BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement A General Rate Increase for Electric Service	)))	Case No. ER-2016-0285

NOTICE OF COMMUNICATON

COMES NOW Kansas City Power & Light Company ("KCP&L" or "Company"), by and through counsel, and files this Notice of Communication. In this regard, KCP&L respectfully states to the Missouri Public Service Commission ("Commission"):

1. On May 25, 2016, a workshop was held in Case No. EW-2016-0123 during which three KCP&L employees made presentations regarding electric vehicle charging stations. See Attachments A1-A3. KCP&L understands that Commission Staff will file these (and other) presentations in Case No. EW-2016-0123 through EFIS.

2. Because it is possible that electric vehicle charging stations may be an issue in this general rate proceeding, KCP&L hereby files these presentations out of an abundance of caution to ensure compliance with section 386.210 RSMo. and 4 CSR 240-4.

WHEREFORE, KCP&L submits this Notice of Communication.

Respectfully submitted,

/s/ Robert J. Hack

Robert J. Hack, MBN 36496
Phone: (816) 556-2791
E-mail: rob.hack@kcpl.com
Roger W. Steiner, MBN 39586
Phone: (816) 556-2314
E-mail: roger.steiner@kcpl.com
Kansas City Power & Light Company
1200 Main – 19th Floor
Kansas City, Missouri 64105
Fax: (816) 556-2110

Attorneys for Kansas City Power & Light Company

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document was served upon the parties listed below on this 26th day of May 2016, by either e-mail or U.S. Mail, postage prepaid.

Staff Counsel Department
Missouri Public Service Commission
200 Madison Street, Suite 800
Jefferson City, MO 65102
Phone: 573-751-2690
staffcounselservice@psc.mo.gov

Nathan Williams
Missouri Public Service Commission
200 Madison Street, Suite 800
Jefferson City, MO 65102
Nathan.Williams@psc.mo.gov

James Owen
Office of the Public Counsel
200 Madison Street, Suite 650
Jefferson City, MO 65102
Phone: 573-751-5318
opcservice@ded.mo.gov

/s/ Robert J. Hack

Robert J. Hack

ATTACHMENT A.1

CLEAN CHARGE NETWORK

PRESENTATION


KCP&L
cleancharge
network

This City May Soon Be the Best Place to Own an Electric Car

A huge plan is in the works to juice electric vehicle adoption.

TIME.COM

State of Missouri Support

"Today's announcement is another great example of how Missouri continues to lead the way toward a more sustainable energy future from right here in the heartland. The Clean Charge Network will help cement Kansas City's position as a center of next-generation automotive technology and innovation, while benefiting drivers and communities alike."
- Governor Jay Nixon

Kansas City Area Development Council

"Today's announcement accelerates our region's ability to attract a new generation of tech-savvy, educated and skilled professionals. It also marks a key milestone in shedding the outdated image some still have of KC, and will provide a significant boost to our region's competitiveness. It will especially have a transformational impact on our ability to attract companies looking to hire a new generation workforce."

"While on the surface this is about a new technology, in reality it is about the resurgence of Kansas City. It is a very big statement that the old days of 'aw shucks' are only glimpsed in the rear view mirror. I am especially eager to start sharing this new lifestyle asset with the corporate decision makers that are evaluating our region as a location where they will invest in their company's future."

"KCP&L is truly breaking new ground with the launch of the Clean Charge Network in KC. This innovative endeavor provides a unique lifestyle advantage for KC residents today and into the future."
- Bob Marcusse, President and CEO

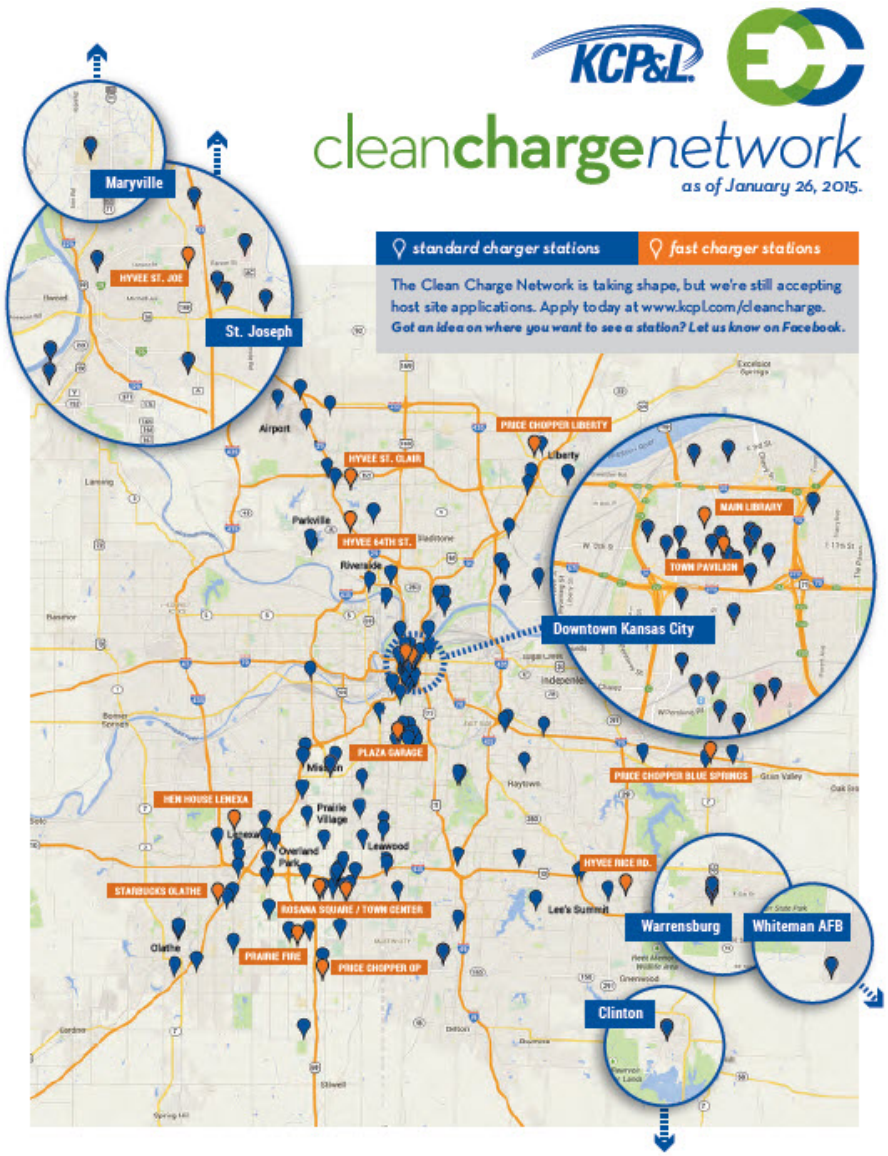
Mid-America Regional Council

"The Mid-America Regional Council (MARC) applauds the efforts of KCP&L as a regional leader in sustainable initiatives such as the Clean Charge Network. These infrastructure improvements encourage the use of electric vehicles, which can help reduce the impact of tailpipe emissions on our local air quality as we strive to maintain compliance with federal standards. Our region benefits from having forward-thinking and community-minded utility providers - we look forward to continued progress toward a cleaner and healthier Kansas City."

- David Warm, Executive Director

2015: Top 5 Metros for EV Growth

Rank	Metro	Q1'16	Q1'16 quarterly YOY growth
1	Las Vegas	2,060	49%
2	Bay Area	77,161	45%
3	LA	89,334	44%
4	Kansas City	1,212	44%
5	Denver	4,700	43%



- KCP&L will design and install a network of more than 1,100 EV charging stations (2,200 plus charging ports)
- Infrastructure sufficient to charge 10,000+ EV's
- The vast majority will be Level 2 charging stations with some Level 3 (DC fast charge) stations
- Installed in groups of 3-5 stations with ports for up to 10 vehicles
- Designed as utility infrastructure
- Focus on publicly accessible, high population density / long dwell time areas, workplaces and geographic dispersion
- Completely free to host companies except for first two years electricity use
- One standard communications and payment platform
- Time of use rates, demand management programs and vehicle to grid distributed electric discharge

