

Electrify Heartland Plan

Appendix H: Electric Vehicle Infrastructure Training Program Promotion



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

Funded by: US DOE DE-EE0005551

By: Metropolitan Energy Center
and Kansas City Regional Clean Cities Coalition

With: Black & Veatch





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CFDA Number 81.086



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



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Appendix H: Electric Vehicle Infrastructure Training Program Promotion

Synopsis

This Appendix of the Electrify Heartland Plan provides details about the Electric Vehicle Infrastructure Training Program (EVITP), including statement of purpose, curriculum topics, curriculum flyer, and an article about training featured in the National Training Institute newsletter.

Section Authors:

Joint Apprenticeship Training Center, EVITP





H.1 EVITP Statement of Purpose

What the Electric Vehicle Infrastructure Training Program Will Do

The Electric Vehicle Infrastructure Training Program (EVITP) has been established to provide the Electric Vehicle Transportation sector of the electrical industry, and all stakeholders, a structured platform to facilitate training and certification for the installation of Electric Vehicle Supply Equipment (EVSE) across Residential and Commercial/Public markets. The program will address the technical requirements, safety imperatives, and performance integrity of industry partners and stakeholders including:

- Automobile Manufacturers,
- Investor-Owned and Municipal Utilities,
- Electric Vehicle Supply Equipment Manufacturers,
- Electrical Energy Storage Device Manufacturers
- State and Local Electrical Inspectors,
- Electrical Contractors,
- Electrical Workers,
- First Responders

Who Is EVITP?

EVITP is a partnership of the stakeholders listed above. EVITP is not a corporation or a business. EVITP is simply a collaboration of member organizations, and does not operate for profit.

EVITP's Goals

EVITP is creating a national training and certification program that provides the EV industry with the highest level of verifiable knowledge and technical understanding to support the sound, safe and successful growth of the EV market. EVITP's training content will incorporate and reflect the requirements, high standards and concerns of industry partners and stakeholders. EVITP is committed to establishing the nationally recognized standard in EV infrastructure training.

Accomplishing EVITP Goals

Through industry collaboration, cooperation, and information contributions, EVITP will bring together the curriculum content and best practices required to fully train electrical contractors and electricians in EV infrastructure installation, commissioning, and maintenance. EVITP will be product diverse - featuring a broad range of stakeholder brand specific training content - and brand neutral in vehicles, charging stations, electrical storage devices and other branded products.



EVITP will offer broad geographic coverage incorporating community college and electrical training center sites across the country. Training will be open to all licensed electrical contractors, and electricians in compliance with the mandatory requirements of each state/municipal jurisdiction in the United States. Core training will be supplemented with local requirements where applicable.

EVITP's rigorous training standards will be built on a national curriculum taught by instructors who have well documented qualifications and considerable experience in their areas of expertise. High entry standards, a challenging train-the-trainer curriculum, and demanding exams will ensure strong classroom performance and consistent training results.

EVITP Training Course Content

EVITP course content will be contributed by industry partners and stakeholders. Key training program elements will include lecture and hands-on lab sessions (as appropriate) in:

- EV prospect/customer relations and customer experience
- Automobile manufacturer's charging performance integrity specifications
- EV battery types, specifications, and charging characteristics
- Utility interconnect policies and requirements
- Utility grid stress precautions including Demand Response integration technologies
- The role of electrical storage devices as charging intermediaries
- Installing, commissioning and maintaining electric storage devices
- Charging station fundamentals; brand/model specific installation instructions for
 - o Level 1: 120 VAC 15 amps
 - o Level 2: 120-240 VAC 60 amps
 - o Level 3: 480 VAC 125 amp or 600VDC 550 amps
- Service level assessments and upgrade implementation
- Integration of EV infrastructure with distributed generation
- National Electrical Code (NEC) standards and requirements
- National Fire Protection Association (NFPA) 70E, and OSHA regulations
- National Electrical Installation Standards (NEIS) for EV Equipment
- First Responder safety and fire hazard measures

Ensuring EVITP Training Quality, Integrity and Consistency

In addition to providing high quality instructor training, EVITP will certify all instructors and training graduates. Certification will utilize well recognized and respected methods to:



- Defend and protect exam security
- Require curriculum comprehensiveness and consistency
- Ensure instructor effectiveness
- Perform random training site visits and inspections
- Maintain proper working lab equipment
- Require 100% lab exercise pass rates

EVITP Funding

Initial training program funding is being provided in-kind by industry stakeholders and partners. Additional funding of ongoing operations will come from a variety of sources including public and/or private grants, sponsorships, and partner contributions.

