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**Prepared Testimony of  
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NRG Energy, Inc  
Submitted to the  
Texas Senate Committee on Business and Commerce**

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**Re: Electric Vehicles**



Mr. Chairman and members of the committee: Thank you for allowing me to testify today.

My name is Glen Stancil, and I am Vice President in the EV Services business unit of NRG Energy, Inc. Our EV Services business unit is dedicated to building infrastructure and offering associated transportation services to drivers of electric vehicles in Texas and across the country.

NRG is an active participant in the Texas competitive power markets. We are the second largest electric power producer in the state with over 10,000 MWs of diverse and growing generation assets. Through our 2009 acquisition of Reliant Energy, we now serve approximately 1.6 million customers across the competitive retail areas of ERCOT. I am proud of NRG's participation in the Texas market and enthusiastic about our plans for new investment at both the wholesale and retail levels of this market.

I believe that Texas has the most advanced power market in the nation – and possibly in the world. Our competitive wholesale market structure has created unmatched business investment in power generation - making Texas the undisputed national leader in renewable generation. Our retail structure has created a vibrant and healthy competitive market with over 35 residential retail electric providers serving the nation's most engaged electricity consumers.

I am here today to provide NRG's perspective on how Texas can build upon this leadership to become a national leader in electric vehicles.

### **Electric Vehicles**

While one charge for this committee proceeding is “reducing electricity demand,” other charges include promoting energy efficiency, improving grid reliability, and improving air quality.

Overall, this is a difficult charge because there are situations where these objectives can conflict with each other. For example, *increasing* electricity use can generate environmental, economic, and reliability benefits when that demand help reduce dependence on foreign oil and pollutants. Given such “beneficial electrification” opportunities, we must evaluate the overall effect of increased use by analyzing when and how it is used and what are the societal impacts.

One such “beneficial electrification” opportunity is electric vehicles. A Texas home that increases electricity consumption by 20% (about 3,000 KWh per year) to fuel an electric



vehicle for 12,000 miles produces a valuable societal result because of its beneficial outcome for the environment, the economy, the grid, and the customer.

#### *The Environment*

Electric vehicles present an effective long-term tool for reducing mobile emissions and bringing Texas metro areas into attainment with EPA air quality standards. An electric vehicle essentially trades daytime tailpipe emissions in densely populated areas for night-time generation emissions in less populated areas. Even in the worse case scenario where 100% of that generation is from coal, there is still a net positive emissions tradeoff. A 2007 study found that using a plug-in hybrid electric vehicle (PHEV) charged from electricity generated from a coal plant would result in CO<sub>2</sub> emissions that are 25% lower than a conventional gasoline vehicle.<sup>1</sup> With our rapidly improving generation portfolio and strong night wind capacity, the environment tradeoff becomes extremely positive.

#### *The Economy*

Growth in the use of electric vehicles will provide many economic benefits. The most prominent of these benefits will be reduction of the \$300B+ U.S. oil import trade deficit. However, the adoption also creates economic value in the manufacturing of motors, controllers, and batteries as well as the development of core technology and intellectual property. Further, electric vehicles are less expensive to operate – as low as 2.5 cents per mile instead of 10 cents per mile for an internal combustion vehicle,<sup>2</sup> providing vehicle owners with an opportunity to spend those savings elsewhere.

#### *The Grid*

The storage capabilities of electric vehicles combined with a network of smart chargers provide a powerful grid asset. This distributed network can dynamically adjust EV charging to grid conditions at the generation, transmission, and distribution levels to optimize economics and ensure reliability. As charger and battery capability evolve, this EV network can also provide various ancillary services though bi-directional capability including the potential to return power to the grid. The synergy of night Texas wind and night smart charging of vehicles presents especially powerful opportunities to better optimize the overall grid and efficiently absorb more renewable generation. While mass usage of EVs does create more consumption of electricity, that demand comes at night where we have existing renewable and under-utilized generation to serve these incremental EV kilowatt hours. Therefore, even with significant addition of EVs and the related electricity demand, the state may not require additional generation capacity with effective smart charging usage.

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<sup>1</sup> Electrification Coalition, *Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security* at 40 (Nov. 2009).

<sup>2</sup> *Ibid.* Note: This cost does not include any charging infrastructure that may be required.



