Naperville Smart Grid Initiative

Question/Response Inventory

Last updated March 25, 2013

The following is a running list of questions submitted to the City about the Naperville Smart Grid Initiative. We have compiled these questions and responses in one document in order to make them available to all customers. We encourage Naperville utility customers to review the questions and responses below before submitting their questions to see if they have already been addressed. This document will be updated periodically as new questions are submitted and answered.

Questions by Topic

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General Naperville Smart Grid Initiative (NSGI) Questions

1. What is the NSGI?

The Naperville Smart Grid Initiative (NSGI) will prepare Naperville for an increased demand on the city's electrical grid and the future of energy conservation. This an investment in Naperville's city-owned utility that will modernize the electric grid using current technology to give residential and business utility customers more choices about how they use electricity and more control over what they pay for it. It will also provide increased reliability, reduced operating costs, improved efficiency and reduced waste.

The NSGI is a three-year project that will consist of three distinct phases. Customers can expect the following:

Phase I: Installation of more than 57,000 digital smart meters in every home and business in Naperville, along with the automation and upgrade of the utility's electric grid backbone. *(Estimated Timeframe: 2012)*

Phase II: Introduction of an ePortal website that empowers customers to access and review secure, detailed data on their energy use at their convenience.
(Estimated Timeframe: Late Spring or Early Summer of 2013)

Phase III: Voluntary new rates, billing options and other optional energy and money-saving programs will become available for utility customers to utilize if they choose.
(Estimated Timeframe: Second Half of 2013)

2. What's in it for me as a resident of Naperville?

There are many benefits in store for customers who get their electricity from the city's electric utility. The municipal utility was purchased for $16,000 by the city in 1890 and is now valued at $356 million and is one of Naperville's largest assets.

Customer benefits include:

More Tools, Choices and Control for Customers - Customers are empowered to securely track their energy use online and choose from new, optional electricity rates and programs to meet their needs and best fit their lifestyles.

Increased Reliability and Efficiency - An automated grid can self-heal – it will detect issues and outages immediately. This will allow for remote restoration and repairs, resulting in reduced outage time, decreased energy waste and greater cost-savings passed along to customers.

Cost Savings for the City and its Residents - The NSGI will mitigate the rising costs of energy and give customers new tools, options and choices to help them save electricity and money.

Creating a More Efficient, Sustainable Community & Reducing Carbon Emissions - The NSGI will reduce carbon emissions and pave the way for adoption of more sustainable energy sources like solar and wind, as well as electric cars and charging support.

Job Creation in Emerging Industries - The NSGI supports job creation in important industries like clean energy and technology.

The NSGI is Yet Another Example of Naperville's Leadership - Naperville was the only Illinois municipality to receive federal matching funds for a smart grid investment grant.

3. What's in it for the businesses in Naperville?

There are many benefits in store for businesses that get their electricity from the city's electric utility. The municipal utility was purchased for $16,000 by the city in 1890 and is now valued at $356 million and is one of Naperville's largest assets.

Business benefits include:

More Information and Tools to Control Energy Expenses – Monitoring energy use and making small changes could translate to greater profit.

More Energy Choices Mean Greater Flexibility – Businesses can tailor their electric service by utilizing optional rates and time and money-saving programs if they choose.

A Competitive Edge for Small Businesses – Small businesses can choose to implement energy efficiency programs similar to those used by larger companies.

Increased Reliability and Efficiency – Fewer and shorter power outages mean higher productivity and less wasted time.

4. When is this being rolled out?

As of August 2011, mass meter installation is scheduled to begin in Q1 2012 pending Pilot 2 testing results. The city has selected NSGI vendors, and they are in the process of designing and developing their solutions (e.g. advanced metering infrastructure, communications, software systems, etc.). The city is also planning customer communication and education programs, as well as expanded customer service efforts to facilitate a smooth transition for our customers. As we are approaching mass meter deployment in November, the city has been working on a segmented roll out schedule that will be publicly available once Pilot 2 is complete.

5. How does this benefit the utility?

The benefits associated with the NSGI will come in the form of lower operating costs at the utility (operational benefits), lower network losses (saving wasted energy), and lower customer energy consumption and demand. The key benefits for utility operations are:

- Lower meter reading expenses
- Higher system reliability, which means fewer unplanned outages
- Lower energy losses on the distribution system
- More system monitoring points on the network, which leads to improved power quality. This can be very important for the city's commercial customers.
- Increased system feedback, which will improve the city's equipment maintenance plans and therefore improve operational efficiency.

6. Where are the papers you submitted to the DOE?

A redacted version of the initial U.S. Department of Energy (DOE) application is available on the NSGI website at www.naperville.il.us/smartgrid.aspx.

7. Is there a phone number for people who want to get more detailed information relating to the Naperville Smart Grid Initiative?

For any additional questions relating to the NSGI, call the Department of Public Utilities – Electric at (630) 420-6131.

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Customer Programs Questions

1. Is Smart Grid technology available for businesses?
Yes, smart grid technology will be available to both residential and commercial customers.

2. Can I start using solar now?
Yes, in accordance with City of Naperville ordinances.

3. What do you expect me to do? How do I act on this information?
Customers should stay informed and act upon information supplied by the City of Naperville in a manner that best suits their lifestyle. Customers can easily stay informed by reviewing the latest information on our website at http://www.naperville.il.us/smartgrid.aspx. The city is committed to open and transparent communication through various channels to keep customers informed about the NSGI.

4. Do we have to opt into a demand-side program?
Yes, any demand-side management (aka "Demand Response – DR") program is completely voluntary and will require the customer to enroll in the program.

5. Will our electric rates stay the same?
As of March 2011, a study is underway to determine a new rate structure. DPU-E performs such rate studies every three to five years to determine the appropriate electricity rates. Previous rate studies were performed in 2006 and 2003. Proposed new rates will be ultimately approved by the City Council in 2011. The Naperville Smart Grid Initiative and new electricity rates are completely independent of one another.

6. Will this use wind power?
Starting in June 2011, the city will purchase renewable energy as part of the total energy portfolio procured through its involvement in the Illinois Municipal Electric Agency (IMEA).

7. Can a homeowner opt out?
All customers will receive a new smart meter that will wirelessly communicate with the Department of Public Utilities-Electric. The customer has the option to do nothing other than pay their electric utility bill. There is no cost to a customer who receives a standard wireless smart meter, either for the device or the installation process.

Alternatively, all Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for

the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes. For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75 (in order to read the non-wireless smart meters manually, new equipment and specialized training is required. Therefore, there is an incremental cost for this service. Again, no customers will be keeping their existing analog meter).

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The only change from the utility's current practices is the frequency of meter readings, whereby the smart meters record four different electrical values in 15 minute intervals (instead of once a month). These meter readings will allow the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

8. What if I want real-time usage data?

Real-time electricity usage data will be made available to the customer through an optional Home Energy Device (HED). Customers will also be able to see their historical energy usage through a secure ePortal website. The purchase of an HED device will be 100% optional and Schneider Electric, the city's HED vendor, will offer these devices. Although the price is not confirmed, anticipated cost is $100 plus tax.

9. How does this affect me at home?

All customers will get a new smart meter that will wirelessly communicate with the Department of Public Utilities-Electric. Customers have the option to do nothing other than pay their electric utility bills. The customer also has the voluntary option to enroll in any future rate or usage structure that meets their lifestyle needs. The city understands that a large customer awareness program is needed to educate customers on the benefits of the smart meters and smart grid. These programs are currently being designed and will soon be implemented.

10. What's going to be the difference in normal rates vs. Time of Use (TOU) rates?

"Normal" rates are what the city terms as "flat rates." These rates do not vary based on different periods of time. Electricity costs more during peak time and less during off peak time. Flat rates do not provide the flexibility to take advantage of the difference in power costs. Time of Use (TOU) rates allow customers to take advantage of the lower power cost during off peak hours and control power usage during peak hours. Because the rates have not been established, as of early August 2011, the city does not know what the rate differential will be between normal (flat) rates and TOU rates. A rate study is underway and new rates will be recommended and ultimately

approved by the City Council in late summer or early fall 2011. Optional time of use rates will be included in the rate structure.

11. There's not a lot you can shift to off-peak hours.

Each customer (residential and business) has an individual lifestyle and electrical power consumption pattern. It may be more advantageous for some customers to take advantage of load shifting while others may not benefit. Load is utility terminology for any electrical device that is connected to the electric distribution system and is drawing power from the utility. Because of this load shifting, the city is allowing each customer to choose their own rate program: a flat rate or Time of Use (TOU) rate.

12. How are pricing rates changing and how are you communicating this to customers? Why does there seem to be confusion?

Setting a rate structure is always a difficult issue. In this instance, it is made more difficult with the city beginning to purchase power from the Illinois Municipal Electric Agency (IMEA) in June 2011 and the concurrent implementation of the NSGI, which are independent projects. The IMEA is a 33 member generation and transmission organization providing power supply for 32 municipals and 1 cooperative in Illinois The current rate structure originated in January 2007 and expired in June 2011. A new schedule of rates, due to the city's energy supplier changing, was always scheduled to be implemented in June 2011. The Naperville Smart Grid Initiative was approved in 2010 and is scheduled to be completed in 2013. A rate study is nearing completion to determine the new rate structure. DPU-E performs such rate studies every three to five years to determine the appropriate electricity rates. Previous rate studies were performed in 2006 and 2003. Proposed new rates will ultimately be approved by the City Council in 2011. Public comments on any new rate structure will be taken prior to City Council approval.

13. How many tiers of electric rates will there be?

At this point, the details of a tiered rate structure are still being discussed and finalized.

14. What's no longer voluntary?

As currently planned, all customers will get a new smart meter that communicates wirelessly with the city's Department of Public Utilities-Electric. Customers have the option to do nothing other than pay their electric utility bills.

All Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed

and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75.

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

15. It appears if I cannot shift the demand component of the usage in my home, my power bills will be going up?

It would be premature, at this point, to predict the effect of new rates. As of July 2011, the rate study is nearing completion to determine a new rate structure. DPU-E performs such rate studies every three to five years to determine the appropriate electricity rates. Previous rate studies were performed in 2006 and 2003. The new rates will be approved by the City Council in the late summer/early fall of 2011. The Naperville Smart Grid Initiative and new electricity rates are completely independent of one another.

16. My understanding is that rates are going up. Why? Is it due to the investment in the Prairie State Coal fired plant which was fraught with cost over-runs? If so, why are the taxpayers of Naperville responsible for the city's bad investments?

As an entirely independent project from NSGI, Naperville is currently evaluating its electric rates this year. Rates are based on the lowest reasonable cost to purchase power and provide safe and reliable electric service. This information will be finalized within the next few months.

The global cost of energy has many factors (cost of mining and/or managing energy sources, cost to transmit/distribute, environmental regulations, etc.) In fact, there was a very compelling article in the Chicago Tribune recently that outlines the challenges the older coal plants in Illinois and Indiana have faced adhering to new EPA laws: http://www.chicagotribune.com/business/feed/ct-biz-0617-bf-replacing-coal-20110617,0,6897319.story.

It is worth noting that the Prairie State Coal fired plant meets the latest EPA emission standards and does not need the expensive upgrades that many of the older coal plants require. One of the key reasons that Naperville signed a long term agreement with IMEA for energy was access to

reliable and low cost energy. Naperville fully expects that it will realize this goal through the IMEA and the Prairie State generation facility.

17. What options do residents in townhomes, condos, and apartment buildings have?

The landlord or property owner of a building, not the tenant, has the legal authority to select the non-wireless meter alternative. If a building's tenant wishes to obtain the non-wireless meter alternative, he or she must enter into a discussion with the landlord or property owner on that subject.

18. What percent of people currently run these appliances in non-peak time?

This is a metric we do not have the means to track nor do we really want to. We are not concerned about actual appliances people use or when they use them. We want to track how much aggregate energy is being used at those times.

19. Since fire-code and instructions recommend using appliances when someone is home and awake to reduce the risk of fire death/injury, what percent of households will actually shift their usage with the deployment of smart meters?

Leveraging TOU rates and HAN devices, like programmable thermostats that can be programmed over the internet or a smart phone, are optional components for consumers and business customers to choose to participate in. The business case assumes a slow growth of Smart Grid capable Programmable Thermostats to reach 13% by the end of 15 years**.**

20. What percent of those who shift their demand to non-peak hours will have fires that could have been prevented if the appliance was run during the normal day?

We do not see the correlation between the time that the appliance is run and safety, so we cannot answer this question. Direct Load control of devices by utilities has been around for over 20 years and we do not anticipate any safety issues.

21. What will the new Time of Use rates be (what is the differential and exact hours), and when will the Time of Use rates be available for customers to sign up for that option?

At this point, the details of the time of use rates and structure are still being discussed and finalized. We estimate more details will be available in summer 2012.

22. What are implications of being on an 'hourly' rate if at certain times you exceed? Is peak higher than the flat rate? How often can you change between rate structures?

Regarding the Time-of-Use/Critical Peak Pricing program, the price for energy consumption varies based on the time of the day. Certain hours of the day align with higher energy demand, and as a result, these peak periods cost more than off-peak periods. Customers that shift consumption to the off-peak periods may realize savings on their energy bill by using energy when rates are lower in the day.

These programs are not designed with any "thresholds" that customers can "exceed." Rather, they were designed so that customers could exercise choice about when they consume energy and save money through this flexibility. Rates are still being determined and are subject to approval by the City Council later this year.

Different rate structures are dependent upon the future programs that will be available (if customers choose to enroll). The choice of enrolling in any given program is based on the personal preferences; however, to truly realize the benefits, we recommend that customers fully engage in the program that best fits their lifestyle preferences rather than continually changing programs and associated rates. It is important to note that customers will have a limitation of how often they can change plans, but this has not yet been determined by the utility. We understand that this will certainly be a determining factor of whether or not a customer chooses to participate.

ePortal and Customer Tools Questions

1. **Will customers have the ability to export data from the Smart Meter ePortal to Excel, text?**
   Customers will have the ability to create reports on their usage from the customer ePortal but whether or not this can be downloaded to an Excel file is still being determined.

2. **System peak vs. customer peak being generally available: am I contributing to taking down the overall peak?**
   Since energy is more expensive at peak periods, customers who voluntarily reduce their electricity consumption during these times help conserve energy and reduce the overall peak.

3. **Will the ePortal normalize temperature over time (historically) to get "real consumption."?**
   The ePortal will provide data and graphs showing historical electric consumption with daily temperatures to understand the impacts of temperature changes and energy conservation efforts individually.

4. **Is (ePortal demo) the user interface?**
   The exact design of the customer/user interface for the ePortal is in the process of being determined.

5. **Will the ePortal show individual appliances? Will I be able to shut them off using the ePortal?**
   As of March 2011, the appliance industry is working toward a common communication interface for data transmission. These types of user (customer) applications may be available in the future with the understanding that third party applications will not be supported by the city. The city will only support thermostats and load control relays. This functionality may be available on "higher-end" Home Energy Displays (HED) which the customer elects to purchase as an option. This is a 100 percent voluntary program. Manufacturers have reached out to the city to be a voluntary testing location and Naperville staff is working through the details.

6. **When is the ePortal available?**
   The final version of the ePortal is projected to be available for use in mid 2013.

7. **What type of data will be available on the ePortal?**
   The ePortal is expected to display a home or business's historical consumption, monthly consumption, monthly cost, recent consumption, expected monthly consumption and expected monthly costs based on expected monthly consumption.

8. How will customers see their data?

Customers will receive summary information in a format similar to the city's current utility bill. Additionally, a secure, customer ePortal website that will provide detailed usage information is currently being developed. As of August 2011, the design of the customer/user interface has been established and will be released to the public soon.