What EVITP Is Asking of Stakeholders

The Electrical Vehicle Infrastructure Training Program (EVITP) is seeking input and information from a cross section of stakeholders who will constitute the Partner Advisory Board. Where and when appropriate, the information will be incorporated into the broader EVITP curriculum. As an Advisory Board Member, we request your participation in four ways:

1. Provide technical and/or other supportive information relevant to your product and/or service, and authorize incorporation of that content into the EVITP curriculum.
2. Share Best Practice techniques and/or concerns about your specific industry function and/or market which may need to be addressed in the EVITP program.
3. Participate in two (2) Strategy Conference Calls with the EVITP Task Force.
4. Support EVITP as an essential part of building the overall success of the EV market, and as a critical credential to facilitate best practice EVSE and electrical energy storage device installation and maintenance.

When Your Participation Is Needed

Your participation is needed now because the market is already unfolding. EVITP intends to have the training and certification program in place in a matter of months (not years). Because EVITP's mission is critical to the safe, effective and consistent performance and growth of the EV market, there is no time to waste.

Contacts for Further Information

Your EVITP Task Force Volunteer:

Kansas City Joint Apprenticeship Training Center (KCJATC) <http://www.kcjatc124.org>



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H.2 EVITP Courses and Key Topics

Courses Available

EVSE Residential Charging Installation Training for electrical contractors and inspectors, available from Clean Cities TV:

<http://www.cleancities.tv/FeaturedContent/Training/EVSEResidentialChargingInstallation.aspx>

EVITP provides training and certification for people installing EVSE. As a voluntary collaboration of electrical industry organizations, EVITP supports developing EV charging infrastructure for residential and commercial markets.

Clean Cities works with EVITP to address technical requirements, safety imperatives, and training needs for electric vehicle industry partners and stakeholders.



Training Opportunities

EVITP offers training around the United States at community colleges and electrical training centers. Training is open to licensed electricians in compliance with requirements of state or municipal jurisdictions. Training on local requirements supplements core training when appropriate.

Focused Curriculum

EVITP collaborates with industry organizations to develop curriculum to train and certify electricians. This training teaches industry best practices in electric vehicle infrastructure installation, commissioning, and maintenance.

EVITP offers brand-specific training for stakeholders to learn about plug-in electric vehicles, charging stations, electrical storage devices, and other industry products.

Key Topics

EVITP's training covers these key topics:

- EV prospect/customer relations and experience
- Automobile manufacturer's charging performance integrity specifications
- EV battery types, specifications, and charging characteristics
- Utility interconnect policies and requirements
- Utility grid stress precautions including demand response integration technologies
- Role of electrical storage devices as charging intermediaries
- Installing, commissioning, and maintaining electric storage devices
- Charging station fundamentals including brand/model-specific installation instructions for:
 - o Level 1: 120 VAC 15 amps
 - o Level 2: 120-240 VAC 60 amps
 - o Level 3: 480 VAC 125 amps or 600 VDC 550 amps
- Service-level assessments and upgrade implementation
- Integration of electric vehicle infrastructure with distributed generation
- Understanding Internet Protocol (IP) networking of charging stations
- National Electrical Code (NEC) standards and requirements
- National Fire Protection Association (NFPA) 70E and OSHA regulations
- National Electrical Installation Standards (NEIS) for electric vehicle equipment
- First responder safety and fire hazard measures.



More Information

For more information about the Electric Vehicle Infrastructure Training Program, email evitpinfo@gmail.com.

