

## Electric Vehicles...the challenge

Electric Vehicles are approaching an inflexion point in their development. As costs come down and mile range increases, more and more people are considering Electric Vehicles as an option for their transportation needs. Just a short time ago, electric vehicles were only considered as an extra vehicle and not overly practical due to limited range. But today there are hybrid vehicles with auxiliary gas engines and electric only vehicles with ranges over 200 miles. There are a huge number of variables for the consumer to consider and it appears in the near future Groton will be becoming home to an increasing number of electric vehicles. This is an issue that could have substantial cost consequences to GELD and our ratepayers and is therefore of increasing importance. The issue is: when to charge electric vehicles?

Most people with electric cars tend to plug in their vehicle as they park them and enter their home. The challenge for GELD is that many people may be running errands in the afternoon or coming home from work at a typical time of early evening and plugging in their vehicle.

Typically, there are three ways to charge an electric vehicle. 1) Using a standard 120V extension cord into a standard electric outlet; many refer to this as a "LEVEL 1" charger. 2) There is an optional 240V charger that can decrease the charge time by about 75%, but it also increases the electrical use four times; many refer to this option as a "LEVEL 2" charger. 3) There are also 480V options but due to their high cost currently we don't see these "LEVEL 3" chargers making a large impact on the residential home market.

If you read the article "How ratepayer behavior affects the costs of GELD", you can see that electric use in the late afternoon and evening drive a large percentage of GELD's costs. You will also be able to see why GELD has a strong preference for electric vehicles in town not to be charging during our Peak hours.

## **\$400 REBATE and 10¢/kWh rate option**

### ***A potential solution with a lower cost for customers and GELD***

For GELD to effectively manage our distribution system, we strongly encourage customers to consider installing a Wi-Fi equipped "LEVEL 2" charger that GELD could communicate with. A "good" Wi-Fi equipped charger costs about \$650.00. To encourage the use of these charges, GELD will provide a \$400 rebate towards their purchase and provide a special vehicle charging rate. These chargers would be pre-programmed by GELD to operate as a "LEVEL 1" charger during non-peak times. Using the Wi-Fi connection, GELD would be able to postpone charging until 11 p.m.-7 a.m. at a rate of \$.10 per kilowatt hour (a significant savings). Even electric vehicles with large batteries and long range would be fully charged by the morning.

The rebate for these chargers is intended to keep the cost of the Wi-Fi "LEVEL 2" chargers less expensive than a standard "LEVEL 2" charger purchased online; so, the value of this rebate may change as the market changes. Our rebate does not include the cost of installation. A licensed electrician is required to install a "LEVEL 2" charger.

Please contact GELD at 978-448-1150 if you would like to participate in this rebate offer and special electric vehicle rate. GELD will acquire the Wi-Fi "LEVEL 2" charger through Charge Pointe (on your behalf) that will be pre-programmed to work with GELD's electric vehicle rate.

## How ratepayer behavior affects GELD's costs

Over 20% of GELD's costs on a yearly basis are determined by one hour each month which is called the "transmission peak". At the end of every month, the hour that had the highest amount of electric generation in New England is determined. We are billed for our transmission costs based on our contribution to that one hour. This transmission peak hour is typically between 5 and 8 p.m., but as more solar enters the New England market, we expect there to be months when this peak hour is pushed later towards 9 p.m. During the summer, air conditioning load can cause the peak hour to be earlier in the afternoon. As early as 2 p.m. on cloudy humid days when air conditioning is running and solar generation is being thwarted by Mother Nature.

The "capacity peak" hour occurs **once a year** and will account for approximately 20% of GELD's costs this year. This all time peak for the year usually occurs on the third day of a heat wave where there is minimal cooling the night before. The capacity peak hour is typically the same hour as the transmission peak hour that month.

As 40% of our costs are determined by an extremely small number of hours each year, you can see why we have a strong preference to postpone electrical vehicle charging during "peak" hours. If you are considering an electric vehicle please consider participating in our special vehicle charging rate and acquiring a "LEVEL 2" charger that GELD can communicate with.