9. Can we view our usage data on a laptop?

Yes. It is planned that, in general, a functioning computer with an internet connection and a newer web browser will be able to securely view and make adjustments to the customer ePortal website. It is also planned that smart mobile devices will have the ability to connect to the ePortal site.

10. Will we have real-time access to the meter?

A Home Energy Device (HED) may be purchased to provide near real-time energy consumption information from the utility meter. The purchase and use of a HED will be 100 percent voluntary. The purchase and use of an HED will be 100 percent voluntary. Schneider Electric, the city's HED vendor, will be providing these devices. The cost of an HED, although it cannot be confirmed, is projected to be $100 plus tax.

11. Are you partnering with someone to provide the monitoring tool?

Yes, Calico Energy has been selected as the vendor to develop the ePortal. This system is still in the process of being designed.

12. Could I check online if I was on vacation?

Yes, it is planned that a functioning computer with an internet connection and a newer web browser will be able to securely view and make adjustments to the customer ePortal website. Smart mobile devices are planned to connect to the ePortal as well.

13. What types of modems can I use?

Access to your internet provider will not change because of the NSGI. Access to the customer ePortal website should work with your current modem/router/gateway with no setting changes required. An optional Home Energy Device (HED) with internet capability will require some network and security setup by the customer in order to function properly.

14. When are Programmable Thermostats coming?

The Programmable Control Thermostats (PCT) are expected to be available in early 2012.

15. Is this standard software?

The software used in the deployment of smart grid technology is not available in the retail market, but all of it is used in other utilities across the United States. Customer access to the customer secure ePortal website will use standard operating systems and browsers.

16. What percent of Naperville's 57,000 homes have programmable thermostats?

This is not a metric the City has the means to track at this time.

17. Of the homes with programmable thermostats, how many are actually used to reduce electric consumption when they are not at home?

Again we do not track this metric. The savings in the business case are based upon results in trials/deployments in other utilities. These are considered conservative numbers in the industry.

18. What percent of Naperville's 57,000 homes use either a timer or photo-eye to control their interior or exterior lighting?

This is not a metric the City has the means to track at this time.

19. What will be the cost for each residence to rewire their home circuits and buy necessary equipment to interface with the smart meter to control their appliances, lighting, air conditioning, electric car charging, etc.?

This depends on the home and the choices homeowners make on their level of participation. This is optional and customers do not have to use smart grid to save electricity.

20. Will a sample version of the ePortal be available for presentation purposes?

A sample of the ePortal should be available for presentation in late spring/early summer 2013. There will be a separate open house dedicated to ePortal training that will be held at the Municipal Center.

21. Will I be able to access the ePortal on my Apple Computer?

The ePortal in Naperville is being designed to support multiple web browsers. If you are having issues using the ePortal with the Mac standard Safari web browser we would suggest downloading Mozilla Firefox or Google Chrome which are both free to download. We do not however anticipate any issues accessing the ePortal via Safari web browser.

22. Why is it taking so long to get the ePortal ready and why isn't there a demo available?

The City continues to closely monitor progress by Calico, the vendor creating the ePortal. The vendor is continuing to refine the software at this time. A sample of the ePortal should be

available for presentation in late spring/early summer 2013. There will be a separate open house dedicated to ePortal training that will be held at the Municipal Center.

23. When will the Home Energy Devices (HED) be available and what exactly will their prices be?

At this point, the details of the HEDs and pricing structure are still being discussed and finalized. We estimate more details will be available in late spring/early summer 2012.

24. How will the ePortal, etc. work with the non-wireless meter?

The City is currently examining whether NWMA customers will be able to take advantage of the ePortal, perhaps through the availability of monthly consumption data as opposed to daily consumption data that will be communicated through a wireless standard smart meter.

NWMA customers will be able to take advantage of time-of-use rates, if they choose, that will be rolled out later in 2013. Time-of-use pricing means customers are charged different rates for electricity used at peak and off-peak times, allowing customers who have flexibility in when they use power to save money if they select this option. Different plans will accommodate the lifestyles and preferences of different users. Participation in optional programs and time-of-use pricing is strictly voluntary. Customers will be able to choose the rate program that best meets their lifestyle and needs.

Please note NWMA customers will not be able to participate in demand response programs, which are optional programs that allow customers and the utility to automatically reduce electricity consumption when overall demand for energy is high. For example, customers who opt-in can allow the utility to control their thermostat (adjust 2-5 degrees) for short periods of time (15-20 minutes per hour) to reduce air conditioning load or have select appliances (such as hot tubs or pool pumps) automatically cycled off during periods of high-energy demand and usage (like hot summer afternoons). Energy prices are at their highest when demand is highest. Customers can choose to participate in optional programs to reduce the amount of electricity used and positively impact their electricity bills. NWMA customers are ineligible for these programs as they require a wireless standard smart meter for participation.

25. If opting into a demand response program, who pays for the HED and/or other control devices (smart plugs)? Does that include install/set-up/programming for above devices? Are you suggesting that residents will have to pay for the control equipment (HED, smart plugs, etc.) to give-up some personal control/comfort and save Naperville money? Those that do not opt-in, but want the HED - must buy it? As a separate, up-front payment, or incrementally through utility bill?

The City is currently working on determining the details for the Home Energy Device, Home Area Network (HAN), installation, training, etc. The hope is to have a plan for this completed around the end of April or beginning of May.

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Billing Questions

1. When will customers receive their new utility billing statements?

Customers can expect to see the new version of their utility billing statement in spring 2012.

2. What will the new billing rates look like?

All customers will be billed at a normal or flat rate, unless the customer chooses to be billed through other rate structures that are still being determined. A rate study is being finalized and new rates will be recommended and discussed with the City Council during a workshop in 2012 and ultimately approved by the City Council in a regular City Council meeting.

The "normal" rates are what the City terms as "**flat rates**." These rates do not vary based on different periods of time. Flat rates do not provide the flexibility to take advantage of the difference in power costs. **Time-of- use (TOU)** rates allow customers to take advantage of the lower power cost during off-peak hours and control power usage during peak hours, if they choose.

There will be **no increase to electric rates** until early 2013. Rates will then increase by 2% for each of three years following that. These rate increases are **not** related to NSGI implementation but rather are related to power supply costs.

3. Can a customer be charged for over usage?

In terms of overusage, the City's electric utility will never charge a customer for more than they consume. Budget billing is available and might assist with this issue.

4. If nothing changes anything at my home (i.e. continue using the same appliances at the same times of day), how will my electric bill change under the new billing scheme? In other words, if I take a representative day in my house and compare the electric bill as it currently is calculated to one computed under the new scheme with smart meters, what will the difference be?

Customer billing under the newly deployed smart meters will not have any effect on the amount of your bill if you choose to continue with the existing flat rate. Furthermore, as part of the Smart Grid Bill of Rights, customers will always have the option of staying with these flat rates. Electricity rates are re-evaluated on a regular basis and must be approved by City Council. The next review is due to occur late summer/fall.

That being said, if customers do decide to take advantage of future programs that have a different billing/rate structure (e.g. such as Time-of-Use rates), this could have an impact on customer savings. Under Time-of-Use rates, the price for energy consumption varies based on the time of the day; certain hours of the day align with higher energy demand, and as a result, these peak periods cost more than off-peak periods. Customers that shift consumption to the off-peak periods may realize savings on their energy bill by using energy when rates are lower in the day. Time-of-Use rates will be adopted by the Council after the late summer/fall review of electricity rates, so it's too soon to provide customers with any specifics of what they might save.

5. Are there any additional surcharges associated with the flat rates? All things being equal (until a new supply contract is negotiated between Naperville Electric and its suppliers), is it correct to assume that my electric bill will be the same as it currently is if I choose to go with the flat rate?

There will be no additional surcharges associated with the flat rate after installation of the smart meters. Residential customers will continue to have a customer charge (currently $11.10/mo.) and an energy charge (currently $.0868/kWh). The flat rates will be the same as they currently are until April 30, 2013. The City of Naperville currently buys all of its power from the Illinois Municipal Electric Agency (IMEA), and it is anticipated that a 2% increase in rates will be necessary on May 1, 2013. Power supply costs will be reviewed in early 2013 to ensure the appropriate increase for May 1, 2013 is 2%.

6. Are there any sample billing structures to get an idea of what the Time-of-Use rate structure is going to look like (i.e. what times the rates will change and the expected differences in cost/kwh)?

The peak periods, or high cost periods for Time-of-Use rates, will be between 12 p.m. and 11 p.m. Monday through Friday. All other periods of time will be off-peak periods or lower cost periods. It is anticipated that the difference in cost per kWh will be approximately 4 to 1 between peak periods and off-peak periods. Time-of-Use rates will benefit those customers who are away from home a substantial portion of the peak periods.

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Funding Questions

1. **How much Naperville tax money is contracted or committed to the federal government, utility companies or other entities?**

The NSGI project is funded by the Department of Public Utilities-Electric (DPU-E) budget and a matching grant from the U.S. Department of Energy (DOE). DPU-E operates through an enterprise fund entirely financed by revenue generated from the electric charges paid by customers and proceeds must be allocated to the operation, maintenance and construction of the electric utility infrastructure.

No property tax dollars have been committed to this project; all property tax dollars go in to the city's General Fund.

DPU-E deferred some capital projects originally scheduled for 2010-2013 in order to allocate the necessary funds for the NSGI project. As noted by the Naperville City Council, the majority of this money was set to be spent on similar initiatives relating to the implementation of smart grid technology in Naperville over a longer period of time.

A municipal utility, in contrast to a for-profit energy company, passes along all cost savings directly to its customers. Any operational savings from increasing efficiencies and reducing load and line loss (energy waste resulting when electrical energy is transmitted across power lines), result in greater savings realized by customers.

According to DOE Guidelines, Naperville must complete the smart grid deployment by April 21, 2013, three years from the original signing of the grant. Additionally, there is a possibility (but not guaranteed) that the DOE will grant an extension for an additional year if necessary.

2. **When and why was an $11.5 million grant accepted w/o public consent if we're responsible for the balance?**

This money was earmarked in the Department of Public Utilities-Electric budget and not the city's general fund meaning that customers are not responsible for any of the balance. There were public Council workshops on this topic and the Council approved the changes in the budget during a regular, publicly noticed City Council meeting to fund the electric utility portion of the NSGI project.

3. How much am I paying for in my taxes? Is this coming from tax money?

The city portion of the smart grid will be paid through the retail sale of electricity. The federal matching grant is provided through federal tax dollars.

No property tax dollars have been committed to this project; all property tax dollars go in to the city's General Fund. DPU-E operates as an enterprise fund –and is entirely funded through revenue generated from the electric charges paid by customers. It is separate from the city's General Fund.

The electric utility enterprise fund does not utilize tax revenue generated by the city – it is solely allocated to the operation, maintenance and construction of the electric utility infrastructure. Since utility funds cover the entire project cost, no Naperville tax money has been allocated for this project.

4. How do we get the $11M back?

The DOE Smart Grid Investment Grant provided $11 million which enabled the city to complete distribution and automation of the electric utility within a shortened timeframe. The benefits associated with the NSGI business case will come in the form of lower operating costs at the utility (operational benefits), lower network losses (saving wasted energy) and lower customer energy consumption and demand. Naperville's not-for-profit electric utility is owned by the city and all savings realized by the utility are passed through to customers. The abstract of the NSGI business case is available to view at www.naperville.il.us/smartgrid.aspx.

5. How will you make the money back? Will it take 44 years?

The benefits associated with the NSGI business case will come in the form of lower operating costs at the utility (operational benefits), lower network losses (saving wasted energy) and lower customer energy consumption and demand. Naperville's not-for-profit electric utility is owned by the city and all savings realized by the utility are passed through to customers. The abstract of the NSGI business case is available to view at www.naperville.il.us/smartgrid.aspx.

6. With our city under budgetary constraints & the state almost bankrupt, why did you opt to spend taxpayer dollars on this project at this time?

The NSGI project is funded by the Department of Public Utilities-Electric (DPU-E) budget. The additional funds came from postponing other electric utility projects that were scheduled for 2010-2013. As noted by the Naperville City Council, the majority of this money was set to be spent on similar initiatives related to the implementation of smart grid technology in Naperville over a longer period of time.

No property tax dollars have been committed to this project; all property tax dollars go in to the city's General Fund. DPU-E operates as an enterprise fund – and is entirely funded through revenue generated from the electric charges paid by customers. It is separate from the city's General Fund.

The electric utility enterprise fund does not utilize tax revenue generated by the city – it is solely allocated to the operation, maintenance and construction of the electric utility's infrastructure. Since utility funds cover the entire project cost, no Naperville tax money has been allocated for this project.

Please go to the NSGI website at www.naperville.il.us/smartgrid.aspx to see the business case summary for the NSGI project. This project is expected to generate more than $45M in savings, resulting in a significant savings for DPU-E and our customers over the life of the project.

7. Why are we spending over $4 million on PR firms when we don't even have a beta test completed?

The purpose of the Customer Relations and Education firm is to provide information to residents in an accessible and understandable format about a very technical project and its potential impact on the city's utility customers. There may be considerable customer-related and operational benefits derived by the Naperville smart grid project.

It is important that customers are made aware of the increased options and choices that the NSGI will create and know how to best utilize these optional elements to best manage their energy consumption, if they choose.

Phase I of the Customer Relations and Education firm contract is for $135,000. There are two additional contract phases scheduled after Phase I, and the City Council must approve any additional phases. Included in Phase I of this contract is the Privacy and Advocacy Plan and Handbook.

West Monroe Partners is a Chicago-based business and technology consulting firm and serves as the implementation and integration consultant, not a Customer Relations and Education firm.

8. Why are PR firms being paid over $4 million to market a product that hasn't passed a proven security assessment by a 3rd party?

Please see the above response. At this point, the city is not planning on expending the significant funds needed for an additional third party audit, as one has already been conducted by the Federal Communications Commission (FCC) and the smart meters have met and exceeded their stringent guidelines. The following list includes utilities currently executing large-scale smart meter deployments in the United States. All are utilizing wireless technology.

- AEP – 5.2 million smart meters
- Alliant Energy – 1.4 million smart meters
- CenterPoint – 2.2 million smart meters
- Detroit Edison – 4 million smart meters
- NextEra (Florida Power and Light) – 4.4 million smart meters
- Oncor – 3.4 million smart meters
- PG&E – 5.1 million smart meters
- SoCal Edison – 5.3 million smart meters
- Southern Company – 4.3 million smart meters

9. Please show/explain what the payback is for the $22 million? What is ROI?

ROI is an acronym for "Return on Investment." The benefits associated with the NSGI business case will come in the form of lower operating costs at the utility (operational benefits), lower network losses (saving wasted energy) and lower customer energy consumption and demand. Naperville's not-for-profit electric utility is owned by the city and all savings realized by the utility are passed through to customers. All these benefits contribute to assisting customers in managing energy costs. The abstract of the NSGI business case is available to view at www.naperville.il.us/smartgrid.aspx.

10. What benefits were used in determining the payoff and how were they calculated? When will the investment in smart meters pay off and to what extent?

Estimated benefits of the NSGI program will result from energy and demand reductions and operational savings by the utility. Operational utility benefits will come from reductions of planned expense by DPU-E that include reduced meter reading cost and improved meter reading accuracy. Distribution efficiency is realized in the reduction of energy demand and consumption due to improvements in the distribution of electricity in the network. Overall, utility benefits do not require any change in behavior by the end consumer and show a forecasted ROI of $26.2 million dollars over 15 years. Reduced energy demand and consumption due to the end consumer's improved management of energy from optional Demand Side Management Programs yield a $20 million benefit over 15 years. Finally, improved service reliability from distribution automation and substation automation, as well as lower greenhouse gas emissions due to energy reductions has an aggregated societal benefit of $16.4 million. From these benefits, the city of Naperville forecasts that the total ROI of the Smart Grid implementation will be $46.2 million over 15 years with the cumulative cash flow break even occurring in year 4. Please refer to the NSGI Business Case overview for more details, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-BizCaseFundamentals.pdf.

