San Francisco MDU Program
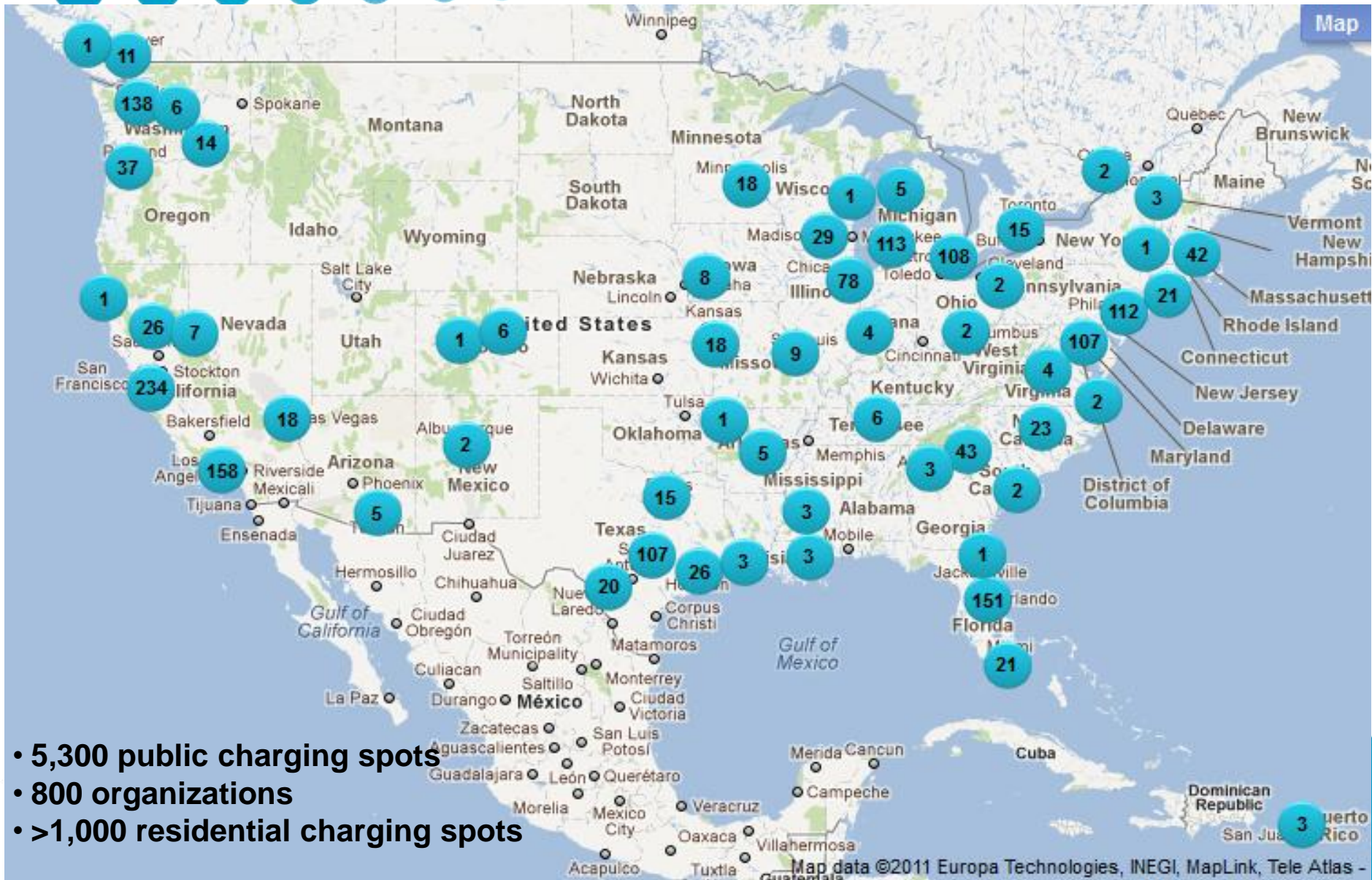
"Multicharge SF"

