Public Utilities and Transportation Electrification

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ABSTRACT: This Article examines the rapidly evolving role of the nation's electric utilities in developing the network of public electric vehicle ("EV") charging stations across the country required to facilitate the growth of EVs. As EV adoption in the United States continues to rise, the roles that governmental entities, electric utilities, and market actors will play in deploying the EV charging stations necessary to support transportation electrification remains a central question. This question raises a multitude of issues relating to consumer demand for EVs, competitive markets, utility rate design, government mandates and incentives, policies to reduce carbon emission and other air pollutants, and equity concerns. This Article focuses specifically on state public utility commissions, which will review and approve electric utility proposals to invest hundreds of millions of dollars in EV charging infrastructure that would be paid for, in most cases, by utility customers through cost-of-service ratemaking. This Article considers how state approaches on this issue may differ, at least in the short term, depending on varying state environmental policies, politics, geography, and utility regulatory structure. One constant among the states, however, is the range of rulemaking, investigatory, and adjudicative processes available to state utility commissions to consider these proposed utility investments. This Article concludes that public utility commissions in each state should focus on using their investigative and adjudicative authority to create a robust administrative record for EV charging-related decisions—both general rulemaking decisions and individual utility proposal decisions. These investigative and adjudicative proceedings can support decisions today regarding short-term utility pilot programs, as well as form the basis for broader, far-reaching policies to govern development in the long term. Notably, there are good reasons for state utility commissions to be central players in this

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process. State commissions, acting in their adjudicative capacity, can be more nimble than state legislatures, allowing for experimentation over different utility rate proceedings, serving an information gathering function for subsequent legislative action and commission rulemaking, and facilitating early investment in EV charging, where appropriate.

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I. INTRODUCTION

The U.S. electric utility industry and the nation's transportation system are both in a period of rapid transition that has brought new challenges and opportunities with it.[1] The next three to five years may reveal the biggest shift in both the electricity sector and the transportation sector in a century. These changes will transform the automobile industry, the use of electricity on a broad scale and, as a result, our modern world. This Article evaluates how developments in legal policy, technology, and economics surrounding electric vehicles ("EVs") and EV charging infrastructure are driving these changes. More importantly, this Article considers the variety of approaches states are taking to address these changes in the context of electric utility regulatory design, and the lessons to be learned as the nation moves through this critical transition period. Because of the U.S. regulatory structure governing both electric utilities and transportation planning, the states rather than the federal government will play an outsized role in how transportation electrification develops in the United States. Thus, "early adopter" states that

1. *See generally, e.g.*, MIT ENERGY INITIATIVE, UTILITY OF THE FUTURE (2016) (examining how use of electricity is likely to change over the next decade); William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614 (2014) (discussing the challenges associated with emission reductions); Nancy E. Ryan & Luke Lavin, *Engaging Utilities and Regulators on Transportation Electrification*, 28 ELEC. J. 78 (2015) (analyzing the challenges with the electrification of vehicles); Shelley Welton, *Public Energy*, 92 N.Y.U. L. REV. 267 (2017) (discussing public forms of energy ownership); *e21 Initiative*, GREAT PLAINS INST., e21initiative.org (last visited Sept. 5, 2018) (providing recommendations to develop and implement new approaches to utility regulation in Minnesota); *REV Initiatives*, N.Y. ST., https://rev.ny.gov/rev-initiatives (last visited Sept. 5, 2018) (discussing "the initiative[] to build a clean, resilient, and more affordable energy system").

are already engaged in major policy development regarding transportation electrification will influence not only activities in their own states but will set the stage for the rest of the nation for a long time to come.

With regard to electric utilities, after years of federal, state, and local government efforts to reduce greenhouse gas ("GHG") emissions and traditional air pollutants associated with electricity generation, the U.S. electricity sector as of 2016 emitted fewer GHG emissions than the transportation sector for the first time in many decades.[2] This shift has resulted from technological developments in hydraulic fracturing and directional drilling that have increased the domestic natural gas supply and allowed gas to cost-effectively replace coal as the dominant source of electric power. This switch from coal to gas—coupled with state mandates and federal tax incentives that make renewable energy resources more attractive—has transformed the nation's utility generation fleet. The Trump administration's recent efforts to reverse these trends in favor of greater use of coal are not likely to be successful as a result of market forces, long-term utility planning horizons, and the fact that state-based policies generally have a more direct impact on utility investments in general.[3] Although most of the nation's electric utilities have addressed these shifts in electricity generation relatively smoothly, there have been other, more significant challenges to the utilities' business model during this same time period. The growth in rooftop solar and other forms of "distributed generation" raise the prospect of large numbers of electric utility customers "leaving the grid" for at least a portion of every day. The rise of distributed energy generation such as photovoltaic ("PV") rooftop solar coupled with rapidly decreasing costs of energy storage technologies have created fears in the industry of a "utility death spiral," where traditional cost-of-service ratemaking can no longer ensure utility profits and financial health.[4] This perceived threat has caused utilities to push back against the rise of rooftop solar through imposing fixed fees and "demand charges" on solar customers, many of which have caused strife and controversy in regulatory proceedings before state public utility commissions.[5] Developments in smart grid technology and the rise of smart meters in many states have also caused many experts inside and outside the utility industry to rethink the parameters of the utility's core service of electricity delivery and whether those parameters should be expanded to include a far broader range of consumer-driven services.[6]

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2. *See infra* note 48 and accompanying text.

3. *See infra* notes 49–50 and accompanying text.

4. *See infra* notes 115–21 and accompanying text.

5. *See, e.g.*, LINCOLN L. DAVIES ET AL., ENERGY LAW AND POLICY 172, 272–73 (2d ed. 2018) (discussing disputes over rooftop solar payments).

6. *See, e.g.*, Shelley Welton, *Clean Electrification*, 88 U. COLO. L. REV. 571, 584–88 (2017) (discussing state efforts to create a new vision for the electric grid, an enhanced role for electric utilities, and a forum for greater grid participation by customers); *e21 Initiative*, CTR. FOR ENERGY

At the same time, there is a global push to electrify the world's transportation system. Countries around the world, including China and most of Europe, have committed to phasing out gasoline-powered vehicles in favor of EVs.[7] These strong national statements are based on experts warning that it will difficult to meet the carbon reduction targets set forth in the Paris Agreement and embraced by major nations around the world without electrifying transportation.[8] Major auto manufacturers such as Volvo, Volkswagen, and Ford have accordingly pledged to transform their vehicle fleets to meet these commitments.[9] With regard to the U.S. role in reducing carbon emissions, experts say the nation must decarbonize the electricity sector and, at the same time, transition large percentages of passenger vehicles and local bus and delivery truck fleets to EVs.[10] Such a shift would require increased investments in electric energy generation and an associated increase in existing electric transmission and distribution infrastructure to support the new generation resources. Thus, electric utilities are critical to transportation electrification.[11]

This Article focuses on the process states will use to determine whether investor-owned electric utilities should go beyond their traditional role of

& ENVT., https://www.mncee.org/policy/e21-initiative (last visited Sept. 6, 2018) ("Minnesota's e21 Initiative unites utilities, consumer advocates, regulators, environmental advocates, and others to develop a 21st century energy system that better aligns a financially viable utility business model with increasing customer expectations and evolving policy goals."); *Reforming the Energy Vision*, N.Y. ST., https://rev.ny.gov (last visited Sept. 6, 2018) ("Reforming the Energy Vision (REV) is Governor Andrew M. Cuomo's comprehensive energy strategy for New York. REV helps consumers make more informed energy choices, develop new energy products and services, and protect the environment while creating new jobs and economic opportunity throughout the State."). *See generally* Joel B. Eisen & Felix Mormann, *Free Trade in Electric Power*, 2018 UTAH L. REV. 49 (discussing new markets for electric power).

7. The term "EV" is used throughout this Article to refer to vehicles that run exclusively or predominantly on electric power and must obtain that power from EV charging equipment connected to the electric grid. Such vehicles are either Battery Electric Vehicles ("BEVs"), like the Nissan Leaf, Chevy Bolt, or various Tesla models, that run exclusively on electricity, or Plug-in Hybrid Electric Vehicles ("PHEVs"), like the Chevy Volt and Ford's C-Max Energi, that run at least partially on electric power obtained from EV charging equipment but also have a back-up gasoline engine for longer trips. BEVs and PHEVs are often referred to collectively as Plug-in Electric Vehicles ("PEVs") or "EVs." EVs do not include Hybrid Electric Vehicles ("HEVs"), like the Toyota Prius, that use technologies such as regenerative braking to convert the vehicle's kinetic energy to electric energy to charge the car's battery for greater fuel economy. HEVs have increased fuel economy over traditional gasoline-powered vehicles, but still depend almost entirely on gasoline or diesel fuel to operate and do not use EV charging equipment. *See* Office of Energy Efficiency & Renewable Energy, *Electric Vehicle Basics*, U.S. DEP'T OF ENERGY, https://www.energy.gov/eere/electricvehicles/electric-vehicle-basics (last visited Sept. 6, 2018); *Hybrid Electric Vehicles*, U.S. DEP'T OF ENERGY, https://www.afdc.energy.gov/vehicles/electric_basics_hev.html (last visited Sept. 6, 2018); *PEV Buying Guide*, DRIVE CLEAN, https://www.driveclean.ca.gov/pev (last visited Sept. 6, 2018).

8. *See infra* notes 34–44 and accompanying text.

9. *See infra* Section II.A.

10. *See infra* Section II.B.

11. *See infra* notes 51–52, 123–25 and accompanying text.

building electric generation, transmission, and distribution infrastructure and receive ratepayer compensation to deploy the EV charging stations and associated electric infrastructure necessary to fuel the new fleet of EVs. Today, there are significant debates in state legislatures, at public utility commissions, and elsewhere over this question.

For instance, opponents of utility proposals for investment in EV charging infrastructure have argued that allowing electric utilities to build and own EV charging stations and offer rebates to residential or commercial customers for such stations will result in non-EV owners subsidizing infrastructure that only benefits EV owners, resulting in unfair cross-subsidies and free riding.[12] They have also argued that allowing utilities to invest in EV charging stations and recover a rate of return for those investments will stifle a developing private market for EV charging stations.[13] In recent years non-utility EV charging companies, environmental and energy non-governmental organizations, ratepayer advocacy groups, state public utility commission staff, state attorneys general, and others have made these arguments in public utility commission proceedings and in state legislatures, often with success.[14]

On the other hand, many of these same groups have argued in other state public utility commission and legislative proceedings that properly designed utility proposals to build EV charging station infrastructure can minimize, or avoid, the cross-subsidy and market problems.[15] They point to proposals that prioritize investments in lower-income neighborhoods and at multi-family residential properties, projects that support municipal and school bus fleets that benefit non-EV owners, and partnerships with private EV charging companies to develop a robust private market for EV charging services.[16] Just as important, proponents of utility investment in these cases point to the broader public benefits of transportation electrification that include not only reduced carbon emissions, but also reduced localized air pollution from cars, buses, and other medium and heavy-duty vehicles and equipment that disproportionately affect low-income neighborhoods and residents.[17] Finally, proponents argue that all utility customers will see lower monthly electricity bills due to overall increased electricity sales flowing from transportation electrification.[18] As the remainder of this Article demonstrates, ongoing activity in state legislatures and at state public utility commissions provides a variety of pathways for addressing these issues. As many states have just started addressing these issues, the lessons learned in these early state proceedings

12. *See infra* text accompanying note 306.
13. *See infra* note 205 and accompanying text.
14. *See infra* Part IV.
15. *See infra* text accompanying note 206.
16. *See infra* Part IV.
17. *See infra* Part IV.
18. *See infra* note 56 and accompanying text.

are particularly instructive and have the potential to shape the role of utilities in transportation electrification for years to come.

Part II of this Article provides a background on EVs, EV charging technology, and the growth of EVs around the world and in the United States. It introduces the non-utility players in the EV space, including governments, auto manufacturers, and EV charging companies like ChargePoint, Blink, EVGo, Greenlots, and Electrify America. It also discusses the Volkswagen ("VW") emissions cheating settlement with the United States. This settlement, finalized in 2016, resulted in VW agreeing to invest billions of dollars toward EV adoption and to build EV charging infrastructure throughout the country, thus providing a significant infusion of financial resources into this growing sector of the economy over the next decade.[19]

Part III focuses on electric utilities. It explains the different state regulatory regimes governing electric utilities, and how these differences impact potential utility investment in, and rate recovery for, EV charging station infrastructure. It also surveys the broad range of federal, state, local, and regional policies governing EVs and EV charging stations, including EV tariffs, rights of way, regional EV corridors, and the like.

Part IV evaluates state legislative and regulatory actions governing utility investment in EV charging infrastructure and rate design for utility sales of electricity for EV charging. This Part reveals that states have taken markedly different approaches to utility investment in EV charging infrastructure. Notably, the several states that have adopted California's Zero Emission Vehicle ("ZEV") mandate have often created a formal, legislatively-driven approach to EV adoption in general and EV charging infrastructure expansion in particular. These legislative structures focus on EV-related carbon emission reduction benefits and create a specific role for utilities in meeting those goals, providing utilities greater investment certainty. In non-ZEV states, the approach is more ad-hoc but a few patterns emerge that are instructive for future efforts by utilities, utility regulators, state legislators, environmental groups, and market participants. Some non-ZEV states have taken a legislatively driven or public utility commission driven approach to policy development. However, in some other non-ZEV states, it is utilities that have taken the initiative, seeking to invest in EV charging infrastructure and obtain rate recovery in commission proceedings. In the absence of legislative mandates to regulators or existing utility commission rules, these utility-driven efforts have been met with mixed success but, in some cases, have encouraged state public utility commissions to take the lead and open formal, investigative dockets to gather evidence and create a regulatory regime for future investment using existing statutory authority. Finally, in another group of non-ZEV states, utility investment in EV charging infrastructure has come

19. *See infra* Section II.D.

about in individualized "rate cases,"[20] where the utility itself or environmental advocacy groups have injected the utility investment in EV charging issue into an ongoing rate proceeding addressing a broad range of utility issues. In some cases, this approach has resulted in pre-approval for utility rate recovery for a certain amount of utility investment in EV charging infrastructure. The variety of approaches in both ZEV and non-ZEV states shows that there is not yet a single "best" approach to this issue, but that in all states, public utility commissions have played a central role in decision-making and policy development either prior to or after legislative action.

Finally, Part V evaluates in more detail the existing approaches to utility investment in EV charging infrastructure in the United States. It situates this discussion within the scholarly literature on agency policymaking processes, with an eye toward considering the broader benefits and drawbacks to agency rulemaking and adjudicative functions as well as the nature of these independent commissions that are not part of the state executive branch. These aspects of independent public utility commissions provide these bodies with a certain amount of nimbleness and expertise that is relatively unique and particularly helpful in developing long-term policy for utility investment in EV charging. Ultimately, this Part proposes that state public utility commissions should not necessarily wait for legislative action before commencing their own rulemaking or investigative proceedings to address utility investment in EV charging infrastructure. As this Part illustrates, state utility commissions have already played a central role in policy development in many states, particularly in their adjudicative and investigative capacities, which has resulted in valuable experimentation and policy development. In doing so, these independent state commissions have created a wealth of information that can support future state commission, as well as legislative, action across the country at this critical point in time for transportation electrification in the United States.

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20. In a "rate case" before a state public utility commission, the utility proposes a "rate" —the overall costs that it will charge to its customers—and justifies that rate to the commission based on the utility's costs, investments, needed return on investment, and other factors. A ratemaking proceeding is an adjudicatory proceeding before the commission where the commission takes testimony and hears from interested parties and experts before deciding on the rate the utility can charge and how that rate will be allocated among different customer classes. Rate cases are often multi-year, complicated proceedings that can ultimately result in a commission order or commission approval of a settlement of the issues by the parties. Ratemaking occurs at the state level with regard to retail sales of electricity and at the federal level—by the Federal Energy Regulatory Commission ("FERC")—with regard to rates and tariffs for transmission of electricity in interstate commerce and wholesale sales of electricity in interstate commerce. *See, e.g.*, DAVIES ET AL., *supra* note 5, at 291–302; ALEXANDRA B. KLASS & HANNAH J. WISEMAN, ENERGY LAW 165–74, 187–91 (2017); *see also* Shelley Welton, *Grasping for Energy Democracy*, 116 MICH. L. REV. 581, 594–95 (2018) (describing state and federal ratemaking processes).

II. ELECTRIFYING TRANSPORTATION

A. EARLY YEARS OF EV DEVELOPMENT AND RECENT TRENDS

The first electric automobile appeared in the United States in 1891,[21] but the history of modern mass-produced EVs in the United States begins with the introduction of the Honda Insight and Toyota Prius hybrid electric vehicles in 2000.[22] In part, this innovation was the product of a generation of federal research and development investments that began with the enactment, over President Ford's veto, of the Electric and Hybrid Vehicle Research, Development, and Demonstration Act of 1976.[23] Hybrid vehicles proved popular, with sales of nearly 200,000 between 2000 and 2004, and then exploding to more than 200,000 in 2005 alone.[24] That same year, the federal government provided the first tax credits for hybrid vehicle purchases as part of the Energy Policy Act of 2005.[25] Most of these credits, which were extended in the American Recovery and Reinvestment Act of 2009,[26] expired on December 31, 2010.[27]

While hybrid vehicles provided a significant reintroduction of electrification into the transportation sector, they remained primarily petroleum-powered machines.[28] Over the decade that followed, work began in earnest on developing vehicles that relied primarily or exclusively on electric propulsion; these cars are known as Plug-In Hybrid Vehicles ("PHEVs") and Battery Electric Vehicles ("BEVs") respectively and referred to collectively as "EVs."[29] Tesla gave the EV industry a significant jolt in 2006 when it announced the release of Tesla Roadster, a luxury BEV sporting a

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21. *Timeline: History of the Electric Car*, PBS (Oct. 30, 2009), http://www.pbs.org/now/shows/223/electric-car-timeline.html.

22. *See Timeline: History of the Electric Car*, U.S. DEP'T OF ENERGY, https://www.energy.gov/timeline/timeline-history-electric-car (last visited Sept. 9, 2018). For a definition of HEVs, EVs, and other types of vehicles, see *supra* note 7.

23. Electric and Hybrid Vehicle Research, Development, and Demonstration Act of 1976, Pub. L. No. 94-413, 90 Stat. 1260.

24. *U.S. HEV Sales by Model*, U.S. DEP'T OF ENERGY, https://www.afdc.energy.gov/data/10301 (last updated Jan. 2016).

