



NEWS RELEASE

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Central Indiana pilot project with Toyota, Duke Energy, Energy Systems Network envisions common standard between plug-in cars, charging stations and utilities

Hoosier commuters will debut new technologies and practices to help cars, chargers, and utilities 'speak the same language'

(INDIANAPOLIS, Ind., August 22, 2012) As plug-in hybrid electric vehicles (PHEVs) continue to gain consumer acceptance and market share, automotive companies, utilities and charging equipment providers are collaborating on common standards to seamlessly align vehicles, charging stations and the power grid. Toyota Motor Corporation's new pilot project in central Indiana will begin to answer the question of how best to manage plug-in vehicle charging based on integrated communication between the vehicle and the electric power grid, taking advantage of the region's existing efforts deploying plug-in vehicles as part of the 'Project Plug-IN' initiative.

Toyota is partnering with Duke Energy and Energy Systems Network (ESN), the non-profit industry initiative that leads Project Plug-IN, for this effort. The pilot project will use advanced technologies to give customers the ability to achieve their own personal charging strategy automatically – for example, minimize electricity costs by communicating with the utility company to recharge during off-peak periods.

The project aims to test and validate the effectiveness of communication standards developed by the Society of Automotive Engineers (SAE) to provide a simple and affordable smart grid communication protocol between the vehicle, the charging station, and the utility company – to effectively manage vehicle charging. Additionally, the project plans to develop appropriate business processes and standards to most effectively manage charging to the benefit of the customer, utility and vehicle systems.

The pilot project will involve 5 Prius Plug-in Hybrid vehicles driven by Duke Energy customers living in the Indianapolis area. These customers will drive the cars regularly during the pilot period, which is expected to begin in early 2013 and last for at least 12 months.

"Through Project Plug-IN, the Indianapolis region has been a national leader in the deployment and monitoring of plug-in vehicles with typical consumers, gathering data and taking steps towards making the 'electric commute' a truly practical alternative for more Americans," said ESN President & CEO Paul

Mitchell. “We’re pleased to extend this effort through the partnership with Toyota and Duke Energy, to help our vehicles, charging infrastructure and utilities speak the same language for the benefit of consumers.”

Toyota will provide a UL certified home charging station and a home gateway communication system to be installed in each customer’s home, allowing the vehicle and the ‘smart grid’ equipment to communicate with each other to evaluate billing and power supply control. Duke Energy will simulate price structures and demand response events to understand the impact to the customer’s bill and understand how these types of programs can aid in grid reliability as plug-ins become more prominent. The pilot will employ the use of Homeplug Green PHY, a Power Line communication standard that is based on SAE technical standard J2931, and utilizes ISO/IEC standard which has been announced by ACEA (European Automobile Manufacturers’ Association) as the European standard beginning in 2017. This method allows the sharing of data collected in a home network between the plug-in vehicle and the utility. Toyota Info Technology Center, U.S.A., Inc.; Sumitomo Electric Industries, Ltd. and Leviton Manufacturing Co., Inc. support this project as the suppliers of the Level 2 EVSE and communication systems.

Toyota hopes to gain technological insight to perfect future vehicle iterations for its customers as well as for the overall advancement of the plug-in vehicle industry. “Smart charging through two-way communication with utilities will not only be a benefit to the customers, but is crucial for the promotion of transportation electrification,” said Edward J. Mantey, VP, Vehicle Planning & Corporate Strategy, Toyota Technical Center.

Each Duke Energy customer will use the vehicle communication system to monitor and manage their optimized charging using a mobile software application provided by Toyota for the pilot project. Data collected from the vehicles and EVSEs will be aggregated and maintained securely, protecting all personal information. Surveys will be administered in order to gather qualitative data on customer experience and behavior related to the pilot project.

“These pilots are key to understanding what electric vehicle owners expect from their charging experience which assists Duke Energy in maintaining overall grid reliability while minimizing costs for all customers,” said David Mohler, VP, Emerging Technologies for Duke Energy. “Standardized communications between vehicle, charging infrastructure and utility is critical to advancing the plug-in vehicle industry and we are excited about being a partner in this project.”

Energy Systems Network (ESN) is a not-for-profit, industry-driven economic initiative focused on the development of the clean technology sector. ESN provides project development and coordination for joint ventures and cooperative partnerships between network members who are seeking to bring new energy technologies, products or applications to market. ESN member institutions provide industry expertise across the energy spectrum, including Fortune 500 and global leaders collaborating on projects totaling nearly \$1 billion in investment. Among several other initiatives, ESN and its partners developed *Project Plug-IN* – a commercial scale pilot of plug-in electric vehicles and smart grid technology working together to demonstrate an energy efficient transportation system solution. It aims

to develop, deploy, demonstrate, market and evaluate a range of plug-in vehicles powered by an integrated charging infrastructure located in homes, businesses and parking facilities. To date ESN has coordinated the deployment of more than 125 electric vehicles to public and private fleets as well as consumers and installed of nearly 200 charging stations across the Indianapolis region. For more information, visit www.energysystemsnetwork.com.

About Duke Energy

Duke Energy is the largest electric power companies in the United States with more than \$97 billion in total assets. Its regulated utility operations serve approximately 7.1 million electric customers located in six states in the Southeast and Midwest. Its commercial power and international business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States.

Headquartered in Charlotte, NC, Duke Energy is a Fortune 250 company traded on the New York Stock Exchange under the symbol DUK. More information about the company is available at www.duke-energy.com.

About Toyota Motor Corporation

Toyota Motor Corporation and its subsidiaries sold over 7.3 million cars, trucks and buses worldwide under the Toyota, Scion, Lexus, Daihatsu and Hino brands in the fiscal year ended March 31, 2012. The company manufactures vehicles and parts in 26 countries and regions around the world and sells them in approximately 170 countries and locations. Toyota established operations in the United States in 1957 and currently operates 10 manufacturing plants. Toyota directly employs over 30,000 in the U.S. and its U.S. investment is currently valued at more than \$18 billion, including sales and manufacturing operations, research and development, financial services and design. In an effort to develop the vehicles and technologies of the future, Toyota's R&D is far reaching and includes investing more than \$1 billion an hour globally in areas such as vehicle safety, quality and sustainability. While Toyota remains committed to hybrids as the core of its environmental technology, their sustainable mobility strategy is far-reaching and incorporates products, partnerships, the urban environment and energy solutions. Toyota is slated to bring multiple plug-in hybrid vehicles and electric vehicles to market by 2012. Key elements of plug-in vehicle expertise at Toyota are housed in the advanced product strategy & product planning group at Toyota Motor Sales U.S.A., Inc. This group oversees the development of new concepts and strategies for future Toyota and Lexus vehicles. Toyota Info Technology Center U.S.A., Inc. is a subsidiary of Toyota in Mountain View, California responsible for developing advanced technologies.