Electrify Heartland Plan

Section 12: Other Considerations

Project title: Kansas – Missouri Community Readiness for EV and EVSE

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By: Metropolitan Energy Center

and Kansas City Regional Clean Cities Coalition

With: Black & Veatch

Metropolitan ENERGY CENTER

Kansas City Regional Clean Cities

BLACK & VEATCH

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Electrify Heartland Plan

Electrify Heartland Project Abstract

Electrify Heartland is an electric vehicle planning project managed by Metropolitan Energy Center. It is a product of the Greater Kansas City Plug-In Readiness Initiative, co-chaired by Kansas City Regional Clean Cities Coalition. Our goal is to produce a regional plan to prepare public resources and secure the economic and environmental benefits of plug-in vehicles within targeted metro areas with estimated 2.7M population. The targeted metro areas include Kansas City, MO & KS; Jefferson City, MO, Wichita, KS; Salina, KS; Lawrence, KS; and Topeka, KS. (14 Counties: Cass, Clay, Cole, Douglas, Jackson, Johnson, Leavenworth, Miami, Platte, Ray, Saline, Sedgwick, Shawnee, Wyandotte).

Electrify Heartland Steering Committee

Team	Organization	Name
Charging Stations	Initiatives	Troy Carlson
Charging Stations	LilyPadEV	Larry Kinder
Charging Stations	Logios	Gustavo Collantes
Government Policy	Polsinelli Shughart PC	Alan Anderson
Government Policy	Black & Veatch	Bill Roush
Project Administration	Metropolitan Energy Center	Ruth Redenbaugh
Project Administration	Metropolitan Energy Center	Kelly Gilbert
Public Education	Nation Ranch Marketing, Inc.	Bill Patterson
Training	Kansas City Kansas Community College	Bob McGowan
Training	National Electrical Contractors Association	Jim Cianciolo
Utility Grid	Black & Veatch	Sam Scupham
Vehicle & Fleet	University of Missouri at Kansas City	Henry Marsh

Exhibit i-i. Electrify Heartland Steering Committee Members

Section 12: Other Considerations

Section Abstract

This section discusses other considerations for EV and EVSE development, which include transit and student programs. The Electrify Heartland planning area has a unique transit history. We briefly discuss this history as well as the possibilities for streetcar development in the near future. This section also recognizes a uniquely innovative student program in the area known as MindDrive and work of students at University of Kansas in the EcoHawks program.

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12 Other Considerations

12.1 Transit

Electric mass transit is important to urban areas due to its accessibility by all income classes, ability to improve air quality, and potential to increase revenue through ease of access to entertainment areas.

12.1.1 History

Kansas City has a unique history when it comes to electric transportation. Franks Sprauge's electric street car made its debut in 1889, allowing for a wide expansion of the rail lines, and by the 1920's 375,000 passengers got around by using the rail system every day. Due to either increased popularity of the car or new conveniences and attractions of the suburban dwelling (or perhaps these two are interrelated) the electric street car (and most public transit for that matter) completely vanished by 1959. [1]

12.1.2 Reasons for Consideration

According to an article in the October 22, 2012 Kansas City *Star* a 2-mile starter streetcar line in the heart of the city has been approved. The line, which may open as early as 2015, is estimated to attract about 2,700 riders daily. The leading argument for this new development, according to Kansas City Mayor, Sly James, "is that we're going to have millennial, those people who believe that having an internet connection is much more important than having a car." The new streetcar will ideally also appeal to business men and women who "simply don't care about the car culture."

There is a business case for the development. Modeled after Portland, where a 55 million dollar investment resulted in 3.5 billion dollars in private sector investment over 11 years, primarily in retail and housing, Kansas City could similarly attract a predicted 500 million dollars in added development through 2025.[2] If we don't reverse the pattern of urban sprawl that has been taking place over the past 60 years, the City will spend somewhere around 8 billion dollars over the next 30 years in infrastructure and other public service

[1]Sherwood, Kyle P. "Kansas City Streetcar Experience." *College of Architecture Planning and Design: Kansas State University*. N.p., n.d. Web. 10 Dec. 2012. <http://capd.ksu.edu/media/pdfs/kcdc-streetcars-by-kyle-sherwood.pdf>.

[2] Horsley, Lynn. "KC Streetcar Plan: Pricey Transit or Economic Magnet?" *The Kansas City Star. Midwest Democracy*. N.p., 30 Oct. 2012. Web. 10 Dec.2012. <http://midwestdemocracy.com/articles/kc-streetcar-plan-pricey-transit-or-economic-magnet/#storylink=misearch>.

extensions, according to the Transportation Outlook 2040 baseline scenario by Mid-America Regional Council. [3]

According to the American Public Transportation Association, "Every $10 million of capital investment in public transportation yields $30 million of increased sales."