25. Energy Policy Act of 2005, Pub. L. No. 109-58, § 1341, 119 Stat. 594, 1038–49 (2005).

26. American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, §§ 1141–44, 123 Stat. 115, 326–33.

27. LYNN J. CUNNINGHAM ET AL., CONG. RESEARCH SERV., R42566, ALTERNATIVE FUEL AND ADVANCED VEHICLE TECHNOLOGY INCENTIVES: A SUMMARY OF FEDERAL PROGRAMS 7 (2013). The remaining credit is for hydrogen fuel cell vehicles, though it will no longer apply beyond vehicle purchases after 2016. IRS, INSTRUCTIONS FOR FORM 8910: ALTERNATIVE MOTOR VEHICLE CREDIT (2017) (last updated Mar. 1, 2018).

28. *What Are Hybrid Cars and How Do They Work?*, EDMUNDS, https://www.edmunds.com/hybrid (last visited Sept. 9, 2018) ("Hybrid cars are sometimes mistakenly confused with electric vehicles. Hybrids are most often gasoline-burning machines that utilize their electric bits to collect and reuse energy that normally goes to waste in standard cars.").

29. See *supra* note 7 on the use of vehicle terms.

200-mile range.[30] 2010 saw the introduction of both the Chevrolet Volt, the first commercially available PHEV in the United States, and the Nissan LEAF, the first mass-produced BEV.[31]

There were 17,731 EVs sold in the United States in 2010 (the year the Volt and LEAF were introduced); that number grew to 194,000 in 2017 (up 23% from the prior year), bringing the total number of PEVs and EVs in the United States to over 850,000 by June 2018.[32] California—which has strict air pollution control requirements in the transportation sector and has incorporated a "Zero Emission Vehicle" or "ZEV" mandate into those requirements—represents approximately 50% of U.S. EV sales.[33]

Europe is also seeing significant growth in EV usage. In 2013, the first year for which EV data is available, slightly more than 49,000 plug-in vehicles were sold in the twenty-eight European Union nations.[34] That number tripled, to more than 149,000, in 2015[35]— exceeding the number of plug-in vehicles sold in the United States that year by 30%.[36] This difference is likely due to increasingly stringent E.U. emissions regulations—including the use of so-called super credits, which provide manufacturers additional incentive to bring low- or zero-emission vehicles to market—and directives requiring E.U. states to implement public charging infrastructure by 2020.[37] Additionally, all E.U. member states, with the exception of Lichtenstein, offer some

30. U.S. DEP'T OF ENERGY, *supra* note 22.

31. *Id.*

32. BLOOMBERG NEW ENERGY FIN., 2018 SUSTAINABLE ENERGY IN AMERICA FACTBOOK 12 (2018); ELEC. VEHICLE CHARGING ASS'N, STATE OF THE CHARGE: 2017 REPORT OF CALIFORNIA'S ELECTRIC VEHICLE CHARGING INDUSTRY 1 (2017); *Sales Dashboard*, VELOZ, http://www.veloz.org/sales-dashboard (last updated July 19, 2018); *see also U.S. Plug-In Electric Vehicle Sales by Model*, U.S. DEP'T OF ENERGY, https://www.afdc.energy.gov/data/10567 (last updated May 2017) (graphing the increase in EV sales from 2011 to 2016). The growth in options is likely a response to *both* increasing consumer demand and the value of HEV, PHEV, and BEV vehicles for meeting CAFE emissions standards, which were dramatically increased during the Obama Administration, and are calculated across a manufacturer's fleetwide average emissions. *See, e.g.*, Colleen Curtis, *President Obama Announces New Fuel Economy Standards*, WHITE HOUSE BLOG (July 29, 2011, 11:20 AM), https://obamawhitehouse.archives.gov/blog/2011/07/29/president-obama-announces-new-fuel-economy-standards. Additionally, ten states—California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont—participate in the Zero Emission Vehicle ("ZEV") program, which is managed by the California Air Resources Board. For additional details on the ZEV program, see *infra* Section IV.A.

33. VELOZ, *supra* note 32; *see also* Sunny Trochaniak, *Electric Vehicle Sales in the United States: 2016 Final Update*, FLEETCARMA (Jan. 19, 2017), https://www.fleetcarma.com/ev-sales-usa-2016-final. While EVs sales represented approximately one percent of total U.S. sales in 2016, in California they made up 3.66% of 2016 in-state sales. *EV Market Share by State*, EVADOPTION, http://evadoption.com/ev-market-share/ev-market-share-state (last visited Sept. 12, 2018).

34. European Envtl. Agency, *Electric Vehicles in Europe*, EEA Report No. 20/2016 at 48 (2016).

35. *Id.*

36. *Compare* U.S. DEP'T OF ENERGY, *supra* note 32, *with* European Envtl. Agency, *supra* note 34, at 48 (showing there were 113,869 plug-in vehicles sold in the United States in 2015, compared with 149,500 in the E.U.).

37. European Envtl. Agency, *supra* note 34, at 59–60.

combination of the following incentives to residents: (1) purchase subsidies; (2) reduced ownership costs (relative to a petroleum–powered vehicle); (3) financial support to the EV industry; and (4) local incentives.[38] Moreover, a number of E.U. states have announced their intention to entirely end sales of gas and diesel cars within their borders: the Netherlands by 2025, Norway by 2030, and France and the United Kingdom by 2040 (with Scotland by 2032).[39]

Beyond the E.U., India plans to sell only EVs and hybrid vehicles by 2030,[40] and China—the world's largest auto market with 30% of global passenger vehicle sales—announced last September that it intends to "end production and sales of traditional energy vehicles . . . in the near future."[41] These national commitments have prompted major automakers to declare a significant phase-out of gasoline-powered vehicles in favor of EV models in the coming years. For instance, Volvo announced in 2017 that all of its new models beginning in 2019 would be hybrids or EV, while General Motors, Ford, and Volkswagen, among others, have all committed to invest a total of at least $90 billion dollars in EVs, with plans to release multiple new EV models in the next five years.[42] Worldwide there were over one million EV sales in 2017 alone, with China accounting for over 50% of new EV sales that year.[43] This was more than double the amount of EVs sold in the United States in 2017, which had been the world leader in EV sales until 2015.[44]

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38. *Id.* at 60–65.

39. Danielle Muoio, *These Countries Are Banning Gas-Powered Vehicles by 2040*, BUS. INSIDER (Oct. 23, 2017, 1:24 PM), https://www.businessinsider.com/countries-banning-gas-cars-2017-10.

40. *Id.*

41. David Roberts, *The World's Largest Car Market Just Announced an Imminent End to Gas and Diesel Cars*, VOX (Sept. 13, 2017, 3:02 PM) (internal quotation marks omitted), https://www.vox.com/energy-and-environment/2017/9/13/16293258/ev-revolution.

42. *See* William Boston, *VW Accelerates Electric Car Effort with $40 Billion Investment*, WALL ST. J. (Nov. 17, 2017, 11:13 AM), https://www.wsj.com/articles/volkswagen-to-invest-more-than-eur34-bln-in-electric-autonomous-cars-1510928349; Mike Colias, *Ford Increasing Electric Vehicle Investment to $11 Billion by 2022*, WALL ST. J. (Jan. 14, 2018, 6:23 PM), https://www.wsj.com/articles/ford-increasing-electric-vehicle-investment-to-11-billion-by-2022-1515972199; Mike Colias, *U.S. Auto Makers Step Up Plans for Electric Vehicles*, WALL ST. J. (Oct. 2, 2017, 3:37 PM), https://www.wsj.com/articles/gm-plans-two-additional-electric-vehicles-for-u-s-market-1506961613; Jack Ewing, *Volvo, Betting on Electric, Moves to Phase Out Conventional Engines*, N.Y. TIMES (July 5, 2017), https://www.nytimes.com/2017/07/05/business/energy-environment/volvo-hybrid-electric-car.html; Paul Lienert, *Global Carmakers to Invest at Least $90 Billion in Electric Vehicles*, REUTERS (Jan. 15, 2018, 4:00 PM), https://www.reuters.com/article/us-autoshow-detroit-electric/global-carmakers-to-invest-at-least-90-billion-in-electric-vehicles-idUSKBN1F42NW (highlighting recent announcement by Ford Motor Company to invest $11 billion in EVs); Bill Vlasic & Neal E. Boudette, *G.M. and Ford Lay Out Plans to Expand Electric Models*, N.Y. TIMES (Oct. 2, 2017), https://www.nytimes.com/2017/10/02/business/general-motors-electric-cars.html. Volkswagen's $40 billion investment does not include the billions of dollars it is required to invest in EVs and EV charging infrastructure as part of its settlement of the vehicle emissions cheating scandal discussed *infra* Section II.D.

43. *See* INT'L ENERGY AGENCY, GLOBAL EV OUTLOOK 2018 9, 111–15 (2018) (providing statistical data on EV sales by country and EV incentives by country).

44. *See id.*

B. ENVIRONMENTAL, ELECTRIC GRID, AND CONSUMER BENEFITS OF EVS

The U.S. Department of Energy touts many reasons to support EVs, including diversity of fuel and vehicle choices in the transportation sector, energy security, and the reduction of GHG emissions and other air pollutants.[45] With regard to air pollution emissions, EVs have no tailpipe emissions but are associated with GHGs and other air pollutants over their "lifecycle" through emissions resulting from the construction of the vehicle and its battery, the generation of the electricity used to power the vehicle, and the disposal-related emissions at the end of the vehicle's use.[46] Not surprisingly, the fuel used to produce electricity can significantly alter an EV's lifecycle emissions. Thus, an EV driven in California or New York, where there is very little coal used to produce electricity, results in far lower air pollution emissions over its lifecycle than an EV driven in Kentucky, which relies heavily on coal to produce electricity. Nevertheless, even in states that rely on coal to produce a large portion of the state's electricity mix, the air pollution emissions associated with an EV are lower than that of a conventional vehicle.[47]

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45. Office of Energy Efficiency and Renewable Energy, *Electric Vehicle Benefits*, U.S. DEP'T OF ENERGY, https://energy.gov/eere/electricvehicles/electric-vehicle-benefits (last visited Sept. 17, 2018).

46. Office of Energy Efficiency & Renewable Energy, *Reducing Pollution with Electric Vehicles*, U.S. DEP'T OF ENERGY, https://www.energy.gov/eere/electricvehicles/reducing-pollution-electric-vehicles (last visited Sept. 30, 2018).

47. *See* Alt. Fuels Data Ctr., *Emissions from Hybrid and Plug-in Electric Vehicles*, U.S. DEP'T OF ENERGY, https://www.afdc.energy.gov/vehicles/electric_emissions.php (last updated June 20, 2018) (comparing emissions from conventional vehicles with EVs, PEVs, and Hybrids in all 50 states based on the electricity mix in each state); *see also* SIDDIQ KHAN & SHRUTI VAIDYANATHAN, STRATEGIES FOR INTEGRATING ELECTRIC VEHICLES INTO THE GRID 2 (2018); RACHEL NEALER ET AL., CLEANER CARS FROM CRADLE TO GRAVE 1–2 (2015); Alexandra B. Klass & Andrew Heiring, *Life Cycle Analysis and Transportation Energy*, 82 BROOK. L. REV. 485, 515–26 (2017) (summarizing studies of tailpipe emissions reduction from EVs compared to the emissions associated with coal-fired electricity used to charge EVs); Dane McFarlane, *Analysis: Electric Vehicles Provide Even Greater GHG Reductions in 2017 and Beyond for the Upper Midwest*, GREAT PLAINS INST. (May 15, 2017), http://www.betterenergy.org/blog/update-electric-vehicles-provide-even-greater-ghgs-reductions-2017-and-beyond (updating a study of the upper Midwest to establish how much EVs can cut emissions based on the sources of energy used to power the regional electric grid); David Reichmuth, *New Data Show Electric Vehicles Continue to Get Cleaner*, UNION OF CONCERNED SCIENTISTS (Mar. 8, 2018, 10:48 AM), https://blog.ucsusa.org/dave-reichmuth/new-data-show-electric-vehicles-continue-to-get-cleaner (updating an earlier report based on power plant emissions data released in 2018 showing EVs are cleaner than previously thought). Although some scholars have disputed the claims of nationwide GHG emissions reductions associated with electrifying transportation, these studies tend to rely on data from prior to 2014, and thus do not fully account for more recent coal retirements, or assume that any coal retirements will be replaced exclusively by natural gas rather than increased renewable energy. For a discussion of these studies see James Archsmith et al., *From Cradle to Junkyard: Assessing the Life Cycle Greenhouse Gas Benefits of Electric Vehicles*, 52 RES. IN TRANSP. ECON. 72, 80–81 (2015); Klass & Heiring, *supra*, at 521–28 (discussing Christopher W. Tessum et al., *Life Cycle Air Quality Impacts of Conventional and Alternative Light-Duty Transportation in the United States*, 111 PROC. NAT'L ACAD. SCI. USA 18490,

As for GHG emissions specifically, as of 2016, the electricity sector's contribution to U.S. GHG emissions has fallen below the transportation sector for the first time since at least the 1970s.[48] This trend is expected to continue, despite the Trump Administration's recent efforts to support the coal industry, because of the strong economic drivers favoring lower cost natural gas and renewable energy in the electric utility sector.[49] Many states and, in past years, the federal government, have set ambitious carbon-reduction goals.[50] Experts warn that it will not be possible to meet these decarbonization goals without converting a significant amount of passenger transportation in the United States to EVs.[51] That is why California and several other states have

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18490–95 (2014)); Stephen P. Holland et al., *Environmental Benefits from Driving Electric Vehicles?* 16–18 (Nat'l Bureau of Econ. Research, Working Paper No. 21291, 2015).

48. Trevor Houser & Peter Marsters, *Preliminary US Emissions Estimates for 2017*, RHODIUM GROUP (Jan. 10, 2018), https://rhg.com/research/preliminary-us-emissions-estimates-2017; *Power Sector Carbon Dioxide Emissions Fall Below Transportation Sector Emissions*, U.S. ENERGY INFO. ADMIN. (Jan. 19, 2017), https://www.eia.gov/todayinenergy/detail.php?id=29612.

49. *See, e.g.*, M.J. BRADLEY & ASSOCS., COAL-FIRED ELECTRICITY GENERATION IN THE UNITED STATES AND FUTURE OUTLOOK 6 (2017); U.S. DEP'T OF ENERGY, STAFF REPORT TO THE SECRETARY ON ELECTRICITY MARKETS AND RELIABILITY 13–20 (2017) (citing market forces leading to coal plant retirements); Clifford Krauss, *Coal's Decline Seems Impervious to Trump's Promises*, N.Y. TIMES (Jan. 24, 2018), https://www.nytimes.com/2018/01/24/business/energy-environment/coal-miners.html; *Short-Term Energy Outlook: Coal*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/outlooks/steo/report/coal.php (last updated Nov. 6, 2018) (analyzing the coal market in the United States each month); Trevor Houser & Peter Marsters, *The Year in Coal*, RHODIUM GROUP (Jan. 4, 2018), https://rhg.com/research/the-year-in-coal (attributing slight increase in U.S. coal production in 2017 to increased exports rather than increased domestic demand).

50. For instance, the California legislature set a goal for the state to reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050. *AB 23 Scoping Plan,* CAL. AIR RES. BD., https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm (last visited Nov. 30, 2018). Massachusetts, Connecticut, Rhode Island, and other states have set similar goals. *See, e.g.*, Colin A. Young, *9 States, Including Mass., Agree to Accelerate Emission Reductions in Next Decade*, WBUR NEWS (Aug. 23, 2017, 5:22 PM), http://www.wbur.org/news/2017/08/23/9-states-including-mass-agree-to-extend-carbon-reduction-goals-to-2030; *Greenhouse Gas Emissions in Minnesota*, MINN. POLLUTION CONTROL AGENCY, https://www.pca.state.mn.us/air/greenhouse-gas-emissions-minnesota-0 (last visited Dec. 11, 2018). Although the Trump Administration has not established carbon reduction goals to date, the Obama Administration made carbon reduction in the electricity and transportation sectors a priority, and future administrations may also embrace those goals. *See, e.g.*, Press Release, White House Office of the Press Sec'y, Fact Sheet: President Obama to Announce Historic Carbon Pollution Standards for Power Plants (Aug. 3, 2015), https://obamawhitehouse.archives.gov/the-press-office/2015/08/03/fact-sheet-president-obama-announce-historic-carbon-pollution-standards.

51. *See, e.g.*, JAMES H. WILLIAMS ET AL., PATHWAYS TO DEEP DECARBONIZATION IN THE UNITED STATES 70 (2014), http://unsdsn.org/wp-content/uploads/2014/09/US-Deep-Decarbonization-Report.pdf (discussing the need to double U.S. electricity generation and convert a large share of the U.S. transportation sector to electrification to meet deep decarbonization goals); Alexandra B. Klass, *Expanding the U.S. Electric Transmission and Distribution Grid to Meet Deep Decarbonization Goals*, 47 ENVTL. L. REP. 10,749, 10,751 (2017); *see also* Dan Kraker, *MN's Greenhouse Gas Goal Flopped. New Goal: 'Electrify Everything'*, MPR NEWS (May 25, 2017), https://www.mprnews.org/story/2017/05/25/some-urge-minn-electrify-everything-cut-emissions (outlining Minnesota's plan to electrify more than just the transportation section to meet decarbonization goals); David Roberts, *The Key to Tackling Climate Change: Electrify Everything*,

established mandates for EV sales.[52] Thus, EVs represent a major component of some states' efforts to meet legislative and executive environmental policy goals.

Moreover, studies show that EVs have the potential to provide cost savings and other benefits to EV drivers, the electric grid, the electric utilities that serve the grid, and all electric utility customers, whether or not they own an EV.[53] EV drivers will benefit from cost savings because the cost of electricity in most states is far less than the cost of gasoline.[54] As for the electric grid and utilities, EVs can provide a range of grid services, including demand response and voltage regulation. Likewise, through implementation of time-of-use pricing programs, utilities can encourage EV charging at times when electricity demand is low, or when wind and solar generation is high, to smooth out electricity demand curves, which can provide significant cost and reliability benefits for all utility customers.[55] Finally, large-scale adoption of EVs will increase electricity sales overall, putting downward pressure on

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VOX (Oct. 27, 2017, 8:48 AM), https://www.vox.com/2016/9/19/12938086/electrify-everything (explaining and summarizing expert research).

52. *See infra* Section IV.A. *See generally* ZEV TASK FORCE, MULTI-STATE ZEV ACTION PLAN: ACCELERATING THE ADOPTION OF ZERO EMISSION VEHICLES (2018), https://www.zevstates.us/wp-content/uploads/2018/07/2018-zev-action-plan.pdf (providing recommendations for states to increase ZEV sales).

