Illinois Commerce Commission
Initiative on Plug-In Electric Vehicles

CNT Energy and I-GO Car Sharing

Joint Comments on Utility EV Assessments

January 21, 2011

I. Introduction

These comments are issued jointly by CNT Energy and I-GO Car Sharing. We greatly appreciate the opportunity to comment on the impact and opportunity that electric vehicles (EVs) present to Illinois' electric grid. We look forward to working with the Commission and all interested stakeholders to ensure that EVs are integrated into our electric systems in an efficient and beneficial manner.

CNT Energy is a division of the Center for Neighborhood Technology. Since 1978, the Center for Neighborhood Technology (CNT) has been a leader in promoting urban sustainability. CNT Energy combines rigorous research with effective solutions and concentrates on helping consumers and communities obtain the information and services they need to control energy costs and become more energy efficient. We pioneered Illinois' residential real time pricing programs, and now administer and co-administer the largest such program in the country for the Ameren Illinois Utilities and Commonwealth Edison. In addition, we have assisted Commonwealth Edison with its ongoing AMI Pilot in the Chicago region. We applaud the Commission for taking proactive steps to prepare for the introduction of electric vehicles (EVs) into Illinois' electricity system, and hope you find our comments here, which are based on our experience in these related areas, to be helpful.

I-GO Car Sharing is a 501(c)(3) established in 2002 by the Center for Neighborhood Technology that offers Chicago area residents mobility through the use of shared vehicles. Individuals, families and businesses can purchase a membership for access to I-GO's fleet located throughout the metro area, providing members with economic and environmentally friendly transit. I-GO Car Sharing's mission is to reduce car ownership rates, decrease transportation

costs, reduce urban congestion, improve air quality in Chicago area neighborhoods and reduce greenhouse gas emissions. I-GO Alternative Transportation for Chicagoland, Inc., I-GO's legal name, points to I-GO's broader goal to provide integrated cutting edge energy efficient and cost effective mobility solutions for the region.

II. Executive Summary

CNT Energy and I-GO Car Sharing are excited by the opportunity that EVs represent to transform our electricity system and transportation infrastructure. We see numerous potential benefits to EV adoption, including:

- Additional balancing capacity within our electrical system
- Improved load shapes, and
- Reduced air and climate pollution.

These benefits, however, are predicated on thoughtful and well-coordinated integration of EVs into our existing transmission and distribution infrastructure. To garner the benefits of EVs, utilities must develop coordinated processes to address EV integration at the time of the EV purchase. Utilities and the Commission must also adopt rate structures and other mechanisms to ensure that EVs flatten peak electric load and can help balance the grid. In particular, we see opportunities to pair EV charging with distributed renewable generation. These themes are referenced throughout our comments.

III. Early Action Items

Buying an EV will involve a whole host of details that car buyers have never before managed. Unlike buying a gasoline, diesel, or even natural gas-powered vehicle, EVs may require charging infrastructure installation, distribution system upgrades, special electric rate plans, and even, in some cases, household electrical upgrades and the associated contractor search and permitting.

Consequently, CNT Energy and I-Go recommend that Illinois utilities work with EV dealers, manufacturers, municipalities, car sharing programs, leasing companies, and fleet owners to create a coordinated process that ensures advance notification, customer education and sign-up for applicable rate plans as well as expediting any required transformer upgrades, household electrical upgrades and the permitting required for the installation of charging equipment. This process should ensure that the following actions take place or are scheduled immediately, and at the point of EV purchase:

- The electric provider is notified of a pending purchase;
- The electric provider determines if a system upgrade is needed immediately;
- The electric provider notifies the customer if a system upgrade is needed immediately and schedules the necessary upgrades;
- The electric provider determines if the home's electrical systems require upgrades to accommodate the charging equipment (applicable once higher power Level 2 and Level 3 charging becomes prevalent. MidAmerican at 4.);
- The electric provider educates the consumer about home upgrades that may be needed to accommodate charging equipment and any related permitting requirements, and gives the customer information on how to find a qualified contractor to do the work;
- The homeowner contacts the relevant agency to arrange permitting, if needed;
- The electric provider educates the customer about appropriate rate options;
- The customer signs up for the appropriate rate option;
- The electric provider schedules meter change-out, if needed, to support the new rate option.

