

M E M O R A N D U M



CITY OF LEESBURG, FLORIDA Electric Department

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Date: November 28, 2011
To: Mr. Jay Evans, City Manager
From: Paul Kalv, Electric Director
Subject: **Recommendation to Authorize AMI and Related Technology Initiatives that are included in the proposed AMI and Related Technology Contract with General Electric Digital Energy**

Executive Summary

During the last four years, staff has worked diligently to develop and implement strategies focused on reducing the utility's largest single expense, the cost of Leesburg's FMPA wholesale power supply, and more specifically, the monthly Coincident Peak demand cost. In 2006, the "demand" cost was 33% of the total FMPA expense; in 2008 "demand" cost was 36% of the total FMPA expense; and for the immediate past fiscal year, "demand" cost was 54% of the total FMPA expense even though the demand reduction management strategies that Leesburg implemented during the period achieved a 4% reduction from what it would have been without demand management. Looking forward to FY 2013 this trend is expected to increase even further... making peak demand reduction strategies even more valuable going forward.

Staff recognized the need to take actions that were within the utility's control (Conservation Voltage Optimization) and the Commission supported staff's recommendation to install new equipment on existing city emergency generators to gain benefits from exercising those generators during hours that were potential "peak" hours each month. The Commission also supported an additional rate to encourage large commercial customers to similarly exercise their generators and Leesburg shared the savings with those customers. The cumulative savings from those strategies has now reached \$3,337,000 over the last 31 months.

On January 8, 2008 a 140 meter pilot Advanced Metering Infrastructure (AMI) project was constructed which has flawlessly delivered 15 minute meter readings since that date. During 2009, the Commission supported the development of an AMI Feasibility Study and Business Case that pointed to \$900,000 in annual operating savings for a full electric utility AMI deployment and \$1,400,000 in annual operating savings with the AMI deployment expanded to include the gas and water utilities.

Also in 2009, the Commission supported a \$19,479,625 comprehensive and aggressive application for a Department of Energy (DOE) Smart Grid Invest Grant (SGIG) that was one of 99 projects selected to receive 50% project funding. In 2010 the Commission also supported an application to the State of Florida for a \$1,240,000 EECBG application that was selected by the State for funding.

Leesburg has already submitted and received 50% reimbursement for the new equipment that enabled the emergency generator project, the rebuilt substation transformer for Airport Substation, and will reimburse 50% of the new substation transformer that the Commission supported during the last Commission meeting. To date, Leesburg has submitted SGIG costs in the amount of \$2,742,956 and has received reimbursement in the amount of \$1,371,478.

Staff is currently working to finalize the distribution equipment elements in the SGIG and will bring those last elements of the total Smart Grid project to you for consideration during late spring or early summer 2012.

Tonight I am pleased to discuss and request your favorable consideration for the most important component of the Smart Grid project which focuses on procurement and installation of Smart Meters and related IT elements that enable significant organizational benefits and fundamentally changes our relationship with our customers by informing them “continuously” of their energy usage, rewarding conservation and energy efficiency by offering alternative rate options that will enable cost savings for the utility and the customer.

Background

During the last four years, Electric Department staff has had the responsibility and honor to present a series of interrelated recommendations to the Leesburg City Commission, each designed to demonstrate the value of the proposed initiative and prove the ability of Electric Department staff to successfully implement the recommended strategy and deliver the desired benefits. Included in these recommendations were:

- On October 22, 2007 the Commission held a public hearing to consider adoption of new PURPA Standards 11 through 15 including Net Metering, Fuel Diversity, Fossil Fuel Generation Efficiency, Smart Metering, and Interconnection. While staff recommended the Commission not adopt any of the five standards in the form proposed by PURPA, staff did see value in the standards and initiated actions that would later lead to similar initiatives that better reflected the needs of Leesburg electric customers.
- On January 8, 2008 a 140 Smart Meter pilot was installed to prove that remote communicating meters with remote service switches in 20 meters would enable delivery of utility services and billing statements without truck rolls for service and meter reading. The pilot has been in continuous operation collecting meter readings every 15 minutes and billing readings without flaw since January 8, 2008. The pilot also identified the specific date and time of the malfunction of a customer’s strip heater that resulted in the wasted use of over \$700 worth of electric service over a two month period. With the prospect of future near real time usage monitoring that A/C system equipment malfunction could have been detected within a day of the malfunction.
- On July 14, 2008 the Commission authorized funding for the development of an AMI Feasibility Study and Business Case to evaluate the potential value of full deployment of Smart Meters for Electric, Gas, and Water utility meters. The study concluded that the potential was present for a reasonable cost/benefit with an annual operational savings of

\$900,000 for an electric only deployment and \$1,400,000 with the addition of smart gas and water utility meters.

