



2011 Plug-In Vehicle Strategic Planning Update

October 31, 2011

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Assessment Summary and Purpose

This report is designed to provide a snapshot in time for Virginia Electric and Plug-In Vehicle readiness. This is intended as a brief update and addendum to the October 2010 Virginia Get Ready Electric Vehicles plan, and can also be used as a resource for the 2012 Richmond Electric Vehicle Initiative final report. This effort encompasses the geographic area of all of Virginia, but can be utilized by regional partners. Portions of this assessment will focus on the greater Richmond Virginia region as a result of clustered planning partners.

This assessment is necessary to provide a backdrop for the Richmond Electric Vehicle Initiative and to accelerate plug-in vehicle efforts within the state.

Past and Current Plug-in Vehicle Implementation

Virginia experienced a growth of electric vehicles in the late 1990's, and remains of those chargers are around today.

Preceding the launch of the Leaf and the Volt, most electric vehicles in Virginia fleets were neighborhood electric vehicles such as GEM cars and small electric utility vehicles from Vantage, Miles, and Zap. Virginia's largest electric vehicle fleet was Norfolk Botanical Gardens with their fleet of Club Car golf carts. In 2009, Virginia Clean Cities hosted an electric vehicle road show to showcase some of these vehicles as well as charging technology.



Example of existing Virginia small electric vehicle in operation at James Madison University

In our planning area, we have a robust electrical grid, net metered solar policy, numerous solar installers, numerous charger installation vendors, and some government programs. While the Chargepoint America program has not been embraced in the national capital region, other chargers have sprung up throughout Virginia occasionally without coalition assistance.

In 2010, Virginia Clean Cities and the Virginia Department of Mines Minerals and Energy gathered together a group of 30 key electric vehicle stakeholders to discuss the subject. It was recognized that electric vehicle planning was important. At the end of the process, nearly 150 stakeholders including government, nonprofits, electric utilities, and businesses were actively engaged, and Virginia produced an initial electric vehicle planning document prior to the Governor's Conference on Energy. This planning effort is posted at the educational portal suggested by the task force: the virginiaev.org website. Electric vehicles played a prime role at the Governor's energy conference with the Volt on display and an electric vehicle session. Clean Cities presented to the full session at a Virginia and West Virginia parking Association meeting.

In 2011, Virginia stakeholders continued electric vehicle planning efforts, including a March 23rd workshop in Northern Virginia. Electric vehicle information was also presented by Virginia Clean Cities to full sessions of the Municipal Electric Power Association of Virginia 2011 conference, and the Electric Drive Transportation Association at their 2011 conference. Richmond EV efforts continued significantly with a June 8 EV stakeholder meeting, a Richmond EV planning group that was facilitated by Virginia Clean Cities and branded as a Sustainable Transportation Initiative of Richmond sub group - partners and VCC provided presentations to zoning and permitting officials and planned for chargers in Richmond. The Ford Focus was launched publically in Richmond with assistance from Virginia Clean Cities. Virginia Clean Cities participated in the Roanoke Virginia rollout of the Ford Focus EV as well as other clean Ford vehicles as part of the Ford Power of Choice Tour.

In 2011, Virginia Main Street program initiated a pilot project committed to encouraging and promoting an electric vehicle network in Virginia by directing vehicle charging to downtown shopping locations. In another area of Virginia, Dominion Electric Vehicles opened in Roanoke selling neighborhood electric vehicles, electric utility vehicles, and golf cars in the footprint of a Chrysler dealership.



Nissan Leaf purchased in Tennessee for local use by Richmond Virginia business (Credit James River AC)



Special Event at Dominion Electric Vehicles for neighborhood plug-in vehicles

In 2011, demonstration vehicle chargers were granted to Virginia from AeroVironment and ECotality and these units were showcased at numerous events. Electric vehicles were purchased in small quantities by fleets and early consumers. Once again, electric vehicles played a prime role at the governor's conference and the Transit Connect and Volt and a Neighborhood Electric Vehicle (NEV) was on display.

A group has met throughout 2011 to discuss vehicle conversions and required safety or permitting for such vehicles.

Richmond Electric Vehicle Initiative

In October 2011, Virginia Clean Cities and the Virginia Department of Mines Minerals and Energy were awarded a major planning grant for electric vehicles through the Clean Cities Community Readiness and Planning for Plug-In Electric Vehicles and Charging Infrastructure grant.