H.3 EVITP Curriculum Flyer



Electrician Training & Certification

Industry Driven Collaborative

Comprehensive Technical and Industry Material

Customer-Focused Curriculum

Electric Vehicle
EVITP[™]
Infrastructure Training Program

Electric Vehicle
EVITP[™]
2
Infrastructure Training Program

Residential - Commercial - Public - Fleet

The Electric Vehicle Infrastructure Training Program (EVITP) is delivering the highest standard in training and certification for the installation of EVSE to support the Electric Vehicle Transportation sector. EVITP is a partnership of stakeholders from the EV industry and does not operate for profit. EVITP has over 220 EVITP Certified Instructors and over 1,000 EVITP Certified Electricians in North America.

www.evitp.org

Exhibit H-1. EVITP Curriculum overview informational flyer



EVITP Curriculum Overview

Phase 1



- EV prospect/customer relations and customer experience
- Automobile manufacturer's charging performance integrity specifications
- EV battery types, specifications, and charging characteristics
- Utility interconnect policies and requirements
- Utility grid stress precautions including Demand Response integration technologies
- The role of electrical storage devices as charging intermediaries
- Installing, commissioning and maintaining electric storage devices
- Charging station fundamentals; brand/model specific installation instructions for:
 - Level 1: 120 VAC 15 amps
 - Level 2: 120-240 VAC 60 amps
 - Advanced Charging: 480 VAC 125 amp or 600VDC 550 amps
- Service level assessments and upgrade implementation
- Integration of EV infrastructure with distributed generation
- Understanding Internet Protocol (IP) networking of charging stations
- National Electrical Code (NEC) standards and requirements
- National Fire Protection Association (NFPA) 70E, and OSHA regulations
- National Electrical Installation Standards (NEIS) for EV Equipment
- First Responder safety and fire hazard measures

Phase 2



- Overview of EV Market Evolution and Progress
- Advanced Charging: 480 VAC 125 amp
- Understanding Commercial, Public and Fleet Applications
- Advanced Load Calculations & Advanced Site Assessment
- Integration of distributed generation, commercial storage & micro grids
- Facility based energy storage and power load management
- National Electrical Code (NEC) standards and requirements, NEC Article 625
- EVSE Troubleshooting, Maintenance and Repair
- Vehicle to Grid (V2G) concept & EV Battery Reuse
- Safety and fire hazard measures, OSHA Guidelines – NFPA 70E Safety & Voltage Testing

EVITP Partner Advisors

General Motors (Vehicle Manufacturer)
 SPX (EVSE Manufacturer; Program Manager)
 BMW North America (Vehicle Manufacturer)
 AeroVironment, Inc. (EVSE Manufacturer; Nissan Partner)
 Coulomb Technologies (EVSE Manufacturer)
 Pacific Gas & Electric (Utility)
 General Electric (EVSE Manufacturer)
 The National Fire Protection Association (NFPA)
 Ecotality (Program Manager)
 The International Association of Electrical Inspectors (IAEI)
 Schneider Electric (EVSE Manufacturer)
 DTE Energy (Michigan Utility)
 PEP Stations (EVSE Manufacturer)
 ClipperCreek (EVSE Manufacturer)
 Exergonix (Battery Storage)
 The University of California-Davis, PHEV Research Center
 Orlando Utilities Commission (Municipal Utility)
 Southern California Edison (SCE)
 EATON Corporation (EVSE Manufacturer)
 Smith Electric Vehicles (Vehicle Manufacturer)
 American Electric Power (Ohio Utility)
 The National Electrical Contractors Association (NECA)
 Hubbell (EVSE Manufacturer)
 Commonwealth Edison (Illinois Utility)
 Leviton (EVSE Manufacturer)
 Consumer's Energy (Utility)
 Legrand/Pass & Seymour (EVSE Manufacturer)
 Kansas City Power & Light (Utility)
 Duke Energy (Southeastern & Midwestern U.S. Utility)
 Ameren Missouri (Utility)
 The National Joint Apprenticeship Training Committee (NJATC)
 Milbank Manufacturing (EVSE Manufacturer)
 California Community Colleges, Advanced Transportation
 Technology and Energy Program Network, (ATTE)
 San Diego Gas & Electric (Utility)
 DBT USA, Inc. (EVSE Manufacturer)
 Gridtest Systems (EVSE Testing Equipment)

For more information: info@evitp.org
www.evitp.org

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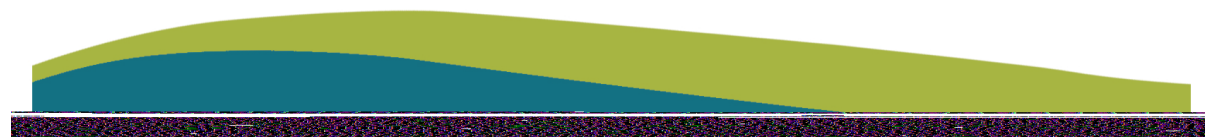


Exhibit H-1. EVITP Curriculum overview informational flyer. Continued.