11. What is the total cost of purchasing, installing, and maintaining the smart meters?
Please refer to the NSGI Business Case overview for details on the costs related to the project, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-BizCaseFundamentals.pdf.

12. What is the annual cost of running the smart meter project?
Please refer to the NSGI Business Case overview for details on the costs related to the project, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-BizCaseFundamentals.pdf. Future costs will be covered through the Department of Public Utilities-Electric operating budget.

13. What annual costs will be eliminated or reduced by the smart meters? Naperville City costs? Customer Costs
One distinction to make is that Smart Meters are part of an overall Smart Grid. The Smart Grid includes tools and technologies that leverage digital meter data for greater efficiencies that are not possible with analog meters. A municipal utility, in contrast to a for-profit energy company, passes along all cost savings directly to its customers. All operational savings from increasing efficiencies and reducing load and line loss (energy waste resulting when electrical energy is transmitted across power lines) will be passed on to customers. Please refer to the NSGI business case overview for additional details, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-BizCaseFundamentals.pdf.

14. Would you please provide estimates of how much customers will pay/kw for the next 10 years with the smart meters? How does that compare to other area communities without smart meters?

The City cannot be sure what customers will pay for the next 10 years. This is something few, if any, utilities can predict. What we can predict with some accuracy is that the global cost of energy is increasing and will continue to do so. Numerous studies predicting higher future energy costs provide further evidence that this project adds value for the consumer. Avoided energy and demand are the cleanest replacement for today's generation. The NSGI will allow customers the option to manage their energy usage. As the price of electric energy and demand increase the benefits for smart grid and smart meters improves.

As an entirely independent project from NSGI, the DPU-E is currently evaluating its electric rates this year. This information will be finalized within the next few months.

15. What would it cost to keep our analog meters and the 5 meter readers that the city has employed for 57,000 residents/businesses? How much would a wired solution cost (software, product, manpower, hook up, maintenance)? How much does a wired solution cost? (side by side analysis of all aspects of the project)

The DPU-E has been planning this upgrade for several years, and is not at this time considering a wired solution. As a part of the RFP process, none of our vendors recommended a wired solution. Estimates range from $65-85 million dollars in additional capital costs to install fiber optic cables to each resident's home. It is important to note that in many of the AMI deployments using fiber optics to connect to the meters also use a wireless mesh to connect between the meters with fiber and those that do not have fiber connectivity. In Chattanooga, TN it is estimated that about 2 of 3 meters use wireless mesh to connect back to the premises with fiber optics, which then relay the information back to the control center over the fiber optics communication.

All Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24. All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

16. Does the net benefit (approx. $32M over 15 years) include the debt service?

Yes, the cost of funds is included in the Net Present Value figure**.**

17. A resident questioned the business case, presentation of the case and its validity. If council based its decision on this work and it is truly found to be faulty or presented in a way that caused council to vote in the affirmative and once a "good" business case were to be presented and council changed their votes, would there be any professional liability of contractual remedy where the city could pursue West Monroe Partners for full reimbursement of any funds lost on the Smart Grid project?

If the City decided to terminate its contracts for the Smart Grid Project because it arrived at a different understanding of the business case for the Project than the understanding it had when the Project was approved (in other words a voluntary termination because of a different understanding of the business case), the City would be liable to pay for products and services through the termination periods of its various contracts for the Project (between 30 and 120 days). Further, the City will lose the value of the services already performed by its various Smart Grid contractors. In addition, since the City would not be providing the cost share required by the

Department of Energy Grant, the Department of Energy would be entitled to recover all funds received by the City from the Grant.

The contractual remedies the City would have against West Monroe Partners ("WMP") upon termination of the Project would depend on the nature of the alleged errors, omissions, or intentional wrongdoing alleged with respect to WMP's analysis of the business case. Depending upon the facts, the City might submit a claim under WMP's errors and omissions insurance policies (with typical coverage in the amount of two million dollars). Furthermore, if claims or litigation resulted from the termination of the Project, and the cause of the termination could be shown to be the result of errors, omissions or wrongdoing by WMP, the City would tender the defense and indemnification of those cases to WMP pursuant to defense and indemnification provisions in the contracts. Neither approach would likely be accomplished without extensive litigation over the alleged errors in the business case, the impact said errors would be likely to have on the overall outcome and profitability of the Project, and the extent to which the City could have mitigated the damages resulting from such errors. Furthermore, to the extent that the City provided information to WMP upon which the business case for the Project was predicated, there could be a defense raised by WMP that the causes of the claimed errors were in part the City's fault.

18. If we are abating the bonds for Smart grid bonds for the utility to pay, have the taxpayers still not assumed additional default risk on the bonds? So, if they were issued as bonds direct from the utility (e.g., revenue bonds) and the utility were to fail the creditors would only have the remnants of the utility to chase whereas under the way we issued the bonds, the taxpayers would be on the hook?

True. However, the risk of the electric utility department defaulting on the bonds is extremely low if at all.

19. It is my understanding this is the final contract for WMP and this will close out their portion of the NSGI. If this were to not pass, would we have to return all the DOE money and if so, how much is that?

The work in the recommended Phase 3 will provide authority for West Monroe to complete their work on the AMI/MDMS/LCMS/HAN Deployments. We have received payments from DOE for work completed through August 2011 of $4,283,730, and have requested payment of $138,856 for work completed in September 2011. If The City failed to meet the terms of the grant, e.g. if the project were not completed, all of the DOE funds reimbursed would have to be returned.

20. We are adding additional systems integration work with an estimate of $175k. Is this our portion or is this the entire amount and the DOE will pay half?

This will be part of the NSGI and half of the $175k is funded through the USDOE Grant. There is no change to either the estimated budget or the schedule.

21. Why did the City pay $400,000 to a PR firm for this project?

The City has not paid $400,000 to a PR firm for the Naperville Smart Grid Initiative (NSGI). In September 2010, the City approved Phase I of a contract with Jasculca-Terman for $135,000 for a Customer Relations and Education Firm. This was the only expenditure related to a Customer Relations and Education Firm. In this contract, Jasculca-Terman was responsible for three fixed deliverables, including the Customer Relations and External Communication Plan, Privacy and Advocacy Plan and the Customer Privacy and Advocacy Handbook. Upon completion of the Phase I deliverables, the contract was not renewed; therefore, no money above the $135,000 was spent.

Please note that the City's NSGI consultant, West Monroe Partners, is **not** a public relations firm. West Monroe Partners is a Chicago-based business and technology consulting firm and serves as the implementation and integration consultant for the NSGI, not a Customer Relations and Education Firm.

Naperville Smart Grid Initiative
Question/Response Inventory
Last updated March 25, 2013

Privacy Questions

1. What does "Nature of use" mean related to monitoring?

"Nature of use" refers to what time and at what rate power is consumed by utility customers. Smart meters will communicate this information to the utility for billing, engineering, technical and operational uses. In cases where a customer has devices such as a renewable energy source or electric car charging/discharging requirements and has voluntarily registered for a Demand Response (DR) program or Time of Use Rate, the utility will need this information in order to bill consumption at the proper rates.

2. Can the utility monitor my consumption and know when I'm home?

The utility cannot detect the presence of people in their homes; only the consumption of electricity is measured for billing purposes.

3. Can you tell what I'm doing in my house?

Generally, no; however, if customers voluntarily register for a Demand Side Management (DSM) Program or voluntarily register devices such as a renewable energy source or electric car charging/discharging requirements, the activity of these devices must be transmitted to ensure proper billing as well as compliance to required DSM regulations.

4. Why will federal money control my appliances?

Neither federal money nor the federal government will have the ability to control the customer's appliances. The city is utilizing federal Smart Grid Investment Grant funds in implementing technology that will provide customers with more options about how they choose to manage and consume electricity.

5. How can you keep customer privacy if this puts out a radio signal?

The radio signals and the data that passes through the smart grid system will be protected and secured through the implementation of the most current and stringent cyber security standards. The network data security, in addition to strict city customer privacy policies, will ensure customer privacy.

6. Won't the city have access to our hour by hour usage of electricity?

Yes, the utility will collect detailed energy usage for the purpose of billing and network monitoring. Use of this hourly data for any purpose other than optimizing the network performance will be strictly controlled by customer information privacy policies.

7. Is this a change in privacy for the customer?

The only change is the frequency of meter readings, which will record the amount of electricity used several times daily. Similar to phone companies that record the time and duration of customers' phone calls for billing purposes, electric meters will receive more accurate information on interval usage of power. The electric utility will maintain the privacy standards currently in place to protect customer consumption data. The Customer Privacy and Advocacy Handbook can be found at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-CPAHandbook.pdf.

8. Will the DOE have access to energy data?

The U.S. Department of Energy (DOE) will not have access to personal information connected to individual energy usage data. As part of the Smart Grid Investment Grant, the city must provide anonymous aggregate usage data to the DOE relating to overall system performance and benefits derived from the smart grid investment program.

9. If I opt in, will it do anything to my dryer? Or to my refrigerator?

The installation of a smart meter will have no effect on any customer appliances. If customers voluntarily register for a Demand Side Management (DSM) Program or voluntarily register devices such as a renewable energy source or electric car charging/discharging requirements, the activity of these devices must be transmitted to ensure proper billing as well as compliance to required DSM regulations.

10. How will the utility company be using the information collected from the meters?

The city will use information generated from the smart meters for billing purposes and network operations only. This data will allow the utility to better forecast energy use over time and will allow better negotiation of future contracts for energy purchases. The NSGI will be able to reduce the city's peak demand by 2 percent and reduce energy consumption by 1 percent through more efficient operation of the network. This would result in significant savings to the utility and its customers, since the Naperville utility passes along any savings realized to its customers.

11. How do you address the fears of those who are concerned that the data could be used as an invasion of privacy by hackers, government, power company or others?

The City of Naperville is taking all necessary measures to secure its network and data by fully implementing the cyber security plan submitted and approved by the federal government. The city is also enforcing the same stringent standards on all of its NSGI vendors. Additionally, the city will be commissioning an independent audit of the cyber security system and implementing all necessary changes as noted through the independent audits.

Additionally, the City of Naperville has outlined the core rights of utility customers based on customer feedback and input, the goals of the overall NSGI, and current national and state guidelines and policies for smart grid projects. City Council adopted the Smart Grid Customer Bill of Rights located at www.naperville.il.us to affirm that Naperville electric utility customers are entitled to responsible and transparent utility operations that include:

The right to be **INFORMED**
The right to **OPTIONS**
The right to **PRIVACY**
The right to **DATA SECURITY**

The Customer Privacy and Advocacy Handbook defines and maps out the specific procedures and methods staff will employ to ensure these rights are upheld and incorporated into the day to day utility operations. A link to the handbook can be found at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-CPAHandbook.pdf.

12. Is Naperville insisting on being able to independently audit the power company for compliance with Naperville's guidelines and requirements, including having access to the full database of raw data collected by these devices? Who will be in possession of the raw data and will Naperville have access to it?

The City of Naperville, thus Naperville electric customers, owns the $356 million Naperville electric utility, the city's largest asset. The city staff will put in place any procedures necessary to ensure adherence to the recently adopted NSGI Smart Grid Customer Bill of Rights, available for public viewing on the city's website. The NSGI project team is currently finalizing a Privacy and Security Handbook, which will be reviewed by City Council. Upon review and approval, the utility will update its rules and guidelines to align with the NSGI Smart Grid Customer Bill of Rights. The Privacy and Advocacy Handbook is being developed so that electric utility customers can understand the policies and procedures that the city will be employing in the management and administration of the smart grid.

13. Is Naperville committed to a periodic review of all the facets of data collection, storage, and use by an independent body?

Naperville submits annual reports to Federal Energy Regulatory Commission (FERC) regarding operation of the electric utility, including information regarding Automatic Metering Infrastructure. As deployment of smart grid projects are a recent development across the country, FERC is currently adding new standards to include smart grid reporting in its requirements. Naperville is committed to complying with all FERC regulations regarding Automated Metering Infrastructure data management.

The City of Naperville also reports to the North American Electric Reliability Council (NERC) regarding the cyber security of its electric utility operations. All smart grid systems, including

Automated Metering Infrastructure, are part of Naperville's reporting requirements. Naperville is obligated by law to comply with NERC and is subject to audit by NERC.

Naperville will also be audited by the U.S. Department of Energy to ensure compliance and adherence to plans submitted relating to the Smart Grid Investment Grant.

14. Is the data sent from the smart meters and collectors encrypted?

Yes, all data sent from the smart meters and collectors is encrypted using NIST and DOE standards.

Naperville Smart Grid Initiative
Question/Response Inventory
Last updated March 25, 2013

Smart Meter Questions

1. What will the new meters do?

Smart meters will communicate wirelessly with the electric utility, eliminating the need for the Department of Public Utilities-Electric to send technicians to customers' homes and businesses to manually read meters.

2. Does each device have wireless? How will it communicate?

Each smart meter will have wireless communication to the Utility Area Network (UAN) and a wireless communication for the Home Area Network (HAN). The meters will communicate with the utility though a wireless mesh network, much like the ones already in use at the area hospitals, libraries and the downtown area as well as for the Police/Fire radio system. The wireless mesh network will be its own proprietary network for security and reliability reasons.

3. Do I get a free meter?

Yes, all utility customers will get a new wireless smart meter at no cost. If the customer chooses to opt for a non-wireless meter, there will be additional installation and monthly costs.

4. How much power does the new meter draw?

The smart meters draw various amounts of power depending on their communication technology and manufacturer design. The power to run the smart meters is not metered to the customer and is considered "line-loss" energy consumption to the Department of Public Utilities-Electric.

5. What kinds of meters are being installed?

Elster is the vendor selected to provide and install Naperville's more than 57,000 smart meters. Elster currently has more than 4 million smart meters installed in the United States and Canada.

6. How much do the new meters cost?

The customer will not be charged to have a wireless smart meter installed, and all utility customers will get a wireless smart meter. If the customer chooses to opt for a non-wireless meter, they will be responsible for covering the additional installation ($68.35) and monthly costs ($24.75) associated with the non-wireless meters.

The amount of $24.75 per month is the monthly estimated cost to manually collect energy interval information from the meter for billing and utility operation purposes. This was based on the number of meters that could be read in one day and the labor costs it would take to perform those meter readings. It was estimated that 20 meters could be manually read in one day by one meter technician. Right now, costs per meter for manual reads are significantly lower because a meter can be manually read as part of the same geographic cycle as your neighbors. By going

house-to-house, more meters can be read. But with the non-standard NWMA meter, it will take much more time to read each meter since:

a. They will be interspersed throughout the City.
b. The new standard meters will be read remotely without the need to have a meter reader drive to the meter locations and back.
c. The manual data will need to be opened, verified and downloaded into the City's billing system.
d. New equipment and specialized training is required. Water meter readers will not have this training and therefore cannot read the NWMA meters as part of their duties.

Naperville's electric utility operates under a "cost-of-service model" in which the utility's fees recoup costs of the services provided. The utility does not operate on a for-profit basis, and the costs of the NWMA are meant to solely capture the cost of this service. Please also note that the one-time $68.35 upfront cost is the difference between the standard wireless smart meter and the NWMA meter that has the wireless card removed. The cost simply covers the difference between the two meters.

7. Will this read both water and gas?

The Advanced Metering Infrastructure (AMI) required to support the smart grid will include provisions to transmit water meter reads for the city's water utility. It will also be tested with a small number of gas meters on the basis of research and development by the Department of Public Utilities-Electric. Initially, it will only be used for electricity.