The Critical Elements for Success
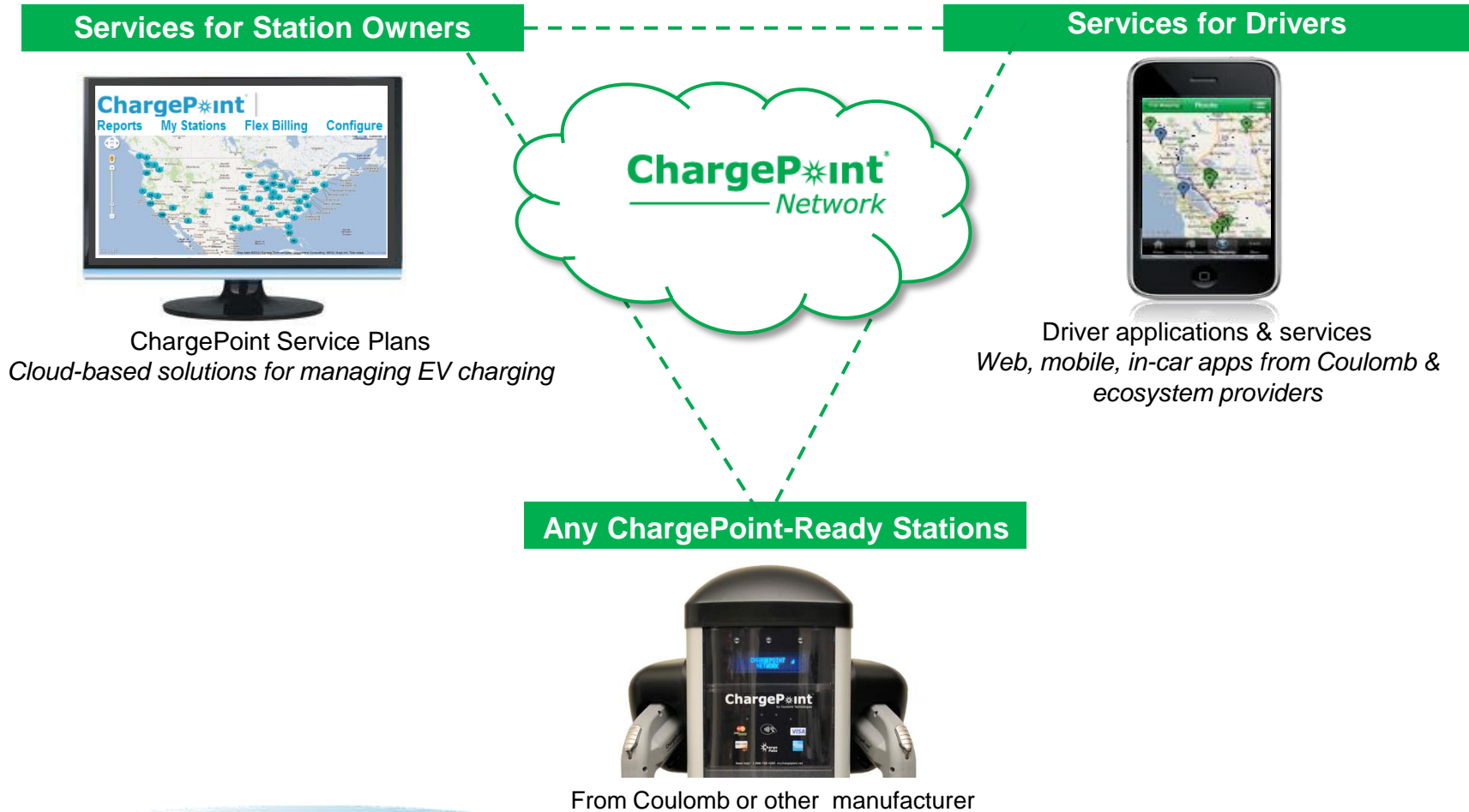
Scott A. Miller

Coulomb Technologies

29 February 2012

Coulomb ChargePoint Network

- **5,300 public charging spots**
- **800 organizations**
- **>1,000 residential charging spots**

ChargePoint Open Network Solution

Services for Station Owners

Services for Drivers

ChargePoint Network

ChargePoint Service Plans
Cloud-based solutions for managing EV charging

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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Coulomb EV Charging Stations