To the extent technically possible, this process should be consistent across Illinois to allow efficient participant education and reduce redundancy and confusion. The utilities' assessments discuss various portions of this process, but we believe that a coordinated, comprehensive process will:

- avoid adverse distribution system impacts caused by customers who do not notify the utility of their purchase immediately, or at all;
- prevent the need for mass customer education around EV charger infrastructure, permitting requirements, and rate options by focusing these efforts at the EV dealers, and on customers who are in the process of buying these vehicles,
- ensure that EV buyers comply with any electrical safety permitting requirements, and
- make it easy for EV buyers to handle all of the details of new EV ownership before they even take the car home.

Utilities and ARES do not need to create these processes from scratch. Project Get Ready, a Rocky Mountain Institute initiative, has already begun partnering with utilities and cities to help them deploy EV charging stations and infrastructure. See more at www.projectgetready.org.

a. Distribution system impacts

Utilities' most immediate concern regarding distribution system impacts is the transformer. (Ameren Assessment at 1, ComEd Assessment at 36, MidAmerican Assessment at 1). CNT Energy and I-Go agree with ComEd's assessment that "advance notification to the utility prior to installing charging equipment rated at Level 2 or above must be required" and recommend that this notification become part of a process, detailed above, that involves all EV dealerships within the utilities' territories. ComEd at 37. In addition, if technically possible, this process should notify the customer if a transformer upgrade is needed and schedule that upgrade at the point of EV purchase.

b. Rate options

i. Real-time pricing is needed to incent customers to charge off-peak

CNT Energy and I-Go strongly believes that residential real-time pricing is needed to provide an incentive for EV users to shift charging to off-peak times. As ComEd has noted, its analysis "shows that PEV charging customers could save between 27-67% by opting for Rate BESH [ComEd's residential real time pricing rate] instead of Rate BES [ComEd's flat rate] and charging their PEVs during the nighttime hours." ComEd at 10. Consequently, we propose that the EV purchaser's electricity provider educate them about these potential savings and switch EV owners to existing residential real-time pricing programs, with a discouraged opt-out policy for customers in special circumstances.

We also recommend that the electric providers provide ample point-of-purchase education. Since real-time pricing programs are unfamiliar to many customers, we recommend that this discussion be held with a dedicated EV-customer service specialist with extensive knowledge of the real-time pricing programs themselves, and of methods for effectively communicating the value of these programs to customers. Further discussion of our recommendations for customer service center enhancements related to EV integration is located below in section IV.e.

Ameren correctly notes that, at this time, its space-heat customers will not benefit financially from an RTP rate. Ameren at 15. The coordinated point-of-purchase process described above will allow the utility to identify these customers and firmly advise them against signing up for real-time pricing. However, if those rates change over time to make real-time pricing a better option, the process will also allow the utility to change its recommendations to these customers accordingly.

We also recommend the creation of a rate plan that combines EV charging with solar generation, where the excess generation is fed back onto the grid. In addition, there needs to be improvements for net metering, such as aggregation, where EV chargers are paired with solar generation at multiple locations.

ii. V-to-G discharging capability requires 2-way real-time pricing

As EVs come onto the market with the capacity to discharge power from their batteries directly onto the electricity grid, the Commission should consider rate mechanisms that accommodate this 2-way flow of power. A 2-way real-time pricing mechanism, which would pay market based rates for electricity from EV sources, could increase the supply of electricity at peak times.

Allowing distributed resources to put excess power back onto the grid at market rates may further incent large EV users, such as fleets and car sharing companies, to invest in renewable charging infrastructure. In addition, the promise of 2-way real-time pricing may incent manufacturers to add V-to-G features to the second wave of electric cars.