8. What makes this a Smart Meter?

An "electro-mechanical meter" (analog meter with spinning dials or disks) simply recorded consumption without recording when the consumption occurred. A "hybrid" meter is an "electro-mechanical" meter with a digital display and some additional functionality. A "digital" meter had no moving parts, and added even more functionality. All of these meters still had to be manually read by a person in front of them. A "smart meter", in general, is a "digital meter" with the communication technology to wirelessly communicate with both the Utility Area Network (UAN) and Home Area Network (HAN).

9. Can you get more than one reading a day?

The Department of Public Utilities-Electric is looking to read the meters once per day and have the previous day's information available on the customer ePortal website. In order to obtain more frequent readings, a customer will need to acquire a Home Energy Device (HED) and register it

with the utility for the HED to provide near real-time energy consumption information from the utility meter. The purchase and use of a HED will be 100 percent voluntary. Although the cost of an HED device is not confirmed, anticipated cost is around $100 plus tax.

10. How do you expect me to use the meter?

All customers will get a new smart meter that will communicate wirelessly with the Department of Public Utilities-Electric. Customers have the option to do nothing other than pay their electric utility bills. The customer also has the voluntary option to enroll in any future rate or usage structure that meets their lifestyle needs. The city understands that a large customer awareness, training and information program is needed to educate customers on the benefits of the smart meters and smart grid. These programs are currently being designed and implemented.

11. KPRC Houston reported on January 4, 2011 that "Thousands of Smart Meters [Are] Getting Pulled." CenterPoint Energy uninstalling 47,000 smart meters because 5,200 meters were sending inaccurate readings and overcharging customers. Australia is also reporting the recall of smart meters as a result of electric shocks being experienced by approximately 2000 residents.

Please find below additional information that can provide further insight into the two issues surrounding CenterPoint Energy as reported by KPRC Houston

a. CenterPoint pulling “tens of thousands of meters”
    1. The reason that the CenterPoint meters were pulled is that the meters did not have a ZigBee Home Profile 1.0 compliant home area network (HAN) technology as specified by the Texas Public Utility Commission (TPUC). The HAN technology will give customers the ability to control when their devices use energy and provide the homeowner the ability to control their major electric loads.

    2. This is considered so important by the TPUC that they demanded CenterPoint replace their meters for meters containing the ZigBee technology.

All NSGI meters will come with a ZigBee Home Energy Profile 1.0 HAN solution. All Naperville customers will have the option to use this HAN capability to help them better control their energy usage and potentially lower their bills. Again, please note that it would be a customer’s choice to use this technology as best suits their particular lifestyle.

b. CenterPoint pulled 5200 meters from service in March of 2010

c. The 5,200 customers affected had incorrectly calibrated commercial and industrial (C&I) smart meters. These were corrected by downloading the correct scaling variables to these C&I meters. This issue should have been caught and addressed with standard quality control measures. The deployment methodologies of CenterPoint have been adjusted to address these issues.

For the NSGI project, we have noted these issues and others that have occurred in the marketplace and have a quality control plan to mitigate this risk. First, the city has required its vendors to test every meter that leaves their warehouse for shipment to Naperville. Also, Naperville's Department of Public Utilities-Electric staff will also test meters as they arrive, before they are certified for installation. Finally, as meters are installed, the city will conduct manual meter reads for three months after installation. The manual readings will be compared to the automatic reads from the new meters. They will also be compared to historical data to determine if there is a potential issue. After these steps, if a meter is found to be in error it will be promptly replaced.

d. As a practice, the NSGI project team monitors all smart grid media reports on a local, regional, national and international level in order to understand and learn from what is happening around the country and world with other smart grid deployments. The city is confident these types of issues experienced in other smart grid deployments will not be replicated in the NSGI implementation.

12. Which smart meter models have been purchased by the city? What are the steps being taken to close the security holes? Who is testing? Is there a wired option?

The meters are provided by the vendor Elster and comply with the National Institute of Standards and Technology (NIST) Cyber Security Standards and will be validated during system acceptance of the meters during the summer 2011 pilot phase program. There has been a two-year-long standards-setting process that continues today by NIST, defining the cyber security requirements of every component in the smart grid. These standards address all known issues along with the best practices employed in other industries, such as telecommunications, banking, financial markets and health care.

All Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75.

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

13. What are the safety and installation requirements?

Naperville's installation contractor will deploy an experienced, full time, on-site project management team consisting of a Project Manager, Quality Auditor / Exceptions Investigator as well as a team of experienced installation technicians that will assist both the project management team and any locally hired installation technicians.

Naperville's installation contractor trains its installers to follow the meter exchange procedure without deviation to prevent improperly seated meters Other quality control standards in place include meter inspections, voltage measurement, and meter data information comparison to confirm like-for-like meters are exchanged. This will ensure the new meter is seated properly and is working as designed before leaving the job site.

Each installer will wear a proper standard uniform, Personal Protection Equipment (PPE) and temporary Naperville credentials and identification on both themselves and their vehicles to effectively represent the city. Naperville's installation contractor also uses a quality assurance process to ensure the installation has been done correctly and the installer is following proper protocol and procedures.

The city also required that the installation contractor provide its health and safety manual for Naperville's review and approval.

14. Do the chosen smart meters (Elster) emit magnetic pulse on the a/c current that runs throughout our homes and businesses?

The meters chosen do not emit a magnetic pulse on A/C current. The data is transmitted through a wireless transmitter to a gatekeeper nearby. They do not send data over power lines (commonly known as PLC or power line communications.)

15. Is 58,000 meters enough for Naperville?

The city has purchased 57,812 meters, which is enough to cover all utility customers.

16. Which smart meter models have been purchased?

There are several types of meters to be purchased as part of the smart grid program, depending on whether they are used in a residential, small commercial or large commercial/industrial environment.

- The residential meters are Elster EnergyAxis® REX2-EA™ meters.
- The commercial/Industrial meters are Elster's A3 ALPHA® Meter in single phase and polyphase meter forms.

17. Will there be a 3rd party independent audit during and after testing?

At this point, the City is not planning on expending the significant funds needed for an additional third party audit, as one has already been conducted per Federal Communications Commission (FCC) stringent guidelines. The meters meet FCC mandated guidelines and RF emissions are at a rate significantly lower than the levels deemed safe by the FCC.

18. Can our group be permitted to have 3rd party evaluators participate in testing during the Pilot tests?

The Federal Communications Commission regulates the safety of wireless devices and collaborates with other federal agencies like the Food and Drug Administration and international organizations like the World Health Organization to monitor the health impacts of radio frequency. These organizations have concluded there is no health risk associated with radio frequency.

The City does not conduct medical studies. We rely on well-established experts like the FCC, FDA, and WHO to commission and review appropriate studies on these topics. .The City will certainly be having credible experts conduct the testing on the meters; safety is the top priority for this and all City projects. In order to complete this testing in a reasonable time frame, and evaluate the results thoroughly, we will not schedule for outside personnel to participate in the testing.

19. Can you confirm whether or not wired smart meters, city-wide have been ruled out?

Currently there are more than 20 million wireless smart meters being installed nationwide and many millions more throughout the world. This concept, its accompanying technology and the health effects on consumers has been proven across the nation. The City continues to stay abreast of developments in this industry and all new research as it becomes available. At this time, we are not pursuing citywide deployment of wired smart meters as a final solution. If the pilot testing fails, we will discuss options at that time. For now, the City is following the Naperville Smart Grid Initiative project plan, which calls for wireless meters.

However, all Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75.

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

20. If you are claiming that the smart meters will reduce the cost of electricity, may I have a copy of the charts showing past and estimated future electricity costs with and without smart meters?

The cost of electricity could mean several different things. The question makes it unclear as to whether you are referring to utility costs or customer costs. Regarding utility costs, the rate Naperville pays to IMEA will not vary based on this project. Also, the City is not claiming that smart meters on their own will reduce this cost. The smart meters are part of an overall Smart Grid, which include tools and technologies that leverage digital meter data for greater efficiencies that aren't possible with analog meters. While smart meters don't change the price of the electricity, they can decrease the operational costs of the utility and help control electricity demand. It is the increased efficiency in the utility operation and energy/demand reduction which drives the smart grid business case benefits.

21. How long will these particular smart meters last and when do they expect they will all need to be replaced? Is there a warranty on the smart meters?

The smart meters are manufactured by Elster and are expected to have a life of roughly 15-20 years. At that time they will be replaced by the city on a rolling basis. Elster's contract states, "The warranties provided herein for meters shall be in force for a period ("Warranty Period") of five (5) years from the date of installation, or as to meter spare parts, for a period of five (5) years from the date of shipment by the Provider."

22. Will we have the ability to read meters manually?

Customers can view their consumption on the meter, or thorough and optional ePortal that will be available to all customers

23. Will we have the capability to attach an external roof antenna to the home to limit EMF exposure?

In order to communicate the readings back to the utility from the meter, no. This option has not been explored and is not currently a part of the project. That does not mean it cannot be addressed in the future.

24. Will we have the ability to hook up the meter via USB to my computer so that I can monitor my power usage in real time? Will it require an added feature and, if so, how much will it cost?

There will not be a USB port in the meters. However, to monitor your electrical usage, there are many devices on the market to assist you. Naperville is working with Schneider Electric to test their HAN and other load control devices with the Naperville System. These units will be available in retail outlets in Naperville. The retail cost of these devices will be around $100.00 +Tax. In addition, future incentives are being planned to provide eligible residents with rebates that go towards the cost of these devices.

There are other devices (the Energy Detective (www.theenergydetective.com) is one) that connect to your electrical service inside your home to assist in monitoring electrical use.

The ability to view electric consumption data with a 1-day lag via the Customer ePortal will be available to all residents with no charge.

25. Will the HAN device offset the cost of "shifting" my electric use? What is the cost/benefit analysis of having to purchase an add-on device to "save" money on my electric bill?

The use of HAN and other devices is the customer's choice. If you are participating in new time of use rates, savings on your electrical bill can be done in many ways;

- Running certain appliances at night (between 10pm and 8 am) such as pool filters, Washer and Dryers, and dishwashers.
- Unplugging electrical appliances when not in use
- Turning off DVR's and LCD or Plasma TV's when not in use
- If no one is home during the day, use setback thermostats to adjust temperature

Generally, the more you avoid using electricity when prices are higher, the more you will save. As mentioned above we are working on building incentives into the plan that make these devices cheaper for customers

26. Will we have the ability to program the smart meter to selectively shut off power to some parts of our homes when power goes above certain limits, while also being sure that some parts get enough power? (i.e. pluggable hybrid plugged in all the time, but only charge it when electricity falls below a certain price, but make sure it gets at least 8 hours of charging so that it's fully charge in the am OR automatically raise the A/C thermostat if electricity goes above a certain price and reduce power when the price goes back down. For instance if the power company decides they need to reduce power consumption in our area to prevent a black out, we want to be able to specify what critical electrical systems in our homes (i.e. security system) continue to get power. All of these features will probably be standard on smart meters in another five years; Why should Naperville deploy meters now that don't have these features that residents want and need?

The smart meter cannot be programmed; however, customers that sign up for the ePortal, or choose to participate in future energy programs, have the ability to have more control over their consumption.

For example, the HAN network that residents install in their home will have the capability to enable "Intelligent Charging" of Electric Vehicles that ensures that vehicles are being charged in "off peak" times and that the charge is maximized during this time. Also, by using Smart Appliances that are coming into the market, residents can program these to ensure they are only used during "off peak" times as well. Residents will also have the flexibility to override this programming and run it anytime they wish. The appliances selected that can be controlled during a "load shaving" event are at the discretion of the resident but these are typically AC units and pool/spa pumps.

27. Isn't this indicative that Naperville's investment in a full smart meter deployment premature? Over the next five years, smart meters will have more features, more standardization, at lower prices. Why not implement a multi-year trial (on a voluntary basis like Hartford, CT) of the smart meters, which they have already begun (i.e. 100 homes) and then assess the benefits, only then considering full deployment? Otherwise it appears that Naperville is rushing into something, trying to be leading edge with an ulterior motive and personal agenda.

The changes in technologies are separate from the smart meters themselves. Regardless of what innovations may come in energy management, the innovations will rely on the digital data provided through new smart meters. Put another way: by not implementing smart meters, Naperville puts itself at risk to not support the existing and future innovations that will be available for customers. Any optional programs, home displays, home energy management applications, or vehicle charging is contingent on the deployment of smart meters. Furthermore,

this technology has been available for several years and has been deployed in other states such as California, Texas, Ohio, Florida, Washington D.C. and others who have seen dramatic positive results. The City and the Utility serve the citizens of Naperville and do not have ulterior motives or personal agendas relating to this project.

28. How will the city handle the case in which a hardware error or insecurity is discovered with the meters and they have to be recalled? (as with Centerpoint in TX) Who will pay for this?

According to the contract, the meter vendor will be responsible for this during the warranty period which is 5 years. As indicated above, if the meters need to be upgraded to new software, this can be done over the network and these upgrades are free of charge to the city.

29. Do the meters require a battery (in order to preserve info. or operation in the case of a power outage)? What is the estimated lifetime of this battery and how will it be replaced if necessary?

The Elster meters do not require a battery.

30. What is the official level of radiation exposure metric for the Elster meters (both at 900mhz and 2.4ghz)?

Reports from three independent test results from the companies who determine whether the Elster meters comply with FCC guidelines. The Smart meter Awareness group also has these measurements (from a FOIA request). For the Elster meters (both REX2 Residential and A3 Commercial meters) it says the following:

- Limit for MPE (from FCC part 1.1310 table 1) is f (MHz) / 1500 = 927.6 / 1500 = 0.62 mW/cm2
- Highest Pout is 250mW, highest antenna gain (in linear scale) is 3.27, R is 20cm, and f = 927.6 MHz
- Pd = (250*3.66) / (1600π) **= 0.182 mW/cm2, which is 0.438 mW/cm2 <u>below</u> to the limit**.

Calculations for this report are based on **highest power measurement and the highest gain of the antenna**. **<u>It's important to note here that the Smart meter will only be transmitting once per hour and for a total of 6 to 78 seconds for the entire day.</u>**

31. What is the number of Tropos units being installed?

Currently, the city plans to install approximately 220 Tropos units, but this number is subject to change in either direction.

32. Since we are doubling the number of Tropos units and they are not costing the city anything, what is their estimated maintenance cost and how much will it cost us to support twice as many of these Tropos units?

Elster will cover the cost of maintenance of the Tropos units during the first three years under their original contract. Beginning January 2014, the cost of maintenance per additional unit will be $325 per year. This includes software, firmware, and hardware support from Tropos. With an approximate 110-120 additional units the total cost will be $35,750-$39,000 more per year.

33. What are the stats on how many meters the city replaces per year as-is due to normal wear and tear?

The city replaces meters, on average, every ten to twelve years meaning approximately 4,500 meters are replaced each year. However, this number can significantly fluctuate year to year.

34. What is the average lifespan of current meters and average age today?

The average lifespan of the current meters is 20+ years. There is no accurate measurement for the average age of the meters since they are replaced on a rolling basis. Some are relatively new and some are much older.

35. Is the city selling or gaining any revenue from old meters after they have been replaced? i.e. Scrap Value?

Yes. Currently, the city is finalizing a plan to recycle the old meters and generate revenue for the city. However, details have not been released to the public at this point.

36. Will the old meters stay in place for a while when the smart meters are installed?

No. Old meters will be removed when the smart meters are installed.

37. How do we know smart meters are safe?

Smart meter equipment is required to meet Federal Communications Commission (FCC) limits. FCC limits are set by the National Council on Radiation Protection and Measurements (NCRP) and the Institute of Electrical and Electronics Engineers (IEEE). Both the NCRP exposure criteria and the IEEE standard were developed by expert scientists and engineers after extensive reviews of scientific literature related to RF biological effects.