The Virginia team was one of only 16 organizations nationwide awarded funding for local collaboration strategies to deploy electric vehicles. The \$430,000 Richmond Electric Vehicle Initiative (REVi) effort will advance the Richmond region as an attractive and sustainable market for electric vehicle technology. The project will lay the educational and policy groundwork for infrastructure installation and electric vehicle adoption in the Richmond region and the Commonwealth at large. A regional electric vehicle strategic plan will be developed and will identify and foster policies to expedite EV infrastructure specific to the Richmond region and prepare the Commonwealth for successful deployment of plug-in electric drive vehicles.

Mayor Dwight Jones said of the initiative: "These panning efforts fit into Richmond's triple bottom line goals of sustainability and will help lower greenhouse gas emissions in the city."

REVi has assembled significant partnership with over 50 engaged organizations and synergistic opportunities. Localities engaged in the proposed program include the town of Ashland, the City of Richmond, and the counties of Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent, and Powhatan as well as municipalities within the Crater Planning District.

Assessment of Plug-in Implementation Potential

Numerous vehicle manufacturers have listed Virginia as one of their initial launch state. Nissan has announced that the 2012 Leaf is available to consumers, and has begun taking pre-orders. The 2012 Chevrolet Volt is available, and the 2011 Volt was available in the Washington DC market. The 2011 and 2012 EV Transit Connect is available. The 2012 Ford Focus will launch in Richmond. The 2012 Plug-in Prius will launch in Virginia. Numerous

neighborhood electric vehicles have been sold throughout Virginia.



Prius Plug-in 2012 launch map (credit: Toyota)



Charger installed at Harrisonburg Electric Commission

As of October 31, 2011, 37 public chargers are available throughout Virginia. Many of these are on government facilities, though the private sector has been very involved.



Map of VA's 37 public EVSE (Credit: DOE AFDC)

Some high profile chargers were installed such as the Science Museum of Virginia, and Virginia Main Street's first charger in Harrisonburg, Virginia.



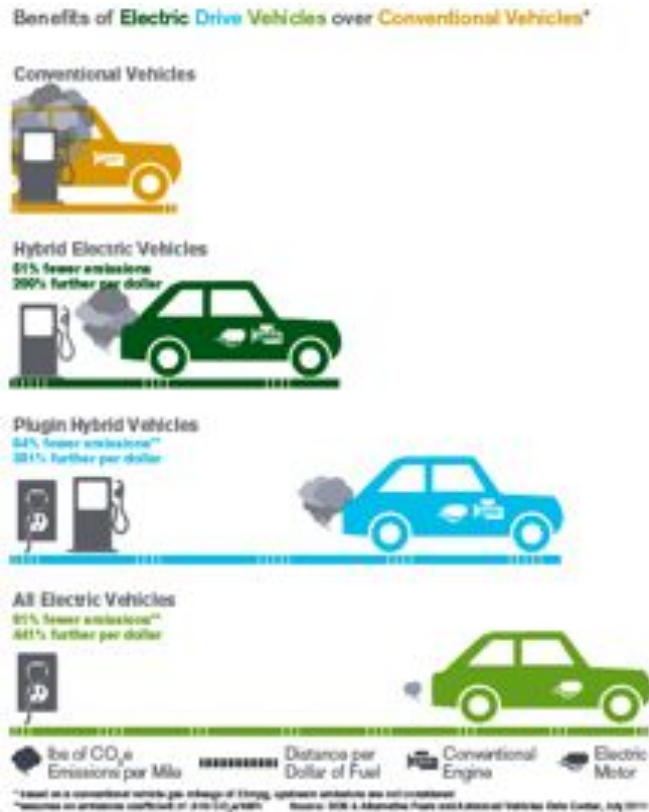
Chargers installed at the Science Museum of VA (Credit: Urban Grid Solar)

A good number of electric vehicles are expected to be sold throughout Virginia with an anticipated ½% of vehicle sales in 2012 and an accelerated growth of approximately ½% each year. Dominion Virginia Power anticipates perhaps 86,000 electric vehicles in their Virginia service territory by 2020, and more than a half million electric vehicles in Virginia by 2035.

Dominion Virginia Power - Virginia Service Territory				
Year	% of New Vehicle Sales	Total On Road EV's	Energy per Year (GWh)	Demand (MW)
2011	0.0%	-	-	-
2012	0.5%	1,916	6	6
2013	1.0%	5,748	17	17
2014	1.5%	11,496	33	33
2015	2.1%	19,160	56	56
2016	2.6%	28,740	84	83
2017	3.1%	40,236	117	117
2018	3.6%	53,648	156	156
2019	4.1%	68,976	201	200
2020	4.6%	86,220	251	250
2021	5.1%	105,381	307	306
2022	5.6%	126,457	368	367
2023	6.2%	149,449	435	433
2024	6.7%	174,357	508	506
2025	7.2%	201,181	586	583
2026	7.7%	229,921	670	667
2027	8.2%	260,577	759	756
2028	8.7%	293,150	854	850
2029	9.2%	327,638	955	950
2030	9.7%	364,042	1,061	1,056
2031	10.3%	402,362	1,172	1,167
2032	10.8%	442,598	1,290	1,284
2033	11.3%	484,751	1,413	1,406
2034	11.8%	528,819	1,541	1,534
2035	12.3%	574,803	1,675	1,667