CNT Energy and I-GO Car Sharing also recommend that, if future rates provide any premium for renewable resources placed onto the grid, those rates should apply to solar EV charging canopies of all sizes.

c. Public charging infrastructure deployment

Prompt public charging infrastructure development is needed to:

- Reduce 'range anxiety',
- Allow renters and urban dwellers without space to install home charging stations to own EVs, and
- Provide car sharing, fleet, and other potential heavy-users of EVs the ability to charge easily and often.

However, to incent deployment and EV ownership, this infrastructure must be easy for vendors to install, provide a positive return to vendors, yet be reasonably priced so that customers without access to home charging will charge at public terminals.

d. Clear adequate info to obtain necessary utility service and third party equipment for in-home and business charging

At a minimum, the coordinated process described above should include all necessary materials to address:

- the need to charge during off-peak hours;
- Real-time pricing education and sign-up;
- the various charging equipment available and potential need for distribution system and household electrical upgrades, if any;
- relevant permitting requirements, if any;

- how to pick a qualified contractor for any needed home upgrades or equipment installations; and
- EV-specific customer service contacts for further information and questions.

IV. Subject Matter Details

a. Commission's jurisdiction and role over the development of electric vehicle charging infrastructure and the provision of electric vehicle charging services, including a discussion of the legal status of the entities that offer such services;

CNT Energy and I-Go Car Sharing hope to explore these issues further in workshops, but generally agree with ComEd's assessment that, while it "believes that PEV charging service may be more appropriately considered a competitive service, the ICC and/or the State may wish to consider some form of regulation of charging service." ComEd at 29.

Our particular interests here relate to the status of electric vehicle charging vendors with solar canopies. At a certain scale, these canopies are merely distributed generation resources that feed electricity onto the grid only when they are not charging EVs. There may be situations where a canopy owner wishes to sell excess electricity directly to neighboring charging vendors, bypassing the grid altogether. Regulatory requirements may discourage these types of installations.

On the other hand, we are concerned that, in the beginning, when public charging is scarce, high charger access fees could hinder the growth of the EV market among urbanites without space for home charging. Consequently, we believe that some basic regulation of charging service may be necessary.

b. A projection of the number, location and timing of customers adding electric vehicles to the utility's system based either on surveys of the utility's customers or other available data;

CNT Energy and I-GO Car Sharing have no additional information on these issues.

c. **Analysis of the distribution system upgrades necessary to ensure that the distribution system is able to accommodate the anticipated number of electric vehicles without disruption in service for any customers;**

As mentioned above, CNT Energy and I-Go feel strongly that Illinois utilities need a coordinated, point-of-purchase process to identify and address potential distribution system upgrades.

d. **Analysis and assessment of dynamic, real-time or time-of-use pricing to enable the use of plug-in electric drive vehicles to contribute to meeting peak-load demand reduction, ancillary service power needs, energy efficiency and/or other programs to minimize the need for existing infrastructure upgrades;**

As mentioned above, CNT Energy and I-GO Car Sharing recommend 2-way real-time-pricing to give drivers an incentive to charge during off-peak times, and to discharge excess power onto the grid during peak hours. Time-of-use pricing also provides more of these incentives than flat rate pricing, but is less targeted than real-time pricing. In addition, real-time pricing programs, and the infrastructure to enroll customers, are already in place in Illinois. Thus, while we agree that TOU pricing is appropriate for EV owners, particularly in MidAmerican territory where residential real-time pricing is not currently available (MidAmerican at 23), we feel that real-time pricing is a better policy choice overall. CNT Energy and I-GO Car Sharing also support enabling EV owners to provide ancillary services, at a rate based on the appropriate wholesale ancillary services rate.

We support the creation of incentives and a rate structure for the installation of solar generation to be used for EV charging. There is a tremendous opportunity to create an application that will help to improve the grid's load profile.