The City has obtained and reviewed all of the independent lab results that indicate the NSGI equipment satisfies FCC guidelines. Please also note there are currently no mainstream studies that suggest the exposure to radio frequency (RF) has a negative effect on a person’s health.

A small group of Naperville utility customers (less than 1 percent) have expressed concern that the smart meters Naperville selected for the NSGI emit unsafe RF levels and may cause adverse health effects. Because of this concern, the Naperville City Council directed City staff to conduct its own RF testing. The summary report of this testing is available to view at www.naperville.il.us/emplibrary/Smart_Grid/Pilot2-RFEmissionsTesting-SummaryReport.pdf. This testing was conducted using a NARDA SRM 3006 Selective Radiation Measurement Device, which is the same device used in FCC compliance testing. This device is significantly more reliable and precise than the Gigahertz meter commonly used in YouTube videos of smart meter RF emissions testing.

In short, the RF testing conducted by the City of Naperville found:

- The NSGI smart meter equipment emitted RF power densities that are below FCC guidelines.

- The smart meter equipment peak RF power densities, which are the highest level of RF emissions received at any given moment, ranged between 1 % and 3.20% of FCC limits at 20 centimeters (approximately 8 inches) away.

- The smart meter equipment average RF power densities ranged between 0.002% and 0.003% of FCC limits at 20 cm (approximately 8 inches) away over a 30-minute period.

- The smart grid equipment average RF power densities were lower than typical common, widely available household devices such as microwaves, cell phones and wireless internet routers.

38. Are the Elster REX2 smart meters in Naperville Underwriters Labs (UL) listed?

No, the Elster REX2 smart meters (Wireless and non-wireless alternatives) are not Underwriters Labs (UL) listed. This is because UL listing is not required for any device on the utility side of the meter socket. Even though UL is currently marketing their services towards the smart grid, this is not an industry norm and it should be noted that UL is a not-for-profit entity that primarily provides certification services for common household appliances and devices. Furthermore, the Elster meters do conform to both American National Standards Institute (ANSI) and Federal Communications Commission (FCC) standards. The ANSI is a not-for-profit organization that provides accredited third party certification to meet both U.S. and international standards. The FCC is an independent agency of the U.S. government that oversees the safety and reliability of the nation’s communications infrastructure. Additionally, Naperville’s electric utility conducted its own radio frequency (RF) and functional testing of the smart meters to further confirm their safety.

39. Will the smart meters interfere with my defibrillator or the data transmission I send to a hospital on a daily basis?

The ambient environment and our hospital in Naperville contains numerous radio frequency sources (cell phones, radio towers, television broadcasts, etc.) and therefore medical devices such as a defibrillator must be designed to operate in these environments. Also, given that the smart meters in Naperville have extremely low transmission power relative to other common household devices such as cell phones, satellite dishes, microwaves, and your communications being sent to the hospital, your defibrillator should still maintain the same operating capabilities as it did prior to the smart grid.

The smart meters in Naperville will operate on a 902 – 928 MHz frequency band. This is an unlicensed frequency band that is available for public use. If your signals being sent to the hospital are outside of this frequency band you should not experience ay issues. If your signals are however being sent in the 902 – 928 MHz frequency band you may experience some interference. Please note, however, that the smart meters are designed to minimize interference to other devices and it is still possible that you will not experience any issues. In order to determine if you will have any issues you will need to consult your hospital to determine what frequency your data transmissions are being sent at.

40. Is my home wiring compatible with the new smart meters and should I be worried about any fire issues?

As long as a home or business is not experiencing issues with its current analog meter, a smart meter should not introduce any new issues. An investigation of several fires related to smart meters has determined that there were multiple causes, the majority being unrelated to the smart meter itself.

Furthermore, in order to avoid any issues regarding new meter installation, the City has required its vendors to test every meter that leaves their warehouse for shipment to Naperville. Also, Naperville's Department of Public Utilities-Electric staff will also test meters as they arrive and before they are certified for installation. Additionally, before a meter is installed, Naperville's technicians will check all connections in the meter box, determine if the meter is properly grounded and also ensure that all wires are going to the appropriate places. In the case that a meter socket is not up to par with City code, the installers will have an electrician make the necessary upgrades/changes at the City's expense.

Please note that all Naperville installation technicians will receive extensive training on proper meter installation as well as the skills required to identify and resolve any issues. Finally, the new smart meters have a feature that sends an alarm to the utility if the meter is not receiving

good quality electricity, etc. This means that the smart meters are significantly safer than the current analog meters, which cannot send this signal to the utility.

41. Do installers have to be certified electricians?

An electrical permit is not required to replace an electric meter; therefore, a certified electrician is not required to replace an electric meter.

Utility Partners of America (UPA) is the installation contractor chosen by Elster, the meter manufacturer. Each installer will wear a proper standard uniform, Personal Protection Equipment (PPE) and temporary Naperville credentials and identification on both themselves and their vehicles to effectively represent the City. Naperville's installation contractor also uses a quality assurance process to ensure the installation has been done correctly and the installer is following proper protocol and procedures.

42. Will my home security alarm system get set off when the meter is installed?

If at the time of meter replacement a utility customer has a security alarm system installed in their home or business, their security alarm system should respond as it normally does during a power outage. If a security alarm system does go off a result of the brief power outage caused by the scheduled meter replacement, the Naperville Police Department (NPD) will respond to the alarm call as described by procedure and protocol. The NDP has a copy of the meter replacement schedule.

Residents should note that almost all security alarm systems have a rechargeable battery that powers the system for a minimum of four hours in the event of a power outage. Wireless systems may contain several batteries in the system's sensors as well as a backup system battery. Backup systems have a useful life of approximately three to five years, and system batteries should be checked annually or after any storm-related false alarm by an alarm technician and replaced when needed. In advance of smart meter installation in an area, a customer should check his/her alarm system battery to avoid a false alarm.

43. Will the smart meter interfere with my pacemaker?

No. Smart meters have lower radio frequency emissions than cell phones, so if cell phones do not cause a problem with a pacemaker, then a smart meter should not.

44. Can I install a De Mark box on my home to read my smart meter?

At this time we have not approved any such device to attach to the new smart meter. If there is a demand for these in the future we will evaluate the feasibility then. Please note however that you will be able to access your usage data via our free online ePortal and through Home Area Network and Gateway devices that can be installed in your home.

45. How many times a day does a residential meter transmit and for how long?

For the Naperville-designed mesh network, a residential meter that is not acting as a relay for other meters would transmit an average of 26 times per day. The total seconds per day such a residential smart meter would transmit is 2.2 seconds per day.

A worst case scenario is a residential meter that is acting as a relay for 25 other meters and would have up to 881 daily transmittals. The total seconds per day that such a residential meter would transmit would be 76 seconds per day. This event is highly unlikely, however, given that the system has been designed to limit the number of hops a meter takes before being collected by a receptacle.

46. Are our water meter changes being made as a result of the NSGI?

Your water meter will not be changed out as part of the NSGI. There were only 10 water meters tested as part of the NSGI and they were tested within the Department of Public Utilities-Electric and not in customer's homes, businesses, or anywhere else in the City.

47. Will the smart meters interfere with my in home powerline communicating technologies such as X10, Insteon, and Universal Powerline Bus (UPB)?

The smart meter communicates to the utility via wireless transmission and therefore should not interfere with your powerline communicating technologies. If any of the devices in your home do communicate wirelessly, please confirm that they adhere to FCC standards. If these devices adhere to FCC standards, you should also have no issues.

48. What does the Non-Wireless Meter (NWMA) Alternative look like?

The NWMA will look very similar to a standard wireless smart meter, however there is a black seal that hoops underneath the meter and visible text under the meter face that says "NWMA."

49. Will residents with the NWMA still have to call in a power outage?

A NWMA customer will still have to call the utility to report a power outage. This is because with a standard wireless smart meter, the meter can directly communicate with the utility via wireless signals. Without these wireless signals communicating, the utility has no way of remotely telling whether a power outage has occurred at a residence or business.

50. Will sun spots affect the collection of data from the smart meters?

Radiation from the sun will not affect the collection of data or transmission of radio signals to and from the smart grid.

51. Has the city considered installing an RF shield between the meter and home?

The meter box itself and any wood, metal or other materials in-between the elements and you act as a significant shield from RF. It is highly likely that others in your neighborhood have wireless internet, satellite TV and numerous other sources that penetrate your home on a regular basis. The smart meter on your home will operate at a lower power than these devices. Please remember that the smart meter power density is 12,000 times lower than the FCC limit for a person sitting 20 cm in front of a smart meter for a 30 minute time period.

52. My WiFi is not working after my meter was replaced. What should I do?

When the city performs a change out of your electric meter this causes a brief power outage in the home. It is common for a WiFi router to require a hard reset after experiencing any type of power outage. In order to reset your WiFi router please unplug it from its power source, wait approximately 30 seconds and plug it back in. Please give the router approximately 5 minutes (this time may vary based on model type) to reset and then try connecting to the web via your computer or other web enabled device. If you are still having issues please contact your internet service provider (Comcast, AT&T, etc.) and they will help troubleshoot your issues.

53. If choosing the Non-Wireless Smart Meter, could the home owner waive the fee and provide/send the information to the utility company?

No, a utility trained employee needs to download the information onto a PC and then upload the data into the City's billing system.

54. How will we know/ can we check to see how many minutes per day the smart meter is actually transmitting and/ or receiving data?

There is no way for a customer to check how many times or minutes the meter is transmitting per day. This is because this is an inherent feature of the meter as it has been programmed by the City to communicate to the utility. For the Naperville-designed mesh network, a residential meter that is not acting as a relay for other meters would transmit an average of 26 times per day. The total seconds per day such a residential smart meter would transmit is 2.2 seconds per day.

A worst case scenario is a residential meter that is acting as a relay for 25 other meters and would have up to 881 daily transmittals. The total seconds per day that such a residential meter would transmit would be 76 seconds per day. This event is highly unlikely; however, given that the system has been designed to limit the number of hops a meter takes before being collected by a receptacle. The bottom line is that there is a very limited amount of time the smart meters will

transmit in the NSGI deployment and this is a key variable driving the very low RF power density that a customer will see from the smart meter on their home or business.

55. Does the smart meter emit Radio-Frequency (RF) when not transmitting and/ or receiving data?

No, the meter does not emit any radio frequency when the meter is not transmitting or receiving data.

56. Is there mercury in the Elster Smart Meters in Naperville?

The Elster Smart Meters in Naperville do not contain mercury.

57. Were the meters that were used by the city for radio frequency testing provided by the manufacturer or were they selected at random off production lots?

The meters that were tested were both supplied by the manufacturer and randomly selected. Please note that 10 different smart meters and associated equipment were tested during the City's RF testing.

58. Can the new smart meters increase the chance of having a fire?

Fires in homes have been linked to improper installation of meters, which could happen with electromechanical or digital meters, or faulty wiring in the home. Smart meters are safer than a customer's current electromechanical meter, because if there is something wrong with the meter, it will alert the utility and an employee can come out and immediately troubleshoot the problem. With the old electromechanical meter, if it is installed wrong or not operating correctly, the utility would not know this unless you had a problem or identified the issue yourself. Please note that due to the smart grid initiative in Naperville and the installation of new meters, the City has identified a handful of electrical issues in the homes of residents that could have resulted in fires.

59. If a customer selects the Non-Wireless Meter (NWMA) and that meter later has problems, could the meter problem cut off all power to the house or would power continue to flow to the house? This happened in the last few years to an analog meter the customer had, and power continued to flow.

It is possible for any meter to have problems. Whether or not power cut off would be a case by case basis. One of the significant advantages of the smart meters in Naperville is that they communicate wirelessly with the utility. This way if there is an issue with the meter the utility is notified immediately and can come out and either fix or replace the meter.

60. If a customer selects the Non-Wireless Meter (NWMA) would it be possible in the future for appliances equipped with the appropriate technology to communicate consumption specific to the appliance to the NWMA?

No, the NWMA does not have any wireless technology installed and therefore cannot communicate with any devices or appliances in the home.

61. How can I tell if my smart meter is acting as a relay for other meters?

There is no way for the customer to determine if their meter is acting as a relay for other meters in the vicinity (meters that send data back to the utility for other meters are acting as a "relay" as opposed to a "gateway"). For the Naperville designed mesh network, a residential meter that is not acting as a relay for other meters would transmit an average of 26 times per day. The total seconds per day such a residential smart meter would transmit is 2.2 seconds. Software updates, bug fixes, and parameter changes can be updated remotely and while this will increase the number of transmissions, it will not be by orders of magnitude. Additionally, these types of changes are not expected to be frequent in nature.

The mesh grid in Naperville has been designed such that the number of "hops" or "communications" between relay meters would be 0, 1, or 2 "hops" on average. The city needs to balance the number of hops with the reliability of each read and topography of the city so this number may change slightly during the deployment. A worst case scenario is a residential meter that is acting as a relay for 25 other meters and would have up to 881 daily transmittals. The total seconds per day that such a residential meter would transmit would be 76 seconds per day. This event is highly unlikely, however, given that the system has been designed to limit the number of hops a meter takes before being collected by a receptacle.

62. If a customer chose the standard smart meter (SSM) and had a problem develop, could she later have the NWMA meter installed?

Yes, a customer may opt into the NWMA by notifying the utility of their desire to have the standard smart meter removed. All associated fees with the NWMA will then be applicable.

63. Does a garage-mounted charger for an electric vehicle talk Zigbee to the meter to know when to start charging or does the car get programmed to start on Naperville's known low-cost time slot?

All commercially available plug-in electric vehicles available at this time use ON Board charging intelligence. The car can be programmed to start charging at a pre-specified time. The car needs to be plugged into the charging station to charge.

There is currently no recognized "car to meter" interface available to commercially available vehicles.

64. Are the smart meters being installed on fire proof boards?

The meters are not installed on fire proof boards however they are installed on Grounded meter troughs. Each meter trough is grounded with its own 8' Copper ground rod per NESC and NEC electric codes. The only instance of arcing would occur if the meter socket, inside the trough, itself was broken. The installers are trained to recognize broken troughs and report them to the utility. DPU-E then dispatches a service truck to make the socket safe until an electrician, paid for by the utility, comes and makes the necessary repairs. Most people do not realize their socket is damaged and this could be hazardous if the grounds did not exist. The damage is typically caused by lack of frost loops when the service was originally installed. The freeze and thaw cycle of the seasons then stretches the cable pulling on the connection until they crack. This is when the arcing could occur.

65. How do I manually read the usage on my smart meter?

For the Rex-2 residential meter the customer should look for the value that is followed by **kWh**. This value will be the total number of kilowatt hours the home has used.

66. Will smart meters have an effect on metal implants (e.g. hip replacement, etc.)?

No. Smart meters have lower radio frequency emissions than cell phones; moreover, the strength of smart meter signals diminish rapidly with distance, so the general proximity of a customer and the meter will also limit one's RF-exposure. If cell phones do not cause a problem with your implant, then a smart meter should not.

67. Is there a standard wireless smart meter (SWSM) available that would have a remote antenna that could be attached to the meter via a co-axial cable and mounted away from the meter so as to reduce exposure to RF and if so, what is the cost for that?

No, the only two available options are the standard wireless meter and the non-wireless meter alternative (NWMA).

68. Couldn't the smart mater have a problem and lock into 24/7 transmission of data, thus exposing him to more RF? How would the utility know if that happened and what steps would be taken to mitigate this?

Smart meters perform a self-test every 24 hours and after any power restoration to determine if they are operating properly. The self-test ensures that the meter is functioning properly and its displayed quantities are accurate. Any errors encountered will be displayed on the LCD. Furthermore, standard wireless meters are programmed to transmit interval data from your meter to the utility each day. Should your meter malfunction in any way, there would be a disruption to

the data that is collected from your meter. The utility will detect this disruption and utilize the error code from the meter to take the appropriate action and correct any issues with your meter.

