Increasing Electric Vehicle Fast Charging Deployment

ELECTRICITY RATE DESIGN AND SITE HOST OPTIONS

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Notice

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Executive Summary

Electric vehicles (EVs) provide customer, environmental, energy grid, and national security benefits. However, limited access to charging infrastructure remains a major hurdle to more rapid EV adoption. While most EV charging occurs at home, additional publicly located charging stations - both Level 2 and direct current fast charging stations (DCFCs) - are needed.[1] DCFCs allow most EVs to be fully charged in 30 minutes or less.[2] This paper is specifically focused on options for increasing public DCFC station deployment.

This paper presents a range of options to increase the deployment of DCFC infrastructure, either through rate design or through implementation by the DCFC site host customer (*i.e.,* the customer that owns the DCFC charging station). Included in these options is "experimentation." Given the early stages of DCFC infrastructure deployment, learning-by-doing is an important option to consider. The merits of any approach to facilitating DCFC deployment will depend on market conditions and policy/regulatory objectives, and the approach should strive for consistency with fundamental principles of good rate design, which require that costs be borne by those that cause them.

Options for Increasing DCFC Deployment

Increasing DCFC deployment requires consideration of both electricity rate design options and site host customer implementation options.

Rate Design Options

Various rate design options for increasing DCFC deployment include the following:

- *Create a separate rate class for DCFC site host customers:* DCFC stations are commonly billed under rates that are designed to recover costs based on the average commercial/industrial load profile. If DCFC site host customers have significantly different load profiles, there may be justification for defining DCFC stations as a separate rate class.
- *Provide rate choices:* Some electric companies offer site host customers a choice of rates, allowing those customers to select the rate that best suits their needs. For instance, some electric companies offer both a non-demand or "two-part" rate, which benefits site host

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1 Public charging is essential in urban areas, in locations near customers who do not have off-street parking or dedicated parking spaces, and along highway corridors.

2 Adam Cooper and Kellen Schefter, "Plug-in Electric Vehicle Sales Forecast Through 2025 and the Charging Infrastructure Required," Edison Electric Institute (EEI) and the Institute for Electric Innovation (IEI), June 2017.

customers with low utilization, and a demand charge or “three-part” rate, which could become beneficial to the site host as utilization increases. Another related rate design choice would be a high demand charge and lower energy charge to incent storage as part of the installation.

- *Experiment:* The availability of DCFC sites is currently low. Electric companies and site host owners are still in the early stages of understanding the preferences and charging behaviors of EV owners at DCFC sites. Therefore, it is important to have the ability to experiment or to offer “start-up” rates. Some electric companies today are offering a flat “dollars per hour” charge for DCFC users in an effort to learn what works for customers.
- *Place limits on demand-related charges:*[3] Some electric companies cap the amount that site host customers pay through a demand charge to limit charges to those customers with very low load factors.
- *Temporarily reduce or replace demand charge with volumetric charge:* Grid capacity costs initially could be recovered through a volumetric charge (cents per kilowatt-hour) rather than a demand charge for a limited period-of-time. Eventually, a commercial rate design, comprised of a demand charge and a volumetric charge, could be introduced as the total electricity consumption volume (*i.e.*, kilowatt-hours) of charging load for a given site host customer increases beyond pre-determined thresholds.
- *Provide more detailed pricing signals:* Provide site host customers with charges that reflect the underlying cost structure and give those customers options to manage load and reduce costs.

DCFC Site Host Customer Options

There are a variety of options the site host customer can take to manage costs, including:

- *Install storage at DCFC station:* On-site storage would allow a site host customer to manage charging load to reduce its electricity bill.
- *Manage load to avoid demand-related charges:* Direct control of charging load can be used to mitigate demand-related charges, though there will be limitations around the extent to which the load of DCFC charging will be flexible.
- *Develop stations for an existing user base:* To address the challenges of under-utilized charging infrastructure, charging stations can be developed in agreement with a known, existing user base.
- *Site charging stations behind meter of large customer:* DCFC stations can be located behind the meter of a large customer. Rather than being billed as a separate customer, the charging load is incremental to the load of the large customer.

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3 Demand charges are used to recover capacity costs. Capacity costs reflect the costs to serve maximum demand, rather than the total volume of energy consumed.

CONCLUSIONS

Increasing public widespread DCFC deployment is likely one important element to support the continued growth in EV adoption. Therefore, it is important to assess and learn from the different approaches being implemented today.