53. *See, e.g.*, GARRETT FITZGERALD ET AL., ROCKY MTN. INST., ELECTRIC VEHICLES AS DISTRIBUTED ENERGY RESOURCES 19–20 (2016), https://rmi.org/wp-content/uploads/2017/04/RMI_Electric_Vehicles_as_DERs_Final_V2.pdf; GARRETT FITZGERALD & CHRIS NELDER, ROCKY MTN. INST., FROM GAS TO GRID: BUILDING CHARGING INFRASTRUCTURE TO POWER ELECTRIC VEHICLE DEMAND 23–25, 77 (2017), https://www.rmi.org/wp-content/uploads/2017/10/RMI-From-Gas-To-Grid.pdf (summarizing studies showing the value of EVs to the electric grid, to electric utility customers, and to EV owners); M.J. BRADLEY & ASSOCS., ELECTRIC VEHICLE COST-BENEFIT ANALYSIS: PLUG-IN ELECTRIC VEHICLE COST-BENEFIT ANALYSIS: MICHIGAN 14 (2017), https://mjbradley.com/sites/default/files/MI_PEV_CB_Analysis_FINAL_03aug17.pdf; MICHAEL SIVAK & BRANDON SCHOETTLE, UNIV. MICH., RELATIVE COSTS OF DRIVING ELECTRIC AND GASOLINE VEHICLES IN THE INDIVIDUAL U.S. STATES 6 (2018), http://umich.edu/~umtriswt/PDF/SWT-2018-1.pdf; D. Lowell et al., *MJB&A Analyzes State-Wide Costs and Benefits of Plug-in Vehicles in Five Northeast and Mid-Atlantic States*, M.J. BRADLEY & ASSOCS. (Feb. 14, 2017), https://www.mjbradley.com/reports/mjba-analyzes-state-wide-costs-and-benefits-plug-vehicles-five-northeast-and-mid-atlantic; Jeff McMahon, *Electric Vehicles Cost Less than Half as Much to Drive*, FORBES (Jan. 14, 2018, 12:03 AM), https://www.forbes.com/sites/jeffmcmahon/2018/01/14/electric-vehicles-cost-less-than-half-as-much-to-drive.

54. *See, e.g.*, M.J. BRADLEY & ASSOCS., *supra* note 53, at ii–iii (determining cost savings in Michigan); McMahon, *supra* note 53.

55. PAUL ALLEN ET AL., M.J. BRADLEY & ASSOCS., UTILITY INVESTMENT IN ELECTRIC VEHICLE CHARGING INFRASTRUCTURE: KEY REGULATORY CONSIDERATIONS 8 (2017), https://mjbradley.com/sites/default/files/GCC-MJBA_Utility%20Investment%20in%20EV%20Charging%20Infrastructure_FINAL.PDF; FITZGERALD ET AL., *supra* note 53, at 19–20; Jim Lazar, *Calming Chicken Little: An EV Grid Tale Without the Scary Ending*, REG. ASSISTANCE PROJECT (Jan. 30, 2018), https://www.raponline.org/blog/calming-chicken-little-an-ev-grid-tale-without-the-scary-ending (explaining how encouraging EV charging at night in Texas and other wind-rich states when wind penetration on the grid is high will avoid curtailing renewable energy resources and lower costs for all ratepayers).

electricity rates, which arguably benefits all electricity customers in the form of lower utility bills.[56]

C. EV CHARGING

As their name implies, EVs—both PHEVs and BEVs—require access to power sources to charge their batteries. This Subpart describes the types of EV chargers on the market today as well as the stakeholders in the EV charging industry.

1. Types of EV Chargers and Battery Technology

There are three types of electric vehicle charging units: Level 1, Level 2, and Level 3 DC fast chargers.[57] A Level 1 charger is simply a standard home electrical outlet, through a basic 120-volt plug, requiring no additional equipment, and, depending on battery size, takes about a day to provide a full EV charge.[58] A Level 2 charger can be "hard wired" or plugged in at a home, garage, or parking lot capable of handling 240 volts and can charge an EV within several hours.[59] The most "capable and durable" Level 2 units designed for home use cost, on average, about $600.[60] The vast majority of publicly available charging stations, found in mall parking ramps or apartment complexes or office surface lots, are Level 2 chargers.[61] Level 3 chargers are also known as DC fast chargers because they use direct current—unlike Level 1 and 2 chargers which convert consumer alternating-current electricity.[62] Current Level 3 DC fast chargers can charge an EV in as little as thirty minutes, and automakers and EV charging companies are now deploying higher power DC fast chargers that can charge an EV in 10–15 minutes.[63] Both types are relatively rare.[64] As of September 2018, there were over 54,000 charging

56. M.J. BRADLEY & ASSOCS., *supra* note 53, at 9; FITZGERALD ET AL., *supra* note 53, at 19–20; *see also* ALLEN ET AL., *supra* note 55, at 16–18 (describing how adoption of EVs can lead to greater overall utility revenues which can put downward pressure on utility rates for all customers); KHAN & VAIDYANATHAN, *supra* note 47, at 3–4 (discussing utility challenges and opportunities associated with integrating EVs into the electric grid).

57. *See Electric Vehicle Charging Guide*, CHARGEHUB, https://chargehub.com/en/electric-car-charging-guide.html (last visited Sept. 19, 2018).

58. *Id.*

59. *Id.*

60. Brad Berman, *Buying Your First Home EV Charger*, PLUGINCARS (Dec. 15, 2017), http://www.plugincars.com/quick-guide-buying-your-first-home-ev-charger-126875.html.

61. *See, e.g.*, Eric Schaal, *How to Choose the Best Locations for Public EV Charging Stations*, FLEETCARMA (May 26, 2016), https://www.fleetcarma.com/ev-charging-stations-choosing-best-locations.

62. *See* ANDREW WOLLENBERG, FACT SHEET: PLUG-IN ELECTRIC VEHICLES 5 (Paul Haven & Brian La Shier eds., 2017), https://www.eesi.org/files/FactSheet_Electric_Vehicles_08.2017.pdf.

63. Eric A. Taub, *For Electric Car Owners, 'Range Anxiety' Gives Way to 'Charging Time Trauma,'* N.Y. TIMES (Oct. 5, 2017), https://www.nytimes.com/2017/10/05/automobiles/wheels/electric-cars-charging.html.

64. Eric Schaal, *These Maps Show the State of Electric Vehicle Charging in 2016*, FLEETCARMA (Sept. 27, 2016), https://www.fleetcarma.com/electric-vehicle-charging-2016-maps.

outlets at over 22,000 public electric charging stations in the United States.[65] The five states with the largest number of public EV charging stations as of September 2018 are California (over 4,000 charging stations), Florida (over 1,000 charging stations), Texas (over 1,000 charging stations), New York (over 1,000 stations), and Washington (800 charging stations).[66]

A 2017 report from the University of Michigan put the proportion of Level 3 DC fast charging stations at 18.1% of the total number of stations that year.[67] This scarcity is due in part to the high costs of developing DC fast charging stations—a single Level 3 plug can cost anywhere between $10,000 and $40,000, with installation costs of between $4,000 and $51,000.[68] Additional complications come from the technology side. Unlike Level 2 chargers, DC fast chargers are not universal; there are two competing formats: CHAdeMO and CCS.[69] Tesla also has its own format for high-speed charging, the Supercharger.[70] Charging time is a function of not only the charging station but also the battery itself. Today's EVs currently use lithium-ion batteries, which have raised concerns surrounding the required energy use and environmental impacts associated with mining the lithium and other needed metals to create and then dispose of the battery.[71] However, scientists are developing new technologies that would allow the use of magnesium batteries in EVs, which would hold twice as much charge as lithium batteries and have the added benefit of using a metal that is far more plentiful worldwide.[72] There are also developments underway to use decommissioned

65. *Alternative Fueling Station Locator*, U.S. DEP'T OF ENERGY, https://www.energy.gov/maps/alternative-fueling-station-locator (last visited Sept. 19, 2018).

66. *Alternative Fueling Station Counts by State*, U.S. DEP'T OF ENERGY, https://www.afdc.energy.gov/fuels/stations_counts.html (last visited Sept. 19, 2018).

67. Fred Lambert, *US Has Now ~16,000 Public Electric Vehicle Charging Stations with ~43,000 Connectors*, ELECTREK (June 19, 2017, 12:52 PM), https://electrek.co/2017/06/19/us-electric-vehicle-charging-stations.

68. MARGARET SMITH & JONATHAN CASTELLANO, U.S. DEP'T OF ENERGY, COSTS ASSOCIATED WITH NON-RESIDENTIAL ELECTRIC VEHICLE SUPPLY EQUIPMENT 11, 17 (2015), https://www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf.

69. Zachary Shahan, *Electric Car Charging 101*, EV OBSESSION (Sept. 10, 2015), https://evobsession.com/electric-car-charging-101-types-of-charging-apps-more.

70. WOLLENBERG, *supra* note 62, at 5; *Electric Vehicle Charging Guide*, *supra* note 57; Lambert, *supra* note 67.

71. *See* Henry Sanderson, *Electric Car Growth Sparks Environmental Concerns*, FIN. TIMES (July 7, 2017), https://www.ft.com/content/8342ec6c-5fde-11e7-91a7-502f7ee26895. Notably, there are plans underway to re-use batteries that can no longer be used in a vehicle but may have sufficient storage capacity for use with PV solar and other electric grid functions. *See* Shijie Tong et al., *Demonstration of Reusing Electric Vehicle Battery for Solar Energy Storage and Demand Side Management*, 11 J. ENERGY STORAGE 200, 200 (2017).

72. *See* John Fialka, *Battery Breakthrough Could Be Game Changer*, GOVERNORS' WIND & SOLAR ENGERY COAL. (Apr. 3, 2018), http://governorswindenergycoalition.org/battery-breakthrough-could-be-game-changer; *see also* Joshua Gordon, *How EV Batteries Work and Developments to Come*, FLEETCARMA (Mar. 28, 2018), https://www.fleetcarma.com/how-electric-vehicle-batteries-work (explaining how EV batteries operate).

car batteries to support residential, commercial, or industrial energy storage systems and to provide other electric grid services such as voltage regulation and other ancillary services.[73]

The lack of sufficient public EV charging infrastructure negatively impacts the adoption of EVs through the creation of "range anxiety"—the fear that the battery could run out before the car reaches its destination or a charging station.[74] Some experts believe that range anxiety and lack of access to Level 3 DC fast chargers is one of the most significant challenges to the wider adoption of EVs.[75] In recognition of the importance of charging infrastructure to furthering EV growth, elected officials are working to increase government investment and support for charging port development. The American Recovery and Reinvestment Act of 2009 contained incentives for EVs and EV charging stations and, several years later in 2016, President Obama pledged up to $4.5 billion in loan guarantees for "commercial-scale deployment of innovative electric vehicle charging facilities."[76] The Obama

73. *From Plug-in Cars to Plug-in Homes—EV Batteries Get a Second Life*, AUTO. WORLD (Feb. 14, 2018), https://www.automotiveworld.com/articles/plug-cars-plug-homes-ev-batteries-get-second-life; Nathanial Gronewold, *Hyundai Envisions 2nd Act for Used EV Batteries*, ENERGYWIRE (July 2, 2018), https://www.eenews.net/energywire/stories/1060087467; Robert Walton, *EVgo Reduces Grid Demand With Used BMW Batteries*, UTIL. DIVE (July 11, 2018), https://www.utilitydive.com/news/evgo-reduces-grid-demand-with-used-bmw-batteries/527461; *see* Jeremy S. Neubauer et al., *A Second Life for Electric Vehicle Batteries: Answering Questions on Battery Degradation and Value*, 8 SAE INT'L J. MATERIALS & MANUFACTURING 1 (2015).

74. Chris Mooney, *'Range Anxiety' is Scaring People Away from Electric Cars—But the Fear May be Overblown*, WASH. POST (Aug. 15, 2016), https://www.washingtonpost.com/news/energy-environment/wp/2016/08/15/range-anxiety-scares-people-away-from-electric-cars-why-the-fear-could-be-overblown; Camille von Kaenel, *Luring Electric Vehicle Buyers with Swift Charging, Roller-Skating*, GOVERNORS' WIND & SOLAR ENERGY COAL. (Jan. 17, 2018), http://governorswindenergycoalition.org/luring-electric-vehicle-buyers-with-swift-charging-roller-skating (discussing industry, state, and utility efforts to build out public EV charging stations to reduce range anxiety and support EV drivers).

75. JIM FRANCFORT ET AL., IDAHO NAT'L LAB., CONSIDERATIONS FOR CORRIDOR AND COMMUNITY DC FAST CHARGING COMPLEX SYSTEM DESIGN ii (2017) ("It is generally thought that the availability of public infrastructure provides consumer confidence against 'range anxiety,' or the perceived fear by battery electric vehicle drivers of becoming stranded once the battery is depleted; however, this availability means that infrastructure must naturally precede the adoption of PEVs."); *An Infrastructure for Charging Electric Vehicles Takes Shape*, ECONOMIST (Sept. 7, 2017), https://www.economist.com/business/2017/09/07/an-infrastructure-for-charging-electric-vehicles-takes-shape; Taub, *supra* note 63; *see* Dan Boyce, *The Number of Electrical Car Charging Stations is Rising, but Does that Mean Wider Adoption of Electrical Cars Will Follow?*, MARKETPLACE (Dec. 11, 2017), https://www.marketplace.org/2017/12/11/business/electric-car-range-anxiety ("'The whole network of user experience issues are something that continue to somewhat inhibit adoption, widespread adoption of electric vehicles,' said Sam Ori, executive director of the University of Chicago's Energy Policy Institute."). *But see Americans' Range Anxiety Lessening, Survey Finds*, CLIMATEWIRE (May 9, 2018), https://www.eenews.net/climatewire/2018/05/09/stories/1060081141 (reporting on 2018 AAA survey reflecting increasing consumer confidence in EV battery range but that long fueling times are still a disincentive to purchase an EV).

76. Press Release, White House Office of the Press Sec'y, Fact Sheet: Obama Administration Announces Federal and Private Sector Actions to Accelerate Electric Vehicle Adoption in the

plan also included implementation of the national EV charging and hydrogen, propane, and natural gas fueling corridors called for by the Fixing America's Surface Transportation ("FAST") Act of 2015, which called for the Secretary of Transportation to "designate . . . corridors that identify the near- and long-term need for, and location of, electric vehicle charging infrastructure . . . at strategic locations along major national highways to improve the mobility of" EVs, and set "an aspirational goal of achieving strategic deployment of electric vehicle charging infrastructure . . . in those corridors by the end of fiscal year 2020."[77]

2. The EV Charging Industry

Private companies have emerged to create the EV charging stations needed to service EVs. As noted above, Tesla has its own charging network but other private companies such as ChargePoint, Blink, EVGo, Greenlots, and Electrify America supply many of the charging stations for non-Tesla EVs. These companies operate networks of public charging stations, sell and install home charging stations, and develop innovative charging technology. Public charging networks developed by these companies play a significant role in promoting the adoption of EVs. Although an estimated 80% of EV charging is done at home, experts caution that mass adoption will not occur until consumers feel comfortable driving EVs without a fear of running out of charge, which requires a significant investment in public EV charging stations around the country.[78]

For most of these companies, the business model involves developing and building EV charging stations and then selling the stations to private parties (i.e., hotels, stores, or other businesses), governmental entities, and universities for public or private charging. EV owners can become subscribers or members, giving owners the ability to charge at any licensed location. It costs nothing to become a member, but membership is connected with a credit card, which is charged a fee (when applicable) at charging locations. Many of the station owners offer electricity to EV drivers for free, but a member card is still necessary.[79]

Many property owners who want to host an EV charging station contract with a third-party charging company because it eases the administrative

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United States (July 21, 2016), https://obamawhitehouse.archives.gov/the-press-office/2016/07/21/fact-sheet-obama-administration-announces-federal-and-private-sector.

77. Fixing America's Surface Transportation Act, Pub. L. No. 114-94, § 1413, 129 Stat. 1312, 1417–18 (2015).

78. *See* ELEC. VEHICLE CHARGING ASS'N, THE STATE OF THE CHARGE: 2017 REPORT OF CALIFORNIA'S ELECTRIC VEHICLE CHARGING INDUSTRY 5 (2017) (reporting that 80% of EV charging is done at home).

79. Brad Berman, *The Ultimate Guide to Electric Car Charging Networks*, PLUGIN CARS (July 13, 2018), http://www.plugincars.com/ultimate-guide-electric-car-charging-networks-126530.html; Travis Hoium, *Investing in EV Infrastructure: Where the Money Is Going*, MOTLEY FOOL (Dec. 12, 2017), https://www.fool.com/investing/2017/03/15/investing-in-ev-infrastructure-where-the-money-is.aspx.

burden of siting and installing a charging station. One benefit to a commercial property owner of hosting an EV charging site is to attract consumers to businesses, such as in a shopping mall.[80] In addition to attracting customers, charging station owners can also charge for the electricity use at their charging stations, which may provide additional revenue, although many choose not to do so.[81] The cost of hosting a charging station consists primarily of deploying and installing the station. Single charging port public stations in parking garages often cost around $6,000, while curbside and surface lot stations cost significantly more because of additional trenching and wiring requirements.[82]

At the present time, state legislatures and state public utility commissions are addressing a variety of questions regarding EV charging, including whether electric utilities should be able to build and own charging stations —an issue addressed in depth in Part IV—and whether non-utility EV charging companies should be regulated as "public utilities" because they are selling electricity through EV chargers. With regard to the latter issue, in recent years, numerous state legislatures and state public utility commissions have declared that EV charging station operators or property owners that install EV charging stations will not be regulated as "public utilities" merely by selling electricity to EV owners at the stations.[83] These debates over utility ownership and EV charger regulation highlight the fact that development of EV charging stations will not and cannot follow the same path as gasoline refueling stations over the last century during the development of the

80. U.S. DEP'T OF ENERGY, PLUG-IN ELECTRIC VEHICLE HANDBOOK FOR PUBLIC CHARGING STATION HOSTS 9 (2012), https://www.afdc.energy.gov/pdfs/51227.pdf; *see, e.g.*, *Increase Property Value and Meet Growing Demand for EV Charging*, CHARGEPOINT, https://www.chargepoint.com/businesses/apartments-and-condos (last visited Sept. 19, 2018).

81. Public and private EV charging station owners that locate the chargers in parking lots or at shopping malls often do not charge for the electricity because they can more than cover the costs of the electricity through parking fees or additional sales at retail stores from EV drivers waiting for their cars to charge. *See, e.g.*, Ryan Stanton, *Ann Arbor's Electric-Car Charging Stations Seeing Highest Usage Ever*, MLIVE (Jan. 10, 2018), https://www.mlive.com/news/ann-arbor/index.ssf/2018/01/ann_arbors_electric-car_chargi.html (discussing city's decision not to charge users for the electricity at the charging stations and instead cover the cost of the stations with parking fees).

82. Josh Agenbroad & Ben Holland, *Pulling Back the Veil on EV Charging Station Costs*, ROCKY MTN. INST. (Apr. 29, 2014), https://rmi.org/pulling-back-veil-ev-charging-station-costs.

