

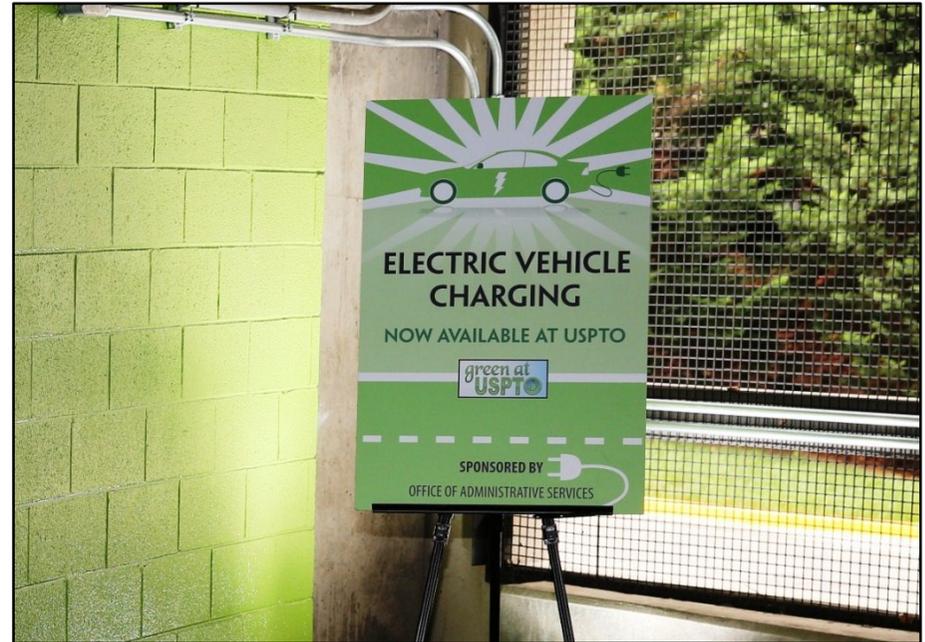
UNITED STATES
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U.S. Patent and Trademark Office

Federal Agency Workplace Charging Workshop

October 19, 2016



UNITED STATES
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Green at USPTO

- Recycling
- Energy-efficient Lighting
- Telework



Message From the Director

Welcome to **Green at USPTO**, a website dedicated to helping employees build a greener future at both work and home.

Practicing energy conservation at every opportunity just makes good environmental and economic sense. With energy costs continuously rising, reducing our energy consumption is critical to our ability to fund Agency priorities since we pay for the cost of our energy use.

That's why we ask everyone to take steps in their daily work lifestyle—whether that means using the revolving doors to the campus buildings instead of the swing doors, participating in our great recycling efforts, or turning off your office lights when not in use. In a workplace with an energy footprint as large as ours, practicing tips such as these can quickly add up to big cost-savings and improve the environment as well.

Join us in making strides toward going green. Learn how you can make a difference.



Michelle K. Lee
Director of the USPTO



USPTO Annual Green Fair



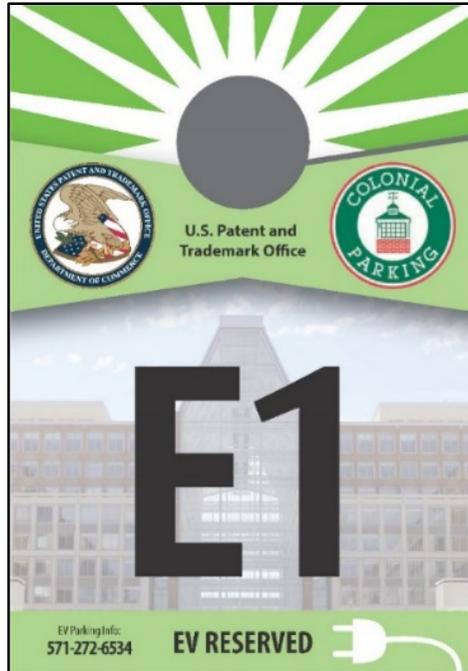
Challenges

- **2012:** USPTO applies for EV charging units via Coulomb Technologies, recipient of ARRA grant administered by DOE. Application denied as federal agencies are not allowed to benefit from federal grant money.
- **2013:** USPTO explores purchasing EV charging stations on its own. General Counsel advises not to, citing GAO ruling prohibiting using appropriated funds for such purchase (Architect of the Capitol, 2010).