Additional operational options also may be available. For instance, the location of DCFC stations could be established with an emphasis on areas of slack grid capacity. Electric companies could also offer payments for grid services, to the extent that control of charging patterns at DCFC stations would provide an added degree of load flexibility.

Designing the "perfect" DCFC rate may not need to be the top priority initially. Experimentation and learning what works to facilitate DCFC adoption in an equitable and efficient manner may be more appropriate near-term objectives.

Each option will need to be evaluated with respect to the electric company's ratemaking principles, appropriate cost recovery, and broader policy and regulatory objectives.

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I. Introduction

Electric vehicles provide customers with a transportation option that has lower operating costs, reduced maintenance costs, and environmental benefits.

Electric vehicle (EV) market share is currently a modest one percent of new car sales, but this has doubled over the past two years.[4] Future projections of EV sales suggest steep growth. A recent forecast by the Edison Electric Institute (EEI) and the Institute for Electric Innovation (IEI) estimated that EV market share could exceed seven percent by 2030, and other forecasts have suggested even higher market penetration rates.[5] In some international jurisdictions, new mandates eventually will require that all cars be electric and/or zero-emissions.[6]

EVs provide environmental, customer, energy grid, and national security benefits.[7,8] However, several challenges could slow the adoption of EVs. One factor is higher first cost, which is offset to some extent by federal, state, and local subsidies and a lower total cost of ownership due to fuel and maintenance savings. A second factor is range anxiety. While the range of an EV on a single charge continues to improve, range anxiety remains a major hurdle to more rapid EV adoption. Hence, access to EV charging is essential.

Currently, most EV charging takes place at home or at work. While home and workplace charging are sufficient to meet most travel demands today, the expansion of public charging infrastructure, including direct current fast charging stations (DCFC), is likely an important factor to overcome range anxiety for longer trips or other mid-journey charging needs. In addition, public charging is an important option in urban areas, in locations where EV drivers do not have access to off-street parking or dedicated parking, and along highway corridors.

Direct current fast chargers address the need for high-speed public charging. Unlike Level 1 or Level 2 chargers, which commonly are located at the home or workplace and which may take

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4 Edison Electric Institute. Electric Vehicle Trends & Key Issues, June 2018.

5 Adam Cooper and Kellen Schefter, "Electric Vehicle Sales Forecast and The Charging Infrastructure Required Through 2030," Edison Electric Institute (EEI) and the Institute for Electric Innovation (IEI), November 2018.

6 For instance, the United Kingdom has announced that there will be no new gasoline or diesel vehicles sold in the country beginning in 2040.

7 Kellen Schefter and Becky Knox, Accelerating Electric Vehicle Adoption. Edison Electric Institute. February 2018.

8 Jurgen Weiss, Ryan Hledik, Michael Hagerty, and Will Gorman, "Electrification: Emerging Opportunities for Utility Growth," The Brattle Group, January 2017. http://files.brattle.com/system/news/pdfs/000/001/174/original/electrification_whitepaper_final_single_pages.pdf?1485532518.

several hours to fully charge an EV's battery, DCFCs can charge most EVs in 30 minutes or less.[9] This paper focuses solely on options for increasing DCFC deployment.

The business model for developing DCFC infrastructure faces a classic chicken-and-egg problem in that the unavailability of chargers is a barrier to EV adoption and the small numbers of EVs (relative to the overall number of vehicles on the road) are a barrier to deploying DCFC infrastructure.

From the viewpoint of electric companies, charging at DCFC stations can introduce infrequent, large spikes in electricity demand. A single DCFC port could lead to 350 kW or higher demand, and DCFC charging stations may include multiple ports. Serving the resulting load patterns sometimes can require expensive upgrades to the distribution grid in areas with insufficient capacity.

Typically, DCFC site host customers are regarded as "commercial" customers by electric companies. Often (but not always) these customers are charged with "three-part" rates that include a fixed monthly charge ($/month) for recovery of fixed costs, a volumetric charge ($/kWh) to recover costs that vary with usage, and a monthly demand charge ($/kW-month) to reflect the cost impact of the customer on the capacity of the system. Such adherence to the ratemaking principle of cost-causation should continue to be the standard for electricity rate design. Cost-based rates simultaneously promote economic efficiency in the use of scarce capital and fuel resources, ensure appropriate collection of costs to operate and maintain the grid, and maintain equity among customers. However, some electric companies are offering other options to DCFC site host customers today as short-term options to increase DCFC deployment.

