



## Charge Across Town RFP Submission, Driving on Sunshine

### 1. Goals of the Project

The goal of the 11<sup>th</sup> Hour grant is to advance the adoption of electric vehicles in urban areas. While adoption rates across the country have increased 100% year over year, electric vehicles still represent one half of one percent of all cars sold. There are many causes hindering EV adoption and this proposal addresses a major one – **limited access to easy and affordable EV charging in urban environments.**

In 2011, the U.S. Department of Energy’s electric vehicle and charging infrastructure grants deployed EV charging units in major cities around the country. Today, the City of San Francisco has over 100 public electric vehicle charging stations installed and available to the general public in city parking garages, at the airport, and in municipal facilities. Additionally, there are more than 200 public chargers installed in the City at workplaces and parking facilities. While this is significant, one of the major complaints from EV drivers is the lack of EV charging available to them when they need it, and the gap in EV infrastructure locations. One of the top reasons, cited by consumers not to buy an EV, is the perceived lack of accessible charging stations. Most EV charging is invisible – it cannot be seen from the street, and though smart phone apps or intelligent vehicles might aid people who already own an EV, the general public does not notice EV chargers in the same way they do gas stations. The result is that they are left with the impression that the infrastructure is not available and therefore do not choose an EV.

A secondary impediment to EV adoption is the perception that electric vehicles are really not that clean, as they rely on fossil fuel from another source – electricity. However, California and the Bay Area boasts one of the cleanest grids in the nation – with over 20% of its energy coming from solar, wind, geothermal and non nuclear resources – an electric car emits a quarter of the amount of harmful carbon pollution per mile as the average new vehicle. According to NRDC, electric cars are cleaner today and will only get cleaner tomorrow.

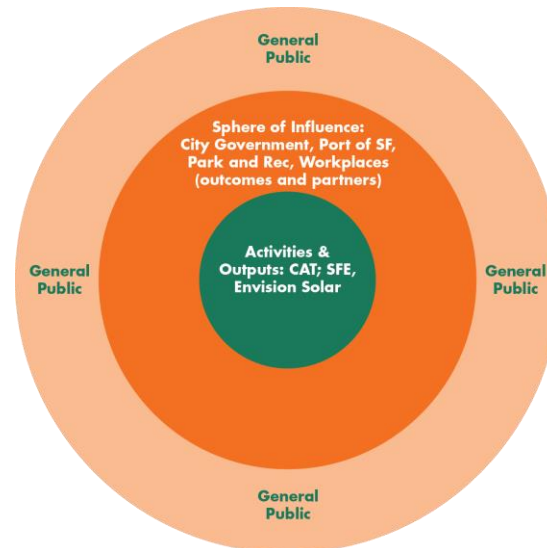
*Driving on Sunshine* addresses the needs for visible urban EV charging stations as well as demonstrating that driving on renewable electricity is virtually emissions-free, and here today. The solar powered EV chargers presented in this proposal address the need for highly visible urban EV charging stations while demonstrating that driving on clean and renewably generated electricity is possible today. Solar powered EV charging with local battery storage has the additional benefit of being incredibly reliable. During a weather caused or man made power outage users of the EV ARC™ will not be stranded while those relying on grid tied infrastructure might not make it home.

The short-term goal of this program is to place 3 Envision Solar EV ARCs™ in multiple locations across San Francisco for 3-month periods. Working with SF City Government, (including the Department of Environment, Port of San Francisco and Recreation and Parks Department), car sharing services, and local businesses and workplaces, CAT will select locations that offer the highest visibility and deliver the most valuable data.

The long-term goal of this project is to educate and excite the general public about the future of EVs and the move from fossil fuels to cleaner, greener forms of personal transportation. Through strategic marketing, public relations, and consumer outreach, the *Driving on Sunshine*

program will attract attention, educate the public on electric vehicles and charging, and help change consumer behavior. **Initial reaction to this EV solar charging project from key city departments, non-profits and key influencers has been tremendous!**

### Outcomes Mapping:



## **2. Implementation**

The EV ARC™ easily provides ready-to-use EV charging in urban settings as it requires no foundation, trenching, permitting, or utility grid connection. This allows for the deployment of EV charging where it's not possible to deliver a grid tied electrical circuit – according to the City and many local businesses, there are many such locations in San Francisco. Without the EV ARC™ it would be impossible to have EV charging in these highly visible and iconic locations.

