

MEETING DATE: October 20, 2020

ITEM NUMBER: 6.A

SECOND READING: NA

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TYPE OF ITEM: Study Session

PRESENTED BY:

David Hornbacher, LPC Administration, david.hornbacher@longmontcolorado.gov

SUBJECT/AGENDA TITLE: CIP ELE099 Advanced Metering Infrastructure discussion

EXECUTIVE SUMMARY:

During the September 8, 2020 City Council meeting review of the LPC CIP budget, additional questions were raised regarding ELE099 AMI. At the October 6, 2020, City Council Study Session, a brief project update was provided by LPC Executive Director David Hornbacher. Additionally, staff committed to provide a broader project discussion at the October 20, 2020 Council Study Session.

This is the largest LPC project of the 2021 budget, which will transform the current manually read electric meter system to a robust, 2-way communication system that provides the framework and the technology to engage with our customers regarding energy use, the integration of Distributed Energy Resources (DERs) and electric vehicles (EVs), creation of a connection between renewable energy production to consumption, and other activities and policies essential to reach the goal of 100% Renewable Energy by year 2030. The 2021 budget is the second year of this three-year funded project. Electric rates for 2020 and 2021 that support the overall LPC budget as presented were approved by City Council in December 2019.

Approval of this CIP in the 2021 budget does not approve or disapprove the specific technology approach to the Advanced Metering Infrastructure (AMI) project. While we believe based upon industry standards that a wireless solution is both feasible and likely most economically advantageous, we are continuing to explore wired or hybrid solutions that may include and utilize the City's extensive NextLight fiber system. We are not at that final stage and welcome continued community discussion of alternatives to address customer potential concerns as well as to identify the overall optimum solution for Longmont. At a future date, the contract for the selected AMI technology will be brought before Council for review and approval.

This Study Session presentation will include several speakers to discuss health and technology solutions. They include Boulder County Public Health, Dr. Timothy Schoechele, Smarthome Laboratories LTD, and Rick Schmidt, Consultant (formerly Black and Veatch Consulting, LLC).

COUNCIL OPTIONS:

Provide staff direction regarding the AMI project and the associated 2021 Budget item CIP ELE099 Advanced Metering Infrastructure.

RECOMMENDED OPTIONS:

Approval of 2021 budget funding of CIP ELE099 Advancing Metering Infrastructure as presented in the 2021 Budget document.

FISCAL IMPACT & FUND SOURCE FOR RECOMMENDED ACTION:

In 2019, the estimated cost for this project was projected to be approximately \$16M. Electric rates were set for 2020 and 2021 to collect \$2.5M each year for this project. The project timeline was estimated to be three years with funding sources coming from rates and Electric and Electric Community Investment Fee fund balances. The annual CIP budgets for ELE099 are as follows: 2020 - \$2.5M; 2021 - \$7.5M; and 2022 - \$6M.

The AMI project was introduced/presented to Council as part of the electric and water rate studies in 2019. Those 2019 presentation dates were April 16, June 11, July 9, August 6, August 27, and September 24. First reading for the proposed 2020 and 2021 rates was October 22, 2019, and rates were ultimately approved after a public hearing and 2nd Reading on December 3, 2019.

BACKGROUND AND ISSUE ANALYSIS:

Within the United States, there are over 80 million smart meters in use that meet or exceed the Federal Communications (FCC) requirements. The dominant technology is wireless and utilizes a low power Radio Frequency (RF) signal to transmit data between the meter and the utility. As fiber deployment occurs in communities to provide access to high speed communication and internet services, a wired or hybrid solution to electric metering and customer interface may be an option.

Regarding the potential of health risk, LPC relies on the expertise and research conducted by agencies such as the Centers for Disease Control and Prevention (CDC), the Federal Communications Commission (FCC), the American Cancer Society (ACS), and other renowned organizations and agencies; some of the very same organizations that are trusted for COVID-19 facts, health risk, and response. Literature from these and similar organizations indicate that the RF emissions from Smart Meters are unlikely to produce any adverse health effects to humans. Attached to this communication is additional research literature to further Council awareness.

Health discussions include a focus on the level of RF level used for Smart Meters communication. The RF signals from Smart Meters are not continuous, commonly

transmitting a data package at 15-minute intervals. This intermittent transmission is a fraction of other common devices in use including WiFi routers and cell phones. Further, the level of RF signal from smart meters is categorized as “non-ionizing,” which is perceived as harmless to humans. To better understand the relation between RF signals and health, the following research literature excerpts are provided.

