

***READY, SET, CHARGE!****DEVELOPING EV-READY STATES, REGIONS, CITIES, AND ELECTRIC UTILITIES*

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<b>Lead Sponsor</b>	<b>Electric Power Research Institute</b>
<b>Managing Partners</b>	<b>Clean Fuel Connection   EV Communities Alliance</b>
<b>Prospective Seed Funders</b>	<b>Electric Power Research Institute   California Energy Commission Edison Electric Institute   Auto Manufacturers</b>
<b>Prospective Clients</b>	<b>Cities:</b> Austin, Portland, Los Angeles, Orlando, Washington, D.C. Sacramento, Houston, Detroit, Chicago, Denver <b>Utilities:</b> Progress Energy, Other Investor-owned and Public Utilities TBD <b>EV Industry:</b> Coulomb Technologies, Others TBD
<b>Mission</b>	<b>To accelerate the transition to electric drive vehicles, and thereby reduce greenhouse emissions and enhance economic vitality.</b>
<b>Goal</b>	<b>Build 12 “EV ready” regions by 2012</b> in partnership with utilities, local and state governments, auto and equipment suppliers, and civic organizations.
<b>Services</b>	<b>Develop EV Transition Plans   Access Funds   Streamline Charger Installation Implement EV-friendly Policies   Prepare Early Deployment Markets Install EV Chargers   Advance Utility Readiness   Build Public Awareness</b>
<b>Leadership Experience</b>	<b>Enid Joffe</b> , CEO, Clean Fuel Connection   17 years’ EVSE experience (2000+ installs) Clients include GM, BMW, Ford, Honda, Nissan, Toyota, BMW, LA DWP, SMUD, Costco, major cities & airports, etc.   Responsible for all Coulomb installs in California 18 year career at SoCal Edison & Edison EV   Lead consultant to Air Quality Districts on EV and AFV issues   Co-author of EPRI studies   Licensed (A, B, C) contractor <b>Bob Hayden</b> , Senior EV Consultant   25 years EV & clean transportation experience Founder and first CEO, Electric Drive Transportation Association   Co-Chair, Bay Area EV Corridor Working Group   Lead Consultant, City of SF EV Initiatives <b>Richard Schorske</b> , Executive Director, EV Communities Alliance   Project Director, Bay Area EV Corridor Project   former Exec. Director, Workforce Silicon Valley Founder, Bay Area EV Training Consortium (CEC funded project on EVSE streamlining)
<b>Key Differentiators</b>	<b><i>Ready, Set, Charge!</i></b> is the only EV ecosystem enterprise providing <u>comprehensive</u> EV infrastructure and EV readiness services for a major metro region, utility, or state. RSC uniquely offers all of the following: <b>EV transition planning, resource development, EV initiative operational management technical utility planning, and EVSE installation services.</b> RSC complements (rather than competes with) the two other national EV ecosystem focused. Where RMI’s Project Get Ready helps regions get organized and move up the learning curve, RSC can “finish the job” with field-level project management services. In turn, the National Plug-in Vehicle Initiative is well-positioned to be a best practice information-sharing hub for all ecosystem initiatives. <b>RMI Project Get Ready</b> provides a web-based menu of policies and practices which local EV consortia largely implement on their own. The principal RMI service is a semi-monthly conference call with partner cities and their technical advisory team. RMI does <u>not</u> deploy consultants into the field to manage EVSE ecosystem development. <b>The National Plug-in Vehicle Initiative</b> mission is to provide “timely and accurate information to the media and general public on the electric drive industry.” As part of EDTA, the NPVI provide best practice information but not regional consulting.

# READY, SET, CHARGE!

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**I. Target Market and Revenue Model:** A broad range of private and public sector entities have a compelling interest in developing EV-ready regions and states. Accordingly, *Ready, Set, Charge!* clients will include individual entities and consortia that include utilities; auto makers; state, regional, or local governments; regional, state, or federal energy and transportation agencies; and EV charge station vendors. To respond flexibly to the needs and funding requirements of diverse client organizations, *Ready, Set, Charge!* is organized as a joint venture between Clean Fuel Connection, Inc. (a private C corporation) and EV Communities Alliance (operating under 501c3 nonprofit auspices.) In general, Clean Fuel Connection will be the contract holder for consulting engagements, while EV Communities Alliance will administer foundation and government grants where a nonprofit agency lead is most appropriate.

