400.00
CIS MMCO Interface Service Fee's	0	$ 2.50	$ -	$ -	$ -	$ 2.50	$ -
CIS AMI Interface Service Fee's (TBD Elizabeth City)	0	$ -	$ -	$ -	$ -	$ -	$ -
SUBTOTAL			$ 14,300.00		$ -		$ 14,300.00
AMI SOFTWARE AND INTEGRATION SERVICES					$ 14,300.00		
AMI YEARLY SERVICES FEE'S							
Cellular Yearly Service Fee	8,168	$ 0.81	$ 6,616.08	$ -	$ -	$ 0.81	$ 79,392.96
		$ -	$ -	$ -	$ -	$ -	$ -
SUBTOTAL			$ 6,616.08		$ -		$ 79,392.96
AMI YEARLY SERVICES FEE'S					$ 6,616.08		