EV's Are Priceline For The Grid

Expedia®

Mandates & Aging Grid: ↑ Costs

---

kWh: Solar & EE ↓ Electric Vehicles ↑

KCP&L Clean Charge Network

Smart Electrification

Improved Environment

Economic Development

Customer Programs

Utility Cost and Infrastructure Advantages

Proactive Policymaking

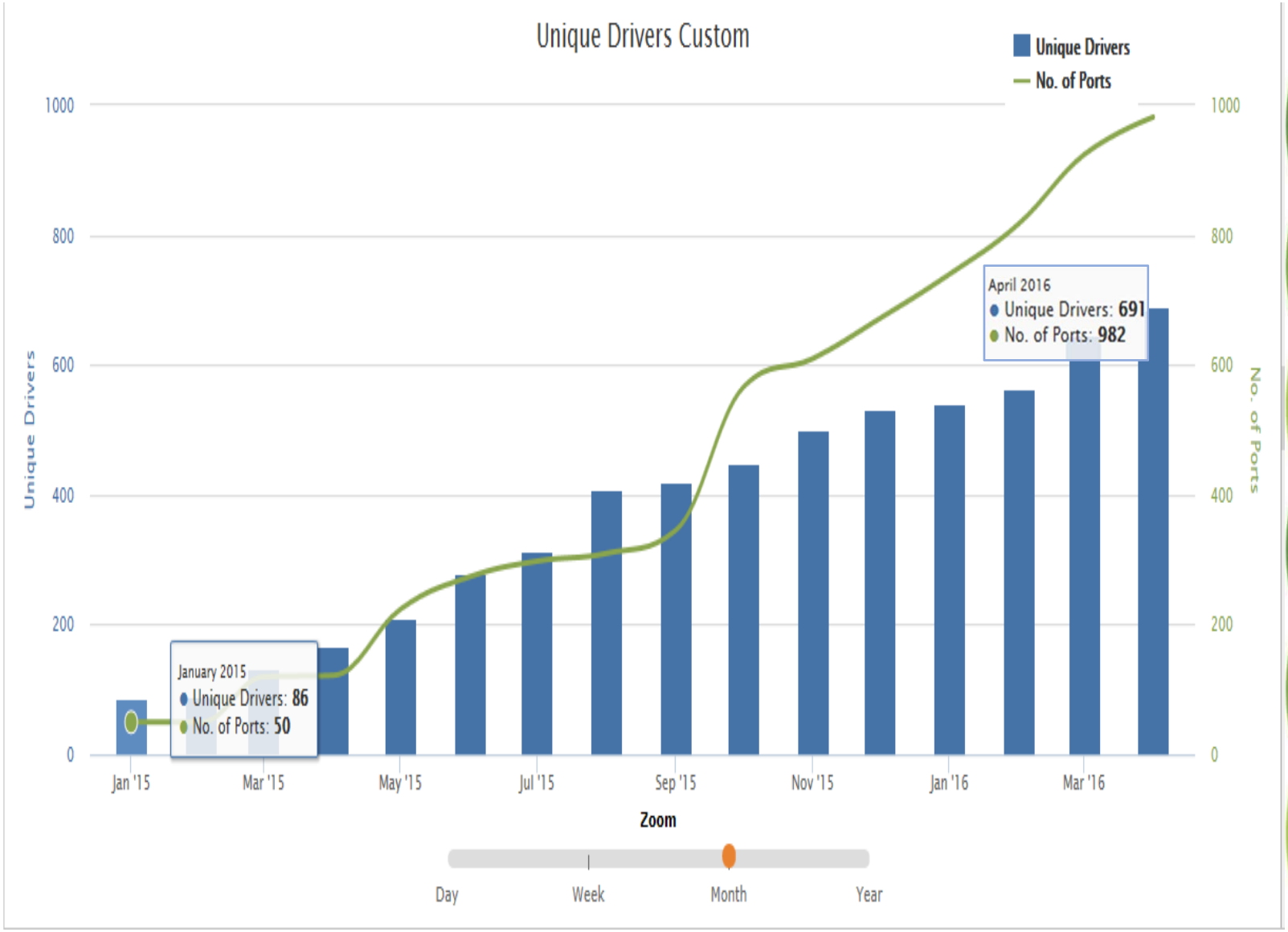
Top 5 Metros for Chargepoint Driver Growth

Rank	Metros	Q1'16	Q1'16 quarterly YOY growth
1	Kansas City	978	118%
2	Denver	2,178	92%
3	Atlanta	9,521	85%
4	Las Vegas	1,005	78%
5	Phoenix	1,441	76%

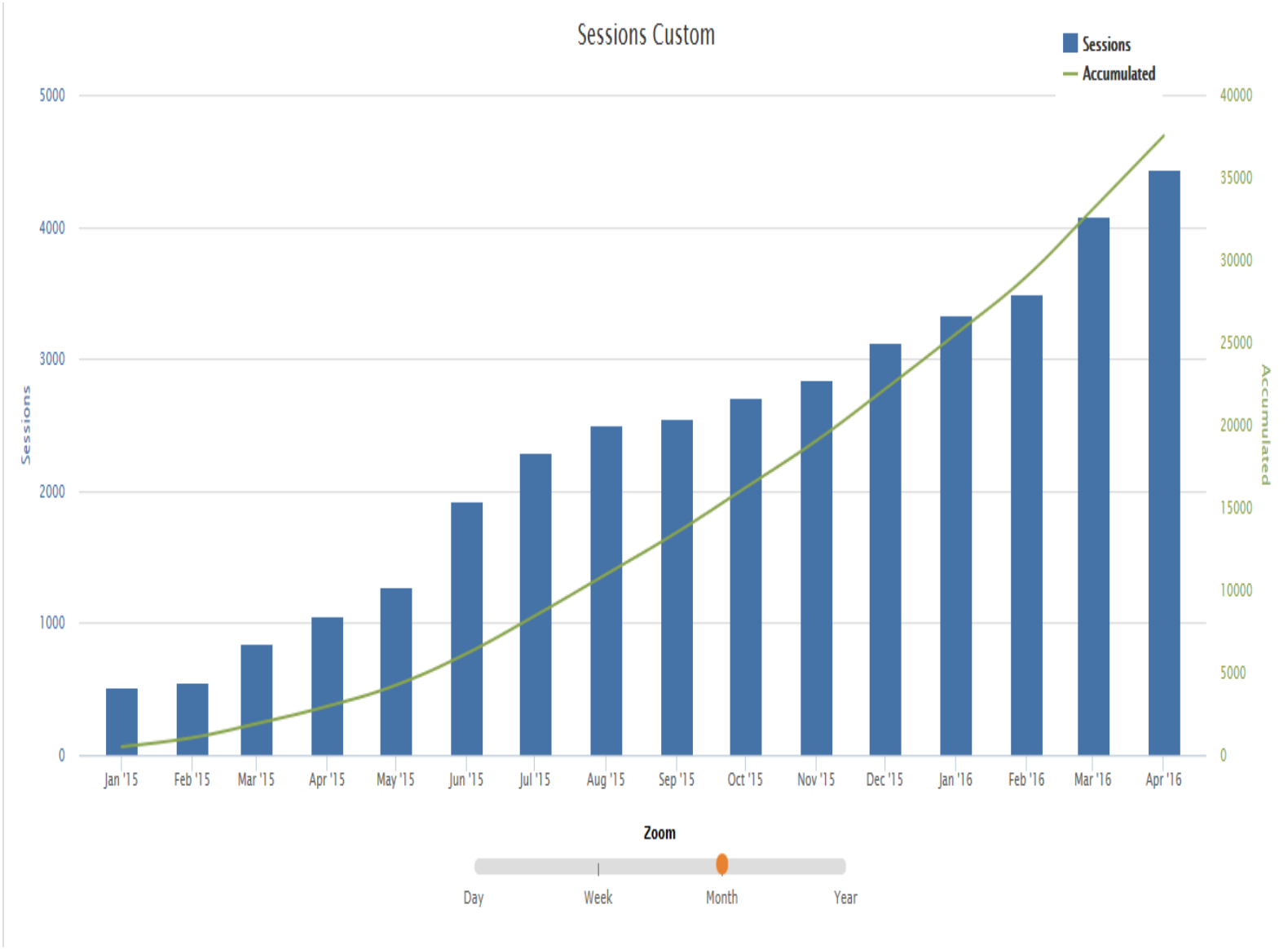
Top 5 Metros for Chargepoint Charging Port Growth

Rank	Metros	Q1'16	Q1'16 quarterly YOY growth
1	Kansas City	1,001	299%
2	Atlanta	672	113%
3	San Diego	498	101%
4	LA	3,063	54%
5	Miami	315	54%

