

# REGION by REGION

Electric utilities face different challenges in different parts of the country By Charlie Morris

**W**hile much of the public may be only dimly aware of the existence of plug-in vehicles, electric utilities have been following developments in the EV world closely for years. From their perspective, the electric vehicle is a major new appliance that more and more people will be plugging in to the grid. As Brewster McCracken of the Pecan Street Project notes, EVs represent the largest new electrical load since US households started adding

air conditioners half a century ago. Computers and flat-screen TVs are electrical lightweights by comparison.

Energy providers all over the world are performing studies and gathering data, trying to figure out if changes to their distribution and/or generating capacities will be needed. However, utilities in different parts of the world face very different situations for a number of reasons, including local weather conditions, different consumer



Photo courtesy of TECO



behavior patterns, and different mixes of energy sources.

With this in mind, we spoke to folks from two of Florida's largest electric power providers, and asked them how they are preparing for the coming world of electric mobility, and what kind of challenges and problems they foresee. We were pleasantly surprised at their answers; both believe that their existing grids could easily handle even a fairly large influx of plug-in vehicles.

Brian Hanrahan is the director of EV programs for Florida Power & Light (FPL), which serves about half the Sunshine State's population. He told us that, as of July, there were around 1,800 plug-in vehicles on Florida roads, roughly half of them in his company's service territory. At the moment he sees no generation, transmission, or distribution concerns.

FPL currently has a study going on, in which it will be monitoring the electrical usage patterns of a few early EV buyers for a year. The company's main concern is reliability. According to Hanrahan, FPL has one of the highest reliability levels of any utility in the country, and it's important to maintain that. Another concern is power

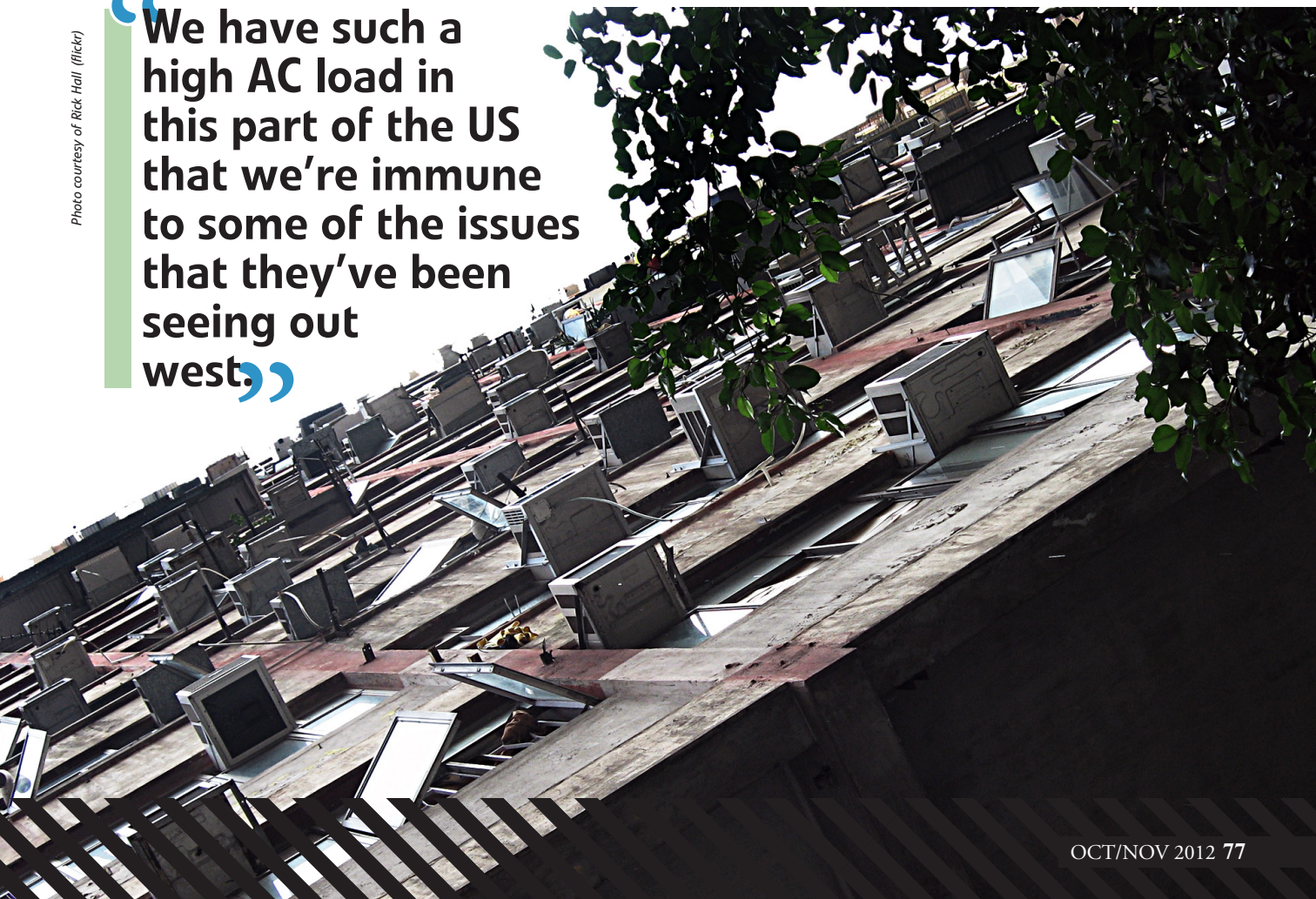
quality. FPL wants to make sure that EV chargers aren't introducing any kind of "noise" into the grid, but it hasn't seen any problems so far.