## Protect your valuable and expensive electronic equipment

*Since both Mother Nature and electricity are unpredictable, take steps to keep your expensive equipment safe from power surges*

Due to the unpredictable nature of electricity, no utility can guarantee an unconditionally stable and consistent power supply. Several elements combine to offer the most effective protection for your home's electronics and electrical systems. **The most important component is a functional service ground**—see “a good ground helps to protect your home”.

Although Groton Electric strives to provide reliable power at the lowest price every day, there will be inconsistencies in the power supply that we have no control over. Because of this, we recommend you protect your valuable equipment with an adequate ground, surge protection, and a UPS (uninterruptible power supply).

A surge protector is a standard piece of equipment that should be included when purchasing computers and high-end electronic equipment. Surge Protectors as the name suggests, protect valuable equipment from sudden surges or spikes in voltage. A surge is a sudden, temporary increase in the normal current or voltage. Normal current in the U.S. is 120 volts, with an acceptable range between 114 and 126 volts. If the voltage rises above 120 volts, there is a problem, and a surge protector helps to prevent that problem from destroying your equipment.

Surge protectors send the surplus voltage to your service ground, diverting it from your equipment. It is important to regularly check your surge protectors because one large surge or a number of smaller surges can destroy the surge protector and then it is no longer protecting your equipment.

There are many types and price ranges of surge protectors, but we recommend purchasing a surge protecting power strip with a UL rating of at least 1449, a good warranty, and an audible alarm. An audible alarm warns you that the surge protector is no longer working and **needs to be replaced**.

### Consider a back-up battery source when purchasing expensive equipment

A UPS (uninterruptible power supply) is a battery that maintains a continuous supply of electric power to connected equipment, by supplying power if utility power is not available or a voltage dip occurs.

A UPS is inserted between the source of power and the equipment it is protecting. When a power failure

or dip in voltage occurs, the UPS will effectively switch from utility power to its own power source almost instantaneously. This is especially important in the summer with the increased frequency of lightning and the increased use of air conditioners.

### A good “ground” helps to protect your home

The most important component to protect your valuable equipment is your home's “service ground.” Without it, excess voltage can damage appliances or in extreme cases, cause a fire. The service ground wire connects directly from the electric service box to the ground via a “ground rod” or, in older homes, the water pipe. Be sure that your ground has not been removed or become loosened. A licensed electrician can determine the adequacy of your ground by measuring its resistance and by making any necessary adjustments.

There are two common types of UPS devices: stand-by UPS and continuous UPS. A **stand-by UPS** runs the computer off of the normal utility power until it detects a problem. At that point, it very quickly switches to the UPS's battery. The battery “back-up” gives you time to save your work and shutdown your computer safely.

In a **continuous UPS**, the computer is always running off of battery power and the battery is continuously being recharged. If the power fails, there is no switchover time. This setup provides a very stable source of power.

Standby UPS systems are far more common for home or small-business use because they tend to cost about half as much as a continuous system. Continuous systems provide extremely clean, stable power, so they tend to be used in server rooms and critical applications. As prices drop, continuous UPSs are becoming more commonly used.

We recommend doing some research to determine the best protective equipment for your needs. There are two key ratings to be aware of when choosing a UPS unit. The first is load rating—expressed as both volt amps and watts; the load typically should not exceed 80% of the load rating. The second is runtime: do you want enough time to safely turn everything off if an outage occurs or do you want to be able to operate your electronic equipment during an extended outage?



## \$10,000 rebate towards 2017 Nissan LEAF—Electric Vehicle

*Limited time offer to GELD customers on a new 2017 LEAF.*

The average model 2017 LEAF retails between \$32K and \$35K. After the \$10K rebate off MSRP (fully funded by Nissan), \$2,500 State Rebate (MOR-EV incentives), and \$7,500 Federal tax credit, the final cost would be around \$12-\$15K. The listed mile range is 107 between charges and the car is set for universal level two charging and DC level three charging under the CHAdeMO configuration. All Massachusetts Nissan dealers are authorized to provide this offer.

**A test drive has been arranged by AutoFair Nissan of Chelmsford at the GELD facility, 23 Station Avenue on Monday, July 10 and Monday, July 17 from 3–7 p.m. Stop by our office and try out the 2017 Nissan LEAF.**

2017 NISSAN  
**LEAF**  
**107** MILE  
RANGE  
**30** KWH  
LITHIUM-ION  
BATTERY