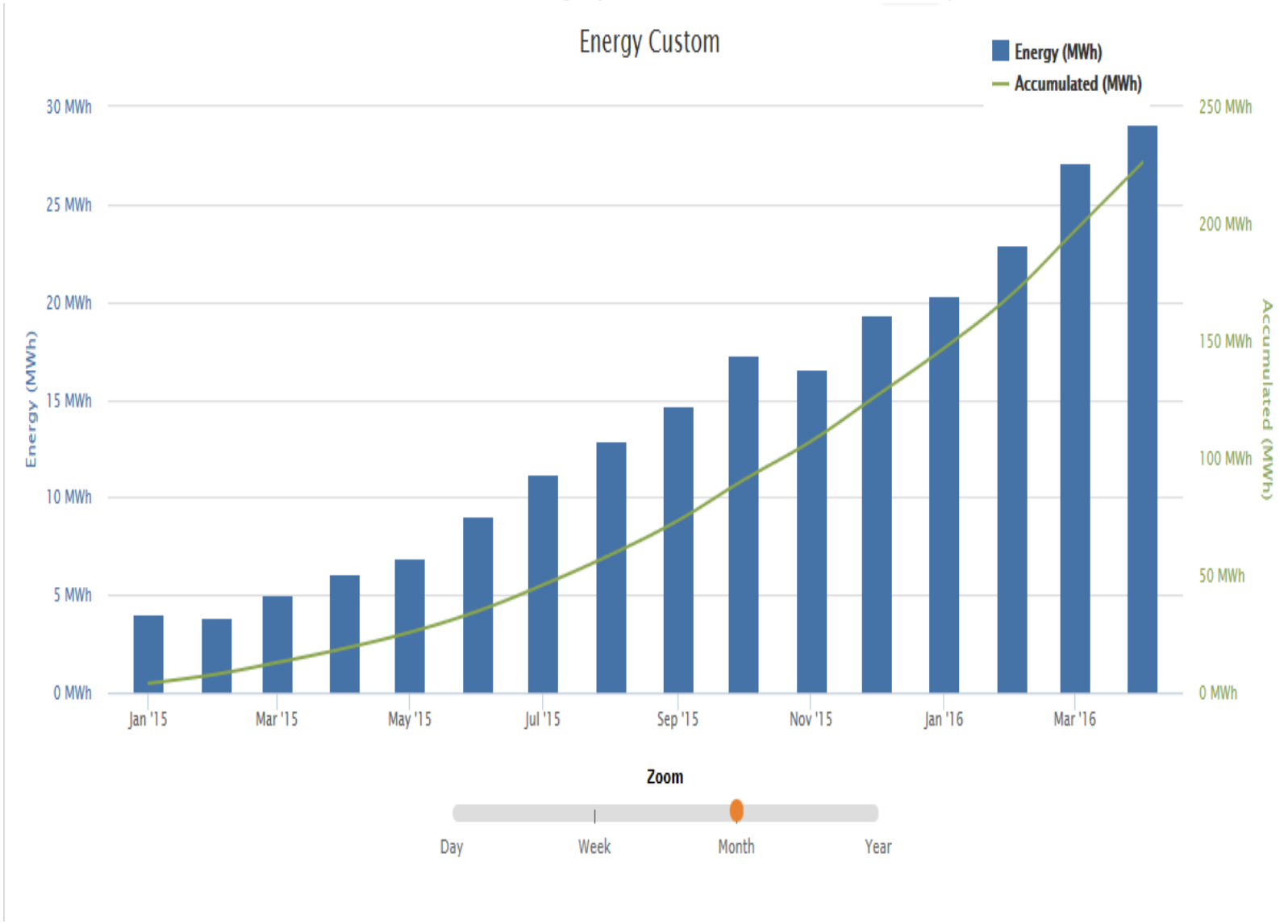
523% Increase in EV Unique Drivers - Monthly



550% Increase in EV Charge Sessions - Monthly



405% Increase in EV Charge Energy - Monthly




KCP&L
cleancharge
network

ATTACHMENT A.2

ARE ALL EV CHARGING STATIONS CREATED EQUAL?

PRESENTATION

MO PSC EV Workshop –
Are all EV Charging Stations Created Equal?

Edward Hedges, P.E.

Consulting Engineer, Energy Solutions

Kansas City Power & Light Co.

May 25, 2016

Types of EVs

- **PHEV (Plug-in Hybrid Electric Vehicle)**

  PHEV has the characteristics of a conventional hybrid electric vehicle, having an electric motor and **an internal combustion engine** , and also has a plug to connect to the electrical grid to charge the onboard battery.

  Most PHEVs support L1 (110v) and L2 (240v) AC charging.

  - Audi A3 Sportback e-tron
  - BMW i8
  - **Chevy Volt**
  - **Ford Fusion Energi**
  - **Ford C-Max Energi**
  - Hyundai Sonata Plug-in
  - **Toyota Prius Plug-in**/Prime

- **BEV (Battery Electric Vehicle)**

  A BEV derives all its power from it's rechargeable battery and thus has **no internal combustion engine or fuel tank**.

  Most BEVs support L1 (110v) and L2 (240v) AC and DC Fast Charging.

  - **BMW i3**
  - Chevy Spark EV
  - Fiat 500e
  - Ford Focus Electric
  - Kia Soul EV
  - Mitsubishi i-MiEV
  - **Nissan Leaf**
  - Smart Fortwo ED
  - **Tesla Model S**
  - Volkswagen e-Golf

Comparison of Most Common EVs Registered in KCP&L Service Area

	EV/PHEV Model	EV Type	EVs Reg. 2010-2015	EV Battery (kWh)	EV Charger (kW)	Charge Plug	Elec. Range (mi.)	Mi per kWh
	Chevrolet Volt	PHEV	418	18.4	3.6	J1772	53	2.9
	Ford C-Max Energi	PHEV	101	7.6	3.3	J1772	19	2.5
	Ford Fusion Energi	PHEV	94	7.6	3.3	J1772	22	2.9
	Toyota Prius Plug-In	PHEV	13	4.4	3.3	J1772	11	2.5
	Tesla S - 70D - 90D	BEV	135	70 90	10 20*	Tesla J1772 ** CHAdeMO**	240 294	3.4 3.3
	Nissan Leaf S Nissan Leaf SV/SL	BEV	109	24 30	3.6 6.6	J1772 CHAdeMO	84 107	3.5 3.6
	BMW i3	BEV	30	22	7.4	J1772 SAE Combo	81	3.7

* option ** with adapter Note: Table data derived from OEM current model year published specifications

EV Charging Levels

- **AC Level 1 - charging from an ordinary household outlet**
  - All EV's support L1 charging
  - 120v, 15 or 20 amp circuit
  - AC-DC rectifier is on-board vehicle
  - Charging is controlled by the EV charge management system
- **AC Level 2 - common workplace and public charging**
  - All EV's support Level L2 charging
  - 240v, 20, 30 or **40** amp circuit per EV charge port.
    (Tesla stations have 100a circuit max)
  - Plug is not energized until plugged into the EV
  - AC-DC rectifier is on-board vehicle
  - Charging is controlled by the EV charge management system
- **DC Fast Charging (DCFC)**
  - Typically supported on BEV
  - 480v 3ph, 500v DC, 25, **50**, 120kW per EV charge port
  - AC-DC rectifier is located within the charge station
  - Plug is not energized until plugged into the EV
  - EVCS and EV charge management system coordinate charge

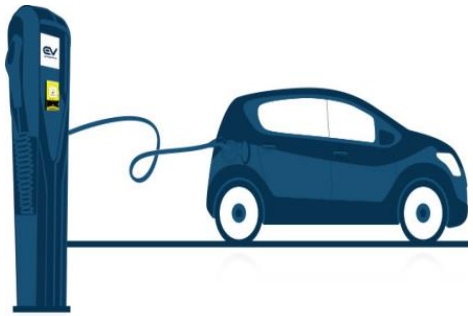
L2 Hourly Charge Comparison

	EV/PHEV Model	EV Type	EV Charger (kW)	Miles per kWh	Charge/Hr. @ L2 Station (kWh)	Miles per Hour of Charge @ L2 Station
	Chevrolet Volt	PHEV	3.6	2.9	3.6*	10.4
	Ford C-Max Energi	PHEV	3.3	2.5	3.3*	8.3
	Ford Fusion Energi	PHEV	3.3	2.9	3,3*	9.6
	Toyota Prius Plug-In	PHEV	3.3	2.5	3.3*	8.3
	Tesla S - 70D - 90D	BEV	10	3.4 3.3	7.2**	24.5 23.8
	Nissan Leaf S Nissan Leaf SV/SL	BEV	3.6 6.6	3.5 3.6	3.6* 6.6*	12.6 23.8
	BMW i3	BEV	7.4	3.7	7.2**	26.6

* Charging rate is limited by EV onboard charger **Charging rate is limited by L2 Charge Station

How L2 EV Charging is Controlled

- **EV battery charging is controlled by the onboard charge management system**
- **EV charging parameters set by**
  - EV Charge Station
    - Available charge capacity
    - Display cost of charge
  - EV Driver Console
    - Charge immediately
    - Complete charge by time
    - Low cost periods
    - Cost thresholds
  - OEM Driver Portal
    - Similar to console preferences



Classes of EV Charge Stations

Non-Networked

- Lower station cost
- Commonly single charge port
- Unable to accept payment
- Can be manually added to on-line charge station maps.
- Some models have a delay charging mechanism
- No access control
- No charge session tracking
- No energy usage tracking
- No charge station monitoring

