WASHINGTON — Finally, payback for the plug-in.

A line of Mini Coopers, each attached to the regional power grid by a thick cable plugged in where a gasoline filler pipe used to be, no longer just draws energy. The power now flows two ways between the cars and the electric grid, as the cars inject and suck power in tiny jolts, and get paid for it. This nascent form of electric car commerce will be announced on Friday by the University of Delaware, the regional grid operator and an electric company. They have developed a system to collect payments for work (balancing supply and demand moment to moment) that is normally the domain of power plants.

The possibilities of using electric cars for other purposes are being realized around the globe. Electric cars like the Nissan Leaf and Chevrolet’s plug-in hybrid Volt, are generally not sold in the United States with two-way chargers that could feed back into the grid. But Nissan is offering a similar device in Japan that allows consumers to power their houses when the electric grid is down.

In the Delaware project, each car is equipped with some additional circuitry and a battery charger that operates in two directions. When the cars work with the grid, they earn about $5 a day, which comes to about $1,800 a year, according to Willett M. Kempton, a professor of electrical engineering and computing. He hopes that provides an incentive to make electric cars more attractive to consumers, and estimates that the added gadgetry would add about $400 to the cost of a car.

Granted, the scale of this project, using 15 two-passenger Mini E models, donated by BMW, is indeed minuscule compared with the task of keeping the grid system that serves two-thirds of North America in balance, making sure that supply matches demand as precisely as possible.

The frequency of electric current in the United States is supposed to be stable at 60 cycles a second, but if the supply from a wind farm or solar plant changes suddenly, or demand shifts, frequency gets out of whack. The market that Professor Kempton is tapping into, known as frequency regulation, has become increasingly important as the mix of generators on the grid has changed. If electric cars become more popular, proponents say that a network of thousands of plug-in cars could help stabilize the grid.

Michehl R. Gent, a former president of the North American Electric Reliability Corporation, the entity designated by the federal government to write and enforce grid reliability rules, called the Delaware idea “tiny but promising.”

“If we can get our electric vehicles to do more than just be electric vehicles, it will be very well received,” said Mr. Gent, who is not associated with the project.

Professor Kempton has had this “vehicle to grid” system in the works for 10 years. He plans to double the size of his fleet by the end of the year. Half the cars are permanently parked and the other half will provide service for all the hours they are plugged in, which could be as much as 20 hours a day.
The cars listen for a signal from the headquarters of the regional grid operator, the PJM Interconnection, in Norristown, Pa., that comes every four seconds. The signal could tell the batteries to charge, or to discharge, or to do neither. Alternatively, if the cars need charging, they can provide the same service by varying the amount of current they draw. For the grid, the effect is to add or subtract load in a coordinated way that aids stability.

Two-way chargers are not generally available to drivers of electric plug-ins right now. Professor Kempton said he is working with five companies that build electric cars and are interested in a two-way system that could collect revenue from the grid: BMW and four other firms he said he could not name because of confidentiality agreements. One of those four, he said, was working on a two-way charger that was three times more powerful than the current one, vastly increasing revenue possibilities.

A Nissan spokesman, Brian Brockman, said the company is exploring such possibilities, and recognizes the benefits of moving toward helping power the grids. “To the electric system, the balancing effect is essentially the same,” said Scott Baker, an engineer at PJM. Mr. Baker predicted that electric vehicles would become an interactive part of the grid, helping in several ways. One goal is to spread out the charging demands of thousands of cars on the grid, so as to avoid overload.

Thomas B. Gage, president of EV Grid, a company in Palo Alto, Calif., that set up the hardware in the cars and the chargers, said that electric cars typically have chargers that run in one direction, at a power level of 3 kilowatts. The Mini Es runs in both directions, at 18 kilowatts. (For comparison, a hand-held hair dryer is 1.5 kilowatts.) With a relatively powerful two-way link, the idea is to branch out into another service the grid needs, known as “spinning reserve.” Power plants that offer that service keep a turbine spinning, but not generating power; they are ready to pick up load at a moment’s notice, if called on by grid operators. Providing spinning reserve burns substantial amounts of fuel, usually natural gas, but batteries could do the same work with no pollution, experts say.

At any given moment, a car could provide one service or the other; an aggregator could decide on an hour-by-hour basis which service to provide. So far, the system now being commercialized is nowhere near the point of absorbing surplus electricity at night and selling it back during the day; for the time being, the frequency regulation market would be more lucrative and the battery capacity is relatively small. Besides, peak demand hours often fall when the driver would want the car on the road.

Professor Kempton is also a leading proponent of building wind turbines off the mid-Atlantic coast, and sees the electric car and the wind machine as complementary tools for a low-carbon energy system. The university has a joint venture with NRG Energy, which is based in Princeton, N.J., to expand the network of electric cars that would be paid for doing the balancing work.