**II. Challenges to be Addressed:** Plug-in vehicles (PEVs) – including both Plug-in hybrid vehicles (PHEVs), and Battery-Electric Vehicles (BEVs) – will be available in significant numbers starting in early 2011. However, auto manufacturers, utilities, and local government stakeholders are increasingly aware that most communities are far from “EV ready.” Specific challenges include the lack of publicly accessible charge networks; the complex and protracted process for installing residential EV chargers; and other challenges discussed below.

- **Lack of adequate publicly accessible charge networks:** Most metro areas current lack the backbone network of publicly accessible EV chargers required to provide a satisfactory customer experience for early adopters of plug-in vehicles, especially Battery-Electric Vehicle (BEV) drivers. Unlike PHEV drivers, who can rely on range extending gasoline engines, BEV owners require a broadly distributed network of EV charge points to alleviate “range anxiety.” Notably, many urban EV drivers will not be able to rely on at-home charging, because of the logistical barriers to installing EVSEs in multi-unit buildings. Therefore, convenient, publicly accessible recharging at workplaces and commercial centers – as well as creative solutions for multi-unit dwelling (MDU) installations – will be essential. To address this challenge, *Ready, Set, Charge!* will help regional stakeholders to:
  - Identify the optimum quantity and location of EVSEs
  - Develop cost-efficient siting and installation protocols for residential and workplace/public sites
  - Develop incentives and guidelines for encouraging MDU charger installs
  - Collect and analyze usage data to fine tune follow-on EVSE deployment strategies.
- **Complex and protracted installation processes for residential charging:** While residential charging is the principal means whereby most EV customers will fuel their EVs, current installation processes are complex, costly, and protracted. Data collected by Clean Fuel Connection (which has installed 2,000+ EVSEs) indicates that the average residential installation time between ordering and installing an EVSE is over four weeks. Most auto OEMs consider these time parameters to be unacceptable. However, the challenge of accelerating EV charger installation is highly complex. To substantially reduce install times in target regions, *Ready, Set, Charge!* team will work closely with all relevant stakeholders to re-engineer the EVSE deployment process from end-to-end, with these goals:
  - To reduce the multiple hand-offs required
  - To consolidate installation steps (for example, by providing for self-certification for simple installs)

- To streamline permitting processes
- To promote EV-friendly building codes that mandate pre-wiring for EVs (including promotion of LEED points for EVSE).

In addition, as EV charge manufacturers and OEMs seek to streamline installation processes, *Ready, Set, Charge!* will work with key stakeholders to reach consensus on proposed process refinements. For example, some EVSE manufacturers and automakers are proposing a special Level 2 wall outlet in lieu of hardwired EVSE. Discussion with groups such as the International Code Council is needed to confirm that such a modification is compliant with Article 625 of the National Electric Code and acceptable to local building officials. As new procedures are developed and approved in our client communities, *Ready, Set, Charge!* will provide training materials, checklists, and processes for contractors, building officials, first responders and utilities to ensure that all stakeholders understand and can implement best practices.

- **Funding, Regulatory, and Utility Infrastructural Challenges:** The planning, installation, and integration of charging infrastructure is the most immediate challenge facing many regional EV ecosystem architects. However, other key issues that must be addressed include:
  - Effectively competing for future state and federal EV infrastructure resources
  - Creating sustainable business models for ongoing EVSE network development and operations (especially on the utility side of the meter)
  - Addressing the challenge of upgrading transformers and ensuring that other components of the emerging smart grid can support mass deployment of EVs in the 2015 – 2025 period and beyond.

The *Ready, Set, Charge!* team brings more than two decades of utility and EV experience to bear on these strategic and technical issues.