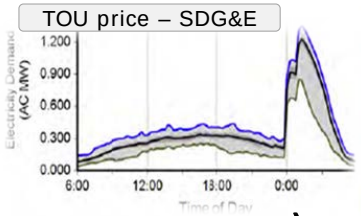
Networked

- Communicate to via Cellular or WIFI to EV Network Mgt. System (Open Charge Alliance's OCPP 2.0 is emerging standard protocol)
- Remote station monitoring and management
- Provide real-time station availability to drivers
- Provide remote support for EV drivers
- Enable station access control
- Ability to monetize and bill charge session usage
- Track and report session details & energy usage
- Provide charge level control and active load reduction

Managing EV Charging for Grid Benefits

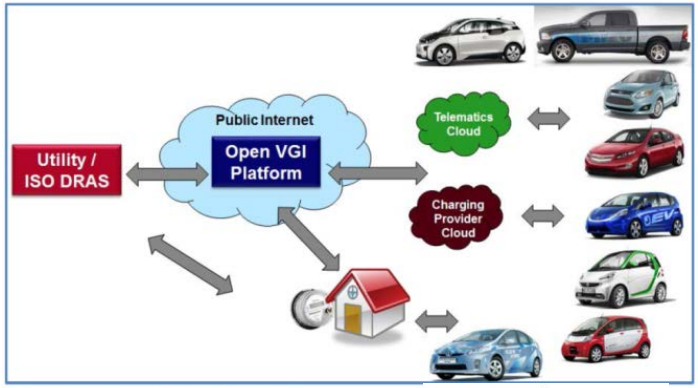
- Today proprietary EVCS Network APIs used to adjust available charge station capacity and price
  - Partial load reduction
  - Load curtailment
  - Load up/down ramping
  - TOU pricing to influence charge periods

Capabilities vary by EVCS Network



- Future Open Vehicle-Grid Integration Platform(OVGIP)

  EPRI' R&D into a single communication interface to all OEM EVs that could provide:
  - EV state of charge
  - EV charge required
  - Driver preferences
  - DR program enrollment
  - Home/Bldg. EMS



Open Platform For Grid Services

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Types of EV Charge Stations

- Historically there have been two classes
  - Basic, non-networked charge stations
  - Multi-Function, networked public access stations
- New networked station classes emerging

Home

Multi-Family

Fleet

25 & 50 kW
Fast DC Charge Stations

Typical CCN L2 Installation

L2 Meter-Service Pedestal

- 120/208-240 Single Phase
- (2) 200a Meter Sockets (back)
- (2) 200a Service Disconnects
- (6) Dual Port Charging Stations per pedestal.

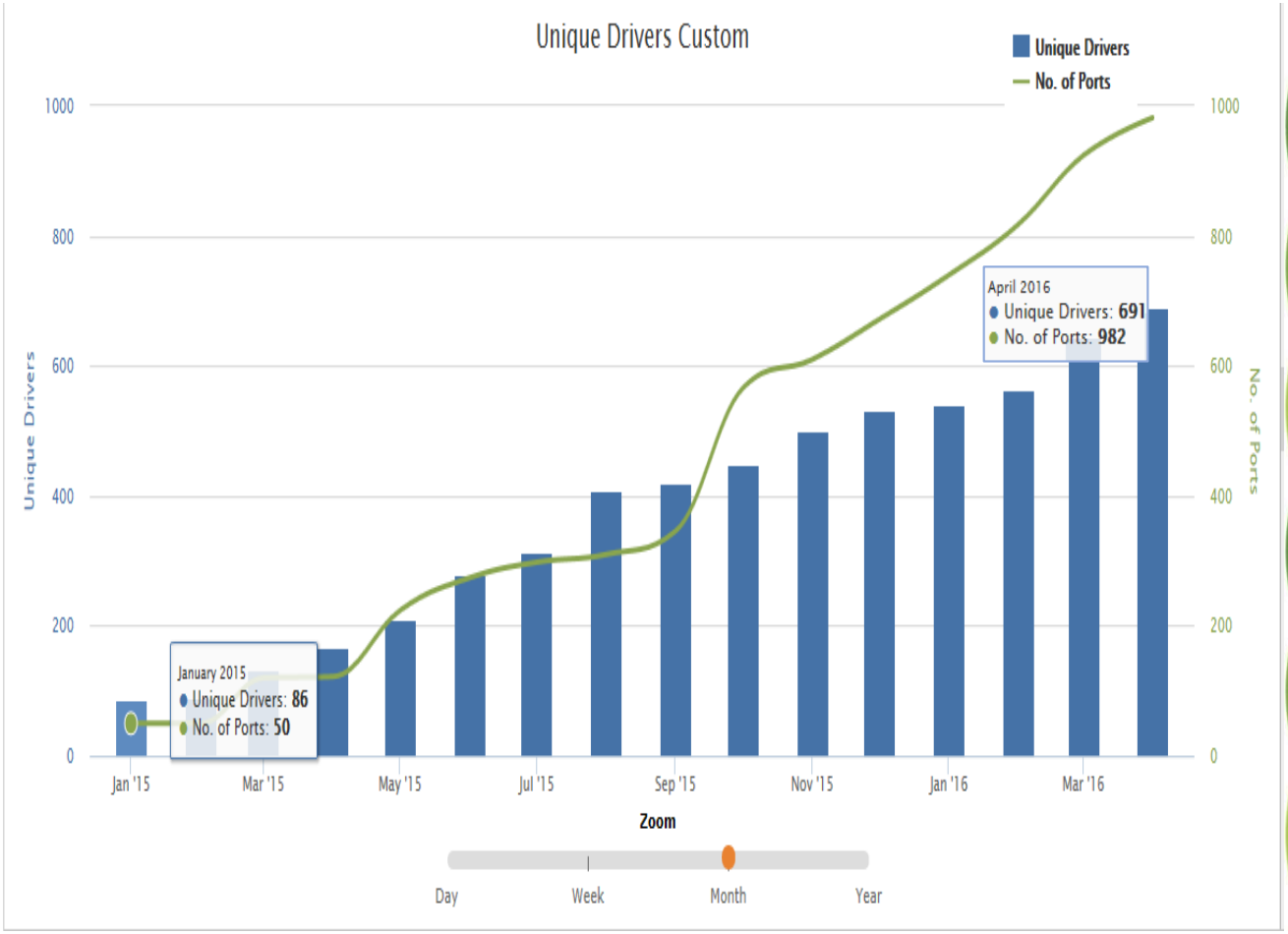
Typical CCN L3 Installations

L3 Meter-Service Pedestal

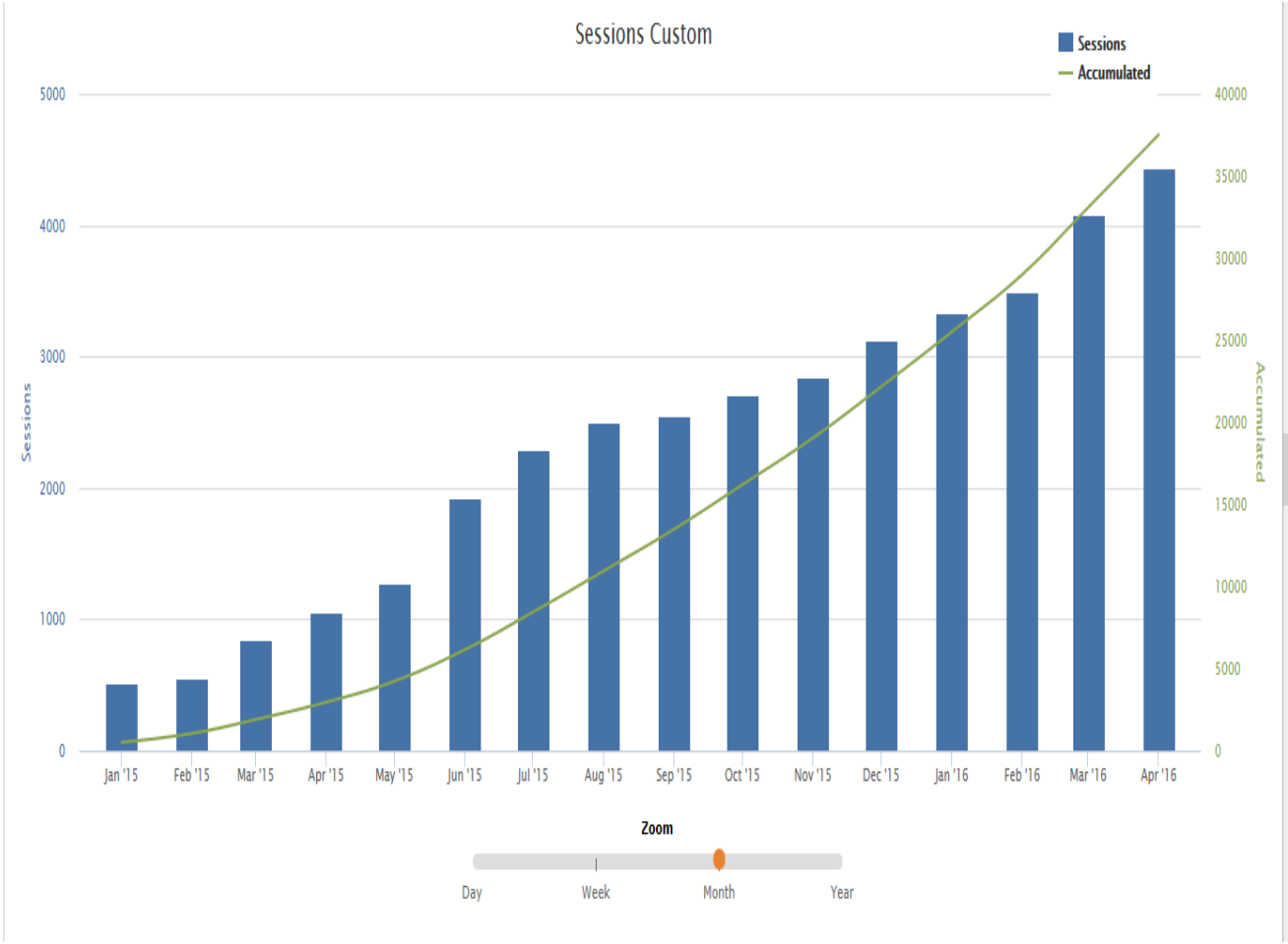
- 277/480 Three Phase
- (1) 200a Meter Socket
- (1) 200a Service Disconnect
- (1) 100a 3p Circuit Breaker per Charge Station (back)