69. According the manufacturer's design specification, how much power does the highest power (smart) meter use when it is not transmitting?

0.25 Watt

70. Given the following:

a. Customers are billed for usage measured in kWh,
b. Power usage in kWh is the integral from 0 to "t" of the instantaneous voltage times the instantaneous current where "t" is the billing time interval.

When the meter displays 1 amp, how many watts am I using?

Residential is at 240 V nominal, 240 V X 1 A = 240 W.

71. If a customer applies for the non-wireless meter alternative (NWMA) and then wants to have the standard wireless meter installed instead:

1) Do customers get their initial $68.35 back?

No, if customers make the choice to have the NWMA installed, the $68.35 would not be refunded as this is the additional purchase price for that meter. The $24.75 meter reading fee would be removed from their monthly invoice.

2) Who do customers contact to have the standard wireless meter installed in place of the NWMA?

Customers would need to contact the Finance Department to initiate the meter change out from NWMA to standard wireless smart meter (SWSM).

Smart Meter Security Questions

1. **The Washington Post reported in December 2009 that "Technologists already are worried about the security implications of linking nearly all elements of the U.S. power grid to the public Internet. Studies show that the information that the power company may be able to glean include whether a house has an alarm system and how often it is activated..."**

   This is a valid concern and the basis for why the National Institute of Standards and Technology (NIST) Smart Grid Cyber Security and Personal Information Privacy Standards were put into place in 2009. In addition, the U.S. Department of Energy (DOE) is ensuring that all Smart Grid Investment Grant recipients, including the City of Naperville, have their entire cyber security plans reviewed by cyber security experts in the federal government.

   The NSGI includes a cyber-security plan that has undergone extensive review and has been approved by cyber security experts in the federal government. The plan's purpose is to ensure secure communications between the utility control network, Naperville's Information Technology (IT) network, the Internet and the new smart grid infrastructure. This plan includes potential vulnerabilities, the likelihood of those vulnerabilities occurring, their impacts, and a set of mitigation strategies.

   As an added security measure, the city will engage an independent cyber security expert (not associated with the project) to conduct an audit of the strength of the NSGI cyber security design and implementation. The city will make any necessary modifications required by the audit to ensure cyber security.

   A summary of the Smart Grid Security Handbook is posted on the city's smart grid page of the website at www.naperville.il.us/smartgrid.aspx. The summary is an overview of the detailed cyber security plan, available for the public to view, however, for obvious security reasons, the details of the plan cannot be made public.

   The NSGI project team is in ongoing contact with the DOE and is kept apprised of any potential or new cyber security issues identified. The smart grid project team participates in regular webinars with the DOE and other groups to ensure that we are up to date on the latest information.

   Additionally, we collaborate with several utilities around the country to share lessons learned from our respective implementations. These utilities include ComEd in Illinois as well as similar

sized utilities in Colorado and other states. These steps are meant to ensure that this plan and our approach meet the latest cyber security standards and best practices.

2. **Can I see the cyber-security plan?**
No. Due to the sensitive nature of the cyber-security proposal, this document is not available to the general public. However, a summary of the cyber-security plan is posted on the NSGI website at www.naperville.il.us/smartgrid.aspx

3. **Are city officials aware of potential security holes? How will the city deal with breaches and issue consequences? How is the city mitigating security breaches?**
The NSGI cyber security plan thoughtfully considers many different scenarios. Naperville prioritized potential threats and documented the mitigation steps used to reduce the impact of these threats. Threats to the smart grid infrastructure can come from numerous sources, including adversarial sources such as hostile governments, terrorist groups, industrial spies, disgruntled employees and malicious intruders as well as natural sources such as system complexities, human errors, accidents, equipment failures and natural disasters.

With the cyber security solutions the city has selected, the city has included mitigation plans in the requirements. There are no known issues with the solutions selected. Additionally, the cyber security plan addresses how the network will be monitored and what actions will be taken if intrusions are detected. Finally, following an independent audit of the security plan, the city will implement any necessary changes noted by the audit.

4. **Are annual independent audits a part of monitoring and ensuring quality assurance?**
The city is currently discussing monitoring and quality assurance of the smart grid after installation is complete and will provide more details as they become available. The city will keep the public apprised of any determinations via its many communication channels, including the NSGI website at www.naperville.il.us/smartgrid.aspx.

5. **What software safeguards are in place to prevent hacking as demonstrated in the above cited articles?**
The entire smart grid system must be designed and implemented with security in mind. The systems selected for the NSGI incorporate the security attributes that meet cyber security requirements. Naperville's smart grid network has also been built to conform to the National Institute of Standards and Technology's NISTcyber security standards. We are happy to provide a white paper from our automated metering infrastructure vendor that documents some of the security attributes of the selected system.

Additionally, below is a direct link to a summary of Naperville's Smart Grid Security Handbook: www.naperville.il.us/emplibrary/NSGISecurityHandbookSummary.pdf

6. What are the safety and installation requirements?

Naperville's installation contractor will deploy an experienced, full time, on-site project management team consisting of a Project Manager, Quality Auditor / Exceptions Investigator as well as a team of experienced installation technicians that will assist both the project management team and any locally hired installation technicians.

Naperville's installation contractor trains its installers to follow the meter exchange procedure without deviation to prevent improperly seated meters. Other quality control standards in place include meter inspections, voltage measurement, and meter data information comparison to confirm like-for-like meters are exchanged. This will ensure the new meter is seated properly and is working as designed before leaving the job site. If the installer sees any potential safety concerns with the existing meter socket or electric pedestal the installer will call a supervisor to determine if an electrician is to be called to repair or replace the customer's socket or pedestal.

Please note this same rare situation can occur with today's analog and non-smart digital meters. DPU-E has been replacing an average of 4,000 meters per year and has rigorous installation, safety and quality assurance processes to ensure the safety of workers and customers.

Each installer will wear a proper standard uniform, Personal Protection Equipment (PPE), and temporary Naperville credentials and identification on both themselves and their vehicles to effectively represent the city. Naperville's installation contractor also uses a quality assurance process to ensure the installation has been done correctly and the installer is following proper protocol and procedures.

The city also required that the installation contractor provide its health and safety manual for Naperville's review and approval.

7. What penalties will be issued should security breaches occur?

The utility department will monitor compliance with privacy and security requirements with respect to smart grid equipment and information. If hacking of the city's smart grid network is attempted, such attempts will be identified by the City's cyber security intrusion tools and process, and referred to appropriate authorities for criminal investigation. In the unlikely event of an internal breach of privacy, the city will rely on its employee disciplinary procedures and legal processes as necessary.

Finally, as referenced above, the City's Smart Grid Customer Bill of Rights provides for customer

protections and the right of customers to file complaints regarding privacy violations with the City's Public Utilities Advisory Board, and to appeal to the City Council if the complaint is not resolved. The NSGI Customer Bill of rights can be found at:
http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-CBoR-web.pdf

8. **Are the meters programmable? Is the city being given the source codes and schematics for the smart meters, including any updates in the future? ((I know that the general public cannot view these codes. However, will the city require the smart meter vendor to provide these codes for the city to have?). Is it going to be subject to review by independent experts? If there are concerns about security or accuracy of the meters, the city will have the source code archived so that it can be reviewed. Is there someone available who could read/interpret the source code?**
The meters are capable of accepting new software downloads over the air and being reconfigured remotely. These are important considerations when looking at longer term cost of ownership of these devices.

The source code is proprietary property of the vendors. Elster meters supports remote upgrade of meter firmware and radio firmware over the EnergyAxis (Elster's head end software located in Naperville's data center) network.

9. **Is there a way for homeowners to manually read the smart meters so that we can double-check the value reported wirelessly and stored in the electric utility database?**
The meter may be read for consumption by reading the digital read out. The cumulative electric usage values are available on the meter and can read by homeowners to double-check cumulative usage values

10. **What is the maximum amount of error in current readings the hardware will produce? (we want the source codes available for review because the software design could compound error) Is there someone who can interpret this?**
The Elster meters are guaranteed to be accurate to +-0.2%, which is significantly more accurate than the existing analog meters. The accuracy of the meter and the readings sent to the billing system will be validated during the different phases of the system tests.

The source code is proprietary system software of Elster and is their secured property. It will not be released by them. In addition, if there are any issues regarding accuracy of readings or billings, they will be handled through new and existing processes that exist for these types of questions from residents.

11. What information exactly will the meters be reporting? How often will it be reported? (definition of the data packets with descriptions of all included fields- the information collected can certainly allow someone to determine if you're on vacation).

Details on this are available in the recently-published Customer Privacy & Advocacy Handbook, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-CPAHandbook.pdf.

12. Any smart device deployed via wireless grid has the potential for being hacked, giving someone the ability not only to affect the power usage reported to the utility, but also to control power to the home. Therefore, it is imperative that Naperville get and independently evaluate the source code for the meters. What ports will the meters expose?

This information is not public information as it would violate Cyber Security Policies. The NSGI includes a cyber-security plan that has undergone extensive review and has been approved by cyber security experts in the federal government. The plan's purpose is to ensure secure communications between the utility control network, Naperville's Information Technology (IT) network, the Internet and the new smart grid infrastructure. This plan includes potential vulnerabilities, the likelihood of those vulnerabilities occurring, their impacts, and a set of mitigation strategies. As an added security measure, the city will engage an independent cyber security expert (not associated with the project) to conduct an audit of the strength of the NSGI cyber security design and implementation. The city will make any necessary modifications required by the audit to ensure cyber security.

Furthermore, this plan is within compliance of all FERC (Federal Energy Regulatory Commission) and NIST (National Institute of Standards and Technology) standards and regulations. As new standards are released, this plan and any subsequent updates will be planned and made to the system to ensure compliance.

A summary of the Smart Grid Security Handbook is posted on the city's smart grid page of the website at www.naperville.il.us/smartgrid.aspx. The summary is an overview of the detailed cyber security plan, available for the public to view, however, for obvious security reasons, the details of the plan cannot be made public.

13. Will the smart meters support software updates in the field? If so, how are they performed? Wirelessly? Via USB?

Elster meters supports remote upgrade of meter firmware and radio firmware wirelessly over the EnergyAxis (Elster's head end software located in Naperville's data center) network.

14. How will the city handle a case in which a security issue or other error is discovered with a meter software and all of the meters must be updated? Who will pay? What will it cost?

According to the contract, the meter vendor will be responsible for this during the warranty period which is 5 years. As indicated above, if the meters need to be upgraded to new software, this can be done over the network and these upgrades are free of charge to the city.

15. **With the introduction of wireless meters, how will the City of Naperville be able to identify my information apart from other customers' information during collection?**
In simple terms, your smart meter, just like other digital devices that transmit data wirelessly, has a unique, secure and encrypted identification "key" that is tied to the data that is transmitted. When a data set arrives back at the utility this key is recognized by the utility's computer systems as being unique to your account and therefore so is the data. It is important to note that no customer sensitive or personally identifiable information is stored or transmitted by the smart meters.

Project-Specific Naperville Smart Grid Initiative (NSGI) Questions

1. Will you get everything done in three years?

The city is contractually obligated to the federal government to complete the project in three years, with a single one-year extension that will be allowed only in the case of extenuating circumstances.

2. Are you talking to other municipalities doing the same thing?

Yes, Naperville is communicating with municipalities and similarly sized cities across the country, as well as fellow U.S. Department of Energy (DOE) smart grid investment grant recipients through the American Public Power Association (APPA) network.

3. Where do the benefits come from in the business case?

The benefits associated with the NSGI business case will come in the form of lower operating costs at the utility (operational benefits), lower network losses (saving wasted energy) and lower customer energy consumption and demand. Naperville's not-for-profit electric utility is owned by the city and all savings realized by the utility are passed through to customers. All these benefits contribute to assisting customers in managing their energy costs. The abstract of the NSGI business case is available to view at www.naperville.il.us/smartgrid.aspx.

4. Why does this take so long?

The completion of the smart grid and the new smart meter installation in Naperville is a complex and highly technical project. The city is conducting extensive research and due diligence in order to ensure that the program will be successfully deployed. The city feels taking extra time to validate equipment and accuracy is critical to successfully mitigate any potential risks.

5. Why is a PR firm being paid $390,000 to market a product that hasn't passed a proven security assessment by a third party?

The purpose of the Customer Relations and Education firm is to provide information to residents in an accessible and understandable format about a very technical project and its potential impact on the city's utility customers. The city anticipates considerable customer-related and operational benefits derived by the Naperville smart grid project, and it is critical to communicate technical information to utility customers in an easy to understand format.

It is important that customers are made aware of the increased options and choices that the NSGI will create and know how to best utilize these optional elements to best manage their energy consumption, if they choose.

Phase I of the Customer Relations and Education firm contract is for $135,000. There are two additional contract phases scheduled after Phase I, and the City Council must approve any additional phases. Included in Phase I of this contract is the development of the Customer Privacy and Advocacy Plan and Handbook. It can be found online at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-CPAHandbook.pdf

A rigorous cyber security plan for the NSGI has been completed, reviewed and approved by cyber security experts in the federal government. The newly released NIST Cyber Security Standards are the basis for the cyber security and the security features implemented by the project vendors for the NSGI. A summary of the Smart Grid Security Handbook is available to the public on the city's website at www.naperville.il.us/smartgrid.aspx.

6. **Are there members on the steering committee who are able to provide an assessment of the technical issues surrounding the smart meters (i.e. computer/electrical engineers, software developers, and security software developers)? If not, who will do this?**

Yes. The Steering Committee is comprised of the leadership of electric utility, which includes several electrical and computer engineers, as well as the City Manager and two City Council members. There are also security experts on the NSGI Project Team who have been responsible for the design and implementation of security networks for a number of utilities, banks and trading firms who require 100 percent secure networks for similar reasons as have been pointed out in your smart grid articles. In addition, the city has contracted with consultant and vendors that have deployed similar solution for other utilities in the United States.

7. **When is the meter rollout?**

As of August 2011, mass meter installation is scheduled to begin in Q1 of 2012 pending Pilot 2 results.

8. **Intellectual property? What is this? (Chic. Trib. Article "Naperville would own whatever intellectual property is developed for the project) Is Naperville paying for the design and development of the smart meters hardware or software? What intellectual property would Naperville actually receive from the project? Is there anyone on the city staff or city council who is personally, professionally or politically benefitting from the NSGI project?**

Naperville's Department of Public Utilities-Electric is paying for the project, and receives the work performed and deliverables from all contracts related to the NSGI as intellectual property. This includes the capital, custom software and hardware installed, as well as the services required to install the hardware and capital.

9. Who is going to maintain the operation of this project when according to the city no one on the city payroll has the expertise, knowledge and background to manage this project?

Naperville DPU-E employees are working along with West Monroe Partners and the other vendors throughout the project. Significant Vendor training and knowledge transfer is taking place in order to have Naperville personnel take over the operations and maintenance of the system. This effort is proceeding as planned and the Naperville personnel will be ready to take the system over at the end of the project. In addition, the Vendors are contracted to support their software and hardware going forward as a part of the maintenance contract.

10. How will the city handle cases of the EMF sensitive population (potentially 3% of the population approx. 4,000 residents)? Litigation costs? Who pays?

The City will leverage its in-house counsel should the need arise just as they do for other resident issues.

11. Exactly who will be responsible and accountable to realize the savings for the city?

The City will be providing reporting of benefit metrics to the Department of Energy every 6 months. It is important to note that the NSGI business case is positive just based on the distribution energy/demand benefits and the operational benefits. That is why we made all customer programs optional. There are some cities who are implementing Smart Grid where these programs are required (not optional).

12. When will I find out when my new meter will be installed?

A map showing the NSGI meter deployment schedule will be made available via the City's website in December 2011.