- Standard features:
  - Robust design
  - Embedded on-board computer
  - Communications subsystem
  - Display
  - Standards-based RFID reader
  - Utility-grade power meter
  - UL Listed
- Minimize on-site maintenance with support of:
  - Over-the-air firmware upgrades
  - Remote real-time alarm monitoring
  - Remote diagnostics & servicing
- SmartGrid Ready:
  - Enable the flow of power to be controlled in accordance with grid load

CT2025
Two L2 connectors
Retractable cords
Top light

CT2021
Two L2
connectors

CT2000
One L2
connector

CT500
One L2
connector

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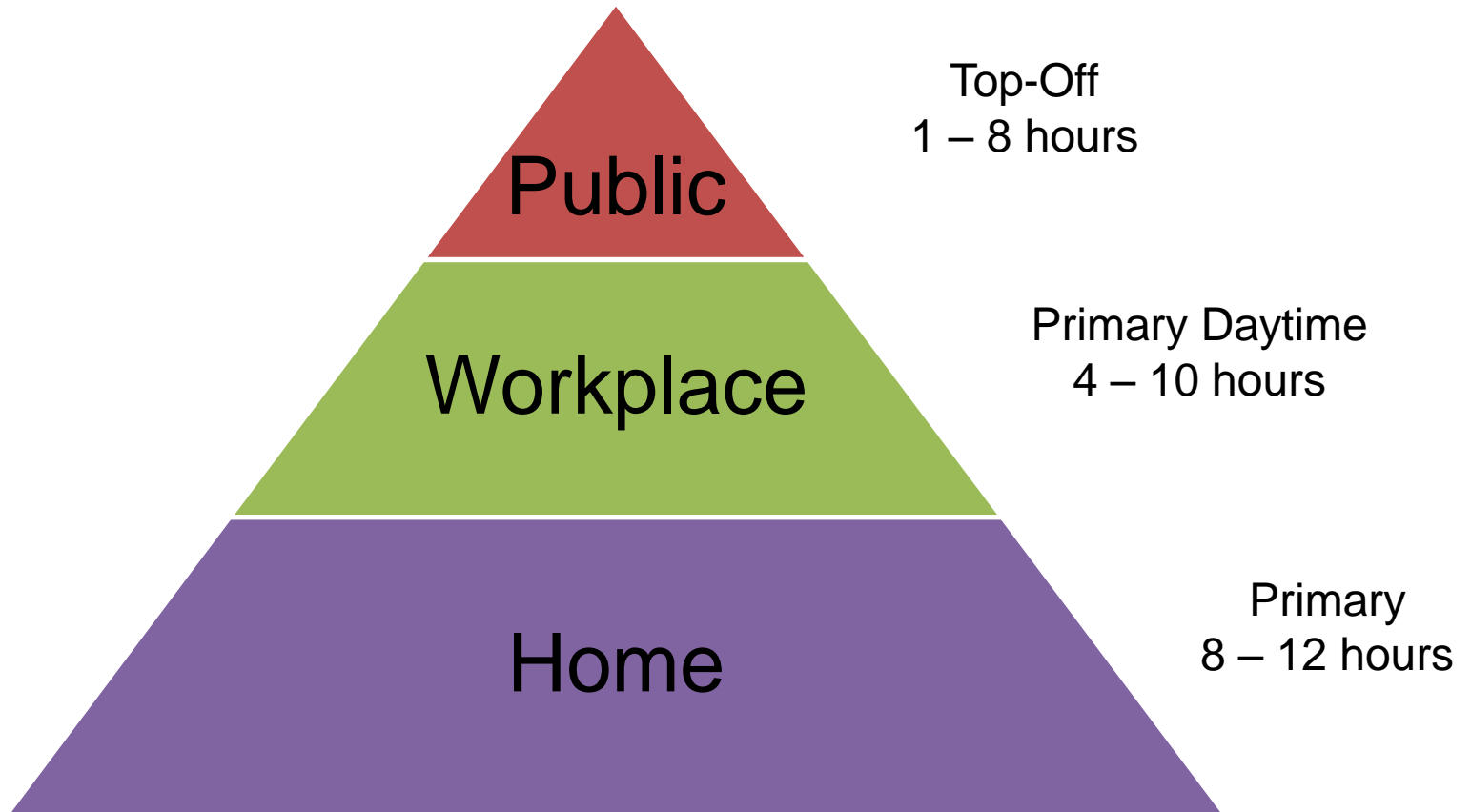# Coulomb Software and ChargePoint Network