Vehicle Penetration, Demand, and Energy Projections from 2011 EV Pilot Program Testimony (Credit: Dominion)

One driver for vehicle adoption is the reduced emissions and reduced fuel costs with electric vehicles. Virginia Clean Cities stakeholder Birch Studio worked with Virginia Clean Cities and with information from the Department of Energy Alternate Fuels Data Center to develop the following infographic.



August 2012 Hybrid Electric Vehicle FLUX report

Virginia Clean Cities and stakeholder partners gathered information, vetted, designed and produced a charging station location guide in the form of a one page flier. This document can help municipalities and businesses select prime locations for chargers, and is based on best practices from Project Get Ready partner cities.

Some new laws and incentives have recently entered into code and moved through regulatory processes in Virginia. They have been enabled by 2011 legislation and enacted into policies below:

Virginia Dominion Power offers two rates for residential customers who own qualified PEVs: the Electric Vehicle Pricing Plan and the Electric Vehicle + Home Pricing Plan. The Electric Vehicle Pricing plan allows PEV owners to take advantage of lower

rates during off-peak hours. Under this plan, customers must install an additional meter specifically for their electric vehicle supply equipment (EVSE); Dominion will provide this meter at no charge. The Electric Vehicle + Home Pricing Plan is a whole-house pricing plan in which the customer's EVSE is treated as another appliance. A new meter provided by Dominion will record energy usage in 30-minute intervals, allowing Dominion to apply pricing based on time of day and encourage customers to charge their PEV during off-peak hours as hours much as possible.

This reduced rate may bring the price per KWH for off peak charging to around 4 cents per kilowatt compared with as much as 11 cents per KWH for retail residential power. For more information, see the Virginia Dominion [Plug-In Electric Vehicles](#) website.

Retail EV charging services were also enabled by legislation that places Virginia businesses and individuals outside the classification of “utility.” Charging by such individuals does not constitute the retail sale of electricity if the electricity is used solely for transportation purposes and the person providing the EV charging service has procured the electricity from an authorized public utility. The Virginia State Corporation Commission may not set the rates, charges, or fees for retail EV charging services provided by non-utilities. (Reference House Bill 2105, 2011, and Virginia Code 56-1.2 and 56-232.2)

The Virginia Get Ready: Electric Vehicle Plan aims to establish Virginia as a leader in EV adoption. The plan details how to overcome potential barriers associated with EV adoption and charging infrastructure, specifically codes, standards and processes; a communication strategy to educate appropriate partners, stakeholders, and the general public; and potential incentives to encourage businesses and individuals to purchase EVs. For additional information, refer to the Virginia Electric Vehicle website at virginiaev.org.

State Laws for Virginia for all alternate fuels can be found online at the Department of Energy’s Alternative Fuels & Advanced Vehicles Data Center : http://www.afdc.energy.gov/afdc/laws/state_summary/VA

The Commonwealth of Virginia invited private sector participation in alternate fuel vehicle transition process. The state is currently reviewing applications for that Public-Private process. A 2012 Ford Focus, Mitsubishi iMEV, Nissan Leaf, and Ford Transit Connect EV were present for the Governor's announcement of this process and bill signing for EV related legislation.



Governor McDonnell signing electric vehicle and state alternate fuel legislation on July 12, 2011

Stakeholders were also invited to participate in a Virginia companies wireless charging effort. Plugless Power of Abingdon Virginia worked with Virginia Clean Cities to invite partners.



EVSE Site Selection guide

Permitting Process Analysis

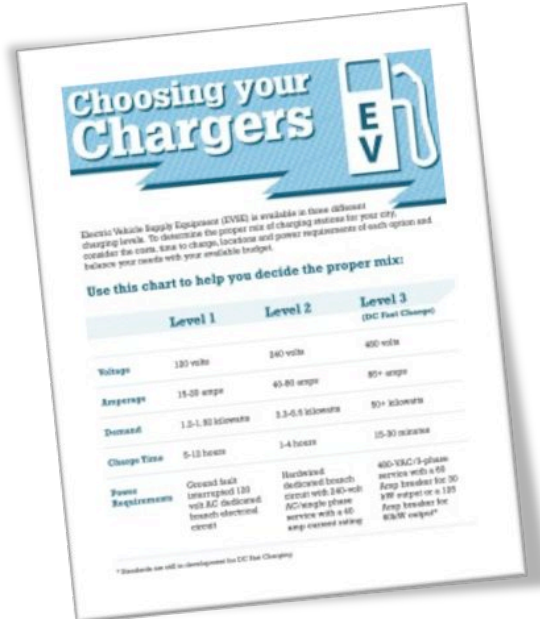
Virginia Clean Cities and partners provided a permit effort analysis. A full copy of this analysis is available at virginiaev.org. Virginia's localities have varying but high levels of readiness for charger permitting. Many localities have already permitted chargers and are prepared for hardware. Best practices are already

