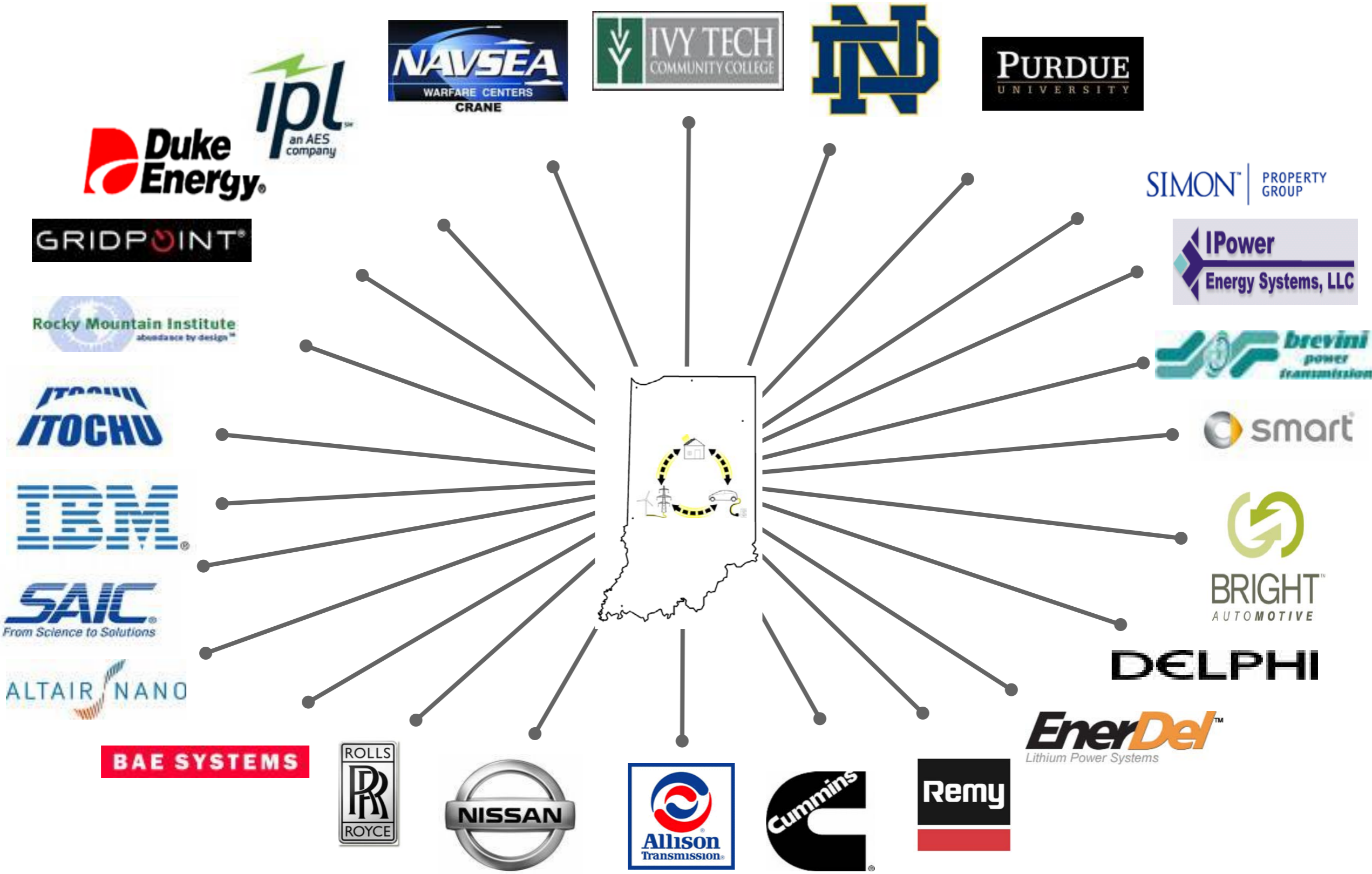




Building An Energy Ecosystem



Energy Systems Network (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 commercialization projects deliver systems level solutions by drawing on a rich diversity of established and emerging companies and institutions across Indiana and beyond who collectively make up a world-class cleantech cluster with expertise that span the energy ecosystem.

ESN Board of Directors

Joe Loughrey (chair) – retired Vice-Chairman & President, Cummins Inc.