Another important consideration of electric mass transit is the air quality benefits. For details about air quality impact of transportation options, see Appendix N.

12.1.3 New Developments

In October of 2012 the Federal Transit Administration issued a Finding of No Significant Impact (FONSI) to the planned Kansas City Streetcar Project after a report was submitted for an environmental assessment of the project in late September.[4]

Effective November 20, 2012, the referendum passed by citizens living in the Transportation Development District in downtown Kansas City Missouri to fund the mechanism to build and operate today's Modern Streetcar. It could be operational as soon as 2015 offering another electric transportation option to Kansas City. The Urban Rail Project has been a long journey succeeding primarily through the efforts of Kansas City Regional Transit Alliance (KCRTA). Major obstacles are being addressed including state statues, largest systems of highways at 33,681 miles, lowest fuel tax of seventeen cents, and historically low funding. Missouri is one of only eight states that restrict state road funds to highways thus excluding transit options. Reference Missouri Constitution article IV Section 30 (b). Low annual funding is evidenced by Missouri spending at $119,000, ranking 45th in the nation, yet there are more than 55,000 transit riders per day. See a presentation by the Kansas city Missouri Councilman and the KCRTA Board on December 18, 2012 http://kcrta.org/images/RTA.pdf for details[5].

12.2 Student Education Programs

Innovative programs involving high school and college students are important to the future of electric vehicle adoption because they are the potential EV owners of the future. As students learn about advanced technology vehicles, interest is sparked in math, science and

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[3]"Growth Scenarios: Visualizing the Future." *Transportation Outlook 2040*. Mid-America Regional Council, n.d. Web. 10 Dec. 2012. <http://www.marc.org/2040/LAND-USE_DIRECTION/DEVELOPING_A_FORECAST/GROWTH_SCENARIOS/INDEX.ASPX>.

[4]*Kansas City Streetcar Project: Finding of No Significant Impact*. N.p.: Federal Tranist Administration, 2012. *City of Kansas City Mo.* Web. 10 Dec. 2012. <http://www.kcmo.org/idc/groups/capitalprojects/documents/publicworks/ocs879231-103299.pdf>.

[5]Johnson, Russ. "Kansas City Regional Transit Alliance December 2012 Holiday Luncheon." *Kansas City Regional Transit Alliance*. N.p., Dec. 2012. Web. 20 Dec. 2012. <http://kcrta.org/images/RTA.pdf>.

engineering careers as well as the next big idea for improving efficiency and reducing environmental impacts of transportation.

12.2.1 MindDrive

Briefly mentioned in Section 7.7.3 MindDrive, a Kansas City-based non-profit, grew out of a project at the DeLaSalle Education Center. Students, primarily from Kansas City's urban core, work with mentors on projects that are current and relate to the environment. One of those projects was the design and construction of an electric vehicle[6]. Subsequent projects have also been design and build of EVs with a view toward marketing and communications.

Steve Rees, the founder and CEO of MindDrive has described the mission statement as "to inspire students to want to learn, not just the stuff that we are teaching in our class but also the core elements that make up education."

MindDrive students in 2012 come from the following urban high schools: Alta Vista Charter High School, DeLaSalle Charter High School, Center High School, University Academy Charter High School, and Shawnee Mission East High School.

The 2000 Lola Indy car shown below in Exhibit 12-1 is extremely innovative and may even be the most efficient car in the world. The school has allegedly applied to the Guinness Book of Records. The car was tested at Bridgestone's Texas Proving Ground and found to achieve 307 miles per gallon equivalent.[7]

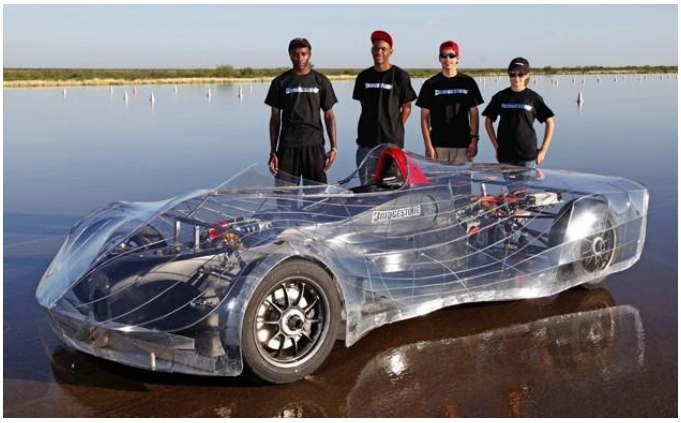

Exhibit 12-1 The 2000 Lola Indy

[6]*MindDrive*. Tangient, n.d. Web. 10 Dec. 2012. <http://minddrive.wikispaces.com/EPK>. This is a wikispace that contains information about the MindDrive project objectives, educational objectives,mentor educational process and project bios.