83. *See* NEV. REV. STAT. § 704.021(11) (2017) (amending definition of "[p]ublic utility" to exclude "[p]ersons who own, control, operate or manage a facility that supplies electricity only for use to charge electric vehicles"); JOHN BONITZ ET AL., NC CLEAN ENERGY TECH. CTR., 50 STATES OF ELECTRIC VEHICLES: 2017 ANNUAL REVIEW 25–26 (2018); A. Christopher Young et al., *Why Your Local Electric Vehicle Charging Station Doesn't (and Shouldn't) Look Like Your Local Gas Station*, 16 PRATT'S ENERGY L. REP. 297, 301 (2016), https://www.pepperlaw.com/resources/24496/4Go (citing California, New York, and "[a]pproximately 15 other states, including Colorado, Florida, Illinois, Maryland, Massachusetts, Virginia and Washington [that] . . . have exempted EV charging stations or [the] owners and operators" of charging stations from state public utility regulation).

automobile and the interstate highway system. In the early 20th century, when gasoline was becoming the fuel of choice for the growing automobile industry, the sale and distribution of gasoline was virtually unregulated.[84] By contrast, states have regulated the generation, sale, and distribution of electricity in the United States for over a century, and the federal government has regulated electricity for nearly that long as well. A host of actors will need to plan and create an integrated system to provide electricity to the growing fleet of EVs on U.S. roadways in order to quickly and efficiently create a fuel delivery system that creates a driving experience comparable to that provided by gasoline-powered cars, in order to attract and engage consumers.

D. THE VOLKSWAGEN SETTLEMENT: AN INFUSION OF FUNDING FOR EVS, EV TECHNOLOGY DEVELOPMENT, AND EV CHARGING STATIONS

A significant EV investment opportunity for states presented itself in the form of a 2016 settlement between Volkswagen, vehicle owners, the United States, and the State of California.[85] Two years earlier, the director of the Center for Alternative Fuels Engines and Emissions at West Virginia University presented research suggesting VW diesel engines were emitting significantly more nitrous oxide ("NO_x") than U.S. guidelines allowed.[86] This finding prompted the California Air Resources Board ("CARB") to undertake its own investigation.[87] The evidence CARB produced led VW to admit it had installed so-called defeat devices into its vehicles emission systems.[88] These "defeat device[s] allowed Volkswagen to cheat on the emissions tests . . . by recognizing when cars were being monitored and changing the exhaust settings. In testing, the cars increased pollution controls. But on the road, pollution controls were scaled back to enhance performance and fuel mileage . . . ."[89] When the defeat devices were engaged, VW vehicles could emit as much as forty times the permitted amount of NO_x.[90]

84. For a discussion of the early days of gasoline fueling, see Marc W. Melaina, *Turn of the Century Refueling: A Review of Innovations in Early Gasoline Refueling Methods and Analogies for Hydrogen*, 35 ENERGY POL'Y 4919 (2007).

85. Jack Ewing, *Volkswagen Reaches Deal in U.S. Over Emissions Scandal*, N.Y. TIMES (Apr. 21, 2016), https://www.nytimes.com/2016/04/22/business/international/volkswagen-emissions-settlement.html; *Volkswagen Clean Air Act Civil Settlement*, EPA, https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement (last visited Sept. 20, 2018) (describing background and terms of the settlement); *VW Diesel Vehicles*, CAL. AIR RES. BD., https://ww2.arb.ca.gov/our-work/topics/vw-diesel-vehicles (last visited Sept. 20, 2018) (defining key terminology).

86. Jack Ewing, *Researchers Who Exposed VW Gain Little Reward from Success*, N.Y. TIMES (July 24, 2016), https://www.nytimes.com/2016/07/25/business/vw-wvu-diesel-volkswagen-west-virginia.html.

87. *Id.*

88. *Id.*

89. Ewing, *supra* note 85.

90. *Id.*

The $14.7 billion settlement is comprised of three components: (1) $10 billion for vehicle buyback and modifications (aimed at individual owners); (2) $2 billion to be directly invested by VW in the building of ZEV infrastructure (including EV charging stations), with $800 million invested in California and the remaining $1.2 billion available to the rest of the country; and (3) the creation of a $2.7 billion Environmental Mitigation Trust.[91] The trust "will fund projects to reduce diesel emissions," with states allocated various portions of the trust "based on the number of affected vehicles in their jurisdiction."[92] To receive their allocations, states must file as beneficiaries to the trust,[93] and are eligible to spend funds "on grants to both public agencies and private businesses."[94] Beneficiaries are authorized to spend up to 15% of their trust allocation on EV charging stations,[95] with many states already announcing their intention to spend the maximum allowed.[96] In addition, an emerging trend in state VW trust plans is investment in EV fleets for public transportation, particularly school and transit buses.[97] Many urban areas are attempting to convert from diesel to electric buses,[98] and mitigation trust funds could provide an important catalyst for those investments.

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91. INGRID MALMGREN & CASSIE POWERS, NAT'L ASS'N OF STATE ENERGY OFFICIALS, VOLKSWAGEN SETTLEMENT: BENEFICIARY MITIGATION PLAN TOOLKIT 4–5 (2017).

92. *Id.* at 5.

93. *Id.*

94. Martha T. Moore, *Billions from VW Settlement Boost Push to Clean Vehicles*, PEW CHARITABLE TRS. (Jan. 4, 2018), http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2018/01/04/billions-from-vw-settlement-boost-push-to-clean-vehicles.

95. *Id.*

96. *Id.*

97. *Id.*; *see also* David Ferris, *In Pacific Northwest, the Ferries Are Going Electric*, GOVERNORS' WIND & SOLAR ENERGY COAL. (July 7, 2018), http://governorswindenergycoalition.org/in-pacific-northwest-the-ferries-are-going-electric (discussing efforts by passenger ferry boat companies in Puget Sound to use VW settlement monies to convert their fleets to electric ferries).

98. Josephine Marcotty, *Minnesota Pollution Officials Tweak, Finalize Plan for Money from Volkswagen Settlement*, STAR TRIB. (Apr. 11, 2018, 10:33 PM), http://www.startribune.com/state-tweaks-finalizes-plan-for-vw-money/479437883; *Minnesota's Plan*, MINN. POLLUTION CONTROL AGENCY, https://www.pca.state.mn.us/air/minnesotas-plan (last visited Sept. 20, 2018) (describing the first phase of Minnesota's $47 million VW Settlement State Plan, which consists of $11.75 million that will be used to fund the acquisition of lower-emitting school buses, heavy-duty on-road vehicles, and off-road equipment of multiple fuel types; heavy-duty electric vehicles, including school buses, transit buses, and trucks; and EV charging stations); Moore, *supra* note 94 (noting, for example, Los Angeles pledged to convert its bus fleet by 2030 and that Seattle announced it would purchase only electric buses after 2020); Kevin Stark, *Chicago Seeks to Expand Its Electric Bus Fleet*, ENERGY NEWS NETWORK (Jan. 4, 2018), https://energynews.us/2018/01/04/midwest/chicago-seeks-to-expand-its-electric-bus-fleet ("Chicago [transit] officials estimate that a single electric bus in an average year will save the city $25,000 on fuel and $55,000 on estimated health care costs."); Camille von Kaenel, *Electric Buses Are All the Rage. Here's Why*, CLIMATEWIRE (May 22, 2018), https://www.eenews.net/climatewire/2018/05/22/stories/1060082339.

VW created Electrify America LLC as a subsidiary company with the sole responsibility of managing the $2 billion ZEV investment.[99] Electrify America has already begun investing in EV charging stations to help create cross-country network of charging infrastructure.[100] CARB approved the Cycle 1 investment in California (out of four investment cycles) in July 2017. The investment consists of $200 million in investments consisting of "building ZEV charging infrastructure in metro areas and along highways, creating brand-neutral ZEV education and outreach programs, and launching a 'Green City' initiative in Sacramento focused on increasing access to ZEV technology."[101] The Cycle 1 investment in the remainder of the country includes building charging stations—including DC fast chargers in eleven target market areas.[102] The Plan also calls for building charging stations along highway corridors; over 300 community-based charging sites in workplaces, shopping centers, parking lots, and multi-family housing; and with a significant percentage of that investment in lower-income areas.[103]

The VW settlement represents a significant infusion of capital for EV charging investment around the country at a time when state legislatures, public utility commissions, and executive agencies begin to consider how EVs may transform vehicle use and transportation policy within their jurisdictions. The first of the VW settlement money will be spent in states in 2018 and will

99. Ryan Beene, *VW Subsidiary Invests $2 Billion to Promote Electric Cars*, BLOOMBERG (Feb. 7, 2017, 1:11 PM), https://www.bloomberg.com/news/articles/2017-02-07/vw-subsidiary-to-invest-2-billion-to-promote-electric-vehicles; *Our Plan*, ELECTRIFY AMERICA, https://www.electrifyamerica.com/our-plan (last visited Sept. 20, 2018).

100. *Our Plan*, *supra* note 99.

101. Jody Barhanovich, *Electrify America to Invest $2B in Electric Vehicle Infrastructure*, INSTITUTIONAL INVESTING IN INFRASTRUCTURE (Sept. 13, 2017), https://irei.com/news/electrify-america-invest-2b-electric-vehicle-infrastructure.

102. Electrify America chose the metropolitan areas for Cycle 1 based on formal proposals from cities around the country. The cities included in the first investment cycle include Washington, D.C., Boston, Chicago, Denver, Houston, Miami, New York City, Philadelphia, Portland, Raleigh, and Seattle. *Our Plan*, *supra* note 99. States are already planning investments based on those funds. *See, e.g.*, Tripp Baltz, *Colorado Plans for More Electric Vehicles, Charging Stations*, BLOOMBERG ENV'T (Jan. 24, 2018, 1:22 PM), https://bnanews.bna.com/environment-and-energy/colorado-plans-for-more-electric-vehicles-charging-stations (discussing Colorado's new EV fast charging infrastructure plan, "to be funded in part by Colorado's $68.7 million share of the Volkswagen diesel emissions settlement, includes five ways to address a lack of electric vehicle fast-charging stations, and support interstate travel and a consistent user experience across the western states"). *See generally* STATE OF COLO., COLORADO ELECTRIC VEHICLE PLAN (2018) (outlining Colorado's plans to support widespread EV adoption).

103. *Our Plan*, *supra* note 99*; see Summary of Electrify America Investment Plan*, CTR. FOR THE NEW ENERGY ECON., http://cnee.colostate.edu/wp-content/uploads/2017/05/Tom-Plant_VW-Settlement.pdf (last visited Sept. 20, 2018). Not all stakeholders favor the VW settlement plan. For instance, automakers like Ford Motor Company worry that the settlement funds allocated to EV charging infrastructure will give the company a competitive edge, particularly as VW has also announced a separate $40 billion investment in EV and autonomous vehicle technologies over the next five years. *See, e.g.*, Letter from John J. Viera, Glob. Dir., Ford Motor Co., to Mark Williams, Cal. Air Res. Bd. (Apr. 10, 2017); Boston, *supra* note 42.

be a major factor for public utility commissions and policymakers to consider as they address complementary electric utility proposals to develop EV charging infrastructure. It is important to note that while this investment is timely and significant, it is far from sufficient and represents only a small portion of charging needs associated with transportation-electrification goals in California and other states.

III. PUBLIC UTILITIES AND EVS

A. ELECTRIC UTILITY REGULATION 101: AN INDUSTRY IN TRANSITION

Virtually all states have public utility commissions (in some states called "public service commissions" or similar designation) that are independent commissions (i.e., not part of the executive branch of government), with statutory authority to regulate companies that provide electricity and natural gas service to residences and businesses within the state.[104] Historically, these private electric and gas companies, known as "investor-owned utilities" or "publicly regulated utilities," entered into what is often called a "regulatory compact" with the state.[105] In return for allowing the state to regulate their prices and services, they were granted a monopoly for a particular service territory.[106] As a result, such companies are also known as "regulated monopolies." These investor-owned utilities stand in contrast to municipal utilities and rural electric cooperatives—which the local government owns and manages in the case of a municipal utility, or by its members in the case of a rural electric cooperative—and are either more lightly regulated by the state commission or not regulated at all depending on state law.[107]

These investor-owned electric utilities may be "vertically integrated," which means they own electric generation facilities (coal plants, natural gas plants, hydropower plants, nuclear plants, etc.), long-distance electric

104. *See* JIM LAZAR, REGULATORY ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 25–28 (2d ed. 2016).

105. *Id.* at 3–6; Emily Hammond & David B. Spence, *The Regulatory Contract in the Marketplace*, 69 VAND. L. REV. 141, 149 (2016).

106. LAZAR, *supra* note 104.

107. *Id.* at 12–13, 29–30. In general, municipal utilities and rural electric cooperatives are large in terms of their numbers, but small in terms of the electricity customers they serve. Overall, investor-owned utilities serve approximately 75% of the U.S. population while municipal utilities, electricity cooperatives, and other public power providers serve approximately 25%. There are exceptions, however, such as the Los Angeles Department of Water and Power, which serves nearly four million customers. For a description of the differences between investor-owned utilities, municipal utilities, and electric cooperatives, see, e.g., *id.* at 11–13; *Differences Between Publicly and Investor-Owned Utilities*, CAL. ENERGY COMM'N, http://www.energy.ca.gov/pou_reporting/background/difference_pou_iou.html (last visited Sept. 23, 2018); *Stats and Facts*, AM. PUBLIC POWER ASS'N, https://www.publicpower.org/public-power/stats-and-facts (last visited Sept. 23, 2018) (providing data on numbers of electricity providers and percentage share of electricity sold for municipal utilities, rural electric cooperatives and investor-owned utilities); *Utility Regulation and Policy*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., https://aceee.org/topics/utility-regulation-and-policy (last visited Sept. 23, 2018).

transmission lines (to transport high-voltage electricity from generation plants to electrical substations) and "distribution lines" (to transport the electricity at lower voltage from the substations to homes and businesses). The states that still operate under this model are known as "traditionally regulated states."[108] They include most of the states in the Midwest, Southeast, and Intermountain West regions of the United States.

In the late 1990s and early 2000s, some states began experimenting with electricity "restructuring" to break up the vertically integrated utilities, create more vibrant markets for electricity generation, and lower costs for consumers.[109] This generally involved directing public utilities to sell off their generation assets and then requiring them to purchase generation to meet their customers' electricity demands in newly created wholesale energy markets.[110] Today, most of the northeastern and mid-Atlantic states, plus Ohio, Illinois, and Texas, are restructured.[111] In some of these restructured states, notably Texas, there is also significant "retail choice," meaning that residential and commercial electricity customers have a choice among multiple electricity providers that compete with each other on cost, generation resource mix, technology, or other metrics.[112] However, even in

108. KLASS & WISEMAN, *supra* note 20, at 187–91.

109. DAVIES ET AL., *supra* note 5, at 404–08.

110. California was at the forefront of this movement, but it designed its regulatory framework very poorly, which allowed Enron and others to manipulate prices for electric generation and transmission, causing prices of both to skyrocket and the largest electric utility in California to file for bankruptcy protection. The state bailout of its electric utilities cost the state nearly $50 billion and caused many states that had not already started the process of restructuring to stick with traditional utility regulation. *See id.* at 382–88.

111. LAZAR, *supra* note 104, at 18; Richard Hirsh, *Fifteen Years Later: Whither Restructuring in the American Electric Utility System?*, TECH. STORIES (Dec. 1, 2013), https://www.technologystories.org/fifteen-years-later-whither-restructuring-in-the-american-electric-utility-system; *see also* William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. REV. 810, 832–33, 836–39 (2016) (describing traditionally regulated and restructured states).

112. LAZAR, *supra* note 104, at 18–19; *see also* KLASS & WISEMAN, *supra* note 20, at 190–91 (discussing customer choices in restructured states). State-level restructuring developments coincided with the Federal Energy Regulatory Commission ("FERC") encouraging the formation of and regulating multi-state non-profit organizations known as Regional Transmission Organizations ("RTOs") and Independent System Operators ("ISOs") to administer multi-state electricity generation markets and operate multi-state regional transmission systems (although the transmission lines themselves remain owned and operated by the utilities that built them). Under FERC rules, utilities may join or leave RTOs voluntarily. There are currently no RTOs in the Southeast or Intermountain West states, but utilities in the Intermountain West region have developed more informal arrangements regarding electric grid collaboration and energy exchanges. DAVIES ET AL., *supra* note 5, at 412–18; LAZAR, *supra* note 104, at 17–18. For a map of the nation's RTOs and ISOs, see *Regional Transmission Organizations (RTO)/Independent System Operators (ISO)*, FED. ENERGY REGULATORY COMM'N, https://www.ferc.gov/industries/electric/indus-act/rto.asp (last visited Sept. 23, 2018). For more details on RTO/ISO design and development, see, e.g., KEVIN B. JONES ET AL., HOW THE RTO STAKEHOLDER PROCESS AFFECTS MARKET EFFICIENCY 2–4 (R ST. POL'Y STUDY NO. 112, 2017); KLASS & WISEMAN, *supra* note 20, at 177–78.

restructured states, monopoly utilities still exist to provide transmission and distribution service to customers because it would result in inefficiencies and waste for multiple companies to attempt to build competing transmission and distribution systems. Thus, in restructured states, these public utilities that retain monopoly service over the transmission and distribution aspect of electricity delivery business are often known as "wires" companies or "transmission and distribution" utilities.

In all states, whenever a utility is seeking an increase in overall rates to cover new investments or expenses, the utility presents a "rate case" to the public utility commission setting forth the revenue it needs to not only recover its costs, but also receive a sufficient return on its investment to retain financial health.[113] Customers (divided into different customer classes) pay that "rate" or price based on how much electricity they use and other services the utility provides. Using the traditional rate formula, the utility recovers its operating expenses (fuel costs, salaries, etc.) plus a percentage "rate of return" on its investments designed to serve the public.[114] In traditionally regulated states, these investments can include generation, transmission, and distribution assets while in restructured states these investments do not include generation, but do include transmission and distribution assets. Thus, the more the utility builds, the more money it makes. EV charging infrastructure falls within the transmission and distribution side of the divide in restructured states. That means EV charging infrastructure can be part of the regulated "service" the utility provides to customers in all states, and thus there is the potential for utilities in both restructured states and traditionally regulated states to receive a rate of return on those investments if the state regulatory commission finds it to be in the public interest.

B. THE UTILITY "DEATH SPIRAL" AND THE PROMISE OF EVS

From the post-WWII period until the 1970s, utility investments and profits were fairly straightforward.[115] The economy and electricity demand was growing, utilities invested in generation, transmission, and distribution assets to meet that demand, and they received a return on that investment through the public utility commission ratemaking process.[116] Cost overruns with nuclear plants in the 1980s caused significant cracks in that model, but that only applied to those utilities that made unwise investments in such plants.[117]

113. LAZAR, *supra* note 104, at 36–51. In some states, rate cases are heard on a predetermined schedule while in others they are heard only when a utility requests a rate increase.