- On March 5, 2009 the Commission approved the retrofit of existing emergency generators to enable distributed generation functionality as a strategy to reduce wholesale power supply costs
- On July 27, 2009 the Commission adopted Resolution 8496 authorizing the submission of a Grant Application to the Department of Energy (DOE) for the deployment of an integrated or cross-cutting Smart Grid Investment Grant (SGIG) for a total project cost of \$19,497,625 with 50% reimbursement by DOE. The Leesburg application was one of 100 projects funded from a pool of over 400 applications submitted... and the Leesburg project was selected by an independent reviewer as one of the fewer than 20 “best projects” of the 100 projects selected by DOE for a grant award.
- On May 10, 2010 the Commission approved the SGIG Agreement with DOE and on May 14, 2010 the SGIG Agreement was signed by DOE. The effective date of the agreement is May 14, 2010 with the project implementation period ending May 13, 2013 with continuing reporting requirements ending May 13, 2015.
- On May 26, 2009 the City Commission adopted a Net Metering Policy to integrate renewable energy resources into the Leesburg electric grid, quantify the energy generated by the renewable resources as well as quantify the disposition of that energy as used by the customer or exported to the grid.
- On November 9, 2009 the Commission adopted a Load Reduction Credit Rider to enable sharing of wholesale power supply cost savings with large commercial/industrial customers that are able to curtail load during hours that are potential coincident peak hours each month.
- On February 12, 2010, staff submitted an Energy Efficiency and Conservation Block Grant (EECBG) application to the Florida Energy and Climate Commission in the amount of \$1,240,000.00. Leesburg’s application was one of 167 applications submitted and was ranked 7th of 37 applications favorably considered for funding. Leesburg’s application was unique in that it was the only application focused on reducing the need for less efficient peaking generation and the only application focused on providing utility consumers with the technology to enable demand reduction.
- On June 8, 2010 the Commission approved the EECBG Grant Agreement with the state of Florida.
- November 14, 2011 the Commission approved a revision to the EECBG Scope of Work deleting deployment of Home Area Network (HAN) technologies to procurement and installation of Smart Meters. The EECBG project cost is \$4,218,167 with a City cost share of \$2,978,167 and a grant award of \$1,240,000. Leesburg’s cost share is also part of the

SGIG and is eligible for 50% reimbursement by DOE. The project EECBG implementation period ends April 30, 2012.

