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Coulomb Technologies, Inc.

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Project ID #: ARRAVT073

ChargePoint America Overview

- **Timeline**
  - Start – May 2010
  - Finish – Dec 2013

- **Budget**
  - Total Project Funding
    - DOE: $15,001,287
    - Contractor: $22,897,220

- **Barriers**
  - EV Sales and deliveries
  - Installation Costs
  - Trained Installers
  - Davis Bacon

- **Partners**
  - BMW
  - Fisker
  - Ford
  - GM
  - Nissan
  - Smart

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ChargePoint America Overview - Relevance

- Department of Energy Award DE-EE0003391 $ 37M Project ($15M DoE)
- 10 Metro Areas
- Approximately 4,600 stations Public and Private Level 2: SAE-J1772
- Two Phases
  - Deployment phase ends 06/30/2012
  - Data analysis phase ends 12/31/2013

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ChargePoint America Overview - Relevance

- Accelerate the development and production of electric vehicles to substantially reduce petroleum consumption, reduce greenhouse gas production, and create jobs.

- Demonstrate the viability, economic and environmental benefits of an EV charging infrastructure

- Roll out an infrastructure for EV drivers to facilitate a rapid increase in the use of Electric Vehicles

- Coordinate Stakeholders and OEM EV deployments to maximize charging station infrastructure usage

- Provide EV charging stations for public, commercial and residential locations to encourage consumers to buy Electric Vehicles
    - Residential stations via OEM partners
    - Public/Commercial stations via Coulomb and Partners

- Collect data from the project (analyzed by INL) to help formulate national EV policies and best practices. The information will be used to understand charging information, such as utilization, charge frequency, duration etc. This information can be used to better understand the infrastructure needs and benefits. Ex. Help Kohl's understand utilization at their stores and benefits to them (encourage people to visit their store, etc.)

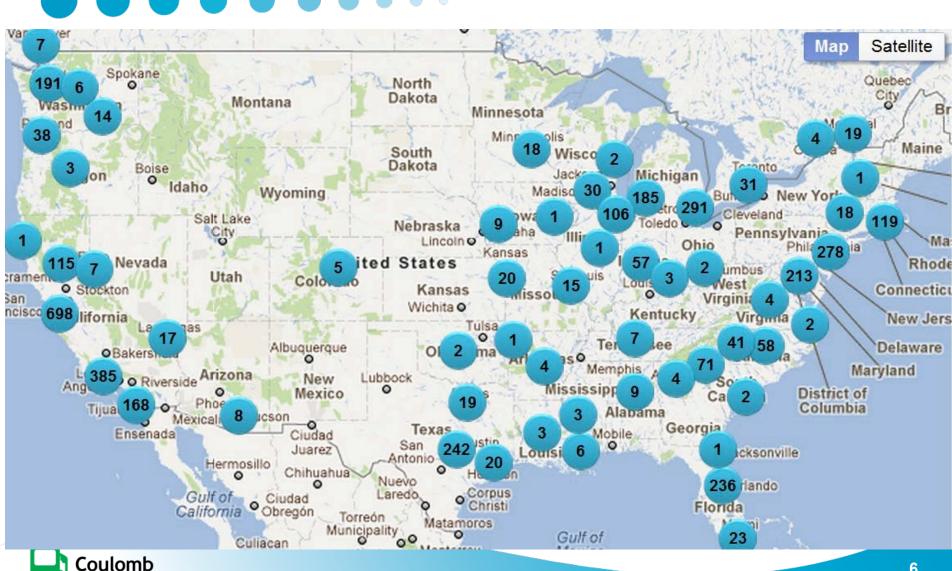**Coulomb Technologies**

ChargePoint America - Relevance

Regions
New York Metro
Washington
DC/Baltimore
Orlando/Tampa
S. Michigan
Boston
Central Texas
LA Metro
Sacramento
SF/SJ Bay Area
Bellevue/Redmond

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Coulomb ChargePoint Network - Relevance

Observations - Approach

- We used existing commercial distribution partners to identify, place, and coordinate installations. This was a low cost solution that worked well.

- Excellent distribution of stations for different type of sites.

- CTI reached out to cities and towns who might otherwise not have been able to afford stations and installations.