114. The classic utility rate formula is R = O + (V-D)r. The terms' meanings are: R=total revenue requirement; O=operating expenses (fuel, wages, salaries, supplies, taxes, etc.); V=total value of tangible and intangible property; D=depreciation; V-D=rate base; and r=rate of return. *Id.* at 49–60; DAVIES ET AL., *supra* note 5, at 300–02.

115. *Id.* at 351–54.

116. *See id.*

117. *Id.*

Bigger problems have arisen in the last decade. Energy efficiency investments at the residential, commercial, and industrial levels have been successful and, as a result, electricity demand has been flat for years.[118] Even more significant from the utility perspective is the growth of rooftop PV solar development in California and elsewhere, which means customers are generating their own electricity at least part of the time, resulting in the utility selling even less electricity. Utilities must then raise prices to cover the cost of their existing infrastructure, which simply encourages customers to consume less electricity or partially or fully leave the grid. This has been labeled the utility "death spiral."[119] Today, some experts contend that the concept of a utility "death spiral" was overstated and alarmist from the beginning.[120] Nevertheless, there is widespread agreement that the role of the utility in modern society must change to accommodate new technologies and new consumer demands.[121] As part of this transition, the role of the EVs in general and EV charging in particular has the potential to play a central role.[122]

In light of concerns over the utility "death spiral," consider what would happen if all or nearly all passenger vehicles, city bus, school bus, and delivery truck fleets throughout the United States converted to EVs. This could significantly increase the demand for electricity and justify utilities investment in more electricity generation (in traditionally regulated states) and in additional transmission and distribution infrastructure (in all states) to accommodate that growth.[123] Electric utilities would see increased revenues as a result of obtaining a return on investment for those capital projects, in addition to the increased revenues associated with selling more electricity in states that have not already "decoupled" utility profits from electricity sales.[124]

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118. *Id.* at 261–62.

119. CARL PECHMAN, U.S. DEP'T OF ENERGY, MODERNIZING THE ELECTRIC DISTRIBUTION UTILITY TO SUPPORT THE CLEAN ENERGY ECONOMY 3, 18–21 (2016); *see* PETER KIND, EDISON ELEC. INST., DISRUPTIVE CHALLENGES: FINANCIAL IMPLICATIONS AND STRATEGIC RESPONSES TO A CHANGING RETAIL ELECTRIC BUSINESS 3–6 (2013) (describing how customer-generated distributed solar and increased energy efficiency will reduce electricity demand which, in turn, will require the utility to charge higher and higher rates to cover the cost of existing grid infrastructure).

120. *See, e.g.*, Mike O'Boyle, *Three Ways Electric Utilities Can Avoid a Death Spiral*, FORBES (Sept. 25, 2017, 8:15 AM), https://www.forbes.com/sites/energyinnovation/2017/09/25/three-ways-electric-utilities-can-avoid-a-death-spiral; Jan Vrins & Mackinnon Lawrence, *Where Is the Utility Death Spiral?*, ENERGY CENT. (Nov. 17, 2016), https://www.energycentral.com/c/pip/where-utility-death-spiral.

121. *See, e.g.*, Eisen & Mormann, *supra* note 6, at 52–57; O'Boyle, *supra* note 120; *see also supra* note 6 and accompanying text (discussing major transformations in the utility industry).

122. *See, e.g.*, Suzanne Shelton, *Could EVs Put the Brakes on the Utility 'Death Spiral'?*, GREENBIZ (Apr. 18, 2017, 2:00 AM), https://www.greenbiz.com/article/could-evs-put-brakes-utility-death-spiral.

123. *See, e.g.*, Robert Walton, *EVs Could Drive 38% Rise in US Electricity Demand, DOE Lab Finds*, UTIL. DIVE (July 10, 2018), https://www.utilitydive.com/news/evs-could-drive-38-rise-in-us-electricity-demand-doe-lab-finds.

124. About half the U.S. states have implemented "decoupling" policies to compensate electric utilities based on factors other than electricity sales to encourage utilities to implement energy efficiency and conservation programs for consumers. *See Decoupling Policies*, CTR. FOR

Electric utilities fully recognize this opportunity and have begun to act accordingly. In 2018, more than ten electric utilities sued the Trump Administration EPA over its decision to relax vehicle GHG emission standards for automobiles in the United States because doing so will limit automakers' incentive to sell more EVs to meet the more stringent standards the Obama Administration had set.[125]

Beyond increased electricity sales and profits through investment in new infrastructure, EVs can benefit utilities, the grid as a whole and all utility customers by potentially serving as energy service and by more generally keeping the electric grid in balance, particularly as states increase the use of intermittent energy resources like wind and solar.[126] In places like California, during the day, when the sun is shining, massive amounts of energy enter the electric grid as a result of rooftop and utility-scale solar generation. Because the electric grid must be in perfect balance at all time—not too much and not too little—this surge of solar energy requires shutting down other forms of flexible electricity generation, such as natural gas plants, and then quickly ramping them back up when the sun goes down. If some or all of that excess solar energy could be stored in EV batteries when the driver is not using the car, and then released onto the grid when needed, this could provide additional benefits to the grid and ultimately all electricity customers.[127]

C. FEDERAL, STATE, LOCAL, AND REGIONAL POLICIES TO ENCOURAGE EV USE AND DEVELOP EV CHARGING

As of 2018, numerous federal, state and local policies designed to encourage EV use and develop EV charging infrastructure exist. This Article's focus centers on policies governing electric utility investment in EV charging. But before turning to that issue in Part IV, this Subpart summarizes the wide

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CLIMATE & ENERGY SOLS., https://www.c2es.org/document/decoupling-policies (last updated Nov. 2016) (describing different forms of decoupling policies); *Utility Rate Decoupling*, ALL. TO SAVE ENERGY (Oct. 24, 2013), https://www.ase.org/resources/utility-rate-decoupling-o ("Decoupling refers to policies designed to 'decouple' utility profits from total electric or gas sales so utilities do not have an incentive to try to sell more energy. Decoupling modifies traditional ratemaking practices to adjust rates frequently to ensure that utility revenue is neither more nor less than what is needed to cover costs and a fair return."). For a discussion of why policymakers can promote transportation electrification at the same time they pursue energy efficiency and decoupling policies, see Max Baumhefner, *Are Efficiency and Electrification Policies in Conflict?*, NRDC (Mar. 29, 2018), https://www.nrdc.org/experts/max-baumhefner/are-efficiency-and-electrification-policies-conflict.

125. *See, e.g.*, Gavin Bade, *Utilities Join with Tesla to Sue EPA Over Fuel Standard Rollback*, UTIL. DIVE (May 18, 2018), https://www.utilitydive.com/news/utilities-join-with-tesla-to-sue-epa-over-fuel-standard-rollback ("Electric vehicles are a key area of growth for electric utilities, many of which have seen their power demand stagnate or decline since the 2008 recession. . . . The suit provides more evidence of a growing alliance between utilities and transportation companies on alternative fuel vehicles, as well as a widening divide with the oil industry.").

126. *See supra* Section II.B (discussing electric grid benefits of EVs).

127. *See supra* Section II.B.

range of other policies related to EVs and EV charging that exist in the United States, some of which relate to electric utility rates for EV charging.

At the federal level, the primary incentive is a $7,500 federal tax credit for purchasing a BEV and PHEV vehicle. Included in the Energy Improvement and Extension Act of 2008, this tax credit was part of the larger financial stabilization legislation package Congress passed in October 2008 in response to the Great Recession.[128] The credit ranges from $2,500 to $7,500, depending on the battery's capacity, and begins to phase out when a given manufacturer sells "a total of 200,000 qualified vehicles."[129] Tesla and General Motors are expected to reach 200,000 qualified vehicle sales sometime in 2018, becoming the first automakers to reach that benchmark.[130]

At the state level, there are a number of policies to support EVs and EV charging.[131] Several state legislatures have enacted tax credits or cash rebates for EV purchases beyond the federal tax credit that range from $500 to $2,500.[132] Other state policies to support EVs and EV charging include reduced vehicle registration fees for EVs, grants or cash rebates for workplaces to install EV charging stations, allowing EV drivers to use HOV lanes on state highways, and requirements that electric utilities offer "time of use" rates or other rate incentives to customers with EVs that provide lower electricity costs for charging the vehicle during times when electricity demand is low.[133] At the

128. Emergency Economic Stabilization Act of 2008, Pub. L. No. 110–343, Div. B. § 205, 122 Stat. 3765, 3835.

129. CUNNINGHAM ET AL., *supra* note 27, at 8; *see also* James B. Stewart, *Electric Vehicle Tax Credit Survives, but G.M. and Tesla Aren't Cheering*, N.Y. TIMES (Jan. 11, 2018), https://www.nytimes.com/2018/01/11/business/electric-vehicles-taxes-tesla-gm.html (discussing the continuation of the EV tax credit in the 2017 Tax Cuts and Jobs Act).

130. *See* Stewart, *supra* note 129; *Tesla Reaches Sales Milestone, Set to Lose $7,500 Tax Credit*, CLIMATEWIRE (July 16, 2018), https://www.eenews.net/climatewire/2018/07/16/stories/1060089119.

131. In February 2018, the N.C. Clean Energy Technology Center published a helpful summary of EV-related "actions" in 2017 and included as state "actions": state-led studies and investigations, regulation, utility rate design, state policy proposals for market development, financial incentives, and state and utility EV or EV charging deployment. *See* BONITZ ET AL., *supra* note 83, at 7.

132. KHAN & VAIDYANATHAN, *supra* note 47, at 21–22 (describing federal, state, and local EV incentives); Kristy Hartman & Emily Dowd, *State Efforts to Promote Hybrid and Electric Vehicles*, NAT'L CONF. OF STATE LEGISLATURES (Sept. 26, 2017), http://www.ncsl.org/research/energy/state-electric-vehicle-incentives-state-chart.aspx; Mia Yamauchi, *Updated 2017 Incentives for Electric Vehicles and EVSE (For Tesla and More)*, PLUGLESS, https://www.pluglesspower.com/learn/updated-2017-incentives-electric-vehicles-evse-state-federal-tax-credits-grants-loans-rebates (last visited Sept. 30, 2018). Notably, several states, including California, have also imposed additional license fees or taxes on EV owners because those drivers do not pay state and federal gas taxes. *See* WOLLENBERG, *supra* note 62 (discussing state incentives and tax credits for EVs); Julian Spector & Julia Pyper, *Updated: 17 States Now Charge Fees for Electric Vehicles*, GREENTECH MEDIA (July 5, 2017), https://www.greentechmedia.com/articles/read/13-states-now-charge-fees-for-electric-vehicles.

133. Hartman & Dowd, *supra* note 132; Yamauchi, *supra* note 132. For an example of a state mandate on utilities to offer time of use rates for EV charging, see David Shaffer, *Minnesota Regulators Approve Special Off-Peak Power Rates for Plug-in Vehicle Charging*, STAR TRIB. (May 21, 2015,

local level, cities in many regions have created their own policies to support EVs and EV charging. These include publicly funded EV charging, parking benefits, and programs to incentive owners of residential buildings to install EV chargers through rebates, building code amendments to encourage EV charging station deployment, and other incentives.[134]

In addition, states, nonprofits, and other stakeholders have joined together around the country to create regional initiatives like EV charging corridors. These include:

- *Charge Up Midwest*, an initiative consisting of regional and national environmental and clean energy groups "committed to helping the Midwest minimize carbon emissions from the transportation sector" by engaging "stakeholders to support actions that increase investment in EV infrastructure, create a more resilient and low-carbon grid, [and] expand public and policymaker education about the benefits of EVs."[135]
- *Northeast Electric Vehicle Network*, a partnership between states, other public entities, private industry, nonprofits, and utilities "to coordinate electric vehicle infrastructure planning and deployment throughout the Northeast and Mid-Atlantic region."[136]
- *Nevada Electric Highway*, "a partnership between the [Nevada] Governor's Office of Energy, NV Energy [(the state's largest utility)], and Valley Electric Association" designed to place EV charging stations at strategic locations between Reno and Las Vegas to connect the state's northern and southern urban populations along the U.S. 95 corridor.[137]

11:33 PM), http://www.startribune.com/minnesota-regulators-approve-special-off-peak-power-rates-for-plug-in-vehicle-charging/304659201.

134. *See* KHAN & VAIDYANATHAN, *supra* note 47, at 15–16, 18–19 (describing municipal utility incentives); ALANA MILLER ET AL., PLUGGING IN: READYING AMERICA'S CITIES FOR THE ARRIVAL OF ELECTRIC VEHICLES 15–27 (2018); Brianna Blaney, *The 10 Best US Cities to Own an Electric Vehicle in 2017*, FLEETCARMA (June 28, 2017), https://www.fleetcarma.com/10-best-us-cities-electric-vehicle-2017; *Drive Electric,* L.A. DEP'T OF WATER & POWER, https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-gogreen/c-gg-driveelectric (last visited Sept. 23, 2018); Katie Pyzyk, *Salt Lake City Removes EV Charging Fees to Encourage Use*, SMART CITIES DIVE (Mar. 7, 2018), https://www.smartcitiesdive.com/news/salt-lake-city-removes-ev-charging-fees-to-encourage-use.

135. Katelyn Bocklund, *Charging Up the Midwest,* GREAT PLAINS INST. (Mar. 29, 2017), http://www.betterenergy.org/blog/charge-up-midwest.

136. *Northeast Electric Vehicle Network*, TRANSP. & CLIMATE INITIATIVE OF NE. & MID-ATL. STATES, http://www.transportationandclimate.org/content/northeast-electric-vehicle-network (last visited Sept. 23, 2018).

137. *See Nevada Electric Highway*, NEV. GOVERNOR'S OFFICE OF ENERGY, http://energy.nv.gov/Programs/Nevada_Electric_Highway (last visited Sept. 23, 2018). The goal of Phase I of the initiative, which was nearing completion in 2017, was to reduce range anxiety during the seven and a half hour, 400-mile trip between the two urban centers and encourage EV adoption by providing free EV charging to users for the first five years through grants and funding by the state and NV Energy. Phase II of the project, which began in 2017, is a collaborative effort between the Governor's Office of Energy, the Nevada Department of Transportation, Nevada's electric

- *Intermountain West EV Corridor*, a 2017 collaboration between Nevada, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming to develop best practices and procedures to promote EV adoption, reduce range anxiety, coordinate EV charging station locations to avoid redundancy, create minimum standards for charging stations, and coordinate funding for implementation.[138]
- *West Coast Electric Highway*, a "network of . . . DC fast charging stations located every 25 to 50 miles along Interstate 5, Hwy 99, and other major roadways in British Columbia, Washington, Oregon, and California."[139]

Notably, electric utilities often partner with cities, states, the automobile industry, and other stakeholders to provide incentives for EVs or EV charging. For example, Utah electric utility Rocky Mountain Power announced in 2018 that it had joined with Summit County, Salt Lake City, Park City, Uber, Lyft, and Utah's Live Electric campaign to begin installing over 700 Level 3 DC fast charging stations in the region to address localized air pollution as well as carbon emissions.[140] Rocky Mountain Power's CEO stated that "[t]he group[] [is] working on infrastructure and policies necessary to 'support 50,000 more electric cars on Utah's roads over the next 10 years.'"[141] The idea is to "create a 'clean-air corridor' from the Salt Lake City International Airport to downtown Salt Lake City [and] Summit County . . . to encourage ride-sharers like Uber and Lyft to adopt [EVs]."[142] Utah's Lieutenant Governor wants the project to be "a showcase to the world" and to encourage drivers to purchase EVs and then "become 'missionaries' in promoting [EVs]."[143]

D. THE RELATIONSHIP BETWEEN PRIVATE EV CHARGING COMPANIES AND ELECTRIC UTILITIES

As discussed earlier, private EV charging companies must work with utilities to provide the electricity necessary to charge the vehicles. This

cooperatives, and local businesses to electrify the entire state highway system. *See* Press Release, Nev. Governor's Office of Energy, Phase II of Nevada Electric Highway Kicked-Off (May 30, 2017), *available at* http://energy.nv.gov/Media/Press_Releases/2017/Phase_II_of_Nevada_Electric_Highway_Kicked-off.

138. Memorandum of Understanding Between Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming Regional Electric Vehicle Plan for the West (Oct. 12, 2017), https://www.colorado.gov/governor/sites/default/files/rev_west_plan_mou_10_12_17_all_states_final_1.pdf.

139. *West Coast Electric Highway*, W. COAST GREEN HIGHWAY, http://www.westcoastgreenhighway.com/electrichighway.htm (last visited Sept. 23, 2018).

140. *See* Ashley Imlay, *New Electric Vehicle Charging Stations Installed to Help Create 'Clean Air Corridor,'* DESERET NEWS (Jan. 17, 2018, 3:58 PM), https://www.deseretnews.com/article/900007809/new-electric-vehicle-charging-stations-installed-to-help-create-clean-air-corridor.html.

141. *Id.*

142. *Id.*

143. *Id.*

provides the utility another source of investment for which it can potentially recover its costs of investment plus a rate of return. To date, there have been different approaches taken among intervenors in state regulatory proceedings over the extent to which utilities can provide charging services themselves rather than simply providing the electrical upgrades needed for the EV charging stations.[144] These disputes are discussed in more detail in Part IV, but the options for utility involvement in EV charging are set forth here for background.

From the utility perspective, there are currently three ways the utility can invest in "public-facing charging infrastructure at multi-unit dwellings, workplaces, or in public locations and along charging corridors."[145] In all three models, the utility invests in and owns the traditional utility infrastructure such as the transformers, utility services, and meters necessary for the charging station (known as the "EV Service Connection"). From there, one model of utility ownership is the "make-ready" model, in which the utility invests in and owns the EV Service Connection infrastructure plus the panels, conduits, and wiring that support the charging station (known as the "EV Supply Infrastructure" or "EVSE") but the site host contracts with a private charging network like ChargePoint, Blink, EVGo, Greenlots, eMotorWerks, or others to purchase and maintain the EV charging station and related equipment (known as the "EV Charger Equipment"). A second model of utility ownership is the "end-to-end" model, where the utility invests in and owns the EV Supply Infrastructure and the EV Charger Equipment. A third model of utility ownership for EV charging is a "hybrid model" where the utility is permitted "end-to-end" utility ownership "in critical and demonstrably underserved market segments (e.g., multi-unit dwellings, and any location within disadvantaged communities) while allowing only 'make-ready' ownership in other market segments (e.g., workplace and public charging)."[146] In California, where state utility commission evaluations of utility proposals is further along than in other states, the state public utilities commission has approved all three of the above-described models in different circumstances.[147]

One of the most significant long-term cost concerns associated with EV charging today is the application of utility "demand charges," which are "special charges based on the peak rate of electricity consumption in a month,

144. *See infra* Part IV.

145. Commission's Own Motion to Open a Docket, Case No. U-18368 at 19 (Mich. Pub. Serv. Comm'n July 31, 2017) (comments of Sierra Club); M.J. BRADLEY & ASSOCS., ACCELERATING THE ELECTRIC VEHICLE MARKET 12–14 (2017).