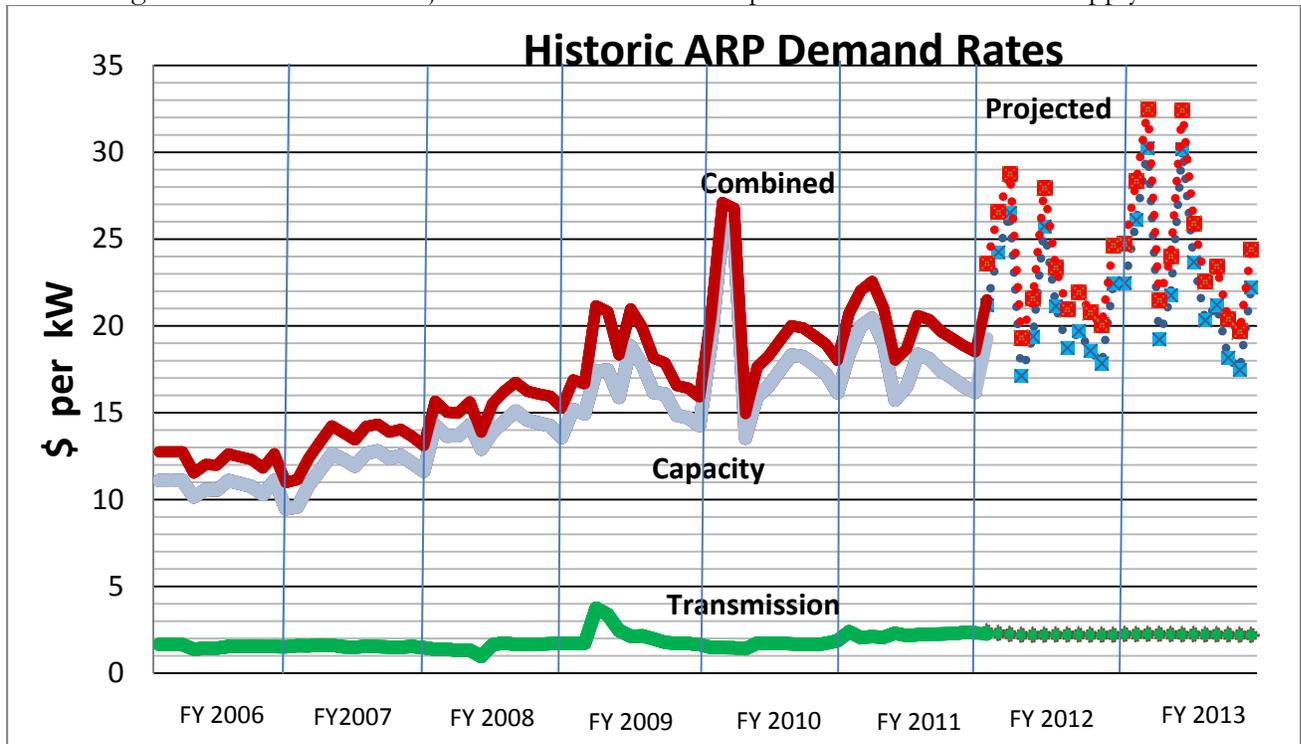
In the July 14, 2008 Agenda Memo recommending approval of funds for the development of an AMI Business Case, staff wrote:

“Consideration for the deployment of an advanced metering infrastructure (AMI) is arguably the third most important decision in the history of the utility, preceded only by formation of the utility itself and the decision to join with other Florida municipal utilities in the formation of the Florida Municipal Power Agency (FMPA.)

“..... staff believes Leesburg needs to partner with our electric customers by providing options to mitigate the higher cost of electricity. These options can be provided through time-based rates and load control technologies to encourage and enable shifts in power usage from higher cost to lower cost hours. Customers must be informed and empowered to make their electric purchasing decisions with full knowledge of the costs and alternatives that meet their needs.”

The FMPA peak demand rate situation described in 2008 has in fact become worse than envisioned and the imperative to engage customers in the effort to reduce wholesale power supply cost has become even more compelling. The rate for the demand component of the wholesale power supply is projected to increase dramatically in FY 2013 as shown in Figure 1.

Figure 1. Historic and Projected Demand Rate Component of FMPA Power Supply



We have talked about the FMPA All Requirements Project (ARP) rate structure which allocates all capacity costs to the ARP utilities, but the “concept” may be more easily understood looking at a gasoline analogy.

All kilo-Watt hours are not created equal

Off-Peak Price Energy Rate \approx \$0.05 per kWh	On-Peak Price Energy and Demand Rate \approx \$20.05 per kWh	Difference (400x higher)
Gasoline Rate \approx \$3.50 per gal	Gasoline with “Demand” \approx \$1,403.50 per gal	(400x higher)

It is easy to see the significant benefit from shifting power usage to off-peak hours.

Electric department staff has demonstrated significant competency in the development of multiple cost effective strategic initiatives to mitigate a portion of wholesale power supply cost increases; and have developed the required employee skill sets and partnered with the appropriate leading industry vendors to deliver the desired benefits.

Since the introduction of Demand Response strategies to reduce Leesburg’s high Peak Demand power costs since 2009, including Conservation Voltage Optimization, exercising Leesburg’s emergency generators and partnering with the Leesburg Regional Medical Center, Leesburg has reduced wholesale power supply costs by \$3,337,000. Leesburg’s opportunity to reduce peak demand costs, while acting on our own initiative and in partnership with the limited customers with whom we may partner in the future, ultimately has limited potential.

While staff will continue to reach out to additional large commercial customers, the most viable and mutually beneficial strategy to deploy going forward is to offer a partnership with all Leesburg electric customers. Our plan is to offer alternative rate plans and demand reduction incentives that will provide options for consideration by educated and informed customers and reward the resulting energy efficiency and conservation with a share the benefits that result.