James E. (Jim) Rogers – Chairman & CEO, Duke Energy

Jeff Owens – President, Delphi Electronics and Safety

Dr. John Kelly III – Senior Vice President and Director of Research, IBM

Charles Gassenheimer – Chairman & CEO, Ener1 Corporation

Mike Hudson – President, I-Power Technologies

John Waters – President & CEO, Bright Automotive

Amory Lovins – Chairman & Chief Scientist, Rocky Mountain Institute

France Cordova – President, Purdue University

Thomas Snyder – President, Ivy Tech Community College

Mark Miles – President & CEO, Central Indiana Corporate Partnership

ESN has also formed a world-class Technical Advisory Council with deep knowledge and expertise across the alternative energy sector.

ESN Technical Advisory Council

Dr. Gerry Wilson – Vannevar Bush Professor of Electrical and Mechanical Engineering; Dean of Engineering 1981-91, Massachusetts Institute of Technology

Dr. Richard O. Buckius – Vice President for Research, Purdue University

John Wall – CTO, Cummins Inc.

Dr. Jim Lyons – CTO, Novus Energy Partners; Chief Engineer, GE Global Research (retired)

Bill Wylam – Chief Engineer- Batteries; Director of International Manufacturing, Delco Remy Division of General Motors Corporation (retired)



PROJECT PLUG-IN

First of its kind commercial scale pilot of plug-in electric vehicles (PEVs) and smart grid technology working together to demonstrate a transportation energy system solution for the Indianapolis area

The pilot will span the service territories of two regulated utilities and will include the development of a model regulatory framework and network architecture needed to take smart grid and plug-in systems to scale

Our plug-in ecosystem will provide an optimal test bed for accelerating the commercialization of plug-in technologies on the vehicle side, grid side, and in-between.

The Indianapolis area is an ideal location for Project Plug-IN because it is approximately 20 miles from all suburbs to the city center (ideal for current battery range) and has no mass transit system . Moreover, Indianapolis is hosting the 2012 Super Bowl where our plug-in ecosystem can be showcased on a global scale.

