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CALIFORNIA ENERGY COMMISSION
DOCKET 12-ALT-02
2013-2014 INVESTMENT PLAN
ALTERNATIVE FUEL AND VEHICLE TECHNOLOGY PROGRAM

PUBLIC COMMENTS
Submitted by
COULOMB TECHNOLOGIES/CHARGEPOINT NETWORK
September 28, 2012

Coulomb Technologies is a California based Silicon Valley company manufacturing and deploying charging stations and business software systems for electric vehicle charging--a necessary ingredient for the successful adoption of electric vehicles.

Coulomb has partnered with the California Energy Commission in AB 118 funding opportunities to both manufacture the software systems as well as deploy charging station infrastructure to support electric vehicles throughout the State of California.

These comments will provide an update on the AB 118 investments already made; as well as share Coulomb's perspective on the EV market and initiatives we suggest be considered by the Commission in this investment plan. These initiatives are:

- Workplace Funding "Jumpstart Program"
- MultiDwelling Unit Funding "Jumpstart Program"
- Super low cost equipment for MDU EVSE DEVELOPMENT
- Network Interoperability Program for California EV Drivers
- Coordination with EPIC funding investment plan to ensure EV Drivers receive benefits of the potential grid efficiencies and ancillary services

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BACKGROUND

Coulomb was founded in 2007 with the sole mission to support electric vehicle adoption by ensuring no one will hesitate to purchase an electric vehicle because they cannot "fuel" their cars.

Coulomb has developed the largest network of independently owned charging stations in the world. Today we have over 9,000 public charge spots up and running on the network.

More than 1,000 companies are providing charging via the ChargePoint Network. Coulomb customers include large employers such as Google and SAP; utilities such as Orlando Utilities Commission and Austin Energy; municipalities such as City of San Francisco and City of New York; large shopping centers such as South Coast Plaza and Bellevue Square; and parking services providers such as Edison Properties and Priority Parking.

Our stations are currently dispensing over 690 megawatt hours of electric fuel each month, the annual equivalent of 1,500,000 gallons of gas avoided and 23Mlbs of CO2 emissions prevented. EV drivers plug into a ChargePoint Station more than 3,600 times every day with 50% of all EV drivers using a ChargePoint

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card and 40,000 mobile apps downloaded. Coulomb currently operates in 14 countries.

AB 118 INVESTMENT UPDATE

In January of 2010 Coulomb Technologies was selected by the Department of Energy to participate in the Electrification of Transportation program funded by stimulus money.

This public/private partnership entitled "ChargePoint America" has deployed charging infrastructure in twelve American cities. In April of 2010 the California Energy Commission approved $4M in match funding to bring the program to California to support residential and public deployment of charging stations.

Under the program entitled "ChargePoint California" we have deployed over 1,300 hundred stations and brought Department of Energy funding to the State. We have successfully worked with cities and local stakeholders to plan and install the infrastructure. Cities in "ChargePoint California" include: Riverside, San Rafael, Pleasanton, Beverly Hills, Campbell, San Francisco, Saratoga, Alameda, Belvedere, Palo Alto, Capitola, Laguna, Seal Beach, Roseville, Sacramento, San Jose, Santa Barbara, Santa Cruz and Los Angeles.

Importantly, we have also worked with developers and business owners to support a business model to encourage private investment in this infrastructure.

The CEC investment in EV Infrastructure has gotten a desired effect in California. With the $15M in DOE funding Coulomb received, along with the $5M in CEC funding-- Coulomb has attracted over $70M in private capital.

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Over the life of the DOE and CEC grant ChargePoint has grown 1,000%. We added additional facilities in California increasing our footprint 3X.

These investments have created hundreds of new jobs-- and EV infrastructure investments going forward will continue to stimulate local economies.

ISSUES IN THE MARKET

The California market remains the focal point for electric vehicles. A recent Pike Research Report has indicated that nearly 1 in 4 Plug In Vehicles sold in US from 2012 to 2020 will be in CALIFORNIA.

This is great news!

California has been a leader in the United States advocating policies to support EV Adoption. Ground breaking legislation such as AB 32, as well as recent decisions by the California Air Resources Board to set air quality standards will ensure that electric vehicles remain a priority of auto manufacturers.

And while these policies are important to ensuring our air quality continues to improve and that reduce our dependency on oil, Coulomb has recognized that in order for this market to scale in California and the United States, **we** must attract and maintain private investment.

The number one objective is to support policies that stimulate cars in the market. By creating more EV drivers we will achieve a massive halo effect in California. More cars mean more drivers and this creates the need for more infrastructure and stimulation of jobs.

Our priority is to get drivers to buy electric vehicles with these important policies:

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- Expand HOV Lane Status for Electric Vehicles
- Ensure a competitive market with electricity as a transportation fuel (AB 631 signed by Governor Brown and sponsored by Coulomb)
- Lower costs to consumers by developing sub metering protocols (Phase II of CPUC Decision)
- Allow EV owners to use the LCFS credits as rebates to lower costs and promote adoption
- Continue to authorize up-front incentives to lower vehicle costs

INVESTMENT PLAN RECOMMENDATIONS

INFRASTRUCTURE DEPLOYMENT FUNDING

1. WORKPLACE

Much of the grant funding has been targeting public infrastructure. We must now incent the workplace adoption.

The majority of EV drivers will be charging at home and at work. The fastest growing market segment for Coulomb is the workplace. Currently 40-50% of our revenue comes from corporate and workplace customers.

One example of a premier California company that has invested in EV infrastructure is Google. Coulomb has worked with Google to support their objectives and serve as a case study for this important segment.