The integrated EnvisionTrak™ tracking system, is designed to increase electrical generation by 18 to 25% over traditional static solar arrays. This unique, patented technology solution should deliver approximately 12,000 extra EV Miles from sunshine to Bay Area EV drivers each year.

The *Driving on Sunshine* program takes a novel approach to measuring, evaluating and placing the EV ARCs in San Francisco for long-term benefits. For a one-year period (Fall 2014 – Fall 2015) the solar charging units will be placed throughout the City at predetermined sites for a 3-month period, and Envision Solar will operate and maintain the units. At the end of this period, Charge Across Town and SF Environment will use the program's evaluation and measurement reports, along with SFE data, to determine where the units had the most impact. The EV ARCs will then be donated to City departments, organizations, car sharing services, where the EV ARCs were most successfully deployed. The EV ARCs have a 20+ year lifecycle, so this is a huge win for the City, for the 3 organizations that will take ownership, and the people of SF.

Envision Solar will operate, maintain and insure the units (up to commercially reasonable limits) during the yearlong program. Additionally, Envision will move the units according to the site schedule (every 90 days). Envision Solar will donate these in-kind services.

The EV ARCs will be networked through a ChargePoint program subscription. Participation in the ChargePoint program will allow coordinated management of the chargers and production of reports generated with data from the EV ARC™s. While FREE, drivers use ChargePoint or other affiliated membership cards to access the chargers. Most EV drivers subscribe to the ChargePoint or affiliated EV charging networks, but drivers who do not, can call a toll free number on the EV ARC to connect to the network in order to charge their vehicles for FREE.

Deployment of the EV ARC takes about 2 minutes and the unit is ready to charge vehicles immediately. It fits perfectly in a standard parking spot and does not reduce total parking space in any way because vehicles park on it. The solar support structure (SSS) and ballast pad is fabricated with welded steel components and all connections and sections have been spec'd by a licensed independent engineer to survive 110mph winds. The SSS is coated using the latest anti corrosive coatings and should last for 50 years.



### 3. Evaluation: Metrics and Mobility

The Driving on Sunshine evaluation will focus in three areas:

1. 'eMiles' Delivered
2. Mobility
3. Public Opinion

The Driving on Sunshine "Use Case" study focuses on 'eMiles delivered', rather than number of cars charged. The study will focus on *top-off events* promoting the idea that EV charging is not an all-day event, sending a community message to share resources. Each EV ARC™ will control user charge and limit the offering to a 2-hour timeframe. The data will be acquired using onboard metrics that can be accessed remotely from the EV ARC™.

The EV ARC™ comes equipped with a standard Level II charger, and can charge any model of EV. It can fully charge a Chevrolet Volt in 3-4 hours. Other models may take more or less time. The charging experience will be similar to any grid tied Level II charger. The on-board battery storage allows for charging day or night and the EV ARC™ will typically deliver more than 60 *eMiles-a-day*, whether allocated for 1 car or multiple cars as a top-off throughout a given day. The average American drives 36.4 miles per day and 8 out of 10 employees need to take less than 15 e-miles from work place chargers.

Since the EV ARC™ is transportable, it will be used as a tool to find out where the most charging can be accomplished - how to get the most "e-miles" delivered. Data will be collected at each location regarding the start/stop times of each charging session, how much power was transferred, zip code of the driver, etc. This data will help the City of San Francisco determine optimum locations for solar charging, the frequency and popularity of solar charging, and the cost savings of off-grid EV chargers. Additionally, data will show the environmental impact of solar charging and the reduction in GHG emissions due to fueling with solar generated electricity.