Network Growth and Utilization

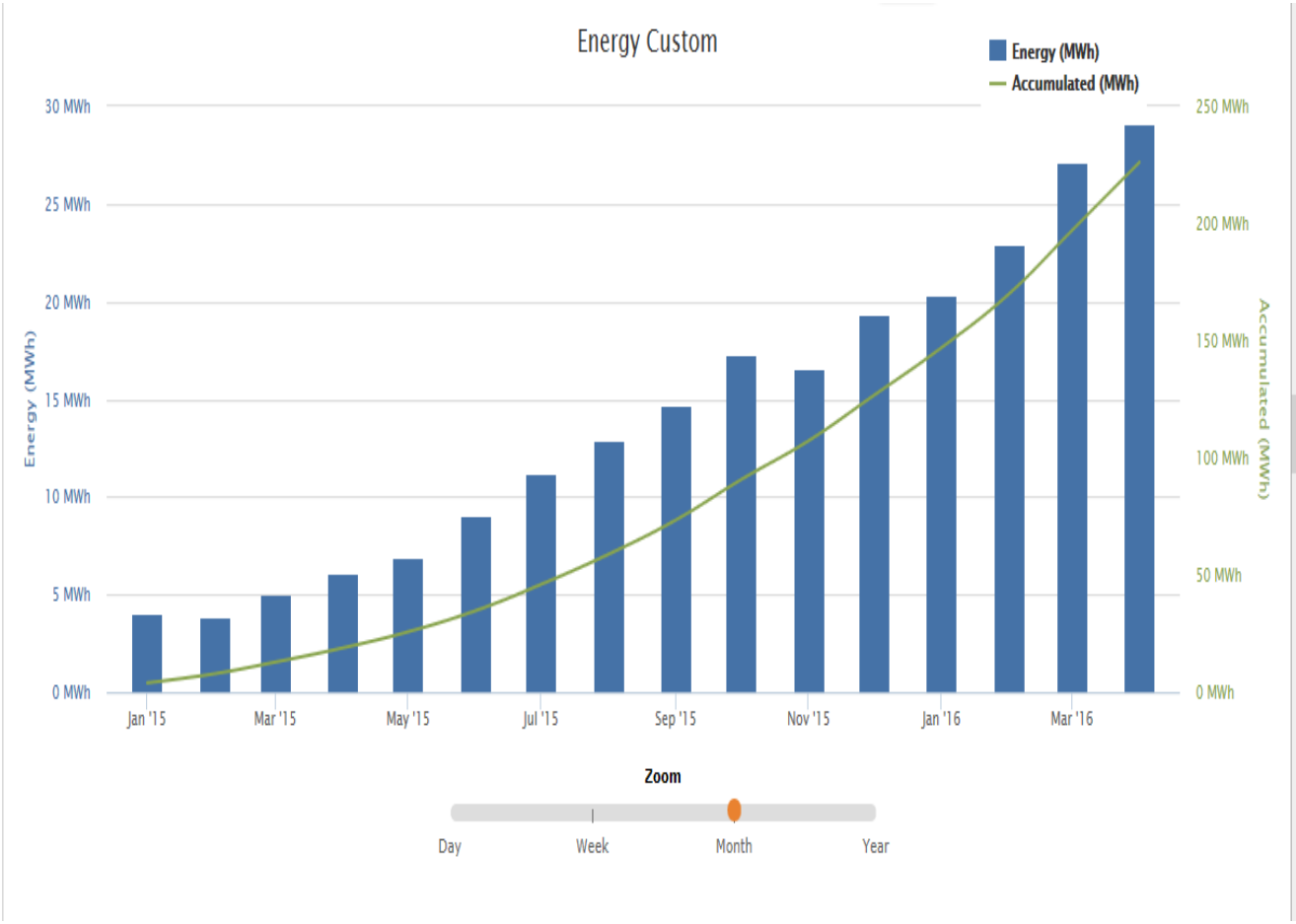
EV Unique Drivers - Monthly



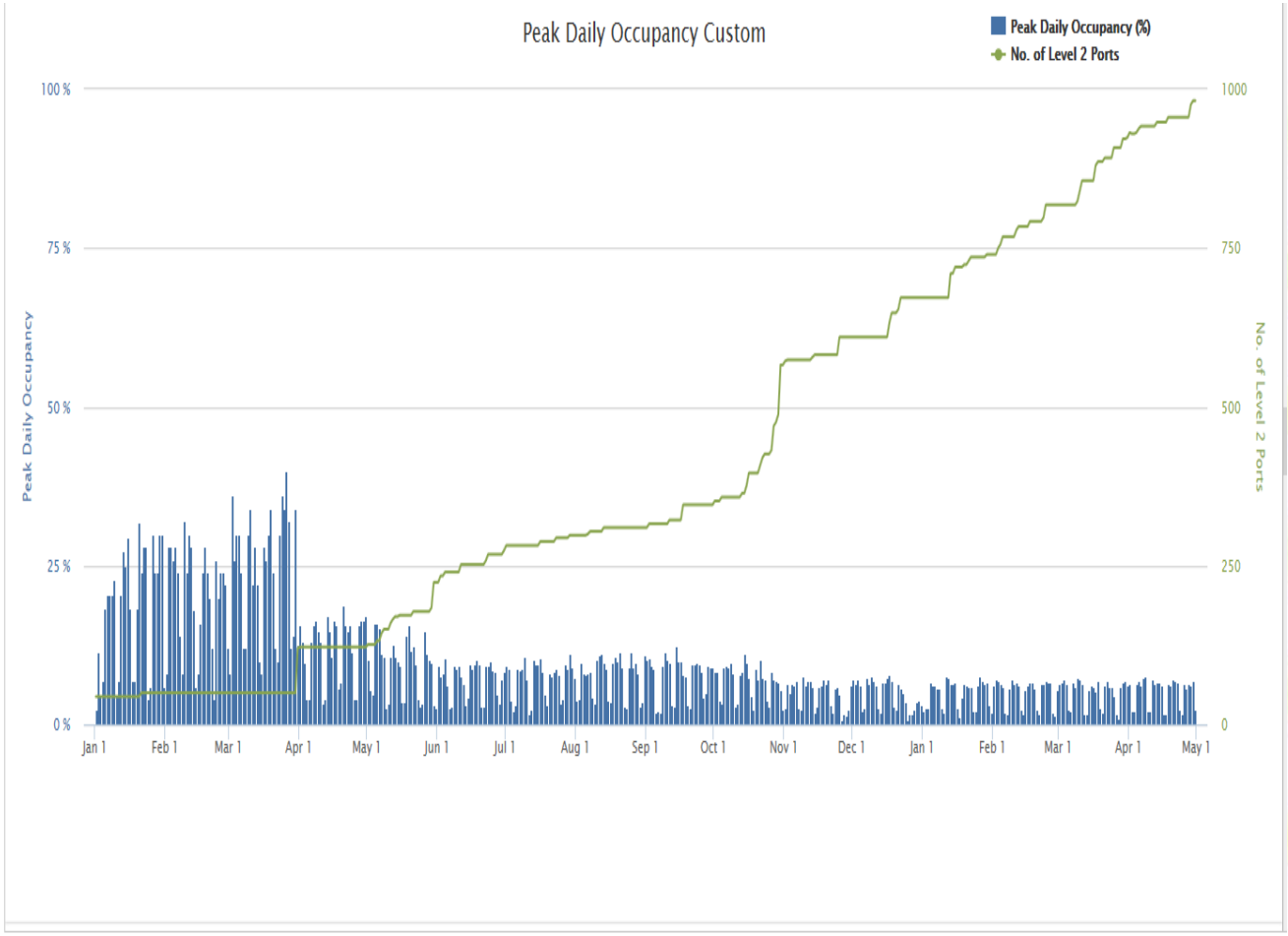
EV Charge Sessions - Monthly