146. *Commission's Own Motion to Open a Docket*, Case No. U-18368, at 19–23; *see also* ALLEN ET AL., *supra* note 55, at 8–11 (describing the utility investment models as (1) make-ready model, (2) utility owner-operator model, and (3) utility rebates for EV charging installation).

147. *Commission's Own Motion to Open a Docket*, Case No. U-18368, at 21–24.

which are applied in addition to the cost of the electricity itself."[148] Demand charges were originally "designed for small-to-medium commercial customers and industrial customers" whose sudden spikes in usage would negatively impact the grid.[149] Because stations (particularly Level 3 DC fast chargers) can often lay dormant and then suddenly come online to charge a passing vehicle, it is common for demand charges to be assessed to stations.[150] The results can be economically disastrous; a study by the Rocky Mountain Institute found "that demand charges can be responsible for over 90 percent of a charging station's electricity costs."[151] The report called for new tariffs to be filed for EV charging stations, replacing demand charges with both time-of-use rates and geographically varying rates, such that the pricing of electricity used for EV charging is still market-responsive, but not punitively so.[152] In response to this problem, the Connecticut Public Utilities Regulatory Authority approved a utility rate rider pilot program in 2014 to eliminate demand charges on public DC fast charging stations in order to "allow for the more rapid deployment of DC fast charging stations and increased adoption of electric vehicles by consumers" as well as to "alleviate the economic impediment of high demand charges relative to actual electricity consumption."[153] In 2018, the California Public Utilities Commission approved a request from Southern California Edison to waive all demand charges for EV charging for at least five years.[154]

As this Part illustrates, state public utility commissions will necessarily play a central role in any move toward transportation electrification in the United States. These independent commissions regulate the investments electric utilities can make, the rates they can charge, and the other actors, such as

148. Chris Nelder, *Rate-Design Best Practices for Public Electric-Vehicle Chargers*, ROCKY MTN. INST. (Apr. 6, 2017), https://rmi.org/rate-design-best-practices-public-electric-vehicle-chargers; *see also* FITZGERALD & NELDER, *supra* note 53, at 43–44 (discussing proposed tariffs by utilities in California to suspend monthly demand charges for a five-year period and recover more costs through energy charges, and then phase in demand charges at an alternative rate, thus "improv[ing] the economics of operating a public DCFC, while still allowing the utility to recover costs adequately, being consistent with good rate-design principles, and helping to achieve the societal objective of widespread vehicle electrification").

149. Nelder, *supra* note 148.

150. *Id.*

151. *Id.*

152. *Id.*; *see* Katie Fehrenbacher, *Report: Public Electric-Car Chargers Are Being Crushed by Demand Charges*, GREENTECH MEDIA (Apr. 6, 2017), https://www.greentechmedia.com/articles/read/public-electric-car-chargers-are-being-crushed-by-demand-charges; Robert Walton, *Is Utility Rate Design the Key to Widespread Electric Vehicle Adoption?*, UTIL. DIVE (Apr. 12, 2017), https://www.utilitydive.com/news/is-utility-rate-design-the-key-to-widespread-electric-vehicle-adoption.

153. Request of CL&P for Approval of Electric Vehicle Rate Rider Pilot, No. 13-12-11, at *4 (Conn. Pub. Util. Regulatory Auth. June 6, 2014), 2014 WL 2801554.

154. NAT'L ASS'N OF REGULATORY UTIL. COMM'RS, STATE COMMISSION STAFF SURGE CALL: ELECTRIC VEHICLES 1 (2018) (reporting on CPUC approval of Southern California Edison rate for commercial customers waiving demand charges for five years and linking to CPUC decision).

private EV charging companies, that would offer potentially EV charging services to drivers. These commissions can only act, however, through authority state legislatures delegate to them. Thus, when it comes to utility investment in EV charging, questions arise regarding the extent to which state public utility commissions can shape policy regarding utility investment in EV charging with and without prior legislative action. Part IV evaluates recent actions by state legislatures, state public utility commissions, and investor-owned utilities with regard to utility investment in EV charging. It shows that while legislative action is ultimately necessary to develop a framework for utility investment in EV charging, state public utility commissions can play a major role in developing the process and evaluating options to guide investment before, during, and after action by state legislatures.

IV. STATE POLICY APPROACHES TO UTILITY INVESTMENT IN EV CHARGING INFRASTRUCTURE

This Part evaluates how state legislatures, state public utility commissions, investor-owned utilities, environmental groups, charging companies, and other market actors are responding to efforts by some or all of these actors to encourage investment in EV charging. The purpose of this evaluation is to determine whether there are discernable patterns to the legislative, regulatory and industry actions to date regarding investment in EV charging and whether there is a particular model that works best either across the country, or in a particular region or state based on politics, geography, climate, consumer preferences, population density, or other factors. Subpart A analyzes approaches toward utility investment in EV charging in California and the "ZEV states"—those states that have adopted California's zero-emission vehicle mandate and have, for the most part, enacted legislation to support utility investments in EV charging infrastructure. Subpart B turns to the rest of the country—those states that have not adopted California's ZEV mandate—and finds that there are four primary paths to state regulatory consideration of utility investment in EV charging infrastructure: (1) the state legislature has directed utilities to propose investments and programs to state public utility commissions to support transportation electrification; (2) the state legislature is silent, but the state public utility commission recognizes the issue as an important one and opened an investigative docket to address the issue on a statewide basis through forward-looking rulemaking; (3) a utility has submitted a proposal to a state utility commission and the commission has issued a decision in the context of that particular request; and (4) a utility, an environmental group, or another interested party has injected the issue of utility investment in EV charging and rate recovery into settlement

negotiations for an existing rate case for that utility.[155] The following chart provides a roadmap that summarizes the discussion in this Part:

EV Charging Infrastructure Action Chart (Dec. 2018)

	Legislature is first mover	**Commission is first mover**
Legislative Action	Nevada, Oregon, Virginia, Washington	California, Massachusetts
	Investigative/Policy docket	**Commission pilot project approval**
Commission Action	Colorado, Maryland, Michigan, Minnesota, New Jersey, New York, Pennsylvania, others	California, Massachusetts, Nevada, Oregon, Washington
	Utility-proposed pilot projects	**Rate case settlement includes utility investment in EV charging**
Regulated Party/Stakeholder Action	Kansas, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, Rhode Island	Florida, Ohio

A. THE CALIFORNIA ZEV MODEL—USING DECARBONIZATION GOALS TO SUPPORT EV ADOPTION AND UTILITY EV CHARGING INVESTMENT

When Congress enacted the Clean Air Act in 1970 (amending earlier federal legislation to control air pollution), it recognized that California had acute air pollution problems from the transportation section and had already enacted laws trying to address them. As a result, the Clean Air Act contains a waiver provision[156] that allows only California to set stricter limits on automobile air emissions than those the federal government imposes if the U.S. Environmental Protection Agency grants California a waiver to do so. The Clean Air Act also allows other states to follow the California standards, once the EPA has approved them.[157] Thus, at any particularly time there can

155. For a discussion the utility ratemaking process see *supra* Section III.A.

156. Under Section 209 of the Clean Air Act, the EPA Administrator shall grant California's request for a waiver unless it finds that (1) California acted arbitrarily and capriciously in finding that its standards are at least as protective of public health and welfare as the applicable federal standards; (2) California does not need the standards to meet compelling and extraordinary circumstances; or (3) the standards are not consistent with Section 202(a) of the Clean Air Act. *See* 42 U.S.C. § 7543 (2012).

157. *Id.* § 7507.

be two sets of auto emission standards—the federal standard and a California standard that may apply in both California and states that adopt the California standards.[158] This Subpart summarizes California's ambitious program to require auto manufacturers to invest in the technology needed to create and sell more EVs and other low and zero-emission vehicles in that state, and the decision by several other states to adopt California's program. It then focuses on the legislative and regulatory polices within California to encourage the expansion of EV charging infrastructure needed to support those vehicles.

1. California's ZEV Program

Through a series of executive orders and legislative enactments beginning in 2012, California has put in place strong policies to accelerate the adoption of Zero-Emission Vehicles ("ZEVs") in California and throughout the country, and to enlist public and private resources to build the infrastructure necessary to support ZEVs.[159] In response to Governor Brown's 2012 Executive Order directing the state to accelerate the market for ZEVs, the California Air Resources Board in 2013 adopted a ZEV plan as part of its Advanced Clean Cars ("ACC") program. The ACC program combines efforts to control both criteria air pollutants and GHG emissions in a single set of requirements for model year 2015–2025 automobiles.[160] The ACC is made up of two components—the Low Emission Vehicle ("LEV") regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the ZEV regulations that require auto manufacturers "to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles [known as "BEVs" and "FCEVs"]) and plug-in hybrid electric vehicles ("PHEV") in the 2018 through 2025 model years."[161] The EPA granted a waiver for the ACC program in 2013.[162]

As of 2018, 15 states have adopted California's LEV regulations: "Connecticut, Delaware, Georgia, Maine, Maryland, Massachusetts, New

158. *See Vehicle Emissions California Waivers and Authorizations*, EPA, https://www.epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations (last visited Sept. 23, 2018).

159. *See* Exec. Order of Governor Edmund G. Brown, Jr., No. B-16-2012 (Cal. Mar. 23, 2012) (directing California agencies to facilitate ZEV adoption and setting ZEV goals); Joseph Bebon, *California Gov. Signs Bundle of Clean Transportation Bills into Law*, NGT NEWS (Oct. 11, 2017), https://ngtnews.com/california-gov-signs-bundle-clean-transportation-bills-law. *See generally California Climate Change Executive Orders*, CAL. CLIMATE CHANGE, http://www.climatechange.ca.gov/state/executive_orders.html (last visited Sept. 30, 2018) (describing Governor Brown's executive orders relating to climate change).

160. The ACC program builds on executive orders and legislative action in the state since 2012 to promote ZEVs and reduce the state's reliance on fossil fuels in the transportation sector. *See* Bebon, *supra* note 159.

161. CAL. AIR RES. BD., CALIFORNIA'S ADVANCED CLEAN CARS MIDTERM REVIEW at ES10 (2018).

162. M.J. BRADLEY & ASSOCS., CALIFORNIA'S LIGHT-DUTY VEHICLE EMISSIONS STANDARDS: THE CLEAN AIR ACT WAIVER, STANDARDS HISTORY, AND CURRENT STATUS 5–6 (2017).

Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, and Washington."[163] Nine of those states—Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont—have also adopted the ZEV regulations or otherwise have ZEV mandates.[164] Together, the ZEV states accounted for over 25% of new car registrations in 2015.[165] CARB's goal in the 2012 program was to have 1.5 million ZEVs on California roads by 2025, making up approximately 15% of new car sales in model year 2025.[166] CARB's mid-term review of the ZEV program in 2017 concluded that a more realistic scenario based on current data for past sales and modeling for future years would result in 1.2 million ZEVs on the road by 2025.[167]

"The ZEV program assigns each automaker 'ZEV credits'" and auto manufacturers must maintain an amount of ZEV credits that equals a percentage of the manufacturer's non-electric sales in the state, with that percentage increasing each year.[168] Under the regulations, in 2018, each manufacturer must ensure that 2.5% of its total auto sales are ZEVs; that percentage rises each year so that approximately 8% of total auto sales must be ZEVs by 2025.[169] The credit per ZEV vehicle sold varies by type of automobile and battery range.[170] There are restrictions on the amount of credits that can come from PHEV as opposed to BEVs or FCEVs. Manufacturers can purchase or trade ZEV credits to comply with the

163. *Id.* at 2 n.3. Colorado's Governor issued an executive order in June 2018 directing the state Department of Public Health and Environment to develop a rule that would establish the LEV program. *See* David Migoya, *Colorado Will Adopt California-Style Low-Emission Vehicle Standards under Hickenlooper Order*, DENVER POST (Aug. 19, 2018, 4:43 PM), https://www.denverpost.com/2018/06/19/colorado-california-emission-vehicle-standards.

164. ZEV TASK FORCE, *supra* note 52, at 3; Maxine Joselow, *Defying Trump, 9 States Roll Out Plan to Boost EVs*, GOVERNORS' WIND & SOLAR ENERGY COAL. (June 21, 2018), https://governorswindenergycoalition.org/defying-trump-9-states-roll-out-plan-to-boost-evs (reporting on 2018 Multi-State ZEV Action Plan); Nadja Popovich, *California Is Ready for a Fight Over Tailpipe Emissions. Here's Why.*, N.Y. TIMES (Apr. 30, 2018), https://www.nytimes.com/interactive/2018/04/30/climate/california-auto-emissions.html.

165. *See* Dave Guilford, *ZEV Mandates Get Harder to Ignore*, AUTO. NEWS (June 27, 2016, 12:01 AM), http://www.autonews.com/article/20160627/OEM11/306279987/zev-mandates-get-harder-to-ignore.

166. Herman K. Trabish, *Can California Hit 1.5M Zero-Emission Vehicles by 2025?*, UTIL. DIVE (Apr. 27, 2017), https://www.utilitydive.com/news/can-california-hit-15m-zero-emission-vehicles-by-2025.

167. CAL. AIR RES. BD., *supra* note 161, at A1–A4; GOVERNOR'S INTERAGENCY WORKING GROUP ON ZERO-EMISSION VEHICLES, 2016 ZEV ACTION PLAN 15 (2016) [hereinafter 2016 ZEV ACTION PLAN].

168. *What is ZEV?*, UNION OF CONCERNED SCIENTISTS, https://www.ucsusa.org/clean-vehicles/california-and-western-states/what-is-zev (last updated Oct. 31, 2016).

169. *Id.*

170. For instance, starting in 2018, PHEVs—which run on both a battery and a traditional engine—"receive between 0.4 and 1.3 credits per vehicle sold" while BEVs and FCEVs "receive between 1 and 4 credits, based on range." *Id.* The Tesla Model S, with a range of more than 200 miles, receives 3.3 credits per car sold, "while the 84-mile range Nissan Leaf is credited 1.8 ZEV credits per car sold." *Id.*

regulations and can also carry over excess credits from one year to the next.[171] Auto manufacturers also receive credits in all other ZEV states for sales of ZEVs in California.[172] This allows companies to create credit banks for compliance in ZEV states other than California even if they haven't sold very many cars in those states.[173] But this provision expires in 2018 for all vehicles except for FCEVs, thus reducing the incentive for concentrating sales of ZEVs solely in California and encouraging auto manufacturers to make more ZEV models available in the other nine ZEV states to obtain compliance in those states.[174]

2. California Policies to Promote EV Charging Infrastructure

The 2016 ZEV Action Plan summarizes progress to date on EVs and identifies six, broad goals for future EV expansion:

1. Achieve mainstream consumer awareness of ZEV options and benefits
2. Make ZEVs an affordable and attractive option for drivers
3. Ensure convenient charging and fueling [i]nfrastructure for greatly expanded use of ZEVs
4. Maximize economic and job opportunities from ZEV technologies
5. Bolster ZEV market growth outside of California [and]
6. Lead by example integrating ZEVs into state government.[175]

As part of the third goal of ensuring convenient charging and fueling infrastructure for expanded use of ZEVs, the 2016 ZEV Action Plan states that "[a] massive scale up of charging and fueling stations is needed to support 1 million ZEVs by 2020 and 1.5 million ZEVs by 2025."[176] The 2016 ZEV Action plan sets forth numerous action items relating to EV charging infrastructure, including support to "[d]evelop guidance for utility investment, evaluate utility proposals and monitor implementation of PEV charging infrastructure deployment[]."[177] As of September 2017, California had approximately 350,000 EVs on the road (including PHEVs), or approximately two percent of the state's vehicles, and had approximately

171. Tesla and Nissan in particular have sold a large number of ZEV credits to other auto manufacturers on the ZEV credit market. *See, e.g.*, Trefis Team, *Tesla's Lucrative ZEV Credits May Not Be Sustainable*, FORBES (Sept. 1, 2017, 11:22 AM), https://www.forbes.com/sites/greatspeculations/2017/09/01/teslas-lucrative-zev-credits-may-not-be-sustainable (explaining how ZEV credits are bought and sold); *2016 Zero Emission Vehicle Credits*, CAL. AIR RES. BD., https://www.arb.ca.gov/msprog/zevprog/zevcredits/2016zevcredits.htm (last updated Oct. 13, 2017).

172. *What is ZEV?*, *supra* note 168.

173. *Id.*

174. *Id.*

175. 2016 ZEV ACTION PLAN, *supra* note 167, at 14.

176. *Id.* at 23.

177. *Id.*

13,000 public EV charging stations in the state.[178] In 2018, Governor Brown proposed a new, eight-year plan, for the state to spend $2.5 billion to add ZEV fueling infrastructure and to fund consumer rebates for ZEVs.[179] He also issued an executive order increasing the state's ZEV goal from 1.5 million by 2025, to 5 million by 2030.[180]

California laws promoting EVs focus heavily on the environmental and GHG reduction benefits.[181] For instance, California adopted Senate Bill 350—the Clean Energy and Pollution Reduction Act of 2015—which increased the state's renewable energy mandate on electric utilities to 50%, doubled energy efficiency requirements, and required the California Public Utilities Commission ("CPUC") to promote the electrification of the transportation sector.[182] The legislature's ultimate goal through these actions is to reduce statewide emissions of GHGs to 40% below 1990 levels by 2030 and to 80% below 1990 levels by 2050.[183]

With regard to electrifying transportation, the California legislature made the following findings in Section 740.12:

- Widespread transportation electrification requires increased access for disadvantaged communities, low- and moderate-income communities, and other consumers of zero-emission vehicles, . . . and increased use of those vehicles in those communities and by other consumers to enhance air quality, lower greenhouse gas[] emissions, and promote overall benefits to those communities and other consumers.[184]
- Widespread transportation electrification should stimulate innovation and competition, enable consumer options in charging equipment and services, attract private capital investments, and create high-quality jobs for Californians, where technologically feasible.[185]
- Deploying electric vehicles should assist in grid management, integrating generation from eligible renewable energy resources, and

178. *See* Mark Chediak, *California Doesn't Have Enough Charging Stations to Hit Its Electric Car Goals*, BLOOMBERG BUSINESSWEEK (Nov. 2, 2017, 5:00 AM), https://www.bloomberg.com/news/articles/2017-11-02/california-doesn-t-have-enough-charging-stations-to-hit-its-electric-car-goals.

179. Anne C. Mulkern, *Governor Brown Seeks $2.5B for Clean Cars Push*, GOVERNORS' WIND & SOLAR ENERGY COAL. (Jan. 30, 2018), http://governorswindenergycoalition.org/governor-brown-seeks-2-5b-for-clean-cars-push.

180. *Id.*

181. *See, e.g.*, CAL. ENERGY COMM'N, ZERO-EMISSION VEHICLES AND INFRASTRUCTURE 1–2 (2017).