One of the unique features and benefits of the EV ARC™ is its mobility, which drives the implementation plan for this campaign. ARC mobility means installation costs don't have to be

weighed into decision making, providing more flexibility in determining options for locations. As a result, the program will use the EV ARC as a tool to gather data in locations where either no other EVSE can be used or in locations where insufficient data exists on which to base a deployment decision and to showcase solar charging in the most visible locations. The EV ARC can be tried out in different locations to see which locations are optimum for EV charging. If at first, a location does not work for reasons such as lack of visibility or low usage, the EV ARC can be moved to a location where more charging will take place.

Because the EV ARC™ does not have to be connected to a source of electricity, it can be placed in locations where installation costs for standard EVSEs are so high that installation is not feasible or it is impossible to connect to a source of electricity. This opens up the possibility of showcasing the technology at sites where there is more visibility and more exposure to the public. During the *Driving on Sunshine* program, the EV ARCs will be moved so the most people can be reached at press events located in high profile sites such as San Francisco's City Hall. By providing FREE charging at locations where no other EVSE can be used, more drivers will have opportunities to charge their vehicles, which will reduce range anxiety and demonstrate to those who are considering an EV that they are a viable solution.

Gauging Public Opinion is critical to the success of this project. Monitoring the program's impact will go hand in hand with the educational and outreach efforts. By putting a QR code on each EV ARC, individuals who use the EV ARCs or merely read the messaging can connect to a survey through their smart phones. The survey will ask participants to provide qualitative information about the impact of the program. The survey will gather important information about how the EV ARC changed the survey participant's perceptions of EVs and charging. The effectiveness of the campaign can be measured and changes made as required.

Impact on the communities involved: Because the EV ARCs can be moved from one location to another, demand for chargers can be tested at neighborhood sites where there is suspected insufficient public charging infrastructure. Importantly, the location trials will be done in a way that demonstrates to the public the connection between driving and solar power.

#### 4. EV ARC Locations:

The EV ARC deployment plan sets forth prime locations and moving times for the EV ARCs to optimize the benefits and minimize the costs. Experienced Envision Solar employees will use a specially designed trailer with a hydraulic lift to transport the EV ARC to and from each location. Most importantly, Envision Solar has agreed to move the EV ARCs at least every 90 days for no additional cost.

*Driving on Sunshine* has been met with excitement by many organizations in San Francisco, especially those unable to install grid tied chargers. Given the high level of interest in hosting a mobile, solar EV charging unit, we believe the sites will provide a broad range of opportunities and high educational value to the general public.

*Sample Deployment of locations under consideration*

	Oct-Dec	Jan - Mar	April-June	July-Sept	Oct - Dec
<b>ARC Deployment Timeline</b>	2014	2015			
	Launch - City Hall Press Event, October 6, Siting Period	Phase One	Phase Two	Phase Three	Evaluation & site donation
ARC #1	Car Sharing Services <i>car sharing</i>	CCS	ZipCar	DriveNow	donation

ARC #2	SF Port/Rec and Park <i>general public</i>	Alcatraz Ferries Pier 33 1/2	Ferry Bldg Pier 3	Marina Green/Zoo Parking area	donation
ARC #3	SFMTA parking <i>neighborhood parking</i>	SFMTA Castro	SFMTA Richmond	SFMTA Sunset	donation

Site's that have been contacted and are candidates for an ARC installation include:

**SFMTA and Neighborhood Parking Lots:** The parking lots that have been identified are in neighborhoods where there are few if any public chargers:

- 2450 California St (between Fillmore and Steiner) – a busy shopping area with lots of townhouse and MDU residential nearby
- 4116 18th St (at Castro) – epicenter of commercial and residential traffic in Castro District
- 324 8th Ave (near Clement St) – very busy commercial and residential zone (many without garages) in Inner Richmond District
- 1325 9th Ave (near Irving) -- very busy commercial and residential zone (many without garages) in Inner Sunset District, very close to GG Park (Botanical Garden area)

**SF Rec & Park and SF Port:** The Marina Green parking area, SF Zoo public parking, and some possible Port sites along the Embarcadero. **Hornblower (Alcatraz Cruises)** is interested in hosting an EV ARC™ deployed at Pier 3 and Pier 33 1/2. Both these locations would be seen by masses of SF citizens and tourists alike so the educational value would be huge.