### III. The Solution -- An EV Readiness Team That Addresses the Full Range of Ecosystem Challenges

The core challenge of an EV-ready community is to provide convenient access to cost-efficient charging, while implementing policies that accelerate the transition to electrified transportation. But what is the best pathway to this result? Most infrastructure initiatives have established structures for policymakers and industry to work together. In the case of EV infrastructure, however, many new players are in the mix -- from auto companies to utility commissions to air quality districts. Too often, different stakeholder groups are waiting for someone else to take the lead. Moreover, the natural “commute shed” of a major metro area often exceeds the boundaries of even the largest regional governments. In these complex, multi-stakeholder environments, new structures of cooperation must be developed, characterized by clear strategic alignment and effective project management.

With on-the-ground experience in leading EV-ready regions (including the Los Angeles and San Francisco metro areas) RSC action teams tackle the full range of EV readiness activities, including:

- Developing effective EV Transition Plans
- Accessing competitive grant funds
- Streamlining charger installation permitting process
- Developing and implementing EV-friendly policies
- Preparing early deployment markets for innovative vehicles
- Installing EV charge networks
- Analyzing grid impacts and advancing utility readiness
- Building public awareness and support for the EV transition
- Supporting fleet managers in developing their plug-in vehicle strategy and infrastructure

To address these needs, *Ready, Set, Charge!* brings together experts in clean vehicle infrastructure, utility program management, process reengineering, and public/private partnership building. These expert teams identify key pressure points in the EV ecosystem – and develop an effective response to each challenge in close collaboration with local stakeholders. *Ready, Set, Charge!* also works closely with other leading stakeholder associations – from the Electric Power Research Institute to the Electric Drive Transportation Association -- to develop, document, and deploy best practices that leverage the learning of early adopter communities. These practices inform our work in the following key domains.

#### IV. Building Robust EV Ecosystems: Key Building Blocks for Success

- **Developing comprehensive EV Transition Plans** – A common vision and action plan is critical to guide the EV transition. Stakeholders engaged by RSC in the ecosystem planning process typically include local, regional, and state government partners, utilities, auto companies, other EV infrastructure vendors, workforce providers, EV and environmental advocates, and public and private funders. In regions that have not yet developed their EV Transition Plans, *Ready, Set, Charge!* regional action teams will help develop comprehensive blueprints that define short and long-term goals, activities, costs, and benefits.
- **Accessing funding** -- State and federal EV infrastructure funding opportunities are subject to intense inter-regional competition. To be successful over the long term, EV-ready regions *must* develop a dual-track strategy of attracting available existing resources, while also building sustainable local and state funding streams. *Ready, Set, Charge!* helps local stakeholders gain national, state, and regional infrastructure funding as a top priority.
- **Installation Process Streamlining** – Installation streamlining requires the leadership of an experienced team that can identify bottlenecks and bring stakeholders together to overcome them in each relevant local jurisdiction. These efforts may require months of concerted effort to revise local codes and standards and establish common EVSE installation processes. *Ready, Set, Charge!* team members have substantial experience in addressing the process challenges of diverse communities. We know that working with local building officials, city councils, and other permitting authorities requires mastery of the key technical issues involved, and patient work at multiple levels of local and regional decision-making.
- **Developing EV-friendly policies and incentives** – Developing EV-friendly policies and incentives across an entire region requires multi-jurisdictional cooperation and strong public-private partnerships. Policy changes can be as simple as developing self-permitting procedures for home charger installations in a single city -- or as complex as coordinating building code revisions across an entire metro area. Whether narrow or broad in scope, *Ready, Set, Charge!* works with local stakeholders to prioritize the highest-impact policy and incentive changes, and builds the coalitions needed to implement them.
- **Training the Workforce** – The shift to electrified transportation is an integral part of the broader green jobs / clean energy transition. By integrating workforce strategies into EV ecosystem planning from the ground up *Ready, Set, Charge!* helps local stakeholders tap into the growing availability of green workforce training funds. RSC workforce partners typically include local contractors, government agencies, Community Colleges, labor organizations, and Workforce Investment Boards.
- **Installing EV Charging Stations** – *Ready, Set, Charge!* has the unique capability to integrate strategic planning, resource development, and EVSE installation. Unlike other initiatives, which emphasize “convening” and “best practice sharing” – *Ready, Set, Charge!* can address the messy details of EV charger installation on a region-wide, turn-key basis, in response to needs identified by local stakeholders. To assist with field-level installation management, the *Ready, Set, Charge!*

team includes the nation's most experienced EVSE installer in Clean Fuel Connection, Inc. (CFCI). CFCI has deployed EV chargers in partnership with leading companies from GM to BMW, and in cities as large as Los Angeles and New York. Clean Fuel Connection also maintains a nationwide contractor and dealer network that can offer cost-effective EVSE equipment and installation solutions customized to local needs.