182. CAL. PUB. UTIL. CODE § 740.12(a)(1) (West 2016).

183. *Id.* § 740.12(a)(1)(D).

184. *Id.* § 740.12(a)(1)(C).

185. *Id.* § 740.12(a)(1)(F).

reducing fuel costs for vehicle drivers who charge in a manner consistent with electric grid conditions.[186]

- Deploying electric vehicle charging infrastructure should facilitate increased sales of electric vehicles by making charging easily accessible and should provide the opportunity to access electricity as a fuel that is cleaner and less costly than gasoline or other fossil fuels in public and private locations.[187]

The law also directed the state's electric utilities to undertake transportation electrification activities and submit proposals to the CPUC for recovery of costs associated with those proposals.[188] Specifically, the law states that the CPUC, in consultation with other state agencies

> shall direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, . . . and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. Programs proposed by electrical corporations shall seek to minimize overall costs and maximize overall benefits.[189]

As for utility proposals for EV charging infrastructure, the legislature directed the CPUC to "approve, or modify and approve, [transportation electrification] programs and investments . . ., including those that deploy charging infrastructure, via a reasonable cost recovery mechanism."[190] In doing so, the CPUC must act consistently with the principles set out above in Section 740.12, must ensure that any approval of utility programs "do not unfairly compete with nonutility enterprises," and "are in the interests of ratepayers."[191] The legislation defines the "interests of ratepayers" to include short or long term direct benefits consistent with "[s]afer, more reliable, or less costly . . . electrical service [or] . . . [a]ny one of the following: [i]mprovement in energy efficiency of travel, [r]eduction of health and environmental impacts from air pollution, [r]eduction in greenhouse gas emissions [from] electricity, . . . [i]ncreased use of alternative fuels, [or]

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186. *Id.* § 740.12(a)(1)(G).

187. *Id.* § 740.12(a)(1)(H).

188. *Id.* § 740.12(b).

189. *Id.*

190. *Id.* § 740.12(b). The legislation defines "transportation electrification" as

> the use of electricity from external sources of electrical power, including the electrical grid, for all or part of vehicles, vessels, trains, boats, or other equipment that are mobile sources of air pollution and greenhouse gases and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity.

Id. § 237.5.

191. *Id.* § 740.12(b).

[c]reating high-quality jobs or other economic benefits."[192] By defining "ratepayer interests" broadly to include not only cost and reliability of electricity service but also reduction of GHG emission and other environmental externalities, the legislature gave the CPUC a mandate to approve utility projects—including investment in EV charging stations—that would facilitate transportation electrification.

Notably, Senate Bill 350 was an iterative process, which began with the CPUC opposing utility involvement or cost recovery in EV charging infrastructure. In fact, until 2014, the CPUC expressly excluded utilities from owning EV charging stations because they were worried that utility involvement would stifle a nascent market for private charging companies the state hoped to create.[193] But when the strong business case for non-utility public EV charging did not materialize, and the state became worried about meeting transportation electrification and GHG reduction goals, the CPUC reversed its decision and solicited proposals from the major California utilities.[194] In 2015, the legislature enacted Senate Bill 350, which resulted in the state's three major utilities filing for $1 billion in EV charging investments that same year, which the CPUC found to be excessive.[195] The utilities came back in 2016 with more modest proposals (a total of approximately $200 million in investment),[196] which the CPUC approved in late 2016. The CPUC required the proposals to include EV charging infrastructure to serve multi-family housing and low-income neighborhoods to address the equity and cross-subsidization problems inherent in utility rate recovery for EV charging infrastructure projects.[197]

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192. *Id.* § 740.8. In another section, the law reiterates that the costs and expenses of transportation electrification programs shall not be "passed through" to electric ratepayers unless the CPUC finds that the programs are in the ratepayers' interests. *Id.* § 740.3(c).

193. *See, e.g.*, Martha T. Moore, *Should Utilities Build Charging Stations for Electric Cars?*, PEW CHARITABLE TRS. (Sept. 11, 2017), http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2017/09/11/should-utilities-build-charging-stations-for-electric-cars (discussing CPUC decision allowing the state's utilities to build EV charging stations); Jeff St. John, *California Utilities Likely to Be Back in the EV Charging Business*, GREENTECH MEDIA (Nov. 18, 2014), https://www.greentechmedia.com/articles/read/california-utilities-are-back-in-the-ev-charging-game (discussing CPUC decision to lift ban on utility investment in EV charging).

194. Jeff St. John, *California Utilities Seek $1B to Build Out Electric Vehicle Infrastructure*, GREENTECH MEDIA (Jan. 24, 2017), https://www.greentechmedia.com/articles/read/california-utilities-seek-1b-to-build-out-electric-vehicle-infrastructure (discussing the proposals by the state's three largest electric utilities for $1 billion in investments in EV charging infrastructure over five years, which include a combination of fast charging stations, electric bus and truck charging systems, and new electric rates and incentives, after CPUC lifted a ban on utility investment in EV charging).

195. *Utility Involvement in Electric Vehicle Charging Infrastructure: California at the Vanguard*, CTR. FOR STRATEGIC & INT'L STUD. (Apr. 6, 2016), https://www.csis.org/analysis/utility-involvement-electric-vehicle-charging-infrastructure-california-vanguard.

196. *Id.*

197. *Id.*

Also in 2016, the CPUC issued a guidance ruling setting forth the requirements for utility applications under Senate Bill 350 going forward.[198] In January 2017, the three largest California electric utilities—Pacific Gas and Electric Company ("PG&E"), Southern California Edison ("SCE"), and San Diego Gas & Electric ("SDG&E") filed additional applications for proposals totaling $780 million in transportation electrification projects over a five-year period.[199] Several other smaller utilities also submitted applications for projects in their service territories.

In January 2018, the CPUC issued its first decision on the three major utilities' applications, approving 15 "priority pilot projects" totaling $41 million.[200] These projects include electrification of school buses, delivery trucks, airport and seaport equipment, truck stops, and commuter locations; installation of Level 3 DC fast chargers for urban locations; incentives for car dealerships; deployment of charging infrastructure in "disadvantaged communities";[201] and $1.7 million for reporting, data collection, and evaluation of projects to ensure the pilots' results are well-documented.[202] Later in 2018, the CPUC approved the utilities' investment in even more

198. *See* Order Instituting Rulemaking to Consider Alternative-Fueled Vehicle Programs, Tariffs, and Policies, R.13-11-007 (Cal. Pub. Utils. Comm'n Sept. 14, 2016) (setting forth criteria for utility proposals for EV-related investment); Robert Walton, *California PUC Approves PG&E Electric Vehicle Infrastructure Plan*, UTIL. DIVE (Dec. 20, 2016), https://www.utilitydive.com/news/california-puc-approves-pge-electric-vehicle-infrastructure-plan (reporting on CPUC approval of PG&E's $130 million proposal "to install 7,500 electric vehicle charging points in its service territory, allowing the utility to own about a third of them" as well as proposals the CPUC approved earlier in 2016 for EV charging plans for SCE ($22 million plan called "Charge Ready") and SDG&E ($45 million plan called "Power Your Drive") and describing each program).

199. *See Transportation Electrification Activities Pursuant to Senate Bill 350*, CAL. PUB. UTILS. COMM'N, http://www.cpuc.ca.gov/sb350te (last visited Sept. 27, 2018).

200. *See* Application of San Diego Gas & Elec. Co. (U 902E) for Approval of SB 350 Transp. Electrification Proposals, Application Nos. 17-01-020, 17-01-021, 17-01-022 at *1 (Cal. Pub. Utils. Comm'n Jan. 11, 2018) (final decision), 2018 WL 555605; *see also* Application of San Diego Gas & Elec. Co. for Approval of SB 350 Transp. Electrification Proposals, Application Nos. 17-01-020, 17-01-021, 17-01-022 at 2 (Cal. Pub. Utils. Comm'n Nov. 22, 2017) (proposed decision) (proposing a final decision of the California Public Utilities Commission).

201. In California, "disadvantaged communities" or "DACs" are those communities most impacted by pollution and are a priority for transportation electrification investments. *See, e.g.*, S. CAL. EDISON, ENVIRONMENTALLY IMPACTED COMMUNITIES (defining disadvantaged communities in the context of pollution exposure); S. CAL. EDISON, TRANSPORTATION ELECTRIFICATION: REDUCING EMISSIONS, DRIVING INNOVATION 6, 9 (2017); Jake Levine & Michael Rebuck, *State Investments in Electric Vehicle Charging Infrastructure*, INSIDE ENERGY & ENV'T (June 23, 2018), https://www.insideenergyandenvironment.com/2018/06/state-investments-in-electric-vehicle-charging-infrastructure (discussing California utilities' investments in DACs).

202. *See* Press Release, Cal. Pub. Utils. Comm'n, CPUC Approves Transportation Electrification Pilot Projects Aimed at Reducing Greenhouse Gases (Jan. 11, 2018), *available at* http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442455912 (providing summary of proposed decision and breakdown of approval of costs for priority review projects for each of the three utilities); Anne C. Mulkern, *Utilities to Spend $41M on Electric Vehicle Projects*, CLIMATEWIRE (Jan. 12, 2018), https://www.eenews.net/climatewire/stories/1060070867.

ambitious electrification projects, totaling $738 billion over five years.[203] The projects included in the investment focus on medium and heavy duty infrastructure (fleet delivery services, school bus fleets, transit but fleets, etc.); residential infrastructure; public DC fast charging on highways and urban areas; and new EV rates for commercial and residential customers.[204]

Throughout the commission's review of the utilities' proposals for EV charging investments, a significant point of dispute was the extent to which the utilities would be allowed to own the EV charging stations and recover a return on investment from ratepayers. Non-utility companies in the charging station market sometimes oppose utility ownership of the stations themselves, arguing that utility ownership will stifle market growth and competition.[205] In other cases, however, at least some charging companies have advocated before the CPUC for utility ownership as a means to foster improved reliability and ensure EV load growth supports the electric grid.[206]

In sum, California has strong legislative and regulatory policies that support utility investments to accelerate widespread transportation electrification. Moreover, the state has experimented with different approaches to utility involvement in EV charging, and continues to do so through CPUC review and approval of individual projects. Finally, the state's commitment to addressing climate change and doing so through transportation electrification is a major driver behind utility investment in EV charging infrastructure and other programs to accelerate transportation electrification. This commitment can serve as a model for some states but certainly not for all states, particularly those that do not recognize climate change as a problem or do not embrace California's policies on environmental and energy issues.

3. Policies Governing Utility Investment in EV Charging in Other ZEV States

As noted above, nine other states have adopted ZEV mandates. A review of legislative and commission actions in those states reveals that a state's

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203. *See* CAL. PUB. UTILS. COMM'N, SUMMARY OF DECISION ON TRANSPORTATION ELECTRIFICATION PROGRAM PROPOSALS FROM THE INVESTOR-OWNED UTILITIES 1 (2018).

204. *See id.* at 2; *Application of San Diego Elec. Co. (final decision)*, at *3; *see also supra* note 199 (California PUC website summarizing transportation electrification projects approved under Senate Bill 350).

205. *See, e.g.*, Portland Gen. Elec. Co., No. UM 1811 (Pub. Util. Comm'n Or. Feb. 16, 2018) (order) (summarizing arguments by ChargePoint opposed to utility ownership of charging stations); Jeff St. John, *PG&E's EV Charging Plan Still Angers Industry Players—and Here's Their Alternative*, GREENTECH MEDIA (July 26, 2016), https://www.greentechmedia.com/articles/read/pges-ev-charging-plan-still-angers-industry-players-and-heres-their-alterna; Herman K. Trabish, *How PG&E's EV Charging Pilot Will Test Utility Ownership Models*, UTIL. DIVE (Dec. 5, 2016), https://www.utilitydive.com/news/how-pges-ev-charging-pilot-will-test-utility-ownership-models (describing positions of ChargePoint and other charging companies in CPUC proceeding).

206. *See supra* Section III.C.

decision to adopt the California ZEV mandate tends to support later legislation and commission action to approve utility investment in EV charging infrastructure in order to meet ZEV goals.

For instance, in 2013, the Massachusetts Department of Public Utilities opened an investigation into the adoption of department policies and regulations for EVs and EV charging stations.[207] The department welcomed comments on suggested EV policies, whether regulated utilities should be permitted to participate in the free market despite their competitive advantage, and potential rate structures for EV charging.[208] In a 2014 Order, the department expressed concern that utilities would have a competitive advantage over non-utility EV charging companies that could hinder the development of a competitive market.[209] Nevertheless, the Department concluded that it would allow and, in fact, encourage, utility requests for rate recovery for EV charging under the following circumstances: (1) EV charging infrastructure ownership and operation for charging the utility's own fleet and employee charging; (2) research, development, and demonstration costs in connection with an EV charging pilot program or grid modernization plan; and (3) a utility proposal that is in the public interest, will "meet a need regarding the advancement of EVs in the Commonwealth that is not likely to be met by the competitive EV charging market," and will "not hinder the development of the competitive EV charging market."[210]

In 2017, the Massachusetts Legislature codified these enumerated requirements for rate recovery for utility investment in EV charging in its "Public Electric Vehicle Charging Stations" bill.[211] That same year, the department approved a proposal by Eversource, Massachusetts' largest transmission and distribution utility, to install more than 4,000 EV charging stations over the next five years, as well as 67 DC fast charging stations along major roadways, representing a utility investment of approximately $45 million.[212] The program includes charging stations at workplaces and multi-unit residential dwellings, and commits Eversource to installing up to ten percent of these charging stations in low-income communities.[213] The utility would also engage in data collection at the charging stations and propose performance metrics to evaluate implementation and customer

207. Investigation by the Dep't of Pub. Utils. Upon Its Own Motion into Elec. Vehicles and Elec. Vehicle Charging, D.P.U. 13-182 at *1 (Mass. Dep't Pub. Utils. Dec. 23, 2013) (order opening investigation), 2013 WL 6835275.

208. *Id.*

209. Investigation by the Dep't of Pub. Utils. Upon Its Own Motion into Elec. Vehicles and Elec. Vehicle Charging, D.P.U. 13-182-A at *13 (Mass. Dep't Pub. Utils. Aug. 4, 2014) (final order), 2014 WL 4052812.

210. *Id.*

211. MASS. GEN. LAWS. ANN. ch. 25A, § 16 (West 2017).

212. *See* Petition of NSTAR Elec. Co. & W. Mass. Elec. Co., D.P.U. 17-05 at 196–257 (Mass. Dep't Pub. Utils. Nov. 30, 2017) (order).

213. *Id.* at 243 n.237.

benefits of the EV charging program.[214] Charging companies supported the Eversource proposal, finding that it encouraged vendor competition for the EV charging stations and preserved site host control over the stations.[215]

Notably, despite general support for Eversource's programs, the Massachusetts Attorney General urged the department to conduct a separate, statewide investigation into utility investment in EV charging stations.[216] The Attorney General wanted the department to develop a statewide plan on "scope of utility involvement, the appropriate number of utility supported EV chargers," cost recovery, rate design, and evaluation metrics.[217] In response, Eversource, charging companies, and environmental groups urged the commission not to delay approval and implementation of Eversource's proposal.[218] The Attorney General also opposed any utility ownership of charging stations—even in environmental justice communities—on grounds that the utility had not proven such ownership was necessary to serve the public interest and meet a need that the competitive market did not serve.[219]

The department rejected the Attorney General's arguments, approved Eversource's EV charging investment proposal with a few modifications,[220] and did not delay implementation to wait for a department-led formal stakeholder proceeding that would include all the state's major utilities and address comprehensive rate design issues.[221] The department found that "based on the current status of EV charging deployment, lowering the investment barrier is an apparent necessity."[222] Thus, the department recognized that even though there remained several open issues regarding rate design and other aspects of utility investment in EV charging, there were benefits to approving the bulk of the proposal, rather than opening a new docket to address a broader range of EV charging issues. One reason the department may have felt comfortable evaluating Eversource's proposal without a formal stakeholder proceeding in advance was the fact that it had

214. *Id* at 243.

215. *See* Dave Packard, *ChargePoint Applauds Eversource EV Charging Program in Massachusetts*, CHARGEPOINT (Dec. 6, 2017), https://www.chargepoint.com/blog/chargepoint-applauds-eversource-ev-charging-program-massachusetts; *see also* Joshua Berman, *Eversource Rate Case Order Green Lights First Utility Electric Vehicle Charging Proposal in the Northeast*, SIERRA CLUB (Dec. 7, 2017), https://www.sierraclub.org/planet/2017/12/eversource-rate-case-order-green-lights-first-utility-electric-vehicle-charging (discussing the benefits and drawbacks of the Massachusetts plan).

216. *Petition of NSTAR Elec. Co. & W. Mass. Elec. Co.*, D.P.U. 17-05 at 479–81.

217. *Id.*

218. *Id.*

219. *Id.* at 485–87.

220. For instance, the commission did not approve costs associated with consumer education on grounds that the focus of the utility's proposal was to recruit site hosts for charging stations, and that the utility did not adequately justify the costs associated with customer education and marketing to potential EV drivers. *Id.* at 499–500.

221. *Id.* at 481–83.

222. *Id.* at 486–87.

already addressed many of the jurisdictional issues surrounding utility investment in EV charging and the legislature had already confirmed the commission's jurisdiction and adopted the commission's criteria for approving utility proposals.

Oregon has also enacted legislation stating that EV charging constitutes a "utility service."[223] The legislation directed the state public utility commission to accept utility applications to build EV charging infrastructure and to allow the utility to recover the costs from all customers based on a variety of factors.[224] These factors include whether the investment is (1) prudent and useful; (2) will improve the utility's ability to integrate variable renewable resources (like wind and solar); and (3) will "stimulate innovation, competition, and customer choice in [EV] charging."[225] The Oregon Public Utility Commission issued regulations in 2016 to implement the legislative mandate that it accept utility proposals for EV charging investments and set forth the requirements for utility applications.[226] In a February 2018 Order, the Oregon commission approved three pilot projects that Portland General Electric Company proposed under the statute and regulation.[227] The pilot projects consisted of $800,000 for the utility "to install, own, and manage six electric bus charging stations," $400,000 for an EV and EV charging education and outreach program, and $2.6 million to "expand the [utility's] Electric Avenue project by installing and owning six new charging stations in its service territory that will each contain up to four DC fast chargers and one level 2 charger."[228]

Even ZEV states without legislation governing utility investment in EV charging infrastructure have relied on the state's ZEV commitment to support utility investment in EV charging. For instance, in 2018, a coalition of utilities in Maryland along with environmental groups, EV charging companies, and others submitted a "Statewide Electric Vehicle Portfolio" proposal to the Maryland Public Service Commission to install 24,000 chargers, becoming "the second-largest EV charging network in the country."[229] The $104 million proposal consists of building EV charging stations and related facilities "at residential, multi-unit, non-residential, and public sites" that would be a

223. 2016 OR. LAWS ch. 28, § 20(6).

224. *Id.* § 20(4).