H.4 Training Institute Newsletter

NTI Wrap-Up

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ELECTRIC VEHICLE INFRASTRUCTURE TRAINING PROGRAM (EVITP) GRADUATES 28 INSTRUCTORS DURING THE NATIONAL TRAINING INSTITUTE ON THE CAMPUS OF THE UNIVERSITY OF MICHIGAN

EV Industry stakeholders gather to discuss NEC Article 625 and experience EVITP Instructor Training



EVITP was honored to participate in NTI 2011 in a variety of ways, including offering test drives of the new Chevy Volt in partnership with General Motors during the NTI Trade Show, teaching an EVITP Instructor Course throughout the week and

gathering a group of EV Stakeholders together with NTI leadership and *NEC* Article 625 code panel members attending NTI for idea sharing and networking.

Over 28 participants from 19 markets experienced twenty-four hours of Phase 1 EVITP curriculum based in large part on the contributions of key EV Industry stakeholders including automakers, utility companies, EVSE manufacturers, universities, as well as electrical inspection and fire protection associations. The course included classroom instruction, rigorous hands-on lab practicum and

skills testing over the week long training event. at NTI, Instructors will return to their home markets to hold EVITP courses for Instructors and Installers.

EV industry partners including Automakers, Utilities, EVSE manufacturers and others also gathered on the campus to meet with sitting National Electrical Code (*NEC*) Article 625 code making panel members including **Mike Johnston, Chairman of the *NEC* Technical Correlating Committee and Executive**

Upon successful completion of the EVITP Instructor course



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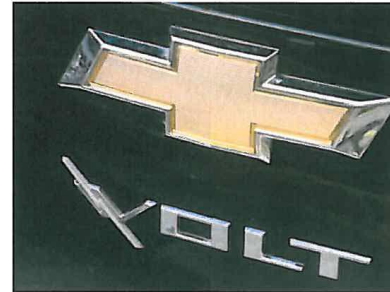
Exhibit H-2. EVITP article in electrical training newsletter.



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NTI Wrap-Up

Director of Standards and Safety for the National Electrical Contractors Association (NECA). Mr. Johnston noted, “A great deal of work is being done to insure that the EV industry is supported by language within *NEC* Article 625 for the safe, proper, installation and maintenance of EVSE equipment to support this new industry.” Representatives from DTE Energy, PEP Stations, ClipperCreek, EATON Corporation, IAEI, NFPA, Leviton, Coulomb Technologies, Schneider Electric, and General Motors attended the meeting.



EVITP is a not for profit, volunteer, EV Industry collaborative, designed to deliver a structured platform to facilitate training and certification for the installation of Electric Vehicle Supply Equipment (EVSE) across the Residential, Commercial and Public markets.



The EVITP collaborative currently includes: General Motors, AeroVironment, General Electric, DTE Energy, Duke Energy, ClipperCreek, Southern California Edison, Schneider Electric, Exergonix, SPX, EATON, Coulomb Technologies, Inc., The National Electrical Contractors Association, Orlando Utilities Commission, PEP Stations, Smith Electric Vehicles, Hubbell,

Commonwealth Edison, Leviton, Ecotality, American Electric Power, Kansas City Power & Light, Milbank Manufacturing, Legrand/Pass & Seymour, The National Joint Apprenticeship Training Committee, The University of California-Davis, PHEV Research Center, Ameren Missouri, The National Fire Protection Association, The International Association of Electrical Inspectors, Pacific Gas and Electric, California Community Colleges Advanced Transportation Technology and Energy Program network (ATTE).

For more information on joining EVITP or EVITP training, contact Bernie Kotlier at (408) 242-4000 or Jennifer Mefford at (248) 318-7885.


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Exhibit H-2. EVITP article in electrical training newsletter. Continued.