

ACUA's Electric Vehicle Technology

Fact Sheet



ACUA is aggressively working to green its fleet and to encourage the development of infrastructure that will support the clean vehicles that are becoming available. ACUA has been using alternative fuel vehicles for many years, from propane vehicles to biodiesel and now compressed natural gas (CNG) for its collection fleet, as well as electric vehicles used onsite at the Wastewater Treatment Facility in Atlantic City.

ACUA has installed electric charging stations at its Atlantic City and Egg Harbor Township sites and continues to add to its zero emission fleet. Electric vehicles offer a cleaner alternative to gasoline and diesel vehicles, especially when charged with electricity generated from renewable sources like wind, solar and landfill gas. Electric vehicles have a history of successful use and are seen as a viable alternative to cars and trucks powered by fossil fuels. Thousands of these clean vehicles, many of them zero-emission, are available at auto dealerships throughout the U.S.

Ford Fusion Plug In Hybrids

Two Ford Fusions were added to ACUA's Electric Vehicle Fleet in December 2014. Each vehicle has a combined city and highway mileage rating of 88 mpg using a combination of electricity and gasoline. The Fusion can travel up to 19 miles using the electric motor before seamlessly switching to the hybrid gasoline engine. For those with a short commute, this midsize sedan will essentially run as an all-electric vehicle. The Fusion can be charged with a 120 volt electrical outlet in 7 hours, or in 2.5 hours using a 220 volt outlet or at stations such as ACUA's AeroVironment chargers. The sedan batteries will partially recharge through regenerative braking.



ACUA's 2012 Nissan Leaf can travel up to 100 miles on a full-charge.

Nissan Leaf

The 2012 Nissan Leaf arrived in March 2012 to help start to update the ACUA's fleet. The Nissan Leaf is 100% electric, with the capacity to fit five people, and can travel at highway speeds. The Nissan Leaf uses a lithium-ion battery to store electricity to run the vehicle and is built to travel up to 100 miles on a full charge. The Leaf can be charged with a common household outlet, using the cord provided, which takes between 18 and 20 hours to charge from empty to full. With a 220 volt outlet or using ACUA's Level 2 charging stations, the charge will take 6 to 8 hours from empty to full.

Toyota Prius Plug-In Hybrid

The 2012 Toyota Prius Plug-In Hybrid arrived in May 2012. The Prius is engineered for dedicated electric driving capability, and allows you to completely charge its lithium-ion battery using a common household outlet in about three hours. In EV2 mode, the Prius Plug-In Hybrid is rated to drive up to 11 miles and has the capability of traveling up to 62 mph using electric power alone. The EV2 mode refers to the blended options of electricity and gas. In EV2 mode, the Prius Plug-In is rated at a 95 mpg equivalent.



In electric vehicle mode, ACUA's 2012 Toyota Prius Plug-In Hybrid travels 11 miles on a charge.



Ford Ranger

In 2010, ACUA purchased a zero emission truck to be used in the wastewater operations. The vehicle is a 2000 Ford Ranger Electric Vehicle (EV), produced by the Ford Motor Company. Ford produced these electric trucks from 1998 to 2002.

ACUA purchased the EV truck from Blue Sky Motors of McClellan, California, an LLC that was established by the company first selected to provide mobile electric vehicle repair services for Ford postal EVs in Northern California.

The Ford Ranger EV truck has a Nickel Metal Hydride (NiMH) battery pack located under the truck's bed, which charges in six to eight hours, has a driving range of 61 miles per charge and can reach maximum speeds of between 70 and 75 mph.



ACUA's Ford Ranger electric vehicle.

Solar Powered Electric Vehicles



ACUA uses solar and wind energy to power "Sunny" at the Wastewater Treatment Facility.

In 2008, the ACUA purchased its first electric vehicle, "Sunny." The vehicle is also known as a GEM, which stands for Global Electric Motors, a Chrysler company.

The ACUA has recently added two new GEM eL-XD work vehicles, one at each facility, to be used for work on site. These low-speed vehicles or neighborhood electric vehicle can be legal street vehicles in nearly all public roads that have a 35 mile-per-hour speed limit or less. New Jersey requires a local permit to operate the vehicle on public streets. It has a top speed of 25 mph and can travel up to 30 miles in distance on a single charge.

The new GEM vehicles have battery which provides a range of 25 to 40 miles.

ACUA is recharging the vehicle with energy produced by its 500-kilowatt solar energy facility and the 7.5 megawatt Jersey Atlantic Wind Farm. The power used to recharge the battery is clean and renewable and the vehicles do not emit any toxic or greenhouse gases.