Our Partners



DELPHI

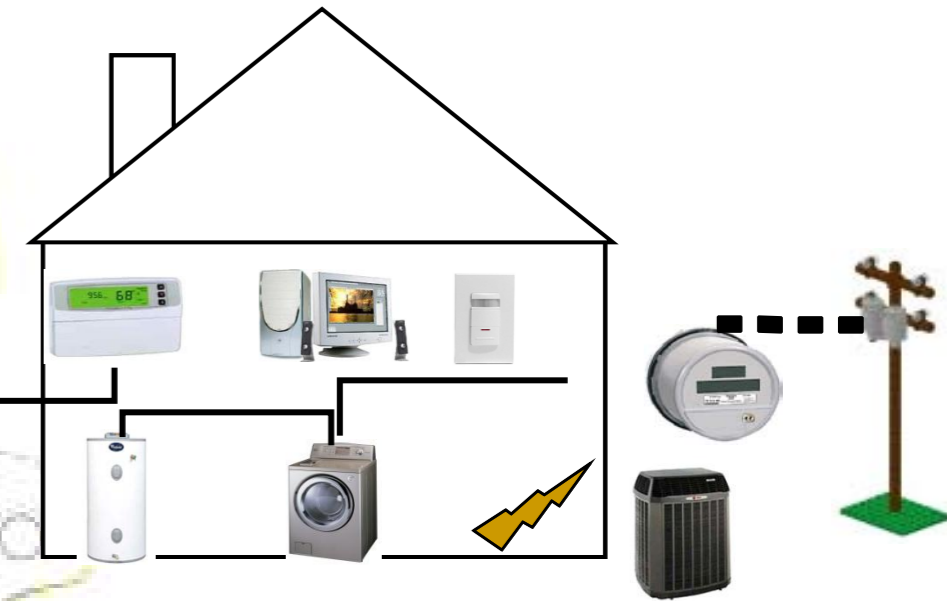
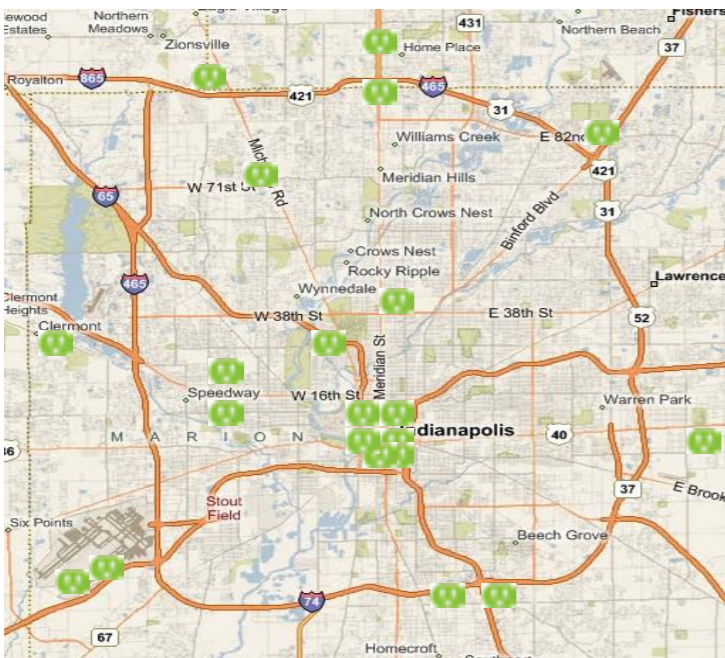
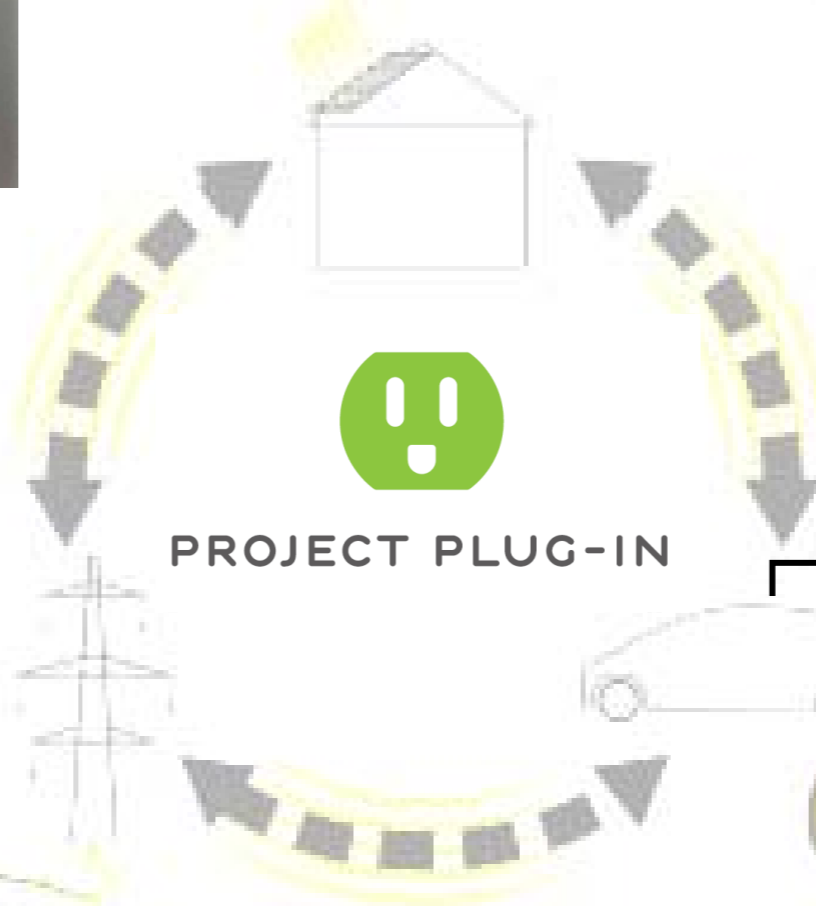


