

**Before the Illinois Commerce Commission
Initiative on Plug-In Electric Vehicles (PEV)
Comments of the Natural Resources Defense Council on the Initial Assessments
January 22, 2011**

I. INTRODUCTION

The Natural Resources Defense Council (NRDC) respectfully submits the following comments on behalf of the 19,454 members and online activists.

We commend the Commission and the utilities under its jurisdiction for taking up the critical and timely issue of the electrification of the transportation sector, and in particular we thank Chairman Flores and Commissioner Diaz for providing leadership on this issue. Together with a clean grid, plug-in electric vehicles (“PEVs”) have the potential to significantly reduce greenhouse gas emissions, improve air quality and reduce dependence on oil. Over the next five years, nearly all major automakers are planning to introduce PEVs into the U.S. market. The corresponding development, production, and supply of advanced batteries, vehicle components and materials, charging infrastructure, and energy management and software services will be a significant source of economic growth.

In order to capture the full environmental, social, and economic potential of PEVs, while minimizing associated costs, NRDC recommends the Commission adopt three overarching policy goals:

1. Reduce barriers for consumers to own and operate plug-in electric vehicles. As with any new technology, many barriers must be overcome before PEVs vehicles will be widely adopted by consumers. Utility planning and notification, consumer education programs, streamlined installation of charging infrastructure, and the adoption of rates designed with PEVs in mind will facilitate a smooth consumer experience.

2. Minimize costs and impacts associated with electrification. Electrification of transportation is moving forward. Ensuring that utilities, charging service providers, and customers have the tools to manage PEV load in an efficient, reliable, and environmentally preferable manner will be critical. At the distribution level, utilities need to be notified as to the location of new PEV load to prevent service interruptions, facilitate service planning, and allow for customer outreach. The Commission should consider methods in addition to bilateral utility-automaker agreements to help assure early utility notification. To minimize impacts at the generation level, the Commission should consider policies that encourage utilities and third party charging service providers to deploy tariffs, equipment, and services that support load management. These policies should include transparent price signals to PEV customers that smooth out the load curve, “smart” charging, and demand response programs. Such load management policies and programs will mitigate the need for costly generation investments.

3. Maximize the environmental, utility customer, and system benefits of plug-in electric vehicles. PEVs, if integrated appropriately, offer electric customers many potential benefits. For example, charged with clean energy, PEVs reduce greenhouse gas emissions and improve air quality. PEV adoption can also significantly reduce dependence on oil, and on fuels in general, as customers benefit from the additional efficiency inherent in the electric drive. Finally, there are also potential electrical grid benefits from PEV charging, including greater utilization of existing generation assets, the ability to provide grid support services that facilitate the integration of variable generation from renewable resources, and in the long term, vehicle-to-home or vehicle-to-grid applications that can reduce the cost of integrating distributed- and utility-scale renewable energy resources. The Commission should establish policy objectives that seek to maximize each of these potential benefits.

II. COMMENTS ON UTILITY REPORTS

NRDC commends Ameren, ComEd, and MidAmerican for their efforts to respond to the Commission’s request for initial reports (hereinafter “the utilities” and “the reports”).

NRDC provides the following comments on the reports with an eye toward accomplishing the three policy objectives articulated above:

A. It is not too early to begin planning for the integration of plug-in electric vehicles.

The reports correctly point out that electric vehicle adoption is predicted to proceed in a non-linear fashion, and will vary regionally, with some regions lagging others. However, NRDC cautions the Commission from using this regional variability to justify delaying action on vehicle integration. We have attached comprehensive analysis conducted by the Planning Edge, on behalf of NRDC, which predicts significant numbers of electric vehicles nationwide:¹



Illinois should begin planning now to accommodate the sharp rise in vehicles on the road that is predicted by 2015.

¹ See Attachment A, pp. 7-13: “The data and figures are based on a bottom-up assessment of over forty vehicle models planned for introduction over the next five years. The list includes twelve large and intermediate volume manufacturers and ten new entrant firms. The estimates by The Planning Edge account for information from company reports, media reports, consulting reports, capital investments, expert judgment, and forecasting tools.”

B. All three utilities should provide information contrasting the emissions associated with their generation supplies during on-peak and off-peak hours.

NRDC commends Ameren for providing information on both their on-peak and off-peak generation resources.² All three utilities should provide such time-differentiated information so the environmental implications of load-shifting can be better understood. Similarly, all three utilities should provide resource-specific emissions factors for their respective portfolios, as included by ComEd.³

C. Third party vehicle charging service providers

Third party electric vehicle charging service providers will play a valuable role in PEV charging in the residential space (both single-home and multi-dwelling units), at work, and in public or commercial environments. These and other third-party business models should be encouraged to develop in collaboration with utilities and automakers. NRDC offers the following observations to better inform the Commission's interpretation of the sections of Illinois law relevant to the regulation of electric vehicle charging.