FPL would like to learn more about charging levels and how they impact the system. It's still uncertain what rate of charge most EV owners will choose to use. Most current EVs charge at 3.3 kW, but the new Ford Focus Electric allows charging at 6.6 kW. If anything over 10 kW becomes the norm (although only Tesla has that option at the moment) that would be cause for concern.

Kenneth Hernandez, Program Manager of Alternative Fuel Vehicles for Tampa Electric (TECO), which serves some 630,000 customers in the Tampa Bay region, told a similar tale. The company did a readiness study, using Coulomb chargers at a 7.2 kW charging rate. Each of TECO's transformers serves an average of seven homes, and the study found that it could "easily" handle three out of those seven simultaneously charging an EV at peak times. "There might be some sporadic issues... but no different than a couple of people that add on to their house and add a couple of air conditioners, or a few pools...nothing

Photo courtesy of Rick Hall (flickr)

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out of the normal operation.” If four out of seven homes added an EV to the grid, that might cause trouble, but needless to say, the day when four out of seven homes has a plug-in vehicle is pretty far in the future.

The main reason Florida utilities have such a robust network is the state’s voracious appetite for air conditioning. TECO’s Hernandez said, “We have such a high AC load in this part of the US that we’re immune to some of the issues that they’ve been seeing out west. Our system is pretty much designed for higher loads anyway. From a generation standpoint, we’ve got good capacity now, and from a planning standpoint, when [EV load] gets to the point that it could [have] an impact, we’ll be able to forecast for that.”

TECO analyzes its load situation every year, and makes a 10-year load forecast, so when charging demand starts to ramp up, the company expects to see it coming in plenty of time to plan for it. The day when the company

needs to add generation capacity is probably many years away.

FPL’s Hanrahan echoes that sentiment, saying that Florida is “resilient to an influx of Level 2 chargers.” Electrical distribution systems are not the same in every state, because different regions have different load profiles. In Florida (and other Sunbelt states, such as Texas), utilities are used to a heavy AC load. In northern California (to give one example), “they are not used to the type of household load that we are. We build our infrastructure differently, our load profiles are very different, so for us, adding an EV is not the big deal it would be elsewhere.”

#### Off-peak pricing

Some utilities have instituted Time of Use pricing plans (also known as Time of Day metering), to give customers incentives to charge their EVs at off-peak times.

FPL is considering such a program, although early data

Photo courtesy of TECO





## Properly located, public chargers make great advertisements for EVs, and help drivers overcome the dreaded range anxiety.

from its reliability pilot seems to indicate that many consumers are already charging off-peak naturally. FPL's peak time is 4-5 pm, and most EV drivers seem to be plugging in later. To implement an EV rate, a utility would need to require customers to invest in a smart meter, a cost that might be hard to recover. Unlike California, Florida already has a pretty low everyday rate, and FPL is the lowest in the state (9.5-10.5 cents per kWh, 25 percent below the national average).