### *The Customer*

Electric vehicles create a great driving experience with unparalleled performance, convenience, and fun. Today, beyond the economic and environmental value, EVs provide the fun of quiet and powerful acceleration with the convenience of never going to the gas station again. Tomorrow, the use of electric motors and batteries hold potential for entirely new customer-centric car designs, electronic features, communications capabilities, personalization options, service options, and ownership models. In many ways, the electric vehicle could evolve to a personalized ownership experience and product model that more closely parallels the mobile phone than today's automobile.

### **Bringing EV Leadership to Texas**

Texas is well-positioned to be a national leader in electric vehicles. We have densely populated metro areas with EV-compatible commute patterns. Our state has a car-centric culture and high levels of home ownership. Those homes have attached garages and most of those garages have electrical service drops. Most of those service drops have sufficient capacity to fuel EVs. Increasingly, that capacity is managed by smart meters and fed by a robust and highly renewable generation portfolio. Most importantly, our state has energy leadership on a global scale with a pro-business climate and a competitive electric market to drive innovation.

However, converting this positioning into actual leadership requires having the right market framework, the right technology platform, and the right public-private cooperation.

### *Market Framework*

Electric vehicles are a catalyst for entirely new product, service, and business models related to the car itself and the underlying transportation fuel. These models have the potential to create tremendous value for both the electric industry and the automotive industry. To achieve this innovation, it is important that infrastructure and services for fueling electric vehicles remain a competitive market driven by business investment and innovation. Following this approach will enable many business models to emerge with the winning models ultimately determined by customer choice.

While safety and reliability of the infrastructure are the highest priority concern, NRG believes these concerns can be fully addressed via market-based mechanisms. The mechanisms include safety certification for smart charging infrastructure (such as through Underwriters Laboratories ("UL")), standard permitting and inspection processes, and smart-grid enabled demand management programs.

On this last point, through the new smart grid capabilities, the market should have the ability to create a new era of demand management programs. These programs can maintain



reliability from the breaker box to the generation bus bar with unprecedented customer participation and involvement. The distributed measurement, verification, and control capabilities of the smart grid make it all possible.

#### *Technology Platform*

Maximizing value from electric vehicles requires smart charging that is actively managed to optimize among customer objectives, cost, and grid reliability. With the evolution to bi-directional batteries and chargers, the value potential expands with the addition of smart ancillary services that are dispatched in real-time to the markets.

However, this value is only delivered with a smart grid technology platform that has standardized communications interfaces as well as a robust set of communication capability including bandwidth, latency, and two-way device-specific addressability. To dispatch an EV charger in the real-time ERCOT market, we must be able to manage the charger specifically, quickly, and securely over standard published interfaces.

#### *Public Support*

Success in EV requires public-private partnership. We believe the State and all levels of government have a role to play in supporting Texas being the national EV leader. While that role would be very powerful as a provider of financial incentives, NRG believes material value and purchase motivation can be achieved through many non-financial benefits as well as the reduction of some remaining EV adoption barriers.

### **Recommendations**

As the committee investigates priorities for the upcoming legislative session, NRG would submit the following themes for consideration:

1. Ensure that EV charging equipment and services remain in the competitive market to drive investment, growth, and innovation.
2. Ensure the Texas smart grid has the necessary communications standards and performance to support smart charging that help optimize generation and ensure grid reliability. On the standards side, national grid standards from NIST and SGIP will provide the necessary guidance with respect to smart charging. On the performance side, if we expect EV chargers to support generation optimization and grid reliability, the underlying smart grid must have adequate standard, secure, point-to-point communications with acceptable bandwidth and latency to be participants in the real-time market.



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3. Government entities should actively support the adoption of electric vehicles. While financial incentives are powerful, NRG recognizes the current budget constraints that limit that activity in the near term. Nevertheless, adoption of the following policies would provide Texans with convenience benefits to promote EV adoption:
  - > Promote phased integration of electric vehicles into the public fleets
  - > Provide preferred roadway access on HOV lanes and toll roads
  - > Provide preferred charger-enabled parking at high value public locations
  - > Enhance building codes to lower future barriers to charger installation
  - > Expedite permitting and inspection for home EV chargers
  - > Offer favorable tax and fee treatment for EVs