falling into place with rapid permitting in Fairfax, and streamlining online services coming to Richmond.

Electric vehicle and charging infrastructure permitting was presented to the Virginia Association of Zoning Officials in September 2011. Meetings were held with Richmond permit officials and greater regional officials throughout spring of 2011, these permit officials later visited early charger installations.



To assist with general charger knowledge, Virginia Clean Cities and stakeholder partners produced a charging station charger selection guide.



Charger selection guide

Local permitting offices have a cursory awareness of EVSE as a result of numerous presentations. Several Virginia localities including Richmond Virginia are moving towards electronic or rapid permitting.

DOE permit template was shared with Virginia's EV stakeholders and provided to the state's association of zoning officials in electronic format in September 2011.

Public Information and Educational Needs

Virginia Clean Cities and stakeholders have advanced an initial public resource at www.virginiaev.org that also includes a full posting of various Virginia EV reports and materials. An education working group produced thoughts in the 2010 EV plan and will be engaged in a 2011 effort with the REVi project. The REVi project will also include a hotline for electric vehicle inquiries.

One repeated item of note: The station locator from the Alternate Fuels Data Center needs an easier access method. It would be fantastic if simple web addresses could be plugged in for common searches.

There are a wide range of educational needs discussed in the 2010 Virginia Get Ready Electric Vehicle Report. J. Sergeant Reynolds Community College (JSRCC) is now offering a trial course on Electric Vehicles and Infrastructure. This one credit course will teach you the advantages and differences between electric and traditional vehicles. An example of a training program supported by stakeholders is the below flier.



Electric Vehicle Training Course Flier (Credit: JSRCC)

A training component for first responders, public safety officers and others will be an ongoing concern. It will be possible to partner with organizations such as JSRCC and the National Alternate Fuels Training Consortium on curriculum; however, educating the

diverse range of city and county first responders and public safety officers remains a logistical challenge.

Analysis of Other Barriers

A listing of potential incentives is included in the initial electric vehicle plan and incentives will be reviewed at length in the Richmond Electric Vehicle Initiative effort.

Role of Coalition to Facilitate Plug-in Vehicle Implementation

Virginia Clean Cities will continue to take a leadership role to facilitate electric vehicle implementation in Virginia, and a supporting role to ongoing activities of partners.

Virginia Clean Cities and other coalitions could use federal support in the form of deployment dollars for electric vehicle chargers. Being able to provide fleets and municipalities with even some small form of discretionary deployment assistance for EVSE may go a long way. An organized sharing structure for information may help.

Virginia Clean Cities has “plugged-in” with efforts of Rocky Mountain Institute Project Get Ready, with a California led nationwide permitting official discussion group, and the Sierra Club’s fledgling electric vehicle initiative. Clean Cities should be granted the funding to contribute more heavily to these initiatives and other coalitions should link with these efforts.

Identification of Key Contacts / Personnel

Virginia Clean Cities maintains a listing of more than 150 established points of contact for electric vehicle efforts. A copy of this information is available on an as needed basis. This listing includes geographic representation from all areas of Virginia, as well as partners in government, utility, nonprofit, solar/renewable, and the business sector including all vehicle manufacturers.

Disclaimer

This snapshot is intended for informational purposes in October 2011. For more information, please contact Virginia Clean Cities.

Additional Attachments

Initial Virginia EV Report October 2010

Dominion Power EV Pilot Program Testimony

Richmond Electric Vehicle Initiative REVi Program Summary

Choosing Chargers Handout with Birch Studio

Site Selection Checklist Handout with Birch Studio

External Copy of the Virginia EV Stakeholder Listing

Online Resources

Virginia Clean Cities – www.vacleancities.org

Virginia Electric Vehicles www.virginiaev.org

Project Get Ready – VA Partner State <http://projectgetready.com/city/partner-city/richmond-va>



Chevrolet Volt charging at The Science Museum of Virginia

* Images can be used freely with credit Virginia Clean Cities unless otherwise noted