This approach is not unique to Leesburg. FP&L and Progress Energy have invested heavily during the last 20 years in Demand Response rebates and alternative rate structures and they will place even greater emphasis in additional partnering with their customers going forward.

We also must reach out and partner with our customers that are willing and able to consider a rate plan that fits their lifestyle and shifts electric usage to off-peak hours in return for a reduced power bill is clearly a win-win strategy that will ultimately lead to lower costs for all. The fact is that most everyone understands on-peak and off-peak phone rate plans, so why not offer those same options with their electric service that is now enabled to support alternative rates..

A large measure of “thanks” and credit goes out to the many functional units throughout the City that have invested considerable time and talent to moving the proposed project forward to this point, most notably, Executive, Purchasing, Information Technology, Finance, Customer Service, Gas, and Environmental Services personnel that have participated in a comprehensive and coordinated evaluation of four short listed AMI vendor proposals representing well known subcontractors with significant expertise and experience. After months of review, discussion, and a scripted on-site demonstration and evaluation, the Evaluation Team was able to rank the four short

listed proposals. Many more months were then spent defining the specific Scope of Work with the lead vendor including informational meetings with specific subcontractors for each technology element to ensure that each technology element focused on meeting Leesburg’s specific needs and the vendor was capable of delivering the desired benefits.

During the last three months, significant focus has been placed on mitigating the risks associated with the interrelated components of the Information Technology portion of the project and the project cash flow element of the Business Case.

Staff is now satisfied that a fair and equitable contract and cost structure, that will meet electric customers’ current and future needs, has been developed and will provide the desired benefits to customers, the utility, and will advance the level of knowledge and understanding of this new Smart Grid initiative that will also meet the needs of DOE.

Elements of the AMI Project

The major components of the AMI project presented for your consideration tonight and are included in the Contract presented for your consideration include the following:

- Electric Meters recording readings every 15 minutes to enable alternative rate plans, equipped with power quality monitoring, two-way communicating functionality, and service switches in residential class meters
- A Communications System of radio Relays and Access Points deployed in a mesh network to deliver meter data to the utility for use for billing, outage notification, and system efficiency optimization capability
- Hosted IT hardware and software solutions to manage meter data, an Enterprise Service Bus to enable the linking of all IT applications including Leesburg’s Customer Information System, Billing system, Geographic Information System, future Outage Management System, and others; a Demand Response Management System, Customer Web Portal for delivering customer information and education; and Pre-pay billing system.
- Business Process Change Management to assist City staff develop business processes to more fully take advantage of the benefits of the new technologies.
- Project Management assistance to benefit from “lessons learned,” coordinate vendor interrelationships, manage project risks.

Financing Considerations for the AMI Project

TABLE 1 – AMI Project Investments

Major Component	Investment \$(000)
Project Management	1,681
Meters	4,592
Communication System	646
Software Systems	5,456
Business and Operational Improvements	1,423
Home Area Network	1,240
TOTAL	15,038

TABLE 2 – AMI Project Summary

Major Component	Investment \$(000)
Project Costs	15,038
SGIG Reimbursement	(7,519)
EECBG (State Grant)	(1,240)
Debt Finance	6,279

Customer Survey Findings – Benefits

Results from recent surveys of consumers with smart meters show that consumers have significant interest for many of the benefits that smart meters can provide, including saving money and helping the environment. About half of smart meter consumers find the potential to save money with time-of-use pricing plans very or extremely valuable, for example. Consumers even seem to find compelling the claim that smart meters could increase their privacy by eliminating the need for meter readers to come to their property: some 43 percent find that very or extremely valuable.

Smart Meter Benefits of Interest to Consumers With Smart Meters	
Benefit	% Vary or Extremely Valuable
My electric bills will be actual, not estimates	64%
Reduce my electricity usage, benefiting the environment	57%
Save money with a new pricing plan by shift usage to off-peak hours	51%
Save money by using info on energy consumption to adjust my usage throughout the month	46%
Increases my privacy: no one has to come to read meter anymore	43%
New valuable services: smart thermostats, intelligent lighting, home automation controlled by my home computer	42%
Manage my household finances better, always knowing what I've spent so far on electricity	41%

Question: Utilities say smart meters bring a variety of benefits to consumers. How valuable would you consider each of the following potential benefits of having a smart meter installed in your home? (Please select one for each.) Responses very valuable + Extremely valuable shown.