Software

- Flexible pricing options
- Variety of payment options
- Ability to limit stations to specific drivers
- Rich real-time data output
  - Station utilization
  - Energy usage
  - Greenhouse gas savings
  - Flexible format

ChargePoint Network

- Reservation capability
- 24 x 7 remote user and host support
- 24 x 7 monitoring of the network with alerts
- Real time status information on web sites, mobile applications, and GPS stations (only for public stations)
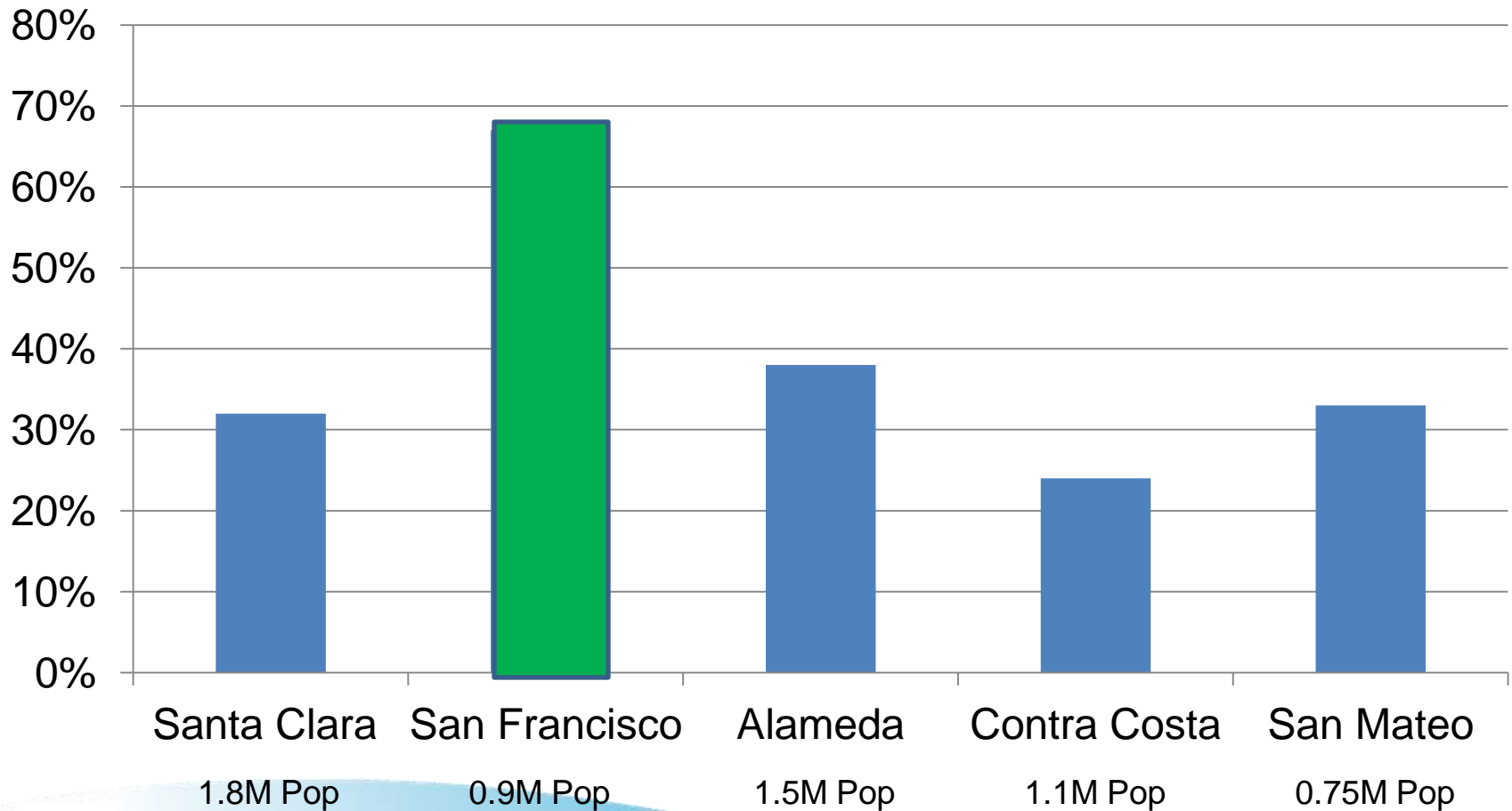- Energy management capabilities