- Google invested initially because they have a car-sharing "G-Fleet" program for employees using electric vehicles

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- They wanted a system for managing the cars and making sure they were plugged in
- The first order was for 25 stations
- When employees saw the availability of stations , they made decisions to purchase EVs because they know that they would have a place to charge while at work
- Today somewhere between 200-500 employees are now EV drivers, and Google has purchased enough stations (close to 300) so EV drivers do not worry about fueling.

An additional benefit to charging at work is that this is primarily off peak charging. Coulomb employees charge their vehicles at one of the 5 stations located at our headquarters. The majority of charging is complete in one and one half hours—from 9am-10:30 am.

We recommend that the EV Infrastructure deployment funding in the 2013-2014 Investment plan include a program directed at workplace adoption.

- Workplace Jumpstart Program: $1M to put the first EVSE in 100 businesses

2. MULTI DWELLING UNITS (MDUs)

Another area of continued funding focus should be the Mult-Dwelling Unit market. With over a third of California's living in MDUs the challenges in this sector have to be addressed or residents will not be in position to purchase EVs.

As part of the California Energy Commission project, Coulomb has partnered with the City of San Francisco and PG&E on the first in the nation Apartment Complex and Multi-Dwelling Unit EV Infrastructure Program. The program –

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MultiCharge SF-- has received overwhelming interest. We contacted over 400 building reps, held workshops and are selecting sites from 68 applications requesting 159 chargers. .

We recommend that the EV Infrastructure deployment funding in the 2013-2014 Investment plan include a program directed at the MDU market.

- MDU Jumpstart Program: $500,000 per city to replicate the San Francisco program– 100 stations in 100 apartments.

3. MANUFACTURING FUNDING

Another issue in the MDU market is the high cost of equipment and installation. We recommend that the Commission commit manufacturing funding to develop a design for a $350 per port smart MDU EVSE product. Coulomb would offer the design free to anyone who wants to use it.

- RECOMMENDATION: $5M in Manufacturing Funding to support Super Low cost MDU EVSE development

4. NETWORK INTEROPERABILITY PROGRAM: Supporting EV DRIVERS

Coulomb's mission is to ensure drivers are confident and comfortable that they can charge. We see two needs for the driver: That they can find a station where they need to and they can use it.

Coulomb's ChargePoint is featured by automakers such as Nissan to support the positive driver experience that they know is critical for consumer adoption. In addition Coulomb has over 1,000 customers who provide charging services to

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drivers.

The industry has recognized that gaps and challenges remain to address these goals. Current challenges for drivers and the adoption of EVs include:

- Drivers must sign up with multiple charging service providers, carry different credentials for authentication and authorization, and use multiple payment systems. This problem was solved for cell phones by enabling roaming across multiple networks.
- Drivers must go to multiple sources/websites to find charging stations
- Drivers do not have a pervasive method to determine if stations are in use prior to arriving, or to reserve them

Coulomb chairs a NEMA committee that was recently selected to lead the development of industry standards to address the "gaps" in infrastructure standards affecting EV rollout in the United States. We recognize that collaboration is needed among EV Charging Service providers and are working with companies such as Eaton, Leviton, ECOtality and GE under the auspices of the National Electrical Manufacturers Association.

We see an opportunity for the California Energy Commission to play a role in promoting this effort to ensure drivers in the California market, the largest EV market in the United States, will be able to access charging stations seamlessly and consequently grow the market in the State.

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- **WE RECOMMEND that the Commission fund the formation of a roaming clearing house that multiple EV Networks can use in order to present a uniform driver experience in which any driver can charge at any EVSE.**

  I. Business Formation costs $500,000

  ii. Technology development $3M

- **WE RECOMMEND that the Commission fund the conversion to a standard authentication mechanism that will replace charging cards used by network providers with cards that have roaming ability - $100,000 (per manufacturer)**

- **WE RECOMMEND that the Commission fund the software modifications to California EV Network Providers to allow roaming and unified station mapping - $500,000 per manufacturer.**

5. ELECTRIC GRID INTEGRATION WITH ELECTRIC VEHICLES

Work must continue to allow electric vehicles to bring benefits to the grid. The DOE has published projections that drivers can charge 180 M vehicles without adding generation through smart charging—we need to get on with it.

Coulomb is participating in the EPIC workshops sponsored by the CEC to encourage R&D investments to continue to bring these benefits to EV Drivers. Our recommendations include:

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- Providing funding for funding areas that support the "next horizon" of EV issues by organizing a stakeholder Electric Vehicle Energy Services Council
- Develop and demonstrate energy management capabilities for EVSE independent of utility AMI networks and Smart Energy Profile 2. It's our contention that this should not be the exclusive or even preferred way of signaling DR, Frequency Regulation, and TOU control to EVSE. Indeed we can demonstrate that these Smart Grid capabilities will move to market much, much faster without the requirement to use SEP2.
- Support for EVSE capabilities to provide ancillary grid services such as grid frequency regulation using electric vehicle charging, by developing and demonstrating a prototype electric vehicle charging system that will perform grid frequency regulation. This will help avoid blackouts and brownouts on the energy grid. It will also help facilitate the integration of renewable energies onto the grid.
- Support EV "Customer-Side Electricity Storage Projects" such as energy storage for peak load reduction, energy storage for load management or demand response and energy storage for integration of renewable generation that would utilize electric vehicles in a micro-grid demonstration and show the way to avoid demand charges in the rollout of high power vehicle charging.
- Support reduction of costs for ratepayers in EVSE deployment by funding the development of a sub meter protocol and certification of sub meters in the EVSE to make embedded meters a reality pursuant to the CPUC Phase II decision.

Coulomb appreciates the opportunity to comment on these important initiatives and look forward to a continued successful working relationship with the California Energy Commission.

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