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Observations - Approach

- Deployment Distribution
  - No one area represents more than 20%
  - Public Parking Garages (Edison Parking, Manhattan Parking, Icon parking, > 15%)
  - Federal/State/Local (Sacramento, San Jose, Ventura, SF, Boston, NYPD, Baltimore, Detroit, Redmond, > 10%)
  - Workplace (Vornado, GM, Whirlpool, Walmart, Denny's, Bloom Energy > 10%)
  - Public Parking Lots (NYC Municipal parking, SF City Hall, > 12%)
  - Retail (Spartan Stores, Kohl's <5%)
  - Utilities (OUC, National Grid, Consumer's Energy, Austin Energy >10%)
  - Major Airports/Train Stations (Kennedy, LaGuardia, Dulles, SFO, Reagan – 4%)
  - Educational Institutions (Stanford, UC Davis, UofW, Menlo college, Austin Community college, UCF, USF, MSU, U of Maryland> 5%)
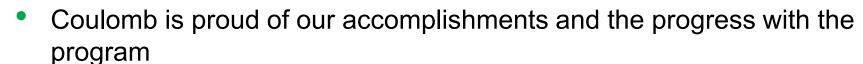
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Program Update - Progress

- Deployment underway since 2010
- EVSE Unit shipments happening daily
- Shipped over 3200 units
- Installed over 2200 units
- Developed and released CT2021 & CT2025 products
- Commercial Program
  - Units fully allocated
  - Stopped accepting applications since Nov 2011
  - Deployment to be completed by June 2012
  - Waitlist for commercial stations
- Residential Program
  - In-progress
  - Deployment to be completed by June 2012
  - Accepting applications, application Process
    - Customer applies through www.ChargePointAmerica.com

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Accomplishments

- Coulomb is proud of our accomplishments and the progress with the program
  - Home and public stations installed in every region of program
  - Hundreds of stations installed every month putting people to work
  - We are fully allocated for public stations, and no longer taking applications
- Coulomb is incentivizing private industry: putting people to work.
  - Good for auto industry. Good for Americans. Good for economy
  - Every station installed puts 3 people to work for a day 2 people to build it and one to install it
  - Matching grant subsidizes the cost of the charging stations to businesses and consumers and, in turn, stimulates matching funds.
- We are laying the groundwork for to reduce our dependence on foreign oil in our nation
  - You can see the results of this grant today in every region of the US where these charging stations are installed.
  - Consumers know their community is committed to this new form of transportation.
  - Dramatic network commercial usage increases to 354 MWh power consumption and 2000 charging sessions a day

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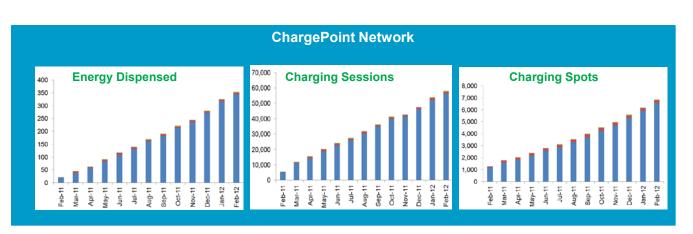
OEM Partners - Collaborations

- Charger deployment will match OEM vehicle flow
  - BMW ActiveE
  - Fisker Karma
  - Ford Focus BEV and Transit Connect
  - GM Volt
  - Nissan LEAF
  - Smart fortwo EV
- Home installations will be coordinated through OEM's
- GM/Volt installed through SPX Services
- Other Home installations through National and Regional installers

ChargePoint Network: The Only Open Network

- ChargePoint Network: the only open network
  - First charging network, live since Jan 2009
  - Largest network of independently-owned electric vehicle charging stations
  - *800* ChargePoint service providers
  - *2,000* charging sessions every day
  - *354* MWh of energy dispensed per month
  - *50%* of EV drivers have a ChargePoint card

- Drivers and station owners demanding network-enabled charging services
  - Follow-on charging station orders must be ChargePoint Network-enabled

- Offers unique, differentiated services to drivers, EVSPs, utilities
  - One stop shop for all driver services
  - Unique services for EVSPs, utilities