The new vehicles are two-passenger vehicles with a long back bed. Other models include a two-passenger GEM with a short-back bed, and four-passenger and six-passenger GEM cars. Each GEM model meets and exceeds all federal safety regulations for low-speed vehicles and are thoroughly tested at the Chrysler Automotive Proving Grounds for quality and endurance.

Electric Charging Stations

ACUA has installed twelve Electric Vehicle Charging Stations at the Atlantic City Wastewater Treatment Facility and the Haneman Environmental Park in Egg Harbor Township.

All of ACUA's charging stations are fed by the Authority's two microgrids and each station is powered by clean, 100% renewable energy sources and are available to visitors during business hours. The Haneman Environmental Park's microgrid is powered by ACUA's landfill gas to electric project while the Wastewater Treatment Plant's microgrid is powered by wind and solar energy. ACUA hopes this project will jumpstart the use of electric cars and the development of charging stations, ultimately reducing pollution and its effects.



ACUA's AeroVironment charging stations at the Haneman Environmental Park.

A full charge takes 6 to 8 hours.

V2G Technology

ACUA, AC Propulsion, Comverge, Pepco Holdings (Atlantic City Electric's parent company), PJM Interconnect and the University of Delaware, as members of the MAGICC or Mid-Atlantic Grid Interactive Cars Consortium, joined together to further the development of vehicle-to-grid or V2G vehicles.

WHAT IS V2G?

V2G is the technology that allows vehicles to run on electricity and generate revenue by storing and providing electricity for utilities. This technology, known as V2G or vehicle-to-grid, allows electricity to flow from the car's battery to power lines and back.

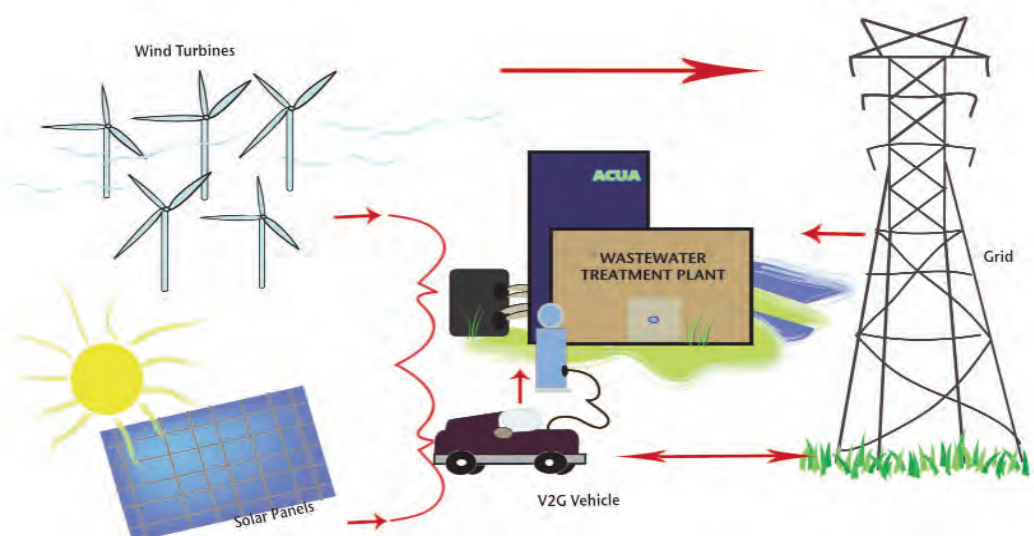
HOW IT WORKS:

When the car is in the V2G setting, the battery's charge goes up or down depending on the needs of the grid operator. The V2G car will help balance the grid which often needs to store surplus power or use extra power to respond to the changes or fluctuations in use. The ability of the V2G car's battery to act like a sponge provides a solution for utilities, which pay millions to generating stations to help balance the grid. With these cars it will lessen such costs. V2G also provides an answer to the intermittency of renewables such as wind and solar. While electrical demand may have predictable peaks, wind and solar power do not always generate electricity when it is needed most.

Having many V2G cars plugged into the grid can allow the vehicles to store the clean, renewable power and to act as a battery, putting the electricity from renewable sources back onto the grid when it is needed.

V2G FACTS:

- University of Delaware has purchased and retrofitted a Toyota Scion which operates as an all electric V2G car.
- This model is both light-weight and has plenty of passenger room.
- Emissions: The car itself produces no carbon dioxide emissions
- Acceleration: 0 to 60 miles per hour in 7 seconds
- Top Speed: 95 miles per hour
- Range: 120 miles highway, 150 miles city
- Battery Life: 5 years or about 50,000 miles (being tested and verified)
- Recharge: 2 hours using 240-volt plug or overnight using 110-volt plug
- Maintenance: No oil changes; brakes last three times longer because the car has regenerative braking, which returns power to the battery.



Atlantic County Utilities Authority
www.acua.com