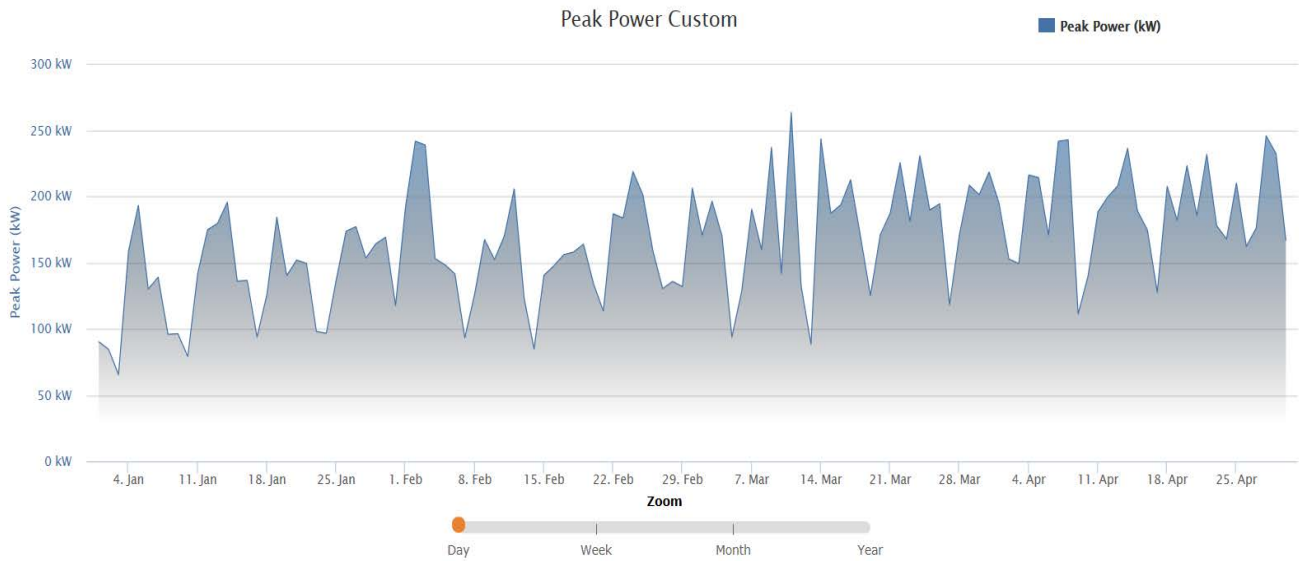
EV Charge Energy - Monthly



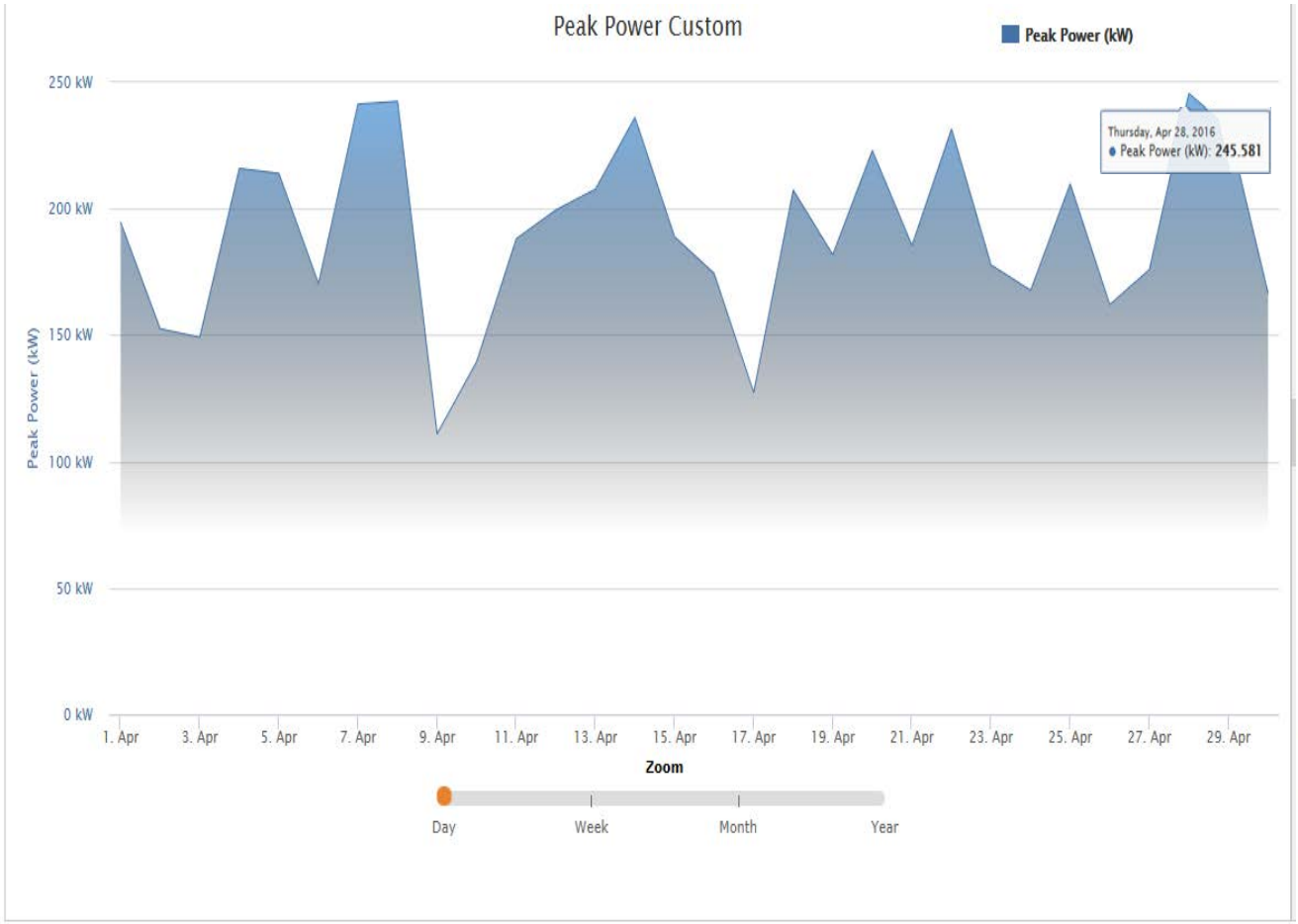
Station Occupancy - Daily



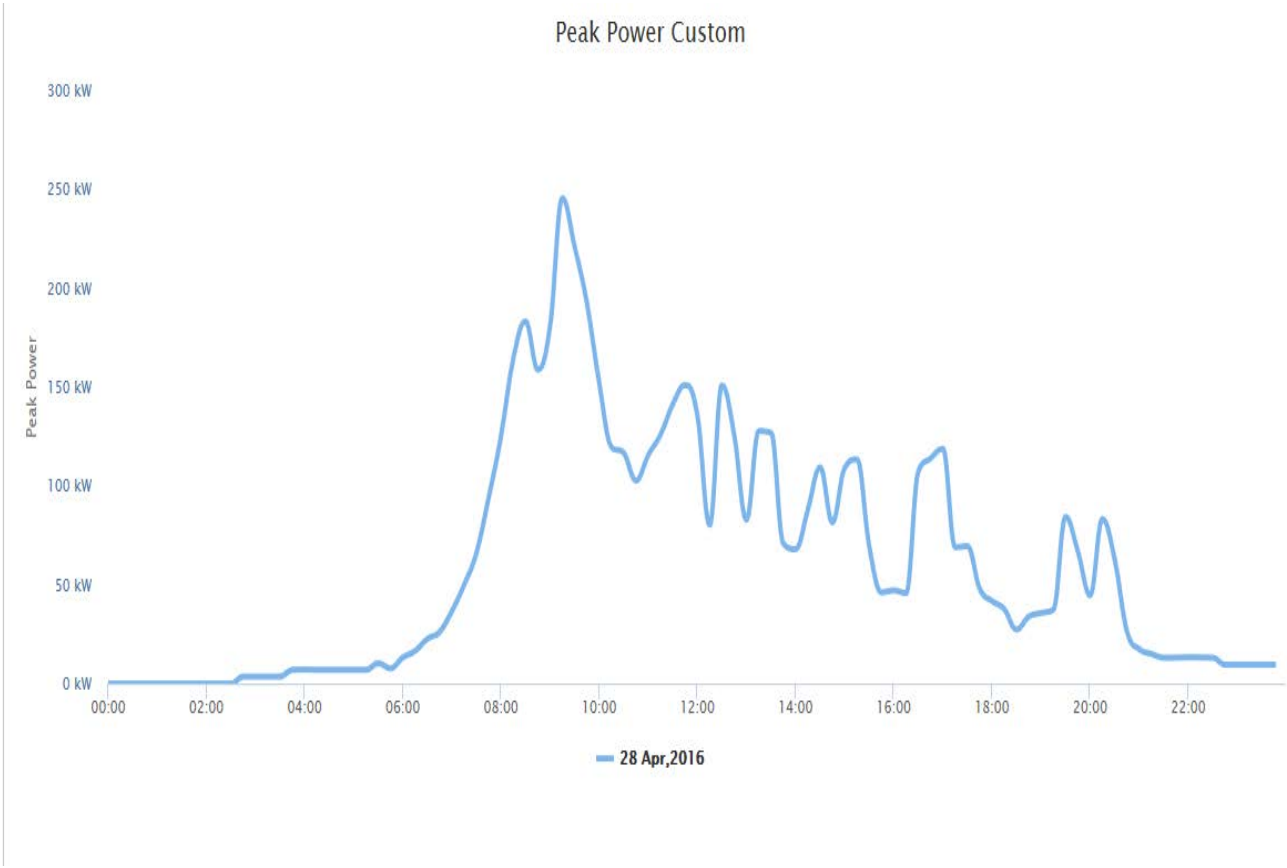