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EV Charging Requires a New Paradigm

Public — Top-Off 1 – 8 hours

Workplace — Primary Daytime 4 – 10 hours

Home — Primary 8 – 12 hours

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San Francisco County Compared to Others

% of Population in Multifamily Buildings

Bar chart showing percentage of population in multifamily buildings by county:
- Santa Clara (1.8M Pop): ~32%
- San Francisco (0.9M Pop): ~68%
- Alameda (1.5M Pop): ~38%
- Contra Costa (1.1M Pop): ~24%
- San Mateo (0.75M Pop): ~33%

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Provided by PG&E

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Every Multi-Family Building is Different

Complexity (vertical axis) vs. Number of Units (horizontal axis)

San Francisco MDU Program: Multicharge SF

- Objective:
  - Increase adoption of EVs within the city of San Francisco
  - Deploy 75 – 100 Level 2 ports in MDUs by June 2012
  - Collect data to better understand the issues
- Approach
  - Provide free charging stations and free installations to applicable MDUs
- Partners:
  - PG&E, City of San Francisco, Clean Cities of SF, California Energy Commission

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Selection Criteria

- Geographic Distribution Across the City
  - Cover all legislative districts
- Economic Diversity
  - Support EV car sharing programs in some districts
- Various Building Types
  - High rises
  - Rentals
  - Condos
  - Co-ops
  - TIC (Tenant in Common)
- Charging Models
  - Individual
  - Shared

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Progress

- Program started: December 2011
- Target completion: June 2012
- Outreach
  - Events – 2 launch events across the city
  - Many individual meetings with stakeholders
  - Emails to stakeholders
  - Web site:

    http://www.sfenvironment.org/our_programs/interests.html?ssi=17&ii=31

- Installers (4 approved)
  - Training/Certification
- Completed:
  - 70 site surveys
  - 34 applications approved for 70+ units
    - Size Range: 3 units – 3,221 units
  - Final contracts go out next week

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MDU Model: Some issues to consider

- Usage: Shared vs. Private
- Who can use?/Who pays?/How?
  - Up Front: Charging Station/installation
  - Ongoing: Maintenance, capital reserves, energy costs (tracking this by driver)
  - Fees: How much? Per hour, Per Session, Subscription?
  - Utility rate implications (EV rates? Peak demand charges)
- Metering
- Zoning/code implications
- Preventing energy theft
- ADA compliance
- Managing the load

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Factors that affect installing stations at MDUs

- Physical Challenges
  - Capacity in the electrical panel
  - Space for additional meters in the meter room
  - Distance between meters, parking spaces, and electrical panels
  - # of parking spaces available
- Cost of Installation and Operation
  - Restrictive facility configurations (master meter, remote parking, etc)
  - Cost allocation to residents (usage, equipment, parking, shared service areas)
  - Ability to take advantage of off-peak charging rates
  - Home Owner Association fees structure
- Codes, Covenants, and Legalities
  - Differences in ownership
  - Who makes the investment and who reaps the benefits
  - Agreements between property owners and residents/renters
  - Deeded parking spaces assigned to individual residents