225. *Id.*

226. OR. ADMIN. R. 860-087-0030 (2016).

227. Portland Gen. Elec. Co., No. UM-1811 at 9–11 (Pub. Util. Comm'n Or. Feb. 16, 2018). The commission approved the pilot projects over the objections of ChargePoint and other charging companies who argued that allowing the utility to own the charging stations would diminish competition for EV charging in the state. *Id.* at 6–7, 11.

228. *Id.* at 2–6.

229. Emma Foehringer Merchant, *Maryland Could Soon Have the Second-Largest EV Charging Network in the US*, GREENTECH MEDIA (Jan. 26, 2018), https://www.greentechmedia.com/articles/read/maryland-second-largest-ev-charging-network.

combination of site-host owned and utility-owned EV charging stations.[230] The proposal also includes time-of-use and other rates to encourage off-peak charging, and a customer education component.[231] Notably, stakeholders in the proposal recognized that they had learned from the California proceedings, where utilities did not initially partner with private EV charging companies, which caused delays and conflicts in the proceedings.[232] By contrast, in Maryland, EV charging companies, utilities, environmental groups, and others formed a stakeholder group at the outset and ultimately submitted a joint proposal that the Commission staff drove.[233] Notably, the Maryland Secretary of the Environment has stated that legislation was not required to approve utility ownership of EV charging stations, citing regulatory actions in other states and support of the Maryland's Republican Governor.[234] Thus, in Maryland, it is the Commission that will evaluate questions of ratepayer funding, how to spread the benefits of investment in EV charging across the state, and how to encourage private investment in EV charging infrastructure.[235] Despite a broad coalition of support for utility investment in EV charging in Maryland, advocates representing low-income groups, ratepayer interests, and rural utility customers have raised concerns about how costs and benefits will be distributed among rural and urban ratepayers as well as EV owners and non-EV owners.[236] As a result, the Commission will need to address these concerns as it reviews the utility proposals.

The recent proceedings in Massachusetts, Oregon, and Maryland show that once a state has embraced the ZEV-related environmental policy goals associated with accelerating EV adoption, there is a strong foundation on which to enact additional legislative and regulatory actions to incentivize electric utilities to help the state achieve those goals and form stakeholder groups to create proposals. However, this model will not work for all states, particularly those that do not share California's policy goals regarding energy and environmental protection. The next Subpart shows that states that have not embraced the ZEV mandate have supported utility investment in EV charging infrastructure through legislative action as well as through regulatory commission rulemaking and adjudicatory powers.

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230. *Id.*

231. *Id.*

232. *Id.*

233. *Id.*

234. Colin Campbell, *Maryland's Utilities Propose Spending $104 Million on Statewide Electric-Vehicle Charging Network*, BALT. SUN (Mar. 26, 2018, 5:00 AM), http://www.baltimoresun.com/business/bs-md-electric-vehicles-20180322-story.html; David Iaconangelo, *Plan for Statewide EV Charger Network Gets First Vetting*, ENERGYWIRE (May 21, 2018), https://www.eenews.net/stories/1060082189.

235. Campbell, *supra* note 234; Iaconangelo, *supra* note 234.

236. Campbell, *supra* note 234; Iaconangelo, *supra* note 234.

B. BEYOND THE ZEV STATES

As of 2018, only a small number of states have adopted California's ZEV mandate, and many states have not prioritized the reduction of GHG emissions in the transportation sector and do not share California's environmental protection policies or its politics. Among this large group of states, there is often little or no existing legislative or regulatory framework to require or encourage electric utilities to invest in EV charging infrastructure, or to provide for rate recovery. Nevertheless, legislatures and regulatory commissions in these states are actively addressing utility proposals for EV charging investments. This is a result of numerous factors that include: (1) the growing number of EVs across the country; (2) the recognition that utility involvement in EV charging in some form is necessary for electric grid management; and (3) the imminent infusion of significant funds in every state for transportation electrification from the VW settlement. As a result, this is a critical time in transportation electrification throughout the country, not only in states that are embracing EV adoption for environmental reasons. Moreover, the variety of state proceedings are a classic example of states acting as "laboratories of democracy."[237] Such state experimentation allows a number of paths for EV infrastructure development in states that do not wish to aggressively pursue GHG emissions reductions or even officially recognize that climate change is a problem that should concern state legislators, regulators, or the public.

The evaluation of EV-related actions in these states shows that electric utilities, legislators, and regulators take a wide range of approaches. In many ways, however, a primary distinction between these states is the process by which the issue of utility investment in EV charging infrastructure is raised in the regulatory process. For example, in more than one non-ZEV state, the state legislature has directed the state public utility commission to consider and approve reasonable requests for utility investment in EV charging, including rate recovery.[238] In other states, there has been no legislative action to date, but a public utility commission on its own initiative, or at the request of a utility or other interested party, has opened an investigative docket to help develop regulatory policies on the issue that would apply to all utilities in the state.[239] In another group of states, a single utility has sought to make EV investments and seek rate recovery in the absence of any legislative or regulatory policy to support those requests.[240] Finally, in yet other non-ZEV

237. As Justice Brandeis famously stated in 1932, one of the values of our federalist system of government is that "a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country." New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

238. *See infra* Section IV.B.1.

239. *See infra* Section IV.B.2.

240. *See infra* Sections IV.B.3.i–.ii.

states, environmental groups, electric utilities, or both have raised the issue of utility EV charging investment as part of a settlement in an individual utility rate case.[241] These efforts in some cases are fairly limited in scope but still allow for the start of EV charging investment in states that do not yet have established legislative or commission policies to support it. Each of these approaches is discussed below with examples from key states.

1. Legislative Support for Utility Investment in EV Charging: Nevada

Nevada is an example of a non-ZEV state that adopted legislative policies to encourage alternative fuel vehicles, including EVs, to reduce air pollution in the state and reduce the state's reliance on foreign oil. Some of these policies focus specifically on utility programs for EV charging infrastructure. In evaluating Nevada's policies, it is important consider that in 2014, Tesla broke ground on its 5.5 million square foot, $5 billion battery plant—known as the "Gigafactory"—outside Reno, Nevada.[242] According to Tesla's founder and CEO, Elon Musk, the facility will contain "the world's largest building by footprint" and is critical to Tesla achieving its goal of producing 500,000 EVs per year in 2018 and higher production levels in subsequent years.[243] Because of the tax, employment, and other economic and social benefits that can flow from this type of private investment in the state, Nevada has a direct financial stake in the success of EVs in the state and nationwide.

In 2017, Nevada Governor Brian Sandoval signed into law Senate Bill 145, which, among other things, created an Electric Vehicle Infrastructure Demonstration Program ("Program"), required the Public Utilities Commission of Nevada to adopt regulations concerning the program, and authorized electric utilities in the state to recover costs associated with carrying out the Program.[244] The statute "declares that it is the policy of this State to expand and accelerate the deployment of electric vehicles and supporting infrastructure throughout this State."[245] The legislature directed the commission to adopt regulations to create the Program and to "require a utility to submit to the Commission an annual plan for carrying out the Program in its service area."[246] The utility's annual plan "may include any measure to promote or incentivize the deployment of electric vehicle

241. *See infra* Section IV.B.4.

242. Danielle Muoio, *New Aerial Photos Appear to Show Just How Massive Tesla's Gigafactory is*, BUS. INSIDER (July 10, 2017, 11:37 AM), https://www.businessinsider.com/tesla-gigafactory-massive-photos-2017-7; *Tesla Gigafactory*, TESLA, https://www.tesla.com/gigafactory (last visited Sept. 27, 2018).

243. Muoio, *supra* note 242; Peter Valdes-Dapena, *Inside Tesla's Ginormous Gigafactory*, CNN BUS. (July 27, 2016, 11:54 AM), https://money.cnn.com/2016/07/26/technology/tesla-gigafactory/index.html.

244. S.B. 145, 79th Leg., § 1.4 (Nev. 2017); *see also* NEV. REV. STAT. § 701B.670 (2017) (codifying S.B. 145).

245. Nev. S.B. 145, § 1.4(1).

246. *Id.* § 1.4(3).

infrastructure, including" incentive payments to customers who install EV infrastructure, education and awareness programs for customers, and technical assistance programs for government or private motor vehicle fleet owners related to EV charging.[247] The utility "[m]ay recover its reasonable and prudent costs, including, without limitation, customer incentives, that are associated with carrying out and administering the Program within its service area by seeking recovery of those costs in an appropriate proceeding before the Commission."[248]

Senate Bill 145 does not specifically direct electric utilities to submit proposals to build EV charging stations, but in 2016, the year prior to its enactment, the Commission voted to open a docket on EV charging infrastructure to develop relevant policies and regulations.[249] The Commission sought comments on, among other things: (1) how to regulate power sales between utilities and EV charging station owners and between EV charging station owners and retail customers, including the issue of demand charges; (2) the best way to encourage the development of workplace and residential EV charging infrastructure, including where to focus public funds and how to allocate costs and benefits among different classes of customers; (3) the extent to which electric utilities should be allowed to own and operate EV charging stations and obtain cost recovery for those investments; and (4) the environmental, economic, and grid benefits associated with transportation electrification.[250] Electric utilities, nonprofit groups, Tesla, Commission staff, and other interested parties submitted filings on all of these issues. Following the enactment of Senate Bill 145 in 2017, the Commission opened a new docket for interested parties to propose regulations necessary to implement Program, including the parameters for evaluating utilities' annual plans.[251] In 2018, it issued regulations directing the state's largest utility, Nevada Energy, to set aside $15 million in existing ratepayer-funded incentive funds to help build out the state's EV charging infrastructure.[252] The funds will help build the state's electric highway and also support workplace

247. *Id.*

248. *Id.* § 1.4(5)(b).

249. Investigation in Elec. Vehicle Charging Infrastructure, Docket No. 16-01018 at *1 (Nev. Pub. Utils. Comm'n July 15, 2016) (procedural order), 2016 WL 3916201.

250. *Id.*

251. Investigation into Elec. Vehicle Charging Infrastructure, Docket No. 16-01018 at *1–2 (Nev. Pub. Utils. Comm'n Nov. 28, 2017) (procedural order no. 4), 2017 WL 5992050 (consolidating Docket No. 16-01018 and Docket No. 17-08021); Rulemaking to Implement the Provisions of Senate Bill 145 (2017), Docket No. 17-08021 at *1–2 (Nev. Pub. Utils. Comm'n Jan. 29, 2018) (procedural order no. 4), 2018 WL 656348 (summarizing comments received and proposed rules implementing statute).

252. *See* Rulemaking to Implement the Provisions of Senate Bill 145 (2017), Docket No. 17-08021 at *8–10 (Nev. Pub. Utils. Comm'n May 11, 2018) (order), 2018 WL 2289552.

and multi-unit charging stations. The regulations allow Nevada Energy to own and operate the stations subject to Commission review and approval.[253]

The details of the parties' submissions, their points of agreement and disagreement, and the Commission's ultimate findings are in many ways less important than the fact that Nevada created a legislative and regulatory framework for the commission to evaluate utility EV charging proposals. These statutes and regulatory proceedings provide interested parties a means to debate the electric utility's role in EV charging with the benefit of legislative support for at least some rate recovery for investment. By creating a forum for discussion and expectations for initial investment, Nevada provides electric utilities, private charging companies, environmental groups, and the Commission the tools to develop a thoughtful and comprehensive program for utility investment in EV charging, and the ability to make modifications along the way.

In sum, Nevada illustrates that states do not have to adopt California's ZEV mandate, or have a comprehensive GHG emissions reduction program to support utility investment in EV charging infrastructure. In the case of Nevada, the Tesla Gigafactory, coupled with recent legislative and regulatory developments, has made the state a favorable environment for electric utility investment in EV charging stations, and can serve as a potential model for other non-ZEV states.[254]

2. Public Utility Commission Investigative Dockets: Michigan

In the absence of legislation governing utility investment in EV charging, some public utility commissions have opened investigative dockets to collect information on the issue with the goal of creating generally applicable standards for utility investments. Michigan provides an example of this approach, as described below, although other states, including Minnesota and Pennsylvania, have opened similar dockets.[255]

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253. *See id.*; Daniel Rothberg, *Regulators Approve Rules for Electric Vehicle Charging, Despite Criticism from Consumer Advocate*, NEV. INDEP. (May 11, 2018, 2:10 AM), https://thenevadaindependent.com/article/regulators-approve-rules-for-ev-charging-despite-criticism-from-consumer-advocate; Robert Walton, *Nevada Regulators Allow Utilities to Own EV Charging Stations*, UTIL. DIVE (May 15, 2018), https://www.utilitydive.com/news/nevada-regulators-allow-utilities-to-own-ev-charging-stations.

254. *See also* WASH. REV. CODE § 80.28.360(2)–(4) (2018) (authorizing Washington Utilities and Transportation Commission to grant utilities a rate of return on capital expenditures for EV charging equipment and setting forth the circumstances under which approval can be granted).

255. *See, e.g.*, Comm'n Inquiry into Elec. Vehicle Charging Infrastructure, Docket No. E999/CI-17-879 at 1 (Minn. Pub. Utils. Comm'n Dec. 28, 2017) (notice of comm'n inquiry); Third Party Elec. Vehicle Charging–Resale/Redistribution of Util. Serv. Tariff Provisions, Docket No. M-2017-2604382 at 1 (Pa. Pub. Util. Comm'n Mar. 15, 2018) (motion of Chairman Gladys M. Brown) (describing commission solicitation of comments to gather information and reduce regulatory uncertainty).

In 2016, Consumers Energy Company proposed to the Michigan Public Service Commission that the company install "DC fast chargers at 30 locations and 750" Level 2 charging stations in its service territory with site hosts on private property.[256] Consumers Energy Company also sought commission approval for rate recovery.[257] The utility would install and maintain the stations while the site host would pay for the electricity and could choose to pass those costs on to consumers or offer the charging for free.[258] The utility also proposed a $1000 rebate for customers who installed an at-home charging station.[259] The number of rebates would be expected to be at 2,500.[260] The utility estimated the capital costs of the charging infrastructure investment would be approximately $10.6 million, and the total cost for the entire program through 2019 would be $15 million.[261] Commission staff recommended that the capital costs of the proposed EV infrastructure installation be excluded from the rate base on grounds that the proposal raised "significant policy questions," including whether a regulated utility's ownership of public charging stations would diminish private investment in the market and whether the nature of the program is "consistent with the essential basis for public utility regulation of a natural monopoly."[262]

ChargePoint, one of the privately owned EV charging companies, also opposed utility rate recovery for capital investment in EV charging infrastructure because it would "prohibit[] competition."[263] The Attorney General's office opposed the program just as strongly, stating that the program was "'ill-conceived and a financial burden. . . .' on ratepayers."[264] Ultimately, the administrative law judge who heard the evidence recommended that the utility's proposal be denied until the policy questions surrounding EV infrastructure and rebates for at-home charging stations were answered.[265] All of the parties supported the idea of a collaborative effort to determine the regulatory treatment of EV infrastructure, and the administrative law judge recommended that the Commission convene a group "that includes all stakeholders in the EV market for the purpose of assisting in the development of a master plan for Michigan's EV charging network."[266]

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256. Application of Consumers Energy Co., Case No. U-17990 at 31–32 (Mich. Pub. Serv. Comm'n Dec. 16, 2016) (notice of proposal for decision).

257. *Id.* at 9.

258. *Id.* at 31–32.

259. *Id.* at 32.

260. *Id.*

261. *Id.* at 33.

262. *Id.* at 34–35, 41.

263. *Id.* at 37–40.

264. *Id.* at 40.

265. *Id.* at 41–42.

266. *Id.* at 42.

As a result of this decision, Consumers Energy withdrew its EV charging proposal and the Commission opened a new docket in February 2017 to "host a technical conference inviting various stakeholders, including utilities, auto manufacturers, third-party suppliers of charging equipment, transportation planners and other parties that are not formal market participants, yet have significant expertise in PEV technology, to discuss issues associated with the deployment of PEV charging."[267] In a subsequent order, the Commission stated that the question the investigation needed to address was "what kind of economic conditions would need to exist for the deployment of charging or fueling infrastructure for alternative fuel vehicles by regulated utilities" and, more specifically, to "generate information regarding when use of ratepayer dollars for such investments would result in a ratepayer benefit, and over what period of time that would be realized."[268] To answer that question, the Commission focused on three additional issues: (1) what technology is available for EV charging stations; (2) the Commission's role in developing applicable policies for electric utilities in the state; and (3) how the Commission and other government entities should "interact with the auto industry, the utilities, and other stakeholders in looking at possible future programs."[269] The Commission set a one-day technical conference in August 2017 with three panels to discuss the three issues outlined above. The stakeholder comments are available on the Commission's website and are summarized in part below.[270] In December 2017, the Commission issued an order summarizing the comments received in the proceedings, adopting guiding principles, and scheduling a second collaborative technical conference to discuss specific pilot programs for regulated utilities.[271] The Commission directed that these proposals should include a detailed cost-benefit analysis if ratepayer funding is proposed.[272] The stakeholder comments submitted in connection with the first and second technical

267. Commission's Own Motion to Open a Docket, Case No. U-18368 at 3 (Mich. Pub. Serv. Comm'n Apr. 28, 2017) (order commencing a collaborative tech. conference) (quoting a February 28, 2017 order).

268. *Id.* at 4.

269. *Id.*

270. *See generally* Commission's Own Motion to Open a Docket, Case No. U-18368 (Mich. Pub. Serv. Comm'n Mar. 29, 2018) (order following second collaborative tech. conference) (summarizing comments from second collaborative technical conference in August 2017); *Case U-18368*, MICH. PUB. SERV. COMMISSION, https://mi-psc.force.com/s/case/500t0000008eg2lAAA/in-the-matter-on-the-commissions-own-motion-to-open-a-docket-that-will-be-used-to-collaboratively-consider-issues-related-to-both-the-deployment-of-plugin-electric-vehicle-charging-facilities-and-to-examine-issues-germane-to-the-use-of-compressed-na (last visited Sept. 28, 2018) (listing the comments for Case No. U-18368).

271. Commission's Own Motion to Open a Docket, Case No. U-18368 at 1, 34–37 (Mich. Pub. Serv. Comm'n Dec. 20, 2017) (order commencing second collaborative tech. conference).

272. *Id.* at 35.

conferences illustrate the range of views on utility investment in EV charging and are summarized below.

ChargePoint warned the Commission not to design any regulation that would crowd out private investment in EV charging.[273] It also urged the Commission to exempt third-party EV charging owners, such as EV charging site hosts, from utility regulation on the grounds that such third-party owners are not generating, transmitting, distributing, or selling electricity for the purposes of the state's statute defining electric utilities.[274] ChargePoint likened the relationship between the EV charging station owner and the EV owner to that of "an internet café that allows users to plug in to charge their computer batteries or a cell phone battery-charging kiosk at the airport than with a regulated public utility operating a grid and selling electricity to