Peak Power – Daily Year-to-Date



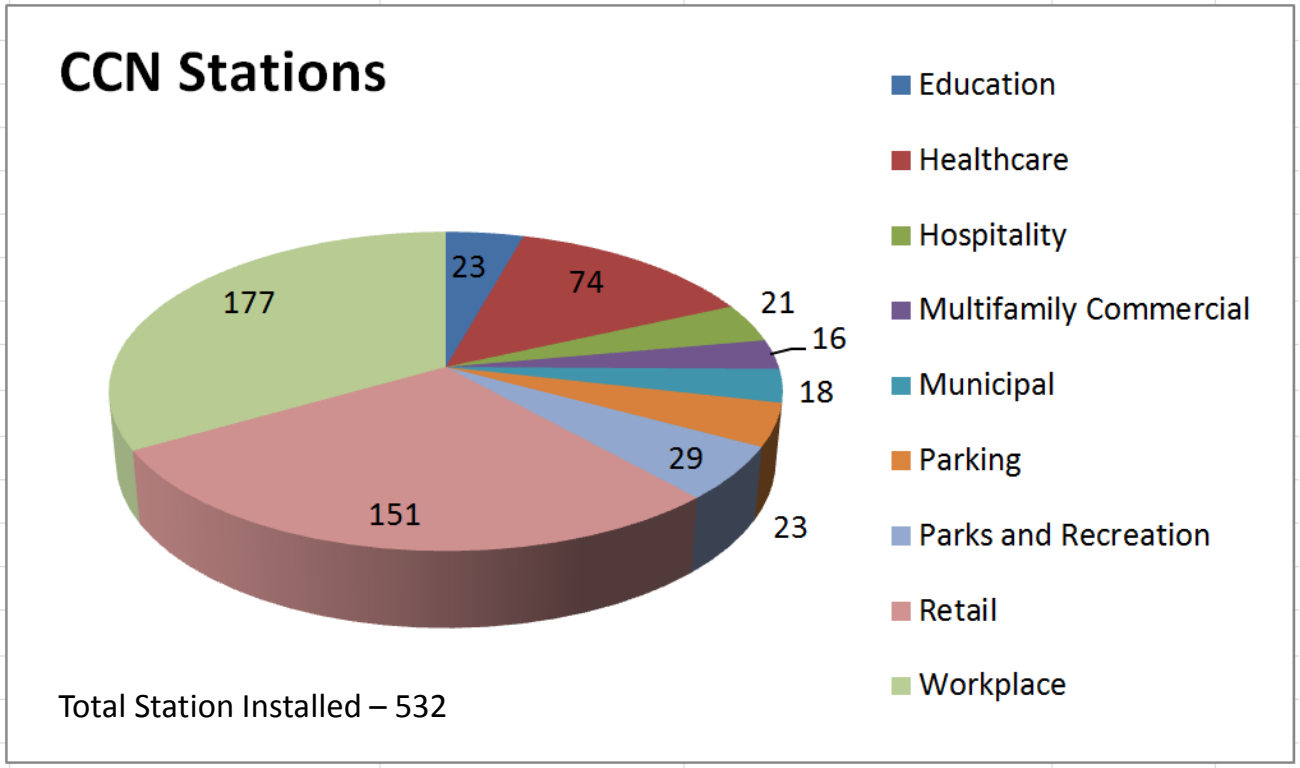
Daily Peak Power – April



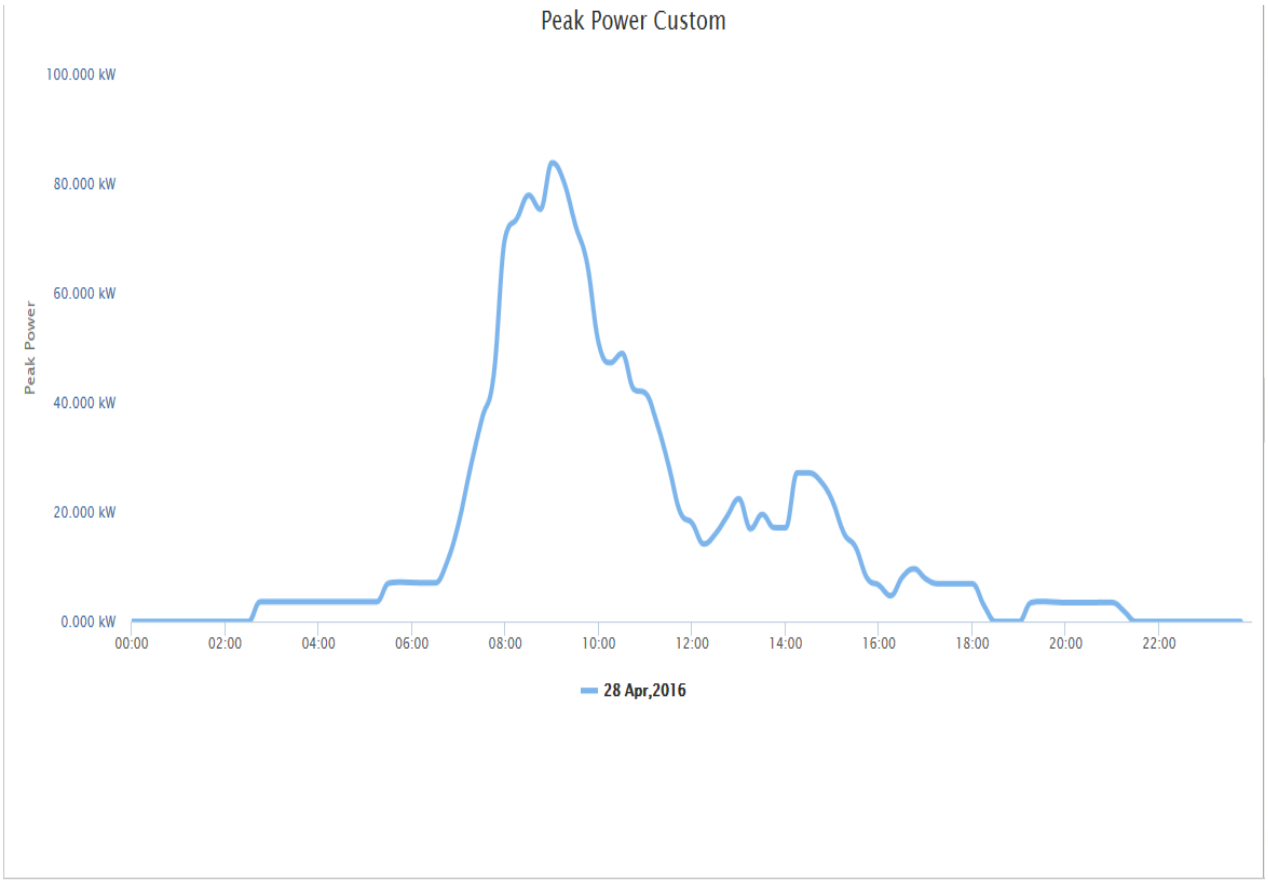
Peak Day Charge Profile – April
All Stations