As EV adoption increases over time, utilization of many DCFC stations will increase, thus improving the economics of owning/operating the DCFC station (although this may not occur for rural sites). In the long run, significant EV adoption could reduce average electricity rates for all customers by increasing the sales volume over which many shared fixed costs are spread.

Ultimately, electric companies must determine how to recover the near-term distribution and transmission grid capacity costs associated with DCFC stations while – at the same time – facilitating longer-term market adoption of EVs to meet customer needs and satisfy public policy goals.

This paper discusses rate design options and DCFC site host customer options for increasing DCFC deployment. The merits of any approach to increasing DCFC deployment will depend on the market conditions and policy/regulatory objectives facing individual electric companies.

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[9] Ibid.

II. Options for Increasing DCFC Deployment

Two types of options for facilitating DCFC deployment are discussed in this paper: rate deign options and DCFC site host customer options.

RATE DESIGN OPTIONS

Rates can be redesigned to facilitate DCFC deployment. A review of electric company tariffs provides tangible examples of rate designs that exist or recently have been proposed in the United States.[10]

Create separate rate class for DCFC site host customer

DCFC site host customers commonly are billed under rates that are designed to recover costs based on the average commercial/industrial load profile. Given the significantly different nature of site host customer load (*i.e.*, brief, large spikes in demand), there may be justification for defining these customers as a separate rate class (with possible limitations on number of customers or kW in service, for example). In doing so, the cost of serving site host customers can be calculated separately from other commercial customers. The creation of a separate rate class also would allow for the design of a rate that is specific to DCFC charging needs, as discussed in further detail in this section of the paper.

Provide rate choices

DCFC site host customers can be offered a choice of rates that are best suited to their needs. For instance, Portland General Electric (PGE), Duke Energy, and Tampa Electric all offer rate choices to commercial customers. PGE offers a rate that collects distribution costs through a flat volumetric charge, and also a demand-charge rate that collects distribution costs through a demand charge.[11] Tampa Electric's offerings include an energy-only rate, a three-part demand charge rate, and a three-part time-of-day rate with separate demand charges for peak and total billing demand.[12] DCFC site host customers with low utilization would benefit from enrolling in a non-demand

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10 Additional examples are discussed in the following report: NYSERDA, "Electricity Rate Tariff Options for Minimizing Direct Current Fast Charger Demand Charges," December 2015.

11 Customers can choose between Schedule 38 (Large Nonresidential Optional Time-of-Day Standard Service) or Schedule 83 (Large Nonresidential Standard Service). The latter is the three-part rate. PGE website: https://www.portlandgeneral.com/our-company/regulatory-documents/tariff.

12 Customers can choose between rate schedules Standard General Service (GSD), Optional General Service (GSD-option), and Time-of-Day General Service (GSDT). Tampa Electric website: http://www.tampaelectric.com/files/content/commratesinsert2017.pdf.

charge commercial rate, while the three-part demand charge rates could become beneficial as utilization increases over time.[13] The two rate options offered by PGE are shown in Table 1.

Table 1: PGE Non-Demand and Demand Charge Rate Options Applicable for DCFC Site Host Customers

		Option 1: Non-Demand Charge Rate	Option 2: Demand Charge Rate
Basic Charge	[1]	25 $/month	30 $/month
Transmission	[2]	0.2 cents/kWh	0.8 $/kW-month (On-Peak)
Energy (On-Peak)	[3]	6.4 cents/kWh	6.9 cents/kWh
Energy (Off-Peak)	[4]	5.4 cents/kWh	5.4 cents/kWh
Distribution	[5]	6.5 cents/kWh	~5 $/kW-month

Notes:
[1]: Basic charge in three-part rate is for single-phase service.
[5]: Distribution charge of three-part rate varies slightly based on customer's maximum demand. It is shown as the sum of a charge for facility capacity and for monthly on-peak demand.

Experiment

The availability of DCFC sites is currently low. Electric companies and site host owners are still in the early stages of understanding the preferences and charging behaviors of EV owners at DCFC sites. Therefore, it is important to have the ability to experiment or to offer "start-up" rates. Some electric companies today are offering a flat "dollars per hour" charge for EV drivers at DCFC sites that they own and operate to learn what works for customers.