TECO already offers a whole-house off-peak rate, which provides a small savings. Hernandez says that it would be better to simply get EV drivers used to charging off-peak. The charging apps that are available for most EVs make it easy to schedule charging for late in the evening, leaving plenty of time to have the battery topped up by morning.

"We are looking at a small pilot that could monitor a couple dozen homes that currently have EVs...so that we can gauge what the customers' patterns are. Maybe all of our customers are already charging off-peak; we don't know. We need to understand what their charging habits are like. Is the program that we have now enough to [incentivize] the customer to make that switch? Maybe offering a super off-peak rate just for EVs...would keep us from increasing generation 10 years from now," Hernandez told us.

### Public charging

Many commentators and public officials seem to believe that a comprehensive network of public chargers needs to be available before EVs will really become popular - the phrase "chicken and egg" gets tossed around a lot. Our utility spokesmen seem to be in the camp of those who believe such concerns to be overstated.

FPL doesn't install or maintain public chargers, but it does work with cities and other installers as a sort of expert consultant, helping them with technology, permits



## the infrastructure



and so forth. Mr. Hanrahan points out that although Florida has far less public charging infrastructure than some states, it already has the third-largest number of EVs in the country. “So you could argue that you don’t need much public infrastructure. Home is most convenient. Home charging is going to be the cheapest and most convenient, and as consumers become more used to EVs, they will become less dependent on public charging.”

While he sees over-saturation on the public charging scene, he acknowledges that there is some need for it, and that it’s mostly appropriate in “destination locations,” which meet these three criteria:

1. You go there for a reason other than to charge the car.
2. You stay for more than 45 minutes or so.
3. You need to charge to comfortably get home.

Likely locations are sports arenas and downtown shopping areas that draw people from afar. One example is Sawgrass Mills Mall, located in the sprawl north of Miami, an emporium so enormous that many visitors come from as far as 80 miles away. Other smaller malls that draw only local traffic would not be good locations for public chargers. Properly located, public chargers make great advertisements for EVs, and help drivers overcome the dreaded range anxiety. Improperly-located ones can create resentment if people never see them being used, so it’s important to choose strategic locations.

When it comes to both home and public charging

Photos courtesy of FPL





**An F-150 PHEV Pickup Truck**  
Built by Quantum Technologies

patterns, both FPL and TECO crave more and better data. TECO receives info about public charging from ChargePoint and The EV Project, but they want their own unique data. “Commuting in Florida is different than it is out west or in the Northeast, so it would be helpful to have data specific to our service territory,” said Hernandez.

The final question we asked Messrs. Hanrahan and Hernandez was about their companies’ own plug-in fleets. FPL was an early adopter of EV technology, and today operates the largest “green” fleet of any investor-owned utility in the country, with 1,700 biodiesel-powered vehicles and 471 plug-ins and hybrids. During the 2009 Clinton Global Initiative, FPL committed to converting the entire fleet of more than 2,400 company cars and trucks to PHEVs by 2020. The company boasts that operation of a greener fleet is one way that FPL lowers operating costs to keep customers’ bills among the lowest in Florida.

TECO has 16 Volts, three LEAFs, two converted Prius Plug-ins, and 20 bucket trucks with battery-powered electric booms, which have turned out to be quite popular. Old-fashioned bucket trucks tend to run the diesel engine continuously while the boom is in use, even though power is only needed when the bucket is being raised and lowered. An electric-powered boom not only saves a lot of energy, but is more pleasant for workers, and for customers who don’t need to have a noisy engine running outside their homes in the wee hours when a crew is doing storm repairs. ☐

An advertisement for Blink Pedestal Charger. The background is a solid green color. On the left, the word 'blink' is written in a large, white, lowercase sans-serif font. To the right is a black pedestal charging station with a white charging port and a black charging cable. The station has 'blink' written vertically on its side. Below the station, the text 'Charge your EV on the go.' is written in a large, white, sans-serif font. Underneath that, 'Blink Pedestal Charger »' is written in a smaller white font. At the bottom left of the ad, the website 'blinknetwork.com' is listed in white.