13. The AMI system vendor, Elster, is not making a customization of their EAMS software. Additional software coding and testing is required for BizTalk to ensure that the required data is sent to other systems in a usable format. What is the additional cost of any other suppliers to support our system?

There is no additional cost for any other suppliers to support the implementation of the Naperville Smart Grid Initiative (NSGI) system.

14. **The functionality of the current EAMS 7.5 software does not satisfy all of Naperville's requirements which has resulted in additional time and resources to understand and mitigate the missing functionality with other systems. How are we planning on addressing that issue?**
We are addressing the issue with this contract award and with the installation of EAMS 8.0, question 16 below.

15. **Elster EAMS 8.0 release is not scheduled until the end of the first quarter of 2012. How have all of Naperville's contract requirements been satisfied, particularly the pilot testing without having the necessary software and chips?**
The current version satisfies all requirements other than a subset related to complex rates such as time-of-use and demand response. Version 8.0 will allow the EAMS software to accept the additional channels from the meters necessary for the complex rates that will be required by next summer. When 8.0 is installed, there will be comprehensive testing to ensure that the balance of Naperville's requirements are met.

16. **What is the additional amount of coordination required and expense to ensure all vendors are designing and developing to the overall system integration design to make sure that our system is what we have purchased?**
This has taken additional effort by City Staff as well as West Monroe Partners. We have kept this effort within budget due to the extra efforts of our Staff and West Monroe Partners. We are working closely with West Monroe Partners and our vendors to keep future interim deliverables on time to ensure we will hit our future major milestones.

17. **What effect does Elster's delay of delivering their 8.0 software have on this program?**
There is no delay to the overall program and scope and the project will not exceed the original budget. As in all large projects, there have been some delays for initial deployment to address integration issues that have arisen. Handling these delays and keeping the project on time and within budget are part of the project management process. The 8.0 version of the software will allow Naperville to offer the complex rates such as time-of-use and demand response, which has always been planned for the summer of 2012.

The NSGI plan continues to be on time and within budget, and we will have all the meters deployed by Q4 2012 and will be able to begin the deployment of advanced rates and Home Area Network (HAN) technologies in 2012.

18. I recently requested the minutes of the last SNI committee and I received notes. I was told that "we don't keep minutes." What is the justification for not keeping copious minutes, since this committee was in charge of $22 million of taxpayers' money?

The Steering Committee meeting is a senior management level meeting meant to share project progress and identify action items from senior management and council members of Naperville, decisions affecting the scope of the project or the funding would always be brought back to the full City Council for final decision making on the record. Therefore, we record only the action items made at this meeting.

19. How is the city going to ensure the accuracy of customer's bills during and after meter change-out?

Using past experience in successfully completing analog meter change outs, the utility has created a comprehensive business process to ensure a customer's power is interrupted for the least amount of time possible during smart meter installation and that bills reflect the correct amount of usage. Three separate processes are in place to ensure a successful meter change out and resulting utility bill.

First, please note meter readings are stored on the utilities' computer database. During a customer's meter change out, smart meter technicians will take a picture of the current reading on the analog meter to provide an additional record of the customer's usage before the new smart meter is installed.

Second, the utility has consulted with multiple software vendors in addition to its own billing staff in order to ensure the proper safeguards are in place to avoid any incorrect bills being sent out. Examples of these safeguards are software systems that check a customer's bill history against the previous month and previous year's reading for the month in consideration. If the customer's new bill differs significantly from the previous month or year's reading, a flag is placed on this bill that requires DPU-E and Finance to investigate the issue.

Third, these systems exist on both the Finance and the DPU-E side of the billing process, meaning that there is a system of checks and balances in place in each department to further ensure that a customer's bill is accurate.

20. Why doesn't the city install monitoring stations that aggregate data from a development instead of collecting data from the end user?

If we were to only install monitoring stations to gather aggregate data for a neighborhood, the utility would not be able to provide the best possible service to each customer or offer any

optional customer programs that will give residents and businesses more choices on how they use and save energy. Examples of these optional customer programs are time-of-use rates and demand response programs that allow customers to save energy, and therefore money, by voluntarily shifting their usage to off-peak times when electricity can be produced at a lower cost.

21. Regarding smart meter benefits, will the City be receiving voltage measurements from the meter, and then perform Volt/Var optimization (or voltage optimization)?

Yes, the City will be receiving voltage measurements from the meter to detect power outages and to perform voltage optimization.

22. Having a smart meter at the house could allow the utility to perform something called Voltage optimization, correct? I believe if the voltages are, say, 124 Volts, the utility can reduce the voltage to an optimal level around 115 volts? This is better for your appliances, reduces costs to the consumer, and reduces electrical generation requirements, lowering the utility costs? Is this all true?

Yes, it is correct. Lower voltage within allowable limits means less power purchase costs for customer and utility.

23. Today we can tell a customer the week of installation but not a specific day of that week. How does UPA schedule the work?

The City cannot guarantee installation on a specific date or even week; the City can only provide customers with the estimated timeframe in which a given cycle will receive smart meter change out. UPA schedules its work based on the current deployment cycle and available personnel, in addition to factors such as special appointments for meter change out being requested by customers. To upgrade more than 57,000 meters in the 10 month timeframe requires UPA to install meters in an expedient yet thorough manner and a specific day simply cannot be guaranteed.

24. Who are the consultants working on the NSGI and what do they do?

Calico Energy – ePortal (customer facing site) software vendor responsible for design and integration of related software and systems

Elster – Meter manufacturer responsible for overall smart grid mesh network

Northstar Utilities – Software vendor responsible for the meter data management system that collects, validates, and processes smart meter readings

Tropos Networks – Vendor providing wireless mesh backbone equipment and responsible for design of network that relays meter signals back to the utility

Utility Partners of America – Vendor assisting the city in the installation of smart meters and related equipment

West Monroe Partners – Runs project management office (overall day-to-day project operations) as well as being in charge of overall systems integration. Also acting as a technical and communications consultant.

25. How many meters and associated equipment's RF output were tested by the utility?

Under the Naperville Smart Grid Initiative, 10 different smart meters and associated equipment were tested during the City of Naperville's radio frequency (RF) testing process. Please note that these devices have already met Federal Communications Commission (FCC) licensing requirements; were tested by numerous other utilities and third parties, including the Electric Power Research Institute; and been have tested by the electric meter manufacturer, who has a longstanding reputation of being a trusted electric meter provider.

26. Why won't a customer receive a discount on his monthly bill for the new wireless smart meter since our manual meter reading costs are going down? Isn't that part of the $11.10 he currently pays on his bill?

As the cost of energy continues to increase across the country, smart meters in Naperville will allow the utility to both lower Operations & Maintenance (O&M) Costs and implement new savings programs that allow the utility to decrease usage and therefore, the cost of energy. Since energy prices are on the rise, these lower O&M Costs and new savings programs will help the utility to lessen the impact of these rising costs on its customers. It is important to note that the utility is owned by the City of Naperville and therefore all cost savings are passed through directly to our customers.

Naperville Smart Grid Initiative Pilot Program Questions

1. **Can I be part of the pilot?**
   There are two planned pilots scheduled for the NSGI in spring 2011. Unfortunately, for operational reasons we cannot accept volunteer participants.

2. **The city council talked about a "pilot" program... when, where and how is it being conducted?**
   The city has taken steps prior to this project to validate the feasibility of smart meters:
   a. In 2009, approximately 100 digital meters were installed and evaluated for communication functionality in the area of East Highlands (50% residential – 50% commercial). This proof of concept pilot helped the city determine the requirements for the Naperville Smart Grid initiative.
   b. In 2010, 30 smart meters were installed for larger commercial and industrial customers.
   c. There are two planned pilots scheduled for the NSGI:
      i. The first will take place in spring 2011 and will involve beta testing at the Electric Service Center facility to validate basic equipment and system functionality.
      ii. The second will occur in summer 2011 and involve field testing approximately 200 smart meters to test full system functionality and end-to-end business processes, which will include acceptance testing of more than 700 contractual requirements.

3. **Which 3rd party will assist in your beta testing efforts to ensure a non-biased collection and analysis of the data?**
   The city's smart grid technical consultant West Monroe Partners will be involved in the pilot testing as will the vendors/manufacturers to ensure that the proper testing protocols are followed and that the results are within limits set by the DOE and FCC. Additionally, an independent cyber security expert not associated with the project will conduct an audit of NSGI cyber security design and implementation. The city will make any necessary modifications required by the audit.

4. **Have you consulted with other municipalities to establish best practices? How many? Which ones? And what were the results?**
   The NSGI project team is in ongoing contact with the U.S. Department of Energy (DOE) and is apprised of any potential or new cyber security issues identified. The DOE and other groups conduct regular webinars which the NSGI project team attends to ensure that they are up to date on the latest information.

Additionally, the team collaborates with several utilities around the country where each shares lessons learned from their respective implementations. These utilities include ComEd in Illinois as well as similar sized utilities in Colorado and other states. In addition, Naperville is part of the American Public Power Association (APPA), which has regular conference calls to share best practices among the more than 30 municipal utilities that have received Smart Grid Investment Grants from the DOE.

The results of these interactions are integrated into the NSGI implementation plans to improve the approaches to data integration, meter deployment and vendor management practices. There have been more than 20 million smart meters already deployed in the United States, and the city is leveraging the experience of utilities and vendors that have previously deployed these solutions to avoid issues that have arisen in those deployments.

5. Is there a 3rd party governing body made up of experts and citizens to oversee the pilot program? Who? What are we paying them?

The Naperville Public Utility Advisory Board and the City Council are the advisory and governing bodies of the utility, respectively. These individuals are not paid for by the utility and oversee the project. The NSGI Steering Committee is made up of City Council members, Department of Public-Utilities-Electric team members, city staff, West Monroe Partners and Jasculca-Terman. With the exception of the City Council members and staff, the rest are all paid for their Steering Committee roles as part of their contracts.

6. Will you run parallel beta testing on a wired vs. wireless system?

Concerning a wired option, during the Request for Proposal process, no vendor recommended this option due to the cost (which is estimated to be about three times higher than the wireless option).

However, all Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75.

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather

appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

7. Since we have 57,000 analog meters out in the field, what are we planning to do with those meters? What value do they have either for resale or are we stocking any of them?

The old meters will be maintained for approximately 4 months after replacement to address any concerns residents may have with regard to the accuracy of the new meters versus the old meters. Of the 57,000 meters currently in service, approximately 42,000 are analog and 15,000 are digital. Digital meters are currently selling for $30 to $75 on the open market and we plan on selling those meters. There is not a market for the analog meters and they will be sold at scrap value.

Naperville Smart Grid Initiative
Question/Response Inventory
Last updated March 25, 2013

Other National Smart Grid Deployment Questions

1. **How can we guarantee that what happened with Pacific Gas & Electric (PG&E) doesn't happen here?**
   The city is continually monitoring regional, national and international smart grid projects in an effort to understand national and worldwide trends regarding this technology. Through this research, the city is using lessons learned to provide a program that is on-time, on-budget, meets the city's requirements and provides customers the projected benefits.

2. **Will cap and trade kill Smart Grid? Experts say it is a possibility.**
   Any response to this question is speculative.

3. **Why wasn't there thorough research done bringing the issues that other cities are dealing with to the forefront before the City Council selected and invested in a smart meter?**
   How do you intend to remedy the situations in Naperville, that other cities have experienced, in connection to smart meters such as a decline in one's health, security breaches, house fires related to smart meters and appliances and equipment burning out as a result of smart meters?
   The City of Naperville has been following up the smart grid-related technologies for the past 14 years related to Substation and Distribution Automation as well as Digital Meters (aka "Smart Meters"). Being an advanced, forward thinking community, the City of Naperville (along with several hundred other municipal, cooperative and investor owned utilities) applied for and received a Smart Grid Investment Grant as part of the American Recovery and Reinvestment Act. The City of Naperville was the only municipality in Illinois to be awarded this grant. The U.S. Department of Energy, Federal Communications Commission (FCC) and many reputable industry and consumer groups have released studies that say the harm done by radio frequency (RF) and digital meters equipped with two-way communications is inconclusive. Security and safety will be addressed later in this document. Many of these studies are posted on the Naperville Smart Grid Initiative (NSGI) website and are available to view at www.naperville.il.us/smartgrid.aspx.

   For the NSGI project, the city has noted the issues that have occurred in other installations and has a quality control plan to mitigate these occurrences. First, the city has required its vendors to test every meter that leaves their warehouse for shipment to Naperville. Also, Naperville's Department of Public Utilities-Electric staff will also test meters as they arrive, before they are certified for installation. Finally, as meters are installed, the city will conduct manual meter reads for three months after installation. The manual readings will be compared to the automatic reads

from the new meters. They will also be compared to historical data to determine if there is a potential issue. After these steps, if a meter is found to be in error it will be promptly replaced.

As a practice, the NSGI project team monitors all smart grid media reports on a local, regional, national and international level in order to understand and learn from what is happening around the country and world with other smart grid deployments. The city is confident these types of issues experienced in other smart grid deployments will not be replicated in the NSGI implementation. Additionally, the NSGI team is in contact with other utilities implementing smart grids to share challenges, lessons learned and best practices.

4. **The Associated Press reported on March 26, 2010 that "Many researchers say wireless smart meter technology is being deployed without enough security. 8 million smart meters have been deployed by utility co. already."**
The cyber security plan includes security inspection and review of all of communication solutions being deployed as part of the NSGI communications systems. The DOE has reviewed the NSGI cyber security plan and has accepted and approved it as meeting the National Institute of Standards and Technology (NIST)-specified Cyber Security Standards. The DOE has stated that the city's plan addresses all cyber security issues. Additionally, the city is holding all NSGI vendors to the same standards. All vendor hardware, software and network components must conform to the highest NIST standards. As an additional precaution, an independent cyber security audit will examine the vendor designs.

5. **In California, Pacific Gas & Electric (PG&E) are delaying installation in Fairfax, CA, and are being forced to abide by a one year moratorium on installation. Why?**
The reason for the PG&E delay is to address the analysis of the inaccuracy issues found during its deployments. The main issue relating to the inaccuracy of the PG&E meters was in the installation/set-up of the new gas automated metering infrastructure (AMI modules, not electric) modules, which were calibrated incorrectly during installation. They also found an issue in the corresponding IT systems that caused minor accuracy issues.

The NSGI system does not have any gas meters in the initial deployment. Regardless, these issues could have been avoided by better quality assurance (QA) processes, which we alluded to in the previous question and corresponding responses. There has not been any significant accuracy issues associated with electric smart meters since these problems occurred last year. Manufacturers and utilities are doing a much better job of quality control in light of these issues. The metrology portion of the smart meters is very well tested and deployed in the field.

Digital meters have been deployed since the 1990s and have been found to be more accurate than the analog meters they replace. As noted above, part of the NSGI program will be do a full system validation and manual meter reading as part of the 100 meter pilot program to ensure no billing inaccuracies are introduced in any part of the process.

Naperville Smart Grid Initiative
Question/Response Inventory
Last updated March 25, 2013

Utility Operations Questions

1. Why can't you just monitor on paper?

The cost of human resources for monitoring on paper is greater than monitoring by collecting data with computers.

2. Can you read my meter locally (not with reader)?

The need for human meter readers is eliminated with the use of smart meters. All customers will get a new smart meter that will communicate wirelessly with the Department of Public Utilities-Electric.

3. What's SCADA?

SCADA is an acronym for Supervisory Control and Data Acquisition. The existing Department of Public Utilities-Electric SCADA system is used by our system controllers to remotely monitor and control our substations. This existing system is the backbone to a smart grid.

4. What is load?

"Load" is utility terminology for any electrical device that is connected to the electric distribution system and is drawing power from the utility. "Source" is utility terminology for the power available in an electric distribution system.