Place limits on demand-related charges

The amount that DCFC site host customers pay through a demand charge can be capped. Rates offered by Duke Energy and Xcel Energy are two examples of how demand charge limits can be implemented.

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13 Additionally, a sufficiently high demand charge could provide an incentive to install storage on-site. Co-locating storage with the DCFC station would allow the site host to manage demand and take advantage of the lower volumetric charge that is associated with a demand rate.

Duke Energy's rate is available to all non-residential customers with less than 500 kilowatts (kW) of demand.[14] The design is a three-part rate with a demand charge. The customer's bill is first calculated under this rate. Then, the total bill is divided by the total kilowatt-hours (kWh) consumed during the billing period. If the resulting average rate (expressed in cents/kWh) exceeds a pre-determined capped rate of 24.1 cents/kWh, the customer's bill is calculated at the (lower) capped rate. This effectively limits the impact of the demand charge on the site host customer's bill. Both bill calculations are presented to the customer, so that the site host customer can understand the opportunities for further bill reductions if it is able to manage charging demand. Table 2 illustrates the bill calculation.

Table 2: Duke Energy's Implementation of a Capped Demand Charge

DCFC Billing Determinants			
Demand	[1]	100	kW
Energy	[2]	3660	kWh
Load factor	[3]	5%	
Rate			
Fixed	[4]	7.50	$/month
Demand charge	[5]	7.75	$/kW
Energy charge	[6]	0.08	$/kWh
Initial Bill Calculation			
Initial total bill	[7]	$965	
Implied average rate	[8]	0.26	$/kWh
Bill Adjustments			
Capped rate	[9]	0.241	$/kWh
Final bill	[10]	**$890**	

Notes:
[5]: Applies to demand in excess of 15 kW.
[6]: Applies to first 6,000 kWh.
[7]: [4]+[5]*([1]-15)+[6]*[2]
[8]: ([7]-[4])/[2]. Excludes customer charge.
[10]: [9]*[2]+[4]
Figures shown are illustrative. Totals may not add due to rounding.

Xcel Energy limits the demand charge impact in a different way. In several of its service territories, Xcel Energy requires three-part rates with seasonal demand charges for its 25 kW or larger

[14] The rate, Rate DS (Service at Distribution Voltage), is available in Duke's Kentucky service territory. Duke Energy Website: https://www.duke-energy.com/home/billing/rates/electric-tariff.

commercial and industrial customers.[15] When calculating the customer's bill, Xcel Energy caps the customer's maximum demand at an amount equal to its total energy consumption for the monthly billing period divided by 100 hours. This limits the demand-related charges that customers with very low load factors will pay in any given month.[16]

Temporarily reduce or replace demand charge with volumetric charge

Recognizing that demand charges can lead to higher bills for site host customers with low DCFC utilization, Southern California Edison (SCE) has received regulatory approval to offer a rate that initially recovers distribution and transmission grid capacity costs through a volumetric (cents per kilowatt-hour) charge.[17] Under SCE's proposal, the rate will transition to collect a larger share of capacity costs incrementally through a demand charge over a 10-year period with the full demand charge in effect at year 10. By the end of the transition, approximately 58 percent of distribution and 70 percent of transmission capacity costs would be recovered through a demand charge that is not time-differentiated.[18] SCE's proposal is intended to provide an initial period in which emerging DCFC companies can become established, while eventually arriving at a rate design that more appropriately recovers the costs of serving site host customers. SCE's proposal is illustrated in Table 3.

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15 The rate feature is offered in Michigan, Minnesota, North Dakota, and Wisconsin. See for, instance, Xcel Energy's tariff for its Wisconsin service territory: https://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory%20PDFs/rates/WI/2We_Section_2New.pdf.

16 A load factor of around 14 percent is roughly the threshold below which the cap comes into effect.

17 California Public Utilities Commission, "Decision on the Transportation Electrification Standard Review Projects," Decision 18-05-040, May 31, 2018.

18 This rate design differs somewhat from the initially proposed design, as it was modified subsequently through a stipulation. Southern California Edison, "Testimony of Southern California Edison Company in Support of its Application of Southern California Edison Company (U 338-E) For Approval of its 2017 Transportation Electrification Proposals," before the Public Utilities Commission of the State of California, January 20, 2017.