[7]Yoney, Domenick. "DeLaSalle School Students Build Super-Efficient Electric Car That Gets 307 MPG." *Auto Blog Green*. AOL, 19 Aug. 2012. Web. 10 Dec. 2012. <http://green.autoblog.com/2010/08/19/delasalle-school-students-build-super-efficient-electric-car-tha/>.

Project information and updates can be found on their website www.minddrive.org or at http://minddrive.wikispaces.com/Project+Updates.

12.2.1.1 EcoHawks

With recognition from local and national news EcoHawks, an innovative University of Kansas student program, has been making a difference for the past four years and showing the way for others to do the same.

Their Mission statement reads:

> "A Sustainable Approach to Automobiles and Energy Infrastructure "
> The students provide the following definition of Sustainability:
> "The application of engineering principles to solving a real-world problem by focusing upon the connection between the *environment*, *energy*, *economy*, *education* and *ethics*[8]"

From 2008 to 2012, KU EcoHawks have been working on many projects, including electric vehicle conversions and smart-grid innovations. From 2008 to 2009, they converted a 1974 VW Beetle into a series hybrid electric vehicle (HEV) that was fueled by electricity and biodiesel. In the 2009-2010 school years, they converted the vehicle to a hybrid electric vehicle and built a solar-powered charge station capable of charging the VW Beetle in half a day. In 2010-2011, using funds from an EPA grant, the students built a small scale electric and wind smart grid. They later were recognized by the EPA with an honorable mention at the People, Prosperity and the Planet Student Design Competition for Sustainability in 2011. In the 2011-2012 school year students have worked on an electric conversion of an SUV to be used as a delivery vehicle. They have also designed a genset trailer that is intended to run on biobutanol created from biomass in order to extend the range of the vehicle.

KU EcoHawks is sparking interest in K-16 students through KU's engineering Expo. In 2013 this two-day event will host over 1,000 students from elementary through high school as they participate in design competitions, examine engineering organization displays, listen to industry professionals speak about real-world engineering and see interactive demonstrations.[9] EcoHawks partnered with OPTIMA batteries in a project called "K-16 Parallel Hybrid Go Kart" and is creating a go-kart sized hybrid vehicle that will be donated

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[8]Depcik, Christopher. "KU Feedstock to Tailpipe Initiative." *Kansas Commerce*. N.p., n.d. Web. 10 Dec. 2012. <http://www.kansascommerce.com/DocumentView.aspx?DID=804>

[9] *KU School of* Engineering. KU Engineering Student Council, n.d. Web. 6 Dec. 2012.<http://groups.ku.edu/~kuesc/cgi-bin/EXPO/generalInfo.php>.

to a local high school for the intention of educating and inspiring younger generations[10]. In a less tangible way this involvement can inspire students to explore their abilities and spark interest in alternative energy technologies.

12.3 About the Author

Crista Childers assisted Electrify Heartland project management as an intern with the transportation programs of Metropolitan Energy Center. Ms. Childers earned a Bachelor of Science in Geology from University of Missouri – Kansas City where she was involved in undergraduate research, worked and traveled with mentors and graduate students, funded by the SEARCH grant.

Kansas City Regional Clean Cities Coalition Administered by Metropolitan Energy Center, the coalition is a public-private partnership among fleet managers and manufacturers, vendors and service providers in the alternative fuels and vehicle industries. It works in communities across Kansas and in western Missouri. Kansas City's coalition is a partner since 1998 with the U.S. Department of Energy's Clean Cities Program, whose mission is to advance the energy, economic, and environmental security of the United States by supporting local actions to reduce petroleum use in transportation. The coalition administers more than $40 million in clean transportation projects in Kansas, Missouri, Iowa and Nebraska. For more information visit www.metroenergy.org/kccleancities.aspx.about

Metropolitan Energy Center is a nonprofit organization with a threefold mission to create resource efficiency, environmental health, and economic vitality in the Kansas City region. Over the past three decades, MEC has grown to be a recognized catalyst for regional energy partnerships that satisfy the triple-bottom-line approach. Founded in 1980, MEC is a catalyst for community partnerships focused on energy conservation. It works through a variety of educational and training programs, including Kansas City Regional Clean Cities Coalition, Home Performance, Project Living Proof and EnergyWorks KC. Every energy dollar conserved through MEC's work remains available for investment in the local economy. MEC was awarded more than $17 million in federal funding for transportation projects in recent years and is a partner in other multi-million-dollar projects in Kansas and Missouri. MEC has been the recipient of many awards recognizing its contribution to energy conservation and was host of the national Affordable Comfort Conference in 2003 and 2009

[10]"Optima",Jim. "Helping the Next Generation." *Optima Batteries*. Johnson Controls, Inc., 6 Feb. 2012. Web. 1 Dec. 2012.<http://www.optimabatteries.com/us/en/experience/power-source/helping-the-next-generation/>.