In most instances, electric vehicle service providers will simply act as customers of utilities. However, the Commission should consider the fact that some charging service providers may wish to procure directly at wholesale. Any decision on the extent of regulation appropriate in the third party charging context should anticipate this fact and assure that Illinois' regulatory framework governing the procurement of electricity remains intact. This includes ensuring that electricity purchased for PEV charging is subject to the same environmental requirements and standards as electricity procured for any other use. Similarly, the Commission should consider its ability to assure that price signals reach end-users. In some

² See Ameren, "Initial Assessment," December 15, 2010, pp. 22-23.

³ See ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 61.

instances, electric vehicle charging service providers may mask the signals of time variant pricing and recover electricity costs via other means. At minimum, PEV customers should be provided with the price paid for electricity so that energy costs are not hidden.

NRDC believes full public utilities regulation for third party providers is unnecessary and unwarranted, particularly since the market for charging services will likely be a competitive one. We recommend establishing minimal requirements for utility notification of charging station installation to facilitate service planning and prevent service disruptions, to guarantee the installation of smart charging equipment that is capable of responding to grid signals, including demand response and time variant price signals, and to assure transparency of electricity pricing.

Should the Commission interpret the relevant sections of Illinois code as conferring jurisdiction over third party charging service providers, NRDC recommends the Commission make plain that the scope of its requirements would be significantly limited and that third-party charging service companies would not be regulated as public utilities. The Commission should make it clear it will only use statutory authority over such charging companies to establish minimal requirements, such as those mentioned above. NRDC does not recommend the Commission regulate other aspects of “utility-customer” charging company business models, including retail pricing, but limit its authority to the minimal requirements discussed above. Many such companies will likely integrate other services in addition to vehicle charging and should be encouraged to develop innovative business models. Minimal regulation of charging service companies would provide the Commission the ability to assure electrification goes smoothly as the market develops in ways that cannot be anticipated.

Alternatively, if the Commission determines it does not have direct jurisdiction over third party providers of electric vehicle charging, the Commission could rely upon its authority

over the tariffs, rules, and rates that govern the relationship between a utility and its charging service company customer. The California Public Utilities Commission (CPUC) has stated that it intends to do just that in the second phase of a rule-making which is currently ongoing. While it is not yet clear whether or not the CPUC will be able to accomplish all of the goals outlined above within this framework, we are working actively and collaboratively with the CPUC, charging companies, utilities, automakers, and consumer advocates to that end. The CPUC is resolving admittedly difficult and complex issues while balancing many competing concerns. We are grateful the ICC is also addressing these issues with the goal of ensuring successful PEV commercialization.

Whatever decision the Commission makes as to how it will regulate PEV charging, it should clearly articulate that any entity procuring electricity at wholesale for PEV charging will be subject to the same regulatory framework as those procuring electricity for any other purpose. The CPUC made this clear in its final decision in the first phase of its rule-making on electric vehicles, concluding as a matter of law:

If a provider of electric vehicles charging services procures electricity on the wholesale market the Commission has jurisdiction to enforce procurement requirements and other laws and rules that apply to direct transactions including Pub. Util. Code § 365.1.⁴

NRDC does not anticipate that many charging service companies will want to procure electricity at wholesale, but the Commission should clearly state it will continue to assure the environmental performance and reliability of Illinois' electrical grid. The Commission should also make it plain it will play its role in assuring that the electrification of the transportation sector proceeds smoothly and in a manner that maximizes environmental and customer benefits, and minimizes adverse grid impacts.

⁴ California Public Utilities Commission, *Decision 10-07-044*, July 29, 2010, Conclusions of Law 5.

D. The Commission should support efforts to ensure utilities are notified when their customers purchase PEVs.

All three utilities note the critical importance of adequate notification when one of their customers decides to purchase a PEV. Without such notification, the costs of PEV integration will be much greater and the customer experience will suffer. Ensuring adequate notification is not a great technical challenge, but it will not happen without dedicated effort. Simply placing the onus on individual customers will be insufficient. Currently, systematic notification largely relies on bilateral cooperation between automakers and utilities, though efforts are underway in California to create a more scalable, data clearinghouse solution that will also capture used-vehicle sales. The Commission should support similar efforts in Illinois and may wish to encourage the utilities under its jurisdiction to engage in the efforts headed by the California Electric Transportation Coalition to ensure the solution is nationally-applicable.