Source: Green Research/e-Rewards Consumer Survey (8/10), n=1007 (US only)

Customer Survey Findings – Concerns

There is no question that significant changes in technology will bring a degree of pushback caused primarily by fear or concern for the unknown. In today's environment this social phenomenon is fueled by the rapid spread of shared concerns using the platform of social media and YouTube. Every utility that has expressed interest in smart meters or announced deployments has received certified letters from concerned customers that they do not grant permission for the utility to change their existing meter to a smart meter. Leesburg has received fewer than 10 such letters.

Consumer Smart Meter Concerns			
Benefit	Some Concern	Very Concerned	Extremely Concerned
May lead to higher electric bills	23%	16%	22%
May lead to the elimination of jobs for some utility workers	28%	14%	13%
May not measure my electricity usage accurately	21%	14%	18%
May reduce my privacy	17%	6%	8%
May pose health risks	11%	4%	4%

Question: Which, if any, of the following concerns about the installation of a smart meter in your home do you have? (Please select one for each.) 1=not concerned at all; 5 = extremely concerned

Source: Green Research/e-Rewards Consumer Survey (8/10), n=1007 (US only)

Additional survey findings provide insight

Broadly speaking, the concerns consumers have about smart meter technology fall into two classes: (1) financial and economic; and (2) health, safety and privacy. More consumers tend to be concerned about the financial and economic implications of smart meters than about health and privacy, though the latter concerns tend to get considerably more media coverage.

The research suggests that providing consumers with clear information about the smart grid and smart meters can be effective in addressing their concerns. For example, simply knowing that electric bills did not rise at most homes where smart meters were installed would address the concerns of over half of those who are concerned that their bill might go up. According to the same survey, eighty percent of smart meter consumers saw no increase in their electric bill after their smart meter was installed. Other concerns consumer have about smart meters and the smart grid can similarly be addressed with clear messaging.

Jobs - About a quarter of smart meter consumers are very or extremely concerned that smart meters could lead to job cuts for utility workers. Eight-four percent of these consumers said a utility's promise of job retraining for laid-off workers would address this concern.

Privacy - Fourteen percent of smart meter consumers are very or extremely concerned about privacy; another 17 percent are moderately concerned. Of this group, 71 percent say that regulations making it illegal for the utility to share information about their electric usage without their permission would effectively address the concern. Clear disclosure from the utility of the privacy measures we are taking and pledges not to share consumer information without permission were found to be effective with 45 percent of the concerned group.

Communications Plan - Themes

To fulfill the potential of the smart grid, utilities need to engage consumers, educating them about its purpose, explaining how it works, equipping them with tools that enable them to make smart choices about their energy consumption. Utilities need to engage consumers as partners in the smart grid. Engagement starts with information.

During the last two years staff has made presentations to homeowner groups, civic organizations and church groups and in every group with whom I have spoken there were certainly questions that

were raised, but the general reaction was that people want the opportunity to be in more control of their utility budget and be offered opportunities to save money. When asked about a willingness to consider Time-of-Use rates, every hand was raised; when asked about willingness to consider reducing air conditioning operation from 3:00pm to 5:00pm on the hottest summer afternoons, every hand was raised; and when asked about a willingness to consider reducing heating operation from 7:00am to 9:00am on the coldest morning, only half the hands went up.

The current “flat rate” offers no surgical opportunity to save and fails to reflect the fact there are a few potential high cost periods during the month with the rest on the month’s power supply cost significantly less.

Staff is preparing messages to convey the range of options that are planned to be offered and the benefits that will be available in the form of themes initially focusing on:

- Increasing utility efficiency
- The potential to save money
- Knowing exactly how much and when power was used during the month
- Empowerment through better information about energy use
- The option to take service under a Pay-as-you-go plan that provides the flexibility to make payments on the customer’s schedule, not the utility’s schedule.
- Improved service reliability

In addition to communicating the benefits, we will provide information focusing on consumer concerns including:

- The accuracy and reliability of the meters
- Optional rate plans that more closely fit individual life styles will be available to consider
- Explaining how smart meters work and how customer information is protected
- Provide references to scientific studies on the safety of the smart grid technologies to be deployed

Media to be used to present these messages will include:

- Bill stuffers
- City Smart Grid web site
- Lakefront TV
- Press releases
- E-mail
- Community group meetings
- Letters
- Other opportunities as presented

Thank you. I will be glad to respond to your questions, thoughts and suggestions.