5. What type of network will you use?

We will be using a "mesh" network, similar to the ones currently utilized by area hospitals, libraries, the downtown area and the police/fire radio network.

6. Can power be switched off to individual homes? What are the specific conditions under which power is reduced or switched off to individual homes? What percent of time can it occur, and for how long?

From the beginning of this project, the City Council realized customers needed to be involved in the NSGI. As such, they directed creation of a document called the Smart Grid Customer Bill of Rights. This document lists the inherent rights of the utility's customers, including the right to be informed, the right to privacy, the right to options, and the right to data security. Included in the Customer Bill of Rights is a statement that says the city will never ration electricity.

Please note that power can currently be turned on or off to an individual home. The same guidelines would apply with the smart grid as with the current electric grid. There are certain occasions currently when power would need to be turned off at a home, including:

1. When the owner cancels electric service

2. Under current utility guidelines used for non-payment
3. When the police or fire department would require the power to be turned off

7. Who will be in possession of the raw data and will Naperville have access to it?

Only the Department of Public Utilities-Electric will have access to the raw data on its servers, and the information will be used solely for billing and network operations. This data will allow the utility to better forecast energy use over time and will allow better negotiation of future contracts for energy purchases. The NSGI will be able to reduce the city's peak demand by 2 percent and reduce energy consumption by 1 percent through more efficient operation of the network. This would result in significant savings to the utility, and, as Naperville owns its own not-for-profit utility and passes along any savings realized, its customers.

8. Is Naperville committed to a periodic review of all the facets of data collection, storage, and use by an independent body?

Naperville submits annual reports to Federal Energy Regulatory Commission (FERC) regarding operation of the electric utility, including information regarding Automatic Metering Infrastructure. As deployment of smart grid projects are a recent development across the country, FERC is currently adding new standards to include smart grid reporting in its requirements. Naperville is committed to complying with all FERC regulations regarding Automated Metering Infrastructure data management.

The City of Naperville also reports to the North America Reliability Council (NERC) regarding the cyber security of its electric utility operations. All smart grid systems, including Automated Metering Infrastructure, are part of Naperville's reporting requirements. Naperville is obligated by law to comply with NERC and will be audited by NERC.

Naperville will also be audited by the U.S. Department of Energy to ensure compliance and adherence to plans submitted relating to the Smart Grid Investment Grant.

9. If an electrical fire, burn or shock occurs in the home or business where a smart meter is installed, what recourse does the occupant have? How will the city mitigate the issue?

The city will continue to adhere to stringent safety standards as it moves forward with the NSGI program. However, as described above, if a customer believes they have a damage claim as a result of the installation of a smart meter, they may contact the smart meter installer at a phone number that will be provided by the City and may also file an incident report with the City's Claim's Administrator. City incident report forms may be obtained by calling (630) 305-5559. Each claim will be individually investigated. .

10. With the fire hazard concerns discussed in the media, who will be installing the smart meters? How have they been trained/certified to install this unique technology?

Naperville's installation contractor will deploy an experienced, full time, on-site project management team consisting of a Project Manager, Quality Auditor / Exceptions Investigator as well as a team of experienced installation technicians.

Naperville's installation contractor trains its installers to follow the meter exchange procedure

11. Why can't we piggyback off the existing infrastructure (coaxial cable, phone line, etc.) to implement a hard wired solution that will put to ease the concerns that have been brought to council? Please provide a detailed and technical description of this answer.

The existing infrastructure that you refer to is not owned by the City of Naperville or the electric utility. Additionally, no vendor proposed a wired solution.

However, all Naperville residents and businesses will have the option to formally select the non-wireless meter alternative. The customers would be charged via their electric utility bills for the (1) one-time incremental cost to provide a non-standard smart meter with wireless functionality removed and (2) the monthly incremental cost to manually collect interval energy information from the meter for billing and utility operation purposes.

For a residential customer that elects this option, the one-time cost (meter cost difference) is $68.35, and the monthly cost (manual read of meter) is $24.75.

All customers must have a smart meter (wireless or non-wireless) so that Naperville's Electric Utility can realize the intended benefits of the NSGI. The smart meters record four different electrical values in 15 minute intervals (instead of once a month) allowing the city to gather appropriate data for benefits such as demand response programming, and system performance analysis and optimization.

12. Exactly how many times per day will the meters transmit data? Is this the same for residential and commercial?

For the Naperville designed mesh network, a residential meter that is not acting as a relay for other meters would transmit an average of 26 times per day. The total seconds per day such a residential smart meter would transmit is 2.2 seconds per day. This number will not be magnitudes higher for a single meter with no others in the mesh. Software updates, bug fixes, and parameter changes can be updated remotely and while this will increase the number of transmissions, it will not be by orders of magnitude. Additionally, these types of changes are not expected to be frequent in nature.

A worst case scenario is a commercial and industrial (C&I) meter that is acting as a relay for 25 other meters and would have up to 909 daily transmittals. The total seconds per day that such a C&I meter would transmit would be 78 seconds per day.

This very low amount of time the smart meters will transmit in the NSGI deployment is a key variable driving the very low RF power density that a customer will see from the smart meter on their home or business.

13. Please explain in detail how the mesh network will work and provide a detailed drawing of it.

Please find attached a paper by the meter manufacturer and communications infrastructure vendor Elster describing how a mesh network works.
http://www.elster.com/en/downloads/Mesh_networks_and_outage_management.pdf

14. How many hops will data transmission take to a collector meter before being sent to the utility?

This will depend on the final design which is being defined as of this writing. As of right now, the design estimate is that the vast majority of the meters will be 0, 1, or 2 "hops". The city needs to balance the number of hops with the reliability of each read and topography of the city so this number may change slightly during the deployment. This is a lower number of hops than previous deployments have optimized around. This design supports the very fact communication that is desired and also decreases the worst case transmission duty cycle of a smart meter on a home or business.

15. Where will the collector meters and/or gatekeepers be located throughout the city?

This is currently being defined as of this writing, but they will not be located on customer property.

16. What additional transmissions will take place through the mesh network?

Additional transmissions may include:

- Repeating communication messages in the case of failed message transactions
- Identifying potential outages
- Firmware upgrades
- On Request meter reads
- Sending pricing information for use by optional HAN devices

These additional transmissions have been included in the estimates for meter transmissions

previously noted.

17. Can't all the distribution benefits happen without the new meter?

This is not completely accurate. Without the smart meters continuously communicating power integrity information to the city's electric utility, localized "neighborhood" outages cannot be detected until a customer arrives at home and notifies the utility, therefore adding unnecessary time to outages and increasing the costs to address these issues. Each smart meter allows the utility to instantly know if there is a power outage at a particular location or if power quality issues exist. The Department of Public Utilities-Electric System Controllers in general will have additional information to better manage the electric grid and restore power outages with greater efficiency.

In conjunction with meter installation, other electric infrastructure improvements are being made that will ensure the municipally owned asset Naperville enjoys continues to be reliable and viable. Smart meters and associated NSGI equipment are critical to the ability of the grid to handle new digital technologies such as plug-in electric vehicles and home area networks that are coming into the consumer market. Without the smart meters, customers will not be able to participate in energy efficiency programs, charge plug-in hybrid or electric vehicles in the future and ultimately sell energy back to the grid if they choose. Without the smart meters, the electric utility does not know the exact power quality condition at every metering point and cannot fine tune energy management. With smart meters, the engineering and planning staff will have better information on the utility's assets and its condition and can more effectively plan for the future.

Ultimately, the smart grid will help the utility and its customers combat rising electricity prices through the implementation of both utility and customer savings programs. This is a win-win situation as Naperville's not-for-profit electric utility is owned by the City and all savings realized by the utility are passed through to customers.

18. What are the testing protocols? How will you test functionality? How will you test data security?

Each functional team is preparing use cases and test scripts that will be used to prove functionality, security and data integrity. This will consist of hundreds of hours of testing and the city is also adding two additional tests to the program. Those include a "duty cycle" test which will demonstrate how long the meter is on during transmission and a power density test which will demonstrate how much RF power is being transmitted from the meter. Additionally, an independent cyber security expert not associated with the project will conduct an audit of NSGI cyber security design and implementation. The city will make any necessary modifications required by the audit.

19. How will you test health safety?

The city is preparing to spot check the Radio Frequency transmitted power from the meters through a power density test to ensure that it falls within the expected limits that have been calculated for the NSGI system. For more information concerning Radio Frequency relating to smart meters, visit our website at http://www.naperville.il.us/smartgrid.aspx.

20. How will you test system reliability?

Built in to the pilot testing, the plan includes testing of more than 700 vendor contractual requirements for the smart grid system. Among these requirements are reliability tests. The city is building an infrastructure with a disaster recovery site so that reliability is maintained even in the case of a major disaster. Finally, the city will be manually reading the meters for three months following installation and comparing those results with the automatic reads to ensure proper system configuration and reliability of billing information.

21. How will you measure RF before install and after?

Yes, as stated above, the city will do a RF power density test of the wireless smart meters during the pilot to ensure that the resulting RF power density level is meeting the expected ranges.

22. How will you measure transient electricity before and after a smart meter install?

The Advance Meter Infrastructure (AMI) technology chosen for the NSGI program uses wireless communications and is not designed to emit transient energy or a magnetic pulse on the A/C lines. The smart meter data is transmitted through a wireless transmitter to the AMI gatekeeper that is not located on any customer's property. There is a form of AMI technology that does communicate over the power lines (commonly known as PLC or power line communications), but this is not what will be deployed in the NSGI project.

23. How will you mitigate any unsafe readings?

Any meters failing to meet all FCC standards will be replaced.

24. How will you test electrical integrity of homes & businesses before, during, and after the install of a smart meter?

First, through the field pilot, the city will interact with residents to ensure that they have not experienced any adverse events in their electrical service. During the deployment, the city will have open lines of communication with the residents and the installation team to ensure that residents do not experience any adverse events. Service teams will respond quickly to any adverse events that are reported on an ongoing basis.

25. If there are electrical issues, how will you mitigate and who is responsible?

If a resident has a damage claim associated with installation of a smart meter, the vendor/installer

should be contacted at a customer service number that will be publicized by the City. Once the smart meters have been fully deployed, customer complaints of damages or injury should be filed with the City's Claim's Administrator. Incident report forms may be obtained by calling (630) 305-5559.

26. How does the city plan to reimburse citizens who are impacted with health implication as a result of the smart meter roll out?

Customers who believe they have suffered an injury as a result of the City's electrical system may file an incident report with the City's Claim's Administrator. Incident report forms may be obtained by calling (630) 305-5559. Each claim will be individually investigated.

27. How will you measure RF transmissions?

The city either will purchase or lease the equipment or service for testing.

28. How will you guarantee there is zero RF transmission entering our homes?

Since there are already many devices emitting RF in public buildings and private residences (e.g. cell phones, cordless phones, baby monitors, wireless internet routers, etc.), the city cannot guarantee that zero RF transmissions will enter your home now or after smart meters are deployed. In addition, mesh networks already exist within the City of Naperville. They are in use at Edward Hospital, the Naperville Public Library, downtown Naperville and by the Police/Fire radio network. For more information on Radio Frequency relating to smart meters, visit our website at http://www.naperville.il.us/smartgrid.aspx.

As part of the pilot test, the city will characterize the loss of signal from the meter into the home, which is expected to be significantly lower than RF Power Density measured in front of the meter and previously stated. The city expects that the signal level will be 40-60 times lower in the home directly behind the meter as compared to the previously stated power density values in front of the meter. This decrease in RF power density inside the home will be based on meter location and construction materials.

29. How will you guarantee there are no RF transmissions permeating our backyard living space?

Since there are already many devices emitting RF in public buildings and private residences (e.g. cell phones, cordless phones, baby monitors, wireless internet routers, etc.), the city cannot guarantee that zero RF transmissions will permeate your backyard living space today or after smart meters are deployed. In addition, mesh networks already exist within the City of Naperville. They are in use at Edward Hospital, the Naperville Public Library, downtown Naperville and by the Police/Fire radio network.

30. Doug Krieger stated at the 2/1 council meeting that he "guarantees" these meters are safe. Please state the basis for this comment.

Based on the NSGI Project Team's research and the selected vendor solutions, as well as what has been learned and calculated based on input from industry and government experts, the team is extremely confident that this solution is well within safety limits established by the FCC, DOE and industry best practices. The calculated worst case RF power density for the solution and configuration to be used in the NSGI project is 125,000 times less than the FCC limit as measured 1 foot in front of the meter. As part of the pilot, the NSGI project team will validate its calculations and system performance based on actual system performance in the field.

31. Who will be running the project once WMP has completed their installation roll out approx. 4/2012? Since according to the council WMP and J/T were hired b/c no one on the city staff had the technical background to implement the program. How much will it cost?

DPU-E is and will be responsible for maintaining the new smart grid solutions and Demand Side Management programs being driven by the NSGI. Vendors were selected to help run the implementation on an accelerated time frame. Part of the project includes training and knowledge transfer to the DPU-E and City employees that will operate the NSGI processes and systems on a daily basis in the future.

32. Why do we need to upgrade a system that according to the DOE is currently 99.97 % accurate?

The City has been planning this upgrade for several years. For reasons why, please refer to the NSGI business case summary, available at http://www.naperville.il.us/emplibrary/Smart_Grid/NSGI-BizCaseFundamentals.pdf.

33. What is rate structure going to look like? How are we going to save money when our appliances aren't smart? What is the reality that most of our electrical behavior is "shiftable" beyond what we are already doing to conserve electricity? Why do we need a smart meter to help us further conserve? We already know when peak demand is and we have a flat rate (.08c/kwh), is the city going to be increasing the rate/kwh more than .08 cents? If so, how much? Is there a maximum amt. of profit that will be allowed to go into the "Enterprise fund?" What is the cost/benefit comparison to utilizing "time of use"/Real-Time-Pricing programs such as ComEd and Ameren offers?

The Smart Grid will allow for optional tools and programs that can help customers manage electricity costs. Customer ePortals will give customers insight in to their daily electricity costs and usage. Optional Home Area Networks, when paired with a new meter, can give customers advanced control over their home. The City's ePortal solutions will let customers see peak and off-peak usage if they're enrolled in a program where that has an impact on price.

Regarding the rate structure, Naperville is currently evaluating customer electric rates this year. This information will be finalized within the next few months.

The cost/benefit to "time of use" rates is difficult to predict, based on each customer's usage patterns. Customers that choose to shift larger loads to off peak hours will pay a lower rate on those loads, which may bring down the overall cost compared to a flat rate. Naperville is not considering a real-time pricing program at this time. It is important to note that these time of use rates will be optional for our customers.

While it is feasible to feed wind and solar power back into the grid, Naperville is currently evaluating this for its grid. A residential wind and solar ordinance was under consideration in early 2011.

Also, the DPU-E is a non-profit department of the city so all the savings that are obtained through this project will go back to its rate payers in the form of lower rates in the future.

34. What is the average annual tax/cost increase/decrease to the average Naperville customer and if the answer is an increase, why would we consider this at this time considering the economy?

As an entirely independent project from NSGI, Naperville is currently evaluating customer electric rates this year. This information will be finalized within the next few months. As for taking on this project at this time, the City is capitalizing on an opportunity to have 50% of this project budget (About $11M) matched by a federal grant. This is a project the City planned to complete in the near term anyways, but the funding opportunity provided a unique window of opportunity.

35. Do businesses pay a different rate than residential customers in Naperville? Why are there different rates?

Yes, businesses pay a different rate than residential customers. Naperville's electric utility conducts rate studies to determine the appropriate rates to charge different classes (e.g. residential and business) of customers. These rate studies are based on how different classes of customers use energy. When conducting a rate study, the company conducting the study will analyze how much businesses contribute to peak demand and overall energy consumption and design rates accordingly.