E. The Commission should also support efforts to ensure intelligent load management

As noted by ComEd, the peak system demand at 5:00 pm coincides with the hour of arrival at most homes.⁵ Preliminary analysis provided to the California Public Utilities Commission by Pacific Gas & Electric suggests that that distribution costs incurred to enable residential charging may be as much as five to twenty-five times greater on-peak than off.⁶ MidAmerican notes that widespread use of simple timers set to begin charging at 9:00 pm, a plausible start time for an off-peak rate, will result in an artificial peak that would be similarly expensive to accommodate. These costs can be avoided, if the right policies and equipment are in place, but this will not occur without clear leadership. ComEd asserts:

⁵ See ComEd, "Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System," p. 35.

⁶ California Public Utilities Commission, Energy Division, *Revenue Allocation and Rate Design*, September 10, 2010, p. 10.

Both residential and commercial charging stations, Level 2 and above, must be “smart,” meaning the charging station must support communications with the utility. These communications include remote load management capability for the utility, such the ability of the charging station to accept electricity price signals, and the ability to start/stop charging based on system load signals.⁷

There is nothing inevitable about “smart” charging. Within the next several years, utility service for PEV charging should be preconditioned upon the customer’s ability to effectively manage load, either through his or her own initiative, or through participation in utility load management programs. The programmability and communications functionality needed to make this possible could be embedded in electric vehicle supply equipment, or in the vehicle itself. The Commission should not pre-determine the most efficient technological solution, but should make it clear this functionality will be required so all customers can manage their load effectively. Requiring this capability soon will prevent unnecessary investments in additional equipment in the future, and will lower costs for all customers by ensuring that load management is possible.

F. Automatic Rate Adjustment

The uncertainty surrounding the PEV load underscores the need for the Commission to consider a mechanism that adjusts rates, up or down, as load contracts or expands to assure that utilities recover no more or no less than their Commission-authorized fixed cost revenue requirements and that customers retain the benefits of “found margins.”

As discussed above, the Commission should guide its policy decisions in this area with the key objectives of:

⁷ See ComEd, “Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System,” p. 35.

- 1) Reducing barriers to PEV deployment and;
- 2) Minimizing the costs associated with PEV charging

If the Commission achieves both of these laudable objectives, the total volume of electricity sales will increase disproportionately to fixed cost investments. Decoupling authorized fixed cost recovery from the actual volume of electricity sales causes increases in sales to result in reduced rates for all customers by spreading only marginally increased fixed costs over significantly more kilowatt hours sold.

A “lost margin recovery mechanism” will fail to adjust rates downward as electricity sales increase with PEV adoption. Absent revenue decoupling, utilities will retain the benefits of “found margins” in the form of greater profits. With revenue decoupling in place, those benefits will be returned to all utility customers in the form of lower rates. Furthermore, decoupling aligns utility incentives with the use of the most efficient vehicles and charging infrastructure by removing any profit-opportunity from maximizing the volume of electricity needed for electric drive. As the Commission is aware, NRDC has proposed decoupling in ComEd’s current rate case (10-0467).

G. The utilities should clarify the assumptions behind the calculations in each report.

The vehicle efficiency assumptions embedded in the utility reports are not clear and should be made transparent. For example, Ameren’s calculations seem to assume a pessimistic vehicle efficiency of 0.42 kWh/mi, while MidAmerican seems to assume a more optimistic 0.2 kWh/mi.⁸ The EPA estimates the efficiencies of the Nissan Leaf and Chevy Volt at 0.34 kWh/mi and 0.36 kWh/mi respectively. The anticipated workshop process can be used to assess the validity of the assumptions behind the reported calculations.

Assumptions about annual vehicle use also appear to vary widely. ComEd appears to assume that Level 2 charging will require 10,512 kWh/yr, while MidAmerican cites General Motors’ estimate that its Volt will consume 2,250 kWh/yr.⁹ Of course, consumption will vary according to individual driving habits, but to place these numbers in context, driving a Nissan Leaf 12,000 miles in a year, using EPA’s efficiency estimates, would require 4,000 kWh.

⁸ See Ameren, “Initial Assessment,” December 15, 2010, p. 17 ($3000 \text{ kWh} \div \left(600 \frac{\text{mi}}{\text{mo}} \times 12 \text{ mo}\right) = 0.42 \frac{\text{kWh}}{\text{mi}}$); MidAmerican, “Initial Assessment of the System Impact of Plug-in Electric Vehicles,” p. 5.

⁹ See ComEd, “Initial Assessment of the Impact of the Introduction of Plug-in Electric Vehicles on the Distribution System,” p. 48; MidAmerican, “Initial Assessment of the System Impact of Plug-in Electric Vehicles,” p. 6.