CNT Energy and I-GO Car Sharing enthusiastically support the targeting of energy efficiency and demand response programs to postpone or alleviate the need for distribution upgrades. CNT

Energy is currently exploring the use of detailed housing data to target home energy efficiency upgrades where they will result in the greatest savings. While these areas may not always correspond to areas where distribution improvements are needed, we would welcome the opportunity to work with the utilities to assess this kind of targeting.

e. Analysis of any other equipment and technology, other than rates, that may encourage owners of electric vehicles to charge in a manner that avoids detrimental impacts on the distribution system, transmission system and bulk power system and assists in the integration of renewable resources;

CNT Energy and I-Go Car Sharing believe that 2-way communicating AMI meters will help EV owners to take advantage of EVs full capability to automate the charging and discharging of electricity to and from the grid.

Utilities should also pay particular attention to the specialized customer service that will be needed by new EV owners. The coordinated process outlined above is meant to smooth the process of managing the additional details that come with buying an EV. To work effectively, the customer service agents that handle EV-related calls must be specialists and problem solvers. They must be knowledgeable about EVs themselves, and also about the real-time pricing rate plans. They must also be skilled in explaining these plans to customers in a way that leaves customers satisfied and educated, not frustrated or overwhelmed. And, their performance metrics must be based on customer satisfaction, not short call times, as these calls will be necessarily lengthy.

f. Analysis of the need for separate metering to track usage of electric vehicles;

CNT Energy and I-Go Car Sharing agree with Ameren (at 19), MidAmerican (at 23), and ComEd (at 54) that, at this time, there is no need for separate metering to track electric vehicle charging in private homes and businesses. However, we would make an exception for customers who do

not choose to use residential real-time pricing in their home. Those customers should be offered the option of installing a separate meter, at their own expense, so that they may participate in real-time pricing for their EV only.

Public charging stations present more difficulties. For example, a charging station owner may partner with a large retail outlet to place stations in their parking garage. But, if the charging stations must be connected through the retail outlet's meter, it may be difficult for the station to buy and sell power at the real-time rate, if the retail outlet uses some other type of rate.

I-GO is prepared to use its EV and solar project as an opportunity to test and evaluate a variety of strategies related to charging stations and grid interaction.

g. Assessment of public and private electric charging infrastructure necessary to support deployment of electric and hybrid electric vehicles;

CNT Energy and I-GO Car Sharing have no additional information on these issues.

h. Description of any regulatory barriers that might create unnecessary delay for consumers for installation at-home charging infrastructure;

The coordinated process discussed above can reduce any permitting delays by assessing the need for household electrical upgrades and permits, if any, at the time of EV purchase.

i. Description of the utility's system-wide fuel profile, including the proportion of electricity generated or purchased from coal, natural gas, and renewable sources during peak and off peak periods and by season;

CNT Energy and I-GO Car Sharing have no additional information on these issues. But, we note that, even if a utility uses coal as fuel, EV motors will reduce air pollution because they are so much more efficient than gasoline motors at turning energy into forward motion.

(MidAmerican at 8-9; See also MN Pollution Control Agency report, March 2007, available at

http://www.state.mn.us/mn/externalDocs/Commerce/Air_Emissions_Impacts_of_PlugIn_Hybrid_Vehicles_in_Minnesotas_Pass_032907013010_PCA_PHEV_emissions_FINAL_2.pdf)

j. **Discussion of how the utility plans to comply with any regulations that may be issued by the FERC pursuant to Section 1305(d) of the EISA of 2007, to the extent such regulations are known, concerning the protocols and standards for integrating plug-in electric vehicles into an electrical distribution system, including Smart Grid systems and devices as described in Title XIII of the EISA of 2007, in 2011 and thereafter; and,**

CNT Energy and I-GO Car Sharing have no additional information on these issues.

k. **Summary of organizations consulted on the development of each plan, including appropriate environmental, civic and consumer organizations, as well as any existing organizations within each utility's service territory that advocate for or represent an interest in electric vehicles.**

I-GO Car Sharing communicates frequently with ComEd regarding the pilot described above. However, even though I-GO does not currently operate in Ameren and MidAmerican territory, it hopes to do so in the future. I-GO welcomes the opportunity to share its experience with all Illinois electricity providers and to work with them to accelerate the electrification of the transportation sector.