SIMON | PROPERTY GROUP



An Integrated System Solution

In-Between



Grid Side

Vehicle Side



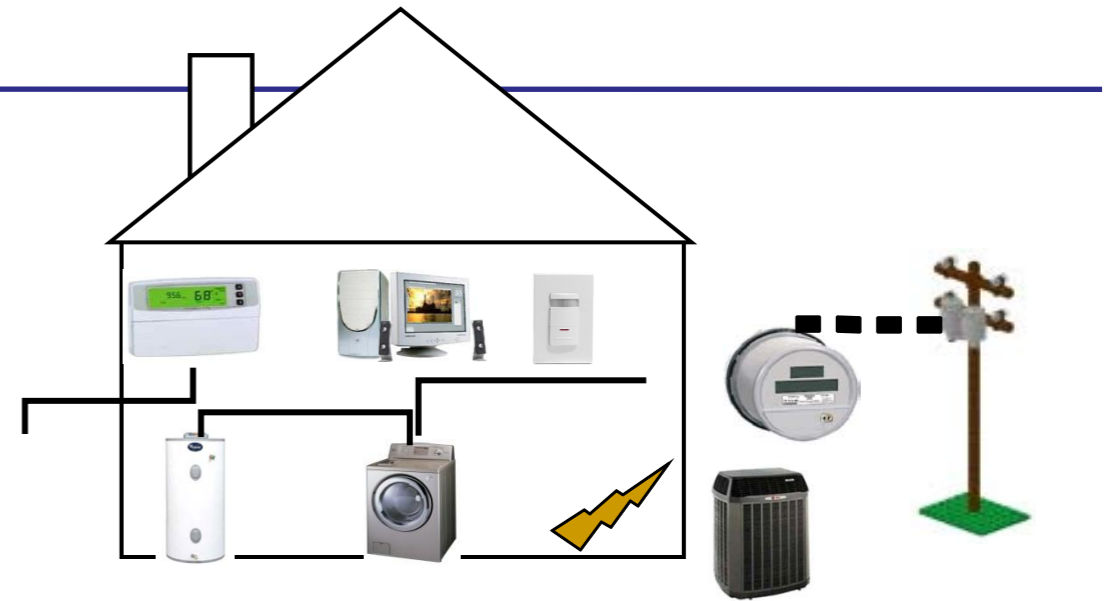


- Incorporate multiple PEV (i.e. PHEV, EV) vehicle platforms across the light, medium, and heavy duty spectrum (MD and HD may require HEV systems only)
 - Achieve a critical mass of plug-in vehicles in the 2009 -2010 timeframe (100+ vehicles)
 - Generate sustained consumer interest through corporate and political support as well as public outreach and education
 - Provide an optimal test bed for demo systems or to prove out related plug-in technologies/applications including smart-charging, wireless communication between the vehicle and grid, and two-way vehicle-to-grid power flow.
- Focus will be on safety and performance to ensure a positive customer experience
- Partners bring a broad expertise including batteries and battery management systems, power electronics, communications systems and expertise, and system integration skills that will enable them to monitor/oversee PEV performance

Indianapolis Infrastructure



- Deploy smart grid in homes and businesses across the Indianapolis MSA
- Ensure an open architecture network design that is scalable:
 - Gateway that supports multiple communication protocols
 - Able to adapt as the evolution of technologies progress
 - Allows Internal and external connections to other devices
- Baseline applications will provide immediate benefits to customers including improved energy efficiency and pricing options



- Smart charge infrastructure will be piloted in select homes, businesses, and parking facilities
 - Faster charging sourced from both renewable and grid power
 - Time charging to lower cost and enable valley filling and load leveling
 - Demonstrate next-generation vehicle-to-grid technology
- Test multiple applications with an eye toward scalability
 - Real time analytics and data modeling that improve load management and energy efficiency
 - Integrate software and intelligent devices to increase customer benefits (e.g., virtual thermostat, on-vehicle telematics)
- Transaction Settlement Management System
 - Enhances transparency in billing and allows charging in multiple utility service territories
 - Needed to support mass commercialization of PEVs

Project Plug-IN will have multiple phases beginning summer 2009

- **Phase 1 – 1 year, Q4 2009 – Q4 2010**
 - HEV to PEV conversions and OEM commercial PEV products (100+ vehicles)
 - Vehicles powered by 240V grid charging installed at homes, malls, and downtown parking facilities
 - Advanced data collection and modeling to support vehicle and charging infrastructure optimization
- **Phase 2 – 1.5 years, Q1 2011 - Q3 2012**
 - Multiple OEM commercial PEV products (1000+ vehicles)
 - Smart Grid with Smart Charge infrastructure installed in select homes, businesses, malls, and parking facilities
 - Analytic modeling, integrated software, and transaction system tested
 - Pilot Smart Charge customer offering with time of use charge tariff
- **Phase 3 – 1 year, Q4 2012 - Q4 2013**
 - Multiple commercial light, medium, and heavy duty PEV products for sale in Indianapolis MSA with high level of early adoption
 - Smart Grid installation launched across Indianapolis MSA with PEV customers offered Smart Charge product options
 - Multiple applications being deployed to enhance Smart Grid and Plug-in system optimization