From the National Institute of Environmental Health Sciences:

<https://www.niehs.nih.gov/health/topics/agents/emf/>

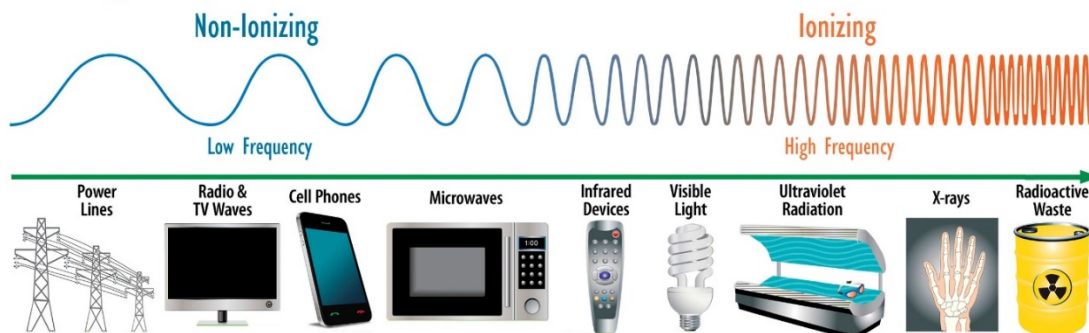
“Electric and magnetic fields (EMFs) are invisible areas of energy, often referred to as radiation, that are associated with the use of electrical power and various forms of natural and man-made lighting. EMFs are typically grouped into one of two categories by their frequency:

- **Non-ionizing:** low-level radiation which is generally perceived as harmless to humans
- **Ionizing:** high-level radiation which has the potential for cellular and DNA damage “

Radiation Type	Definition	Forms of Radiation	Source Examples
Non-ionizing	Low to mid-frequency radiation which is generally perceived as harmless due to its lack of potency.	<ul style="list-style-type: none"> • Extremely Low Frequency (ELF) • Radio Frequency (RF) • Microwaves • Visual Light 	<ul style="list-style-type: none"> • Microwave ovens • Computers • House energy smart meters • Wireless (wifi) networks • Cell Phones • Bluetooth devices • Power lines • MRIs
Ionizing	Mid to high-frequency radiation which can, under certain circumstances, lead to cellular and or DNA damage with prolonged exposure.	<ul style="list-style-type: none"> • Ultraviolet (UV) • X-Rays • Gamma 	<ul style="list-style-type: none"> • Sunlight • X-Rays • Some gamma rays

In graphic form, the electromagnetic spectrum from non-ionizing to ionizing:

Electromagnetic Spectrum



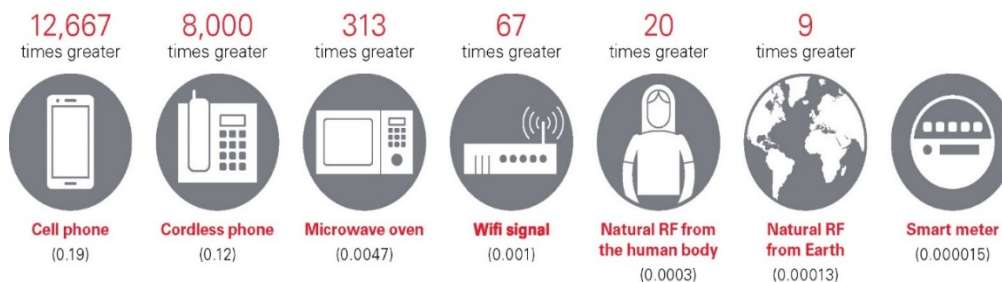
More specifically, the level of RF comparison from a Smart Meter to typical household devices:

From the FCC RF Safety FAQ –

<https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety#Q2>

Radio Frequency Levels in Common Household Devices

Source: Federal Communications Commission



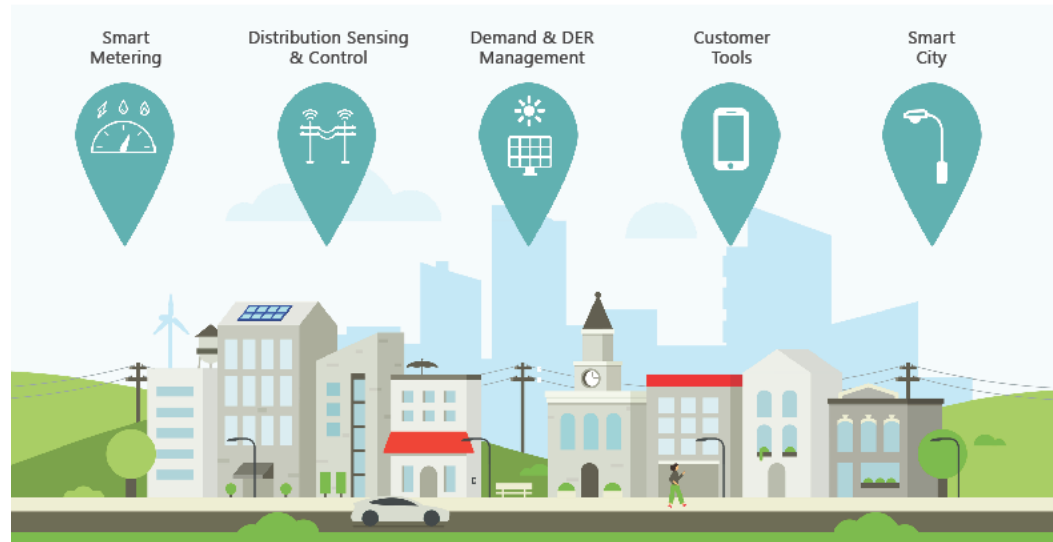
From the American Cancer Society regarding smart meters:

Because, the amount of RF radiation you could be exposed to from a smart meter is much less than what you could be exposed to from a cell phone, it is very unlikely that living in a house with a smart meter increases risk of cancer.

<https://www.cancer.org/cancer/cancer-causes/radiation-exposure/smart-meters.html>

The FCC regulates the RF signal strength for devices that emit a RF signal including Smart Meters. There are no other Federal, State or Local mandates specific to the adoption of Smart Meters in Longmont. Please note that an important aspect of the AMI program design is establishing and providing an alternative metering or opt-out program for those electric customers who remain concerned.

AMI and Technology Considerations



(Graphic Source: Landis and Gyr)

AMI is a cornerstone of tomorrow's utility providing the information and tools to create the next advanced generation of the electric distribution grid, enabling both utility and customers to interact and manage energy use which is essential in achieving the goal of a 100% renewable electric energy in year 2030.

Presently, there are two primary technical approaches to AMI – wireless or wired. In very limited cases, cell phone communication or a power line carrier have been used. Locally, the following table describes the current state of metering in this region.

Current State of Neighboring Utilities AMI Systems:

Utility	Service	Advanced Meter	Notes Technology Solution
Longmont	Water	Y	Multi-year conversion to AMR
Loveland	E	Limited	AMI deployed on some commercial, key accounts and Multi-Dwelling units
Fort Collins	W/E	Y	AMI
Estes Park	W/E	Y	AMR system in place incrementally migrating to AMI.
Poudre Valley REA	E	Y	AMI system initiated in year 2008
United Power REA	E	Y	AMI system

Xcel Energy	E/G	Y	<p>Predominately AMR system. AMI in Boulder. Migrating to AMI to build advanced grid beginning 2021.</p> <p>Note – In years 2009 and 2010, Xcel installed SMART meters to a significant number of households during their SMART City project with Boulder.</p>
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Smart Meters and Home Energy Management Systems

What is the Smart Grid?



Search the Resource Library



Smart meters provide the Smart Grid interface between you and your energy provider. Installed in place of your old, mechanical meter, these meters operate digitally, and allow for automated and complex transfers of information between your home and your energy provider. For instance, smart meters will deliver signals from your energy provider that can help you cut your energy costs. Smart meters also provide utilities with greater information about how much electricity is being used throughout their service areas.

This energy information coming to and from your home through your smart meter can be run through a home energy management System (EMS), which will allow you to view it in an easy-to-understand format on your computer or hand-held device. A home EMS allows you to track your energy use in detail to better save energy. For instance, you can see the energy impact of various appliances and electronic products simply by monitoring your EMS while switching the devices on and off.

An EMS also allows you to monitor real-time information and price signals from your utility and create settings to automatically use power when prices are lowest. You can also choose settings that allow specific appliances and equipment to turn off automatically when a large demand threatens to cause an outage—avoiding peak demand rates, helping to balance the energy load in your area, and preventing blackouts. Your utility may provide financial incentives for doing so.

Source: SmartGrid.gov

As LPC reviews potential AMI solutions for the Longmont Community, the system solution must:

- (1) include the ability to interact with customer tools that may be present in the Smart House,
- (2) support elements of the Climate Action Task Force recommendations; and
- (3) support the ability to implement DER Strategies in 5 key areas:
 - Energy Efficiency and Conservation
 - Demand Response
 - Distributed Generation
 - Distributed Energy Storage
 - Beneficial Electrification

The review and system selection process is underway. Council will be kept advised of key milestones and will have full review and approval of contracts that select the technology and deployment of AMI.

ATTACHMENTS:

Attachment A: American Cancer Society Smart Meters

Attachment B: Federal Communication Commission RF Safety FAQ

Attachment C: Health Impacts of RF Exposure from Smart Meters – California Council on Science and Technology

Attachment D: Dr Bruce Cooper Medical Director Health District of Northern Larimer County – Review of Health Effects

CITY COUNCIL COMMUNICATION



Attachment E: SmartGrid GOV smart home overview Attachment F: Solar Today Fall 2020 p 18-23 Dr. Schoechle
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