**Car Sharing Services: City Car Share**, which has the largest fleet of EVs, is interested in installing an EV ARC in one of it's two car sharing spaces outside San Francisco City Hall – one of the highest visibility locations in the city. **Zipcar and DriveNow**, with access to street parking, are very interested in having the ARC for use and education during this period.

**5. Marketing and Outreach Efforts:**

A critical portion of the program is the marketing and outreach efforts to the general public, garnering positive press coverage and building a social media audience. Charge Across Town will engage its network of marketing, public relations and social media professionals to launch the *Driving on Sunshine* marketing campaign. Our efforts will include launching the campaign at a press event with San Francisco's Mayor Ed Lee, displaying educational branding and signage to bring attention to the EV ARCs, using social media to engage the public, and surveying the users and public to monitor the impact of the campaign.

The Launch event will coincide with the high visibility **EV Week 2014**, October 6-10, with a press conference at San Francisco's City Hall Plaza. EV ARCs will be on display and one will be located in the green showcase parking spaces. Mayor Lee, who has opened EV Week in the last two years, is anticipated to kick-off this year's event including the launch of *Driving on Sunshine*. This press event provides the perfect venue for announcing the *Driving on Sunshine* campaign's major site installations and goals of the project. It is also attended by industry influencers, OEMs, most major local broadcast media, print and EV journalists, online and EV bloggers.

At each EV ARC site, there will be educational signage about the *Driving on Sunshine* program, the use of the EV ARC, and the benefits of using solar to power their vehicles. A goal is to empower people to share their experience and foster positive conversation about EVs and a new way of fueling vehicles. With a QR Code as part of the ARC branding and signage, we will be able to capture baseline information on knowledge and attitudes toward

EVs and solar charging, including measuring people's consideration of an electric vehicle purchase.

Moving the campaign online to social media will build momentum throughout the year. Engaging the public with an ARC naming contest, interactive games and competitions on Google, Facebook and Twitter, will broaden the reach of the campaign. During the campaign, electric vehicle drivers can share their personal stories, photos and videos, about how *Driving on Sunshine* has transformed the way they get around town.

Program Partners will have an important role in the *Driving on Sunshine* marketing efforts and will utilize a variety of communications channels such as public display space, email bulletins, and social media communities.

## **6. Program Leadership**

**The collaboration of Charge Across Town, San Francisco Department of the Environment, and Envision Solar will ensure the success of this project.**

Charge Across Town (CAT), led by Maureen Blanc, will oversee the grant and act as lead project manager. CAT oversees and manages large urban events and projects and produces EV Week every year in the bay area. CAT has been the key partner in the current Metropolitan Transportation Commission's Experience Electric campaign, targeting major urban cities with educational ride and drive events. CAT will be responsible for managing project partners, implementation, budgeting and workflow. Additionally, CAT brings expertise in strategic marketing, branding and social media, oversees success measurements and outcomes, and acts as liaison with campaign influencers, City Government, and the general public.

San Francisco Department of Environment (SFE) led by the Department's Transportation Manager, Bob Hayden, will direct the project's efforts within the City of San Francisco, acting as EV ambassador to other City departments and agencies involved in the project. SFE will advise on site placement, help with permitting and/or any regulatory hurdles. Additionally, *Driving on Sunshine* will be an important part of SFE's Electric Vehicle initiative to increase public charging infrastructure.

Envision Solar International (OTC: ENVI), led by Desmond Wheatley, is a publicly traded company based in San Diego with multiple EV ARC installations. Envision Solar will be involved in the on site installation and implementation of the EV ARCs in San Francisco. Erin Geegan, employed by Envision Solar, is a solar and transportation expert who received President Obama's Champion of Change for Renewable Energy award for her vision to build a sustainable fuel infrastructure for American cities. Ms. Geegan will oversee the EV ARC output data and evaluation metrics and work with Charge Across Town on project goals and outcomes.