- **Utility Planning for Transportation Electrification:** The speed of the EV transition will depend on many uncertain variables -- including future economic growth, fuel prices, government incentives, and vehicle cost curves. Regardless of the exact pace of market growth, however, utilities have many challenging near-term issues that must be addressed. These include:
  - Preparing for the grid impacts of EV charging
  - Developing special EV rates
  - Resolving metering and billing issues associated with EV "roaming"
  - Developing strategies to shift charging off-peak.
  - Creating vehicle and utility communication protocols for smart charging

In addition, utilities have a number of options to consider with regard to the deployment of EV charging stations. Some utilities (such as Georgia Power) are engaging in a robust campaign to encourage residential charging and are performing EVSE installations in a vertically integrated approach. Other utilities (such as Southern California Edison) are working to resolve challenges related to charging in multi-family dwellings, and are already planning transformer upgrades and other needed infrastructure. Other utilities are considering outsourcing their EV-readiness efforts. To meet utility needs in a flexible and comprehensive manner, *Ready, Set, Charge!* includes utility veterans with the expertise to address the full range of strategic and technical issues pertaining to the EV transition.

**V. *Ready, Set, Charge!* Services:** RSC addresses EV ecosystems in a comprehensive yet flexible approach -- offering a wide array of services from which client organizations can choose. These include:

- **EV Transition Planning**
  - EV Coalition Building
  - Needs Assessment
  - Regional EV Transition Plans
  - EVSE Infrastructure Planning (residential, commercial, and government)
  - EV public awareness campaigns
  - Integration of EV plans with climate action and economic development strategies
  - Strategies for EV integration in government and private fleets
- **Resource Development**
  - Local, state, and federal grant development
  - Development of public-private funding coalitions
  - Utility cost and revenue modeling for EV-related services
- **EVSE Installation Streamlining**
  - EVSE "pre-approval" processes for residential customers
  - Development of rapid local approval processes
  - "End-to-end" process reengineering to reduce residential and commercial installation times

- **EV-related Policy and Incentives Development**
  - Development of policy options for EV ecosystem development
  - Field-level work with key decision-makers to enact high-impact policies
  - Coordination of public and private sector incentives for EVs and related infrastructure
  - Development of comprehensive “early deployment market” programs with OEMs
  
- **EV-related Workforce Training**
  - Identification of workforce funding and program opportunities
  - Development of EV-related workforce training coalitions
  - Planning and implementation of training programs in cooperation with key stakeholders (including local employers, colleges, labor organizations, Workforce Investment Boards)
  - Training of police, fire, and building officials in EV issues
  
- **EVSE Installation**
  - Pre-qualification of EVSE customers via home or workplace visits
  - Cost estimation of municipal, corporate, or region-wide EVSE installations
  - Training, deployment, and supervision of contractor teams to cost-efficiently install EVSEs
  
- **Utility Planning for Transportation Electrification**
  - System impact assessments
  - Design and integration of electricity fuel metering and billing systems
  - Addressing EV “roaming” across utility districts
  - Time of use charging and rate strategies
  - Capital planning for residential, commercial, and public charging infrastructure
  - Distribution level infrastructure assessment and upgrades
  - Integration of renewable energy resources with PEV load
  - PEV customer service to build customer readiness
  - Design of EVSE incentives and finance options for infrastructure upgrades on the customer side of the meter
  - Developing a strategic and technical architecture for vehicle-to-grid connectivity

**For More Information:** To discuss your EV ecosystem development needs, please contact:

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