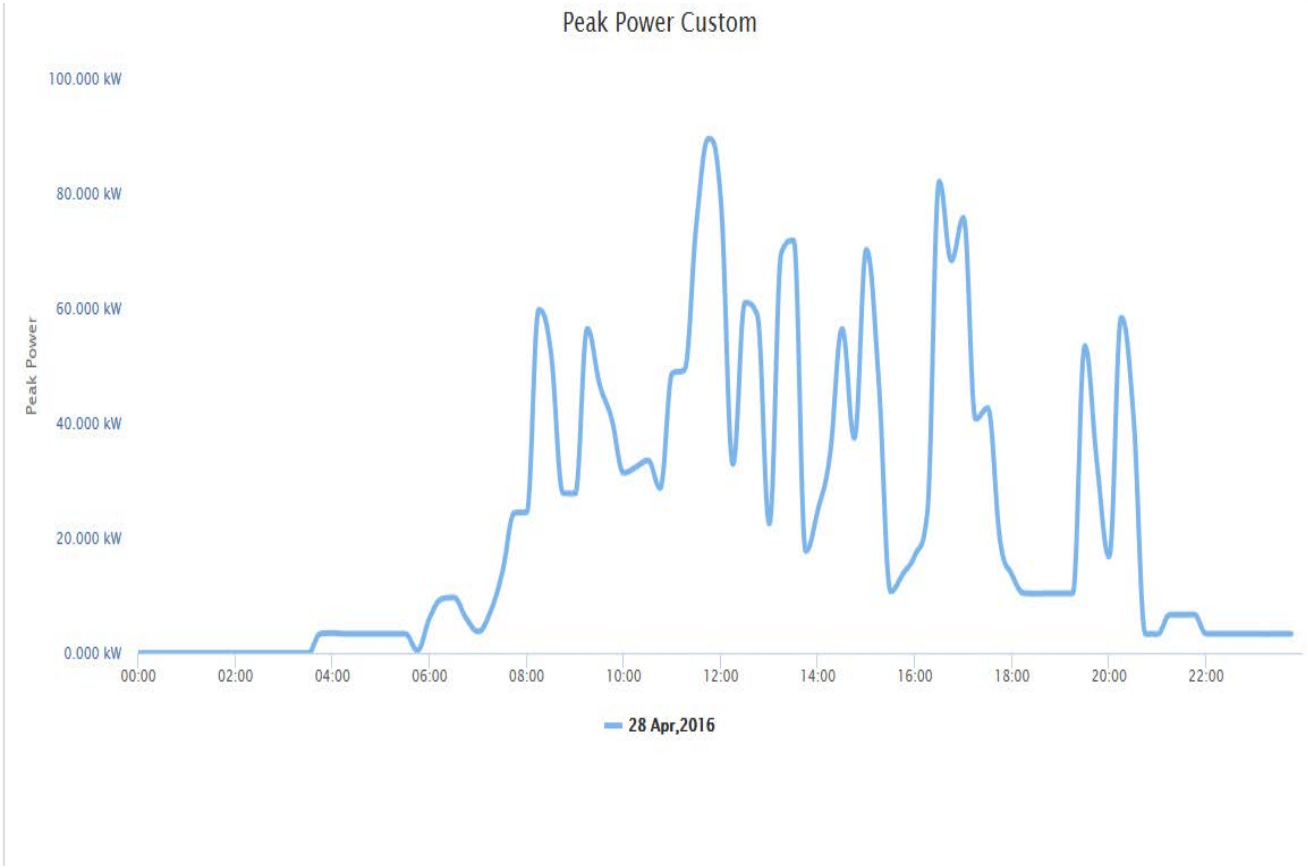
Charge Stations by Customer Type



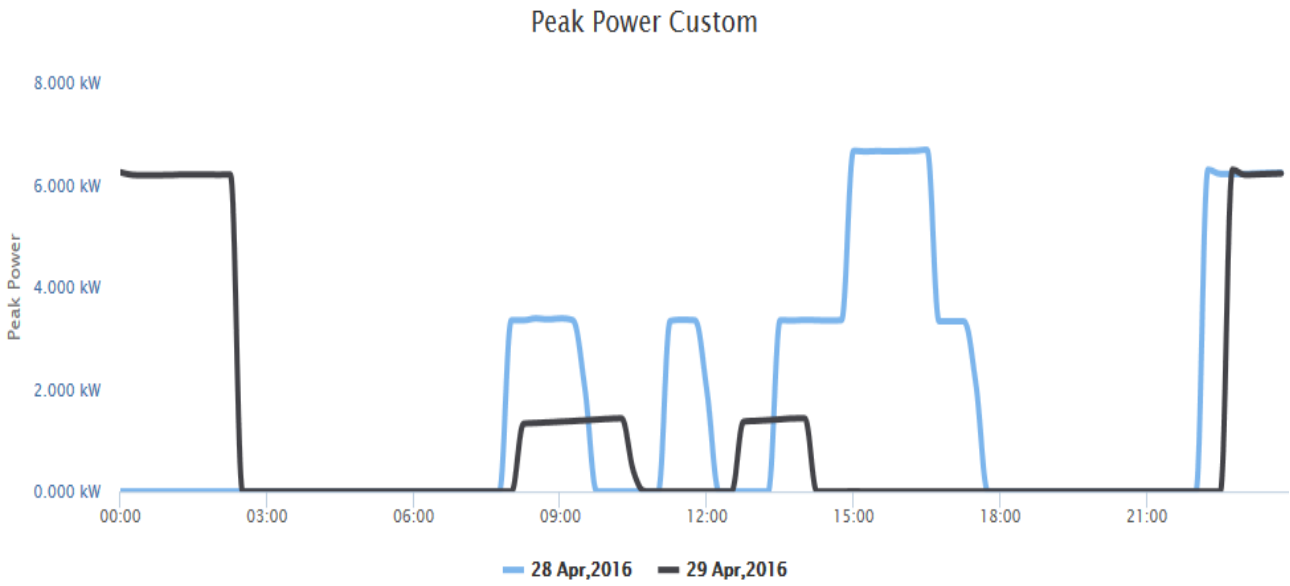
Peak Day Charge Profile – April Workplace



Peak Day Charge Profile – April Retail



Peak Day Charge Profile – April Multi-Family




KCP&L
cleancharge
network

ATTACHMENT A.3

KCP&L EV CHARGING STATION

FUNDING AND COST RECOVERY

PRESENTATION

EV Charging Station Funding and Cost Recovery

Darrin Ives

Vice-President, Regulatory Affairs

Kansas City Power & Light Co.

May 25, 2016

Overview

- Basis for governmental entities to provide incentives or other assistance for Electric Vehicle Charging Stations ("EVCS").
- Utility-owned EVCS
  - Funding
  - Cost Recovery Sources
    - Rates paid by users
    - Rates paid by 'home base' users
    - Rates paid by all customers
- Non-utility-owned EVCS
  - Potential for third-party ownership over time
  - Certain issues would need to be examined
    - Resale of electricity
    - Comparison of benefits
    - Existing facility extension policies

Utility-owned EV Charging Stations

<u>Funding-</u>

- Utility Shareholders fund the necessary capital to deploy.

<u>Cost Recovery Sources-</u>

- Rates paid for use of EV Charging Stations (“EVCS”)
  - Essential element of cost recovery;
  - Must send appropriate price signals;
  - Must not be set at prohibitive ‘out-of-market’ level that would impede use;
  - May be paid by EV user and/or host site; and
  - Costs recovered from revenues for the use of EVCS should increase over time as EV adoption increases.

Utility-owned EV Charging Stations (continued)

<u>Cost Recovery Sources (continued)-</u>

- Rates paid for charging at a 'home base' (typically a residence)
  - 75-80% of EV electricity charging occurs at a 'home base';
  - 'Home base' EV charging creates electricity usage that would not otherwise exist but for EV adoption and thus it is reasonable to recover some EVCS costs from that revenue;
  - Increased 'Home base' charging could lead to time-of-use rates and better infrastructure utilization.
- Rates paid by all customers if some EVCS costs must be spread among customer classes
  - In light of:
    - Substantial public benefits of EV usage;
    - Emerging state of EV adoption; and
    - The imperative not to set EVCS usage rates at prohibitive 'out-of-market' levels that would impede EV adoption.

Non-Utility-owned EV Charging Stations

Non-utility owned EVCS may be a good idea at the right time and under the right conditions. A number of issues would need to be examined, including:

- The current prohibition of the resale of electricity;
- The difference in benefit levels provided by non-utility owned EVCS compared to utility owned EVCS which are integrated with operation of the grid; and
- Whether existing facilities extension policies are suitable for non-utility owned EVCS.

Resolution of these and other issues would likely be assisted by data obtained through operation of utility-owned EVCS.

Summary

EV Adoption

- New opportunity to provide benefits for many interests.
- Providing and paying for infrastructure must be done right and may differ from tradition, convention and custom.
- There may exist a perception of uncomfortable risks but issues will become familiar as dialog continues.

At KCP&L, we firmly believe that the EV status quo is not the right path and hope you agree that the potential benefits of broader EV adoption justify both the time to address and understand issues and the acceptance of measured risks to broaden EV adoption.


KCP&L
cleancharge
network