Table 3: SCE's Transition to a Phased-In Demand Charge for DCFC Site Host Customers

	Volumetric Charge			Demand Charge		
Year	Distribution Capacity	Transmission Capacity	Generation	Distribution Capacity	Transmission Capacity	Generation
1-5	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
6	88.4%	86.0%	100.0%	11.6%	14.0%	0.0%
7	76.8%	72.0%	100.0%	23.2%	28.0%	0.0%
8	65.2%	58.0%	100.0%	34.8%	42.0%	0.0%
9	53.6%	44.0%	100.0%	46.4%	56.0%	0.0%
10+	42.0%	30.0%	100.0%	58.0%	70.0%	0.0%

Notes: Table shows amount of each cost category recovered through a volumetric charge and a demand charge, by year. The table is based on information provided by SCE.

Similarly, Pacific Power has proposed an EV transitional rate in Oregon. The rate is initially structured as a volumetric time-of-use (TOU) charge with a small demand charge. Over the course of 10 years, the peak period of the TOU charge will decrease, and the demand charge will increase proportionately until it reaches its full, cost-based level by the end of year 10. The rate is offered exclusively to DCFC site hosts customers.[19]

Provide More Detailed Pricing Signals

As part of its Transportation Electrification Proposal filed with the California Public Utilities Commission (CPUC), San Diego Gas & Electric (SDG&E) proposed a "Commercial Grid Integration Rate."[20] The rate recovers costs through a variety of price signals. It is intended to provide site host customers with granular charges that reflect the underlying cost structure in a manner not available in standard commercial rates. This gives site host customers a range of options to manage load to reduce costs. Elements of the SDG&E rate design include:

[19] Pacific Power website: https://www.pacificpower.net/content/dam/pacific_power/doc/About_Us/Rates_Regulation/Oregon/Approved_Tariffs/Rate_Schedules/Public_DC_Fast_Charger_Optional_Transitional_Rate_Delivery_Service.pdf

[20] SDG&E, "Prepared Direct Testimony of Cynthia Fang on Behalf of San Diego Gas and Electric Company, January 20, 2017. https://www.sdge.com/sites/default/files/regulatory/Direct%20Testimony%20Chapter%205%20-%20Rate%20Design.pdf

- An annual demand-based charge ($/kW-yr) which recovers fixed customer costs and 80 percent of distribution costs.[21]
- A critical peak price ($/kWh) for generation capacity, which is dynamically applied to the top 150 hours of transmission system peak demand and recovers 50 percent of generation capacity costs.
- A critical peak price ($/kWh) for distribution capacity, which is dynamically applied to the top 200 hours of the local distribution circuit peak demand and recovers 20 percent of distribution costs.
- An hourly volumetric charge ($/kWh), which includes a flat-priced component for transmission and other costs, and a component that varies hourly to reflect fluctuations in energy costs.

Notification of the critical peak price events is provided on a day-ahead basis, so that DCFC site host customers can manage load in response to price signals. SDG&E has proposed a temporary direct monthly lump sum payment to site host customers to offset the impact of the annual demand-based charge. The payment will be phased out over several years. SDG&E also has proposed a second rate, called the "Public Charging Grid Integration Rate," which would collect distribution costs through a flat volumetric charge rather than the annual demand-based charge (while still maintaining hourly price variation on the energy cost component).

DCFC Site Host Customer Options

There are also several ways for DCFC site host customers to manage their electricity bills.

Install storage at DCFC station

On-site storage would allow a DCFC site host customer to manage charging load to reduce its electricity bill. For instance, if the charging time at a DCFC station will rarely exceed 30 minutes, one or more 30-minute batteries could be installed to help manage the maximum electricity drawn from the energy grid. These batteries could potentially provide other grid balancing services as well. If multiple EVs are charging at once, larger battery storage capacity will be required. A portion of Tesla's Supercharger stations are coupled with solar arrays and batteries to manage the rate at which electricity is drawn from the grid.[22] Expired EV batteries can be repurposed for use at DCFC stations.