Solution

- 2014:
 - USPTO partners with LCOR, owner of the Alexandria campus buildings, to retrofit existing electrical outlets in both onsite garages.
 - This approach resulted in the creation of 12 Level-1 EV charging parking spaces and avoided being in conflict with the GAO ruling.
 - Program kicks off on August 14, with 10 spaces utilized.

USPTO EV Kick-off - August 14, 2016



Program Scope



- Program consists of 12 assigned EV parking spaces (6 in each of our two campus garages), each space equipped with a 120-volt (12 amp) outlet.
- Each space costs \$20/month (in addition to the regular monthly parking rate). \$20/month rate based on estimate of 80 cents of electricity used for a one-day charge for a Level-1 EV.
- To offset installation cost and promote the program, spaces are in prime parking locations and prominently designated with signage.

EV Parking Spaces at USPTO



\$20/Month – Cost Recovery Model

- Each 120-volt outlet was installed with a 12 amp breaker so no outlet can pull more than 12 amps.
- Equation for Ohm's Law (voltage = current x resistance) was applied for power such that power = voltage x current. Hence, 120 volts x 12 amps = 1,440 watts, the maximum amount of power each outlet is capable of providing.
- If a user pulls the maximum number of watts for one full hour, 1.44 kilowatt hours of power would be used (a kilo equally 1,000, so 1 kilowatt = 1,000 watts).
- A user plugged in for 8 hours a workday would then be using 1.44 kilowatt hours x 8 hours = 11.52 kilowatt hours.
- USPTO is charged 7 cents per kilowatt by Dominion Virginia Power, so 11.52 kilowatt hours x .07 = .80 (i.e., 80 cents of electricity used for a one-day charge).
- On the average, employees work 20 days/month; therefore, the most electricity a monthly permit holder can draw from an outlet is approximately \$16 (20 days x .80 = 16).

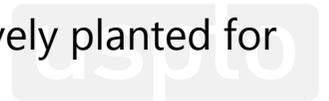
GHG Emissions Avoided

Customer Profile:

- Avg. distance is 40 miles roundtrip
- Avg. days commute per month is 20 days
- 40 miles x 20 days x 12 months = 9,600 miles driven per user
- 9,600 miles driven per user x avg. 10 users / year = 96,000 total miles driven annually

Fuel Vs. Electricity:

- Avoided driving 25 miles using gas (national avg.), so...
- 96,000 miles driven / 25 mpg = 3,840 gallons of gas avoided
- With one gallon of gas producing an average of 20 pounds of CO₂, then 76,800 pounds of CO₂ were prevented from entering the atmosphere (3,840 x 20 = 76,800) annually.
- Young trees can absorb 13 pounds of CO₂ a year; therefore, 5,907 trees are effectively planted for each operating year (76,800 / 13 = 5,907).



Energy Cost Savings per User

- 96,000 miles driven annually (10 users collectively over one year)
- Using gas, users would have gotten 25 mpg (source: University of Michigan)
- Avg. cost of mid-grade gas in VA in 2014/2015 was approximately \$2.60 (source: AAA)
- $96,000 / 25 \text{ mpg} = 3,840$ gallons of gas avoided
- At \$2.60/gallon, this equates to \$9,984 collectively saved, or \$998 per user
- Compared to annual cost of \$240 for EV permit, each EV customer's annual commuting cost was reduced by 76% ($\$240 / \$998 = .24$)