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Provided by PG&E

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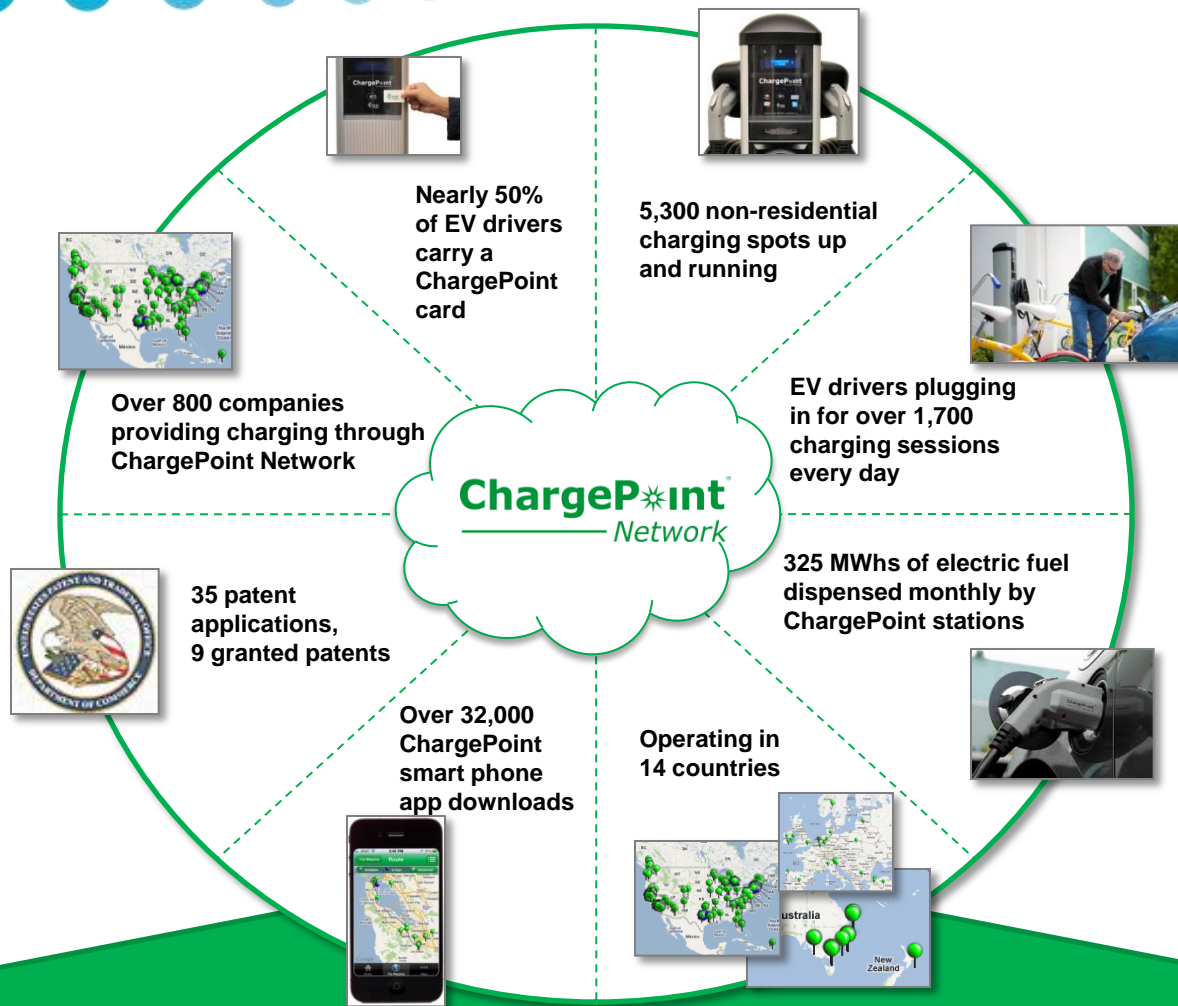
Keys to a successful MDU program …

- City needs to be the front end for the program
- Utility participation and support important
- Requires an effective market outreach/marketing plan
- Requires a set of trained contractors
- Data collection important to understand usage trends
- Free helps a lot (equipment and installations)
- Will not work for every MDU. No silver bullet.

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Desired for Charging Stations for MDUs

- Required
  - Ability to allocate costs for the charging (RFID, Credit Card)
  - Ability to break-out usage by driver
  - Remote user support
  - Ability to "advertise" location and real-time status of charging station
  - Ability to connect to Utilities' smart grid (if applicable)
- Preferred
  - Access control
  - Ability to download software to future-proof stations
  - Ability to allow reservations
  - Ability to alert driver when charging session is complete or when there is a fault.

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ChargePoint Network: Open Charging Network Leader

Nearly 50% of EV drivers carry a ChargePoint card

5,300 non-residential charging spots up and running

EV drivers plugging in for over 1,700 charging sessions every day

325 MWhs of electric fuel dispensed monthly by ChargePoint stations

Operating in 14 countries

Over 32,000 ChargePoint smart phone app downloads

35 patent applications, 9 granted patents

Over 800 companies providing charging through ChargePoint Network

ChargePoint® Network

The 50 Best Inventions of 2010 — TIME

20 Small Businesses of the Future — Bloomberg Businessweek