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21 The charge is based on the customer's maximum annual demand, with a fixed monthly charge assigned based on demand ranges. For instance, the charge is $522 for maximum annual demand from 0 to 20 kW, $882 for maximum demand from 20 to 50 kW, *etc.*

22 Fred Lambert, "Tesla plans to disconnect 'almost all' Superchargers from the grid and go solar+battery, says Elon Musk," Electrek, June 9, 2017. https://electrek.co/2017/06/09/tesla-superchargers-solar-battery-grid-elon-musk/

Manage load to avoid demand-related charges

Management of charging load can mitigate demand-related charges. For instance, DCFC site host customers could charge higher prices to EV drivers during times of high demand (to encourage temporary reductions in charging load) or temporarily could throttle charging to manage peaks. However, there will be limitations around the extent to which the loads at DCFC stations will be flexible since this load is determined by the EV driver and not the DCFC site host customer.

Develop stations for an existing user base

To address the challenges of under-utilized charging infrastructure, charging stations can be developed in agreement with a known, existing user base such as fleet owners. For instance, EVgo, a DCFC developer, recently announced a partnership with Maven, GM's car sharing business.[23] EVs are part of Maven's fleet of shared vehicles. By installing chargers at Maven car ports, EVgo can tap into a pre-existing network of EVs with known charging needs.

Site charging stations behind meter of large customer

DCFC stations can be located behind the meter of a large customer. Rather than being billed as a separate customer, the charging load is incremental to the load of the large customer. For instance, charging stations sited at a shopping mall parking lot could be treated as part of the shopping mall's load. Doing so would take advantage of load diversity between the shopping mall and the DCFC station. Of course, the amount of load created behind the meter would increase. The electric company could help assess the extent to which the DCFC station load is in fact complementary to the load of the existing large customer.

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[23] EVgo: https://www.evgo.com/about/news/evgo-partners-gm-personal-mobility-brand-maven-offer-free-dc-fast-charging-services/

III. Considerations and Conclusions

Electric companies, policymakers, and interested stakeholders will need to consider many important factors when evaluating ways to increase DCFC deployment.[24]

Widespread public DCFC station deployment is likely one important element to support continued growth in EV adoption. Therefore, it is important to assess and learn from the different approaches being implemented today.[25]

Additional operational options for increasing DCFC deployment also may be available. For instance, the location of DCFC stations could be established with an emphasis on areas of slack grid capacity. Electric companies could also could offer payments for grid services, to the extent that control of charging patterns at DCFC stations would provide an added degree of load flexibility. Recently, PG&E partnered with BMW to offer a program that provides an incentive of up to $900 for remote control of home, public, and workplace EV chargers.[26]

In the long run, appropriately managing charging of EVs and strategically locating DCFC stations could decrease rates for all customers if this leads to sufficiently higher utilization of existing grid capacity. A "starter rate" that may not be fully revenue neutral today may become a more broadly applicable option as DCFC utilization increases, or may just be useful on a temporary basis. In fact, designing the "perfect" DCFC rate may not need to be the top priority initially. Experimentation and learning what works to facilitate DCFC adoption - while ensuring appropriate cost recovery for the energy grid in an equitable and efficient manner - may be a more appropriate near-term objective.

Options will need to be evaluated in relation to the electric company's ratemaking principles, appropriate cost recovery, and broader policy and regulatory objectives. It is well known that the principle of cost-causation states that rates should reflect the underlying cost structure.[27] Another core principal is equity between customers. From a policy standpoint, options will need to be

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24 For instance, see Jurgen Weiss, Ryan Hledik, Roger Lueken, Tony Lee, and Will Gorman, "The Electrification Accelerator: Understanding the Implications of Autonomous Vehicles for Electric Utilities," *The Electricity Journal*, 30 (2017), p. 50-57.

25 For instance, one important consideration is the role that electricity costs play in the DCFC business model. According to NYSERDA, "eliminating demand charges improves the business case [for DCFC] but does not make it economically viable." NYSERDA, "Electricity Rate Tariff Options for Minimizing Direct Current Fast Charger Demand Charges," December 2015.

26 BMW website: https://www.bmwchargeforward.com/

27 An article by Maximilian Auffhammer of the Haas Energy Institute at UC Berkeley discusses the implications of pricing EV charging based on rate designs that deviate from the underlying electriccompany cost structure. Maximilian Auffhammer, The Economics of EV Charging Stations, Energy Institute at Haas Blog, March 16, 2015.
https://energyathaas.wordpress.com/2015/03/16/the-economics-of-ev-charging-stations/

evaluated relative to overarching electric transportation policy goals, with consideration given to rate design or other policy mechanisms that are most appropriate for facilitating DCFC deployment to support continued growth in EV adoption.

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