ChargePoint Network

Energy Dispensed

Charging Sessions

Charging Spots

ChargePoint Open Network Solution

Services for Station Owners

ChargePoint Service Plans
Cloud-based solutions for managing EV charging

ChargePoint Network

Services for Drivers

Driver applications & services
Web, mobile, in-car apps from Coulomb & ecosystem providers

Any ChargePoint-Ready Stations

From Coulomb or other manufacturer

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ChargePoint Charging Stations

- Standard features:
  - Embedded on-board computer
  - Communications subsystem
  - Display
  - Standards-based RFID reader
  - Utility-grade power meter
- Minimize on-site maintenance with support of:
  - Over-the-air firmware upgrades
  - Remote real-time alarm monitoring
  - Remote diagnostics & servicing
- Enable the flow of power to be controlled in accordance with grid load
- *Mature:* First stations installed in 2008
- *Proven:* 6,000 non-residential residential charging spots up & running
- *Open:* ChargePoint service plans also work with stations from other manufacturers

CT2025
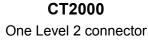- Two Level 2 connectors
- Retractable cords
- Top light

CT2021
Two Level 2 connectors

CT2000
One Level 2 connector

Bollard   Pole   Wall

CT500
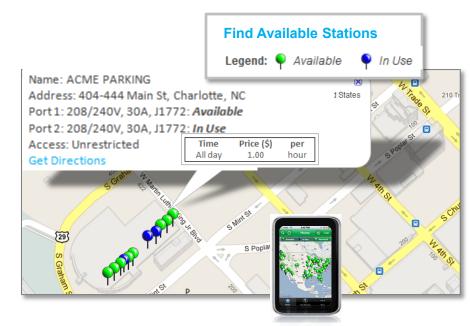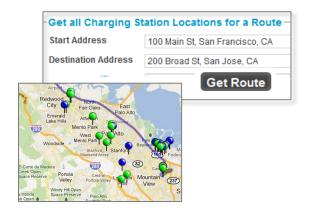One Level 2 connector

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ChargePoint Driver Services

- All CPA drivers have a ChargePoint card
- Stations are visible to all drivers who use:
  - ChargePoint mobile apps
  - A variety of mobile & in-car navigation systems
  - ChargePoint web site
- Drivers prefer & seek out stations on ChargePoint Network because they:
  - Find stations from a variety of devices
  - See station availability before they go
  - Map trips
  - Reserve stations from smart phone or web site
  - Receive notification when charging is complete
  - Get alerted if charging is ever interrupted
  - View charging stats as car charges
  - Get summary of usage across all stations
- The information is used to collect data on operation

Find Available Stations

Legend: 🟢 Available   🔵 In Use

Name: ACME PARKING
Address: 404-444 Main St, Charlotte, NC
Port 1: 208/240V, 30A, J1772: *Available*
Port 2: 208/240V, 30A, J1772: *In Use*
Access: Unrestricted
Get Directions

Time	Price ($)	per
All day	1.00	hour

Get all Charging Station Locations for a Route
Start Address: 100 Main St, San Francisco, CA
Destination Address: 200 Broad St, San Jose, CA
Get Route

ChargePoint Network:
Vehicle Fully Charged on
BEST RETAIL PLAZA.

OK   Call

Charging Status
Current Session (1 of 1)

Station Name	ACME HQ MAIN ENTRANCE
Vehicle Status	Charging
Hours charged	01:10:11

Home   Charging Status   Trip Mapping

CPA Organizations Providing EV Charging via ChargePoint Network

ChargePoint Network: Open Charging Network Leader

Nearly 50% of EV drivers carry a ChargePoint card

6,000 non-residential charging spots up and running

Over 800 companies providing charging through ChargePoint Network

EV drivers plugging in for over 2,000 charging sessions every day

35 patent applications, 9 granted patents

354 MWhs of electric fuel dispensed monthly by ChargePoint stations

Over 33,000 ChargePoint smart phone app downloads

Operating in 14 countries

ChargePoint® Network

Future Work

- Remaining deployments
- Davis Bacon paper work
- Data Collection

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Summary

- Complete deployment by June 30, 2012
- Collect Davis Bacon paperwork for the completed installations
- Collect data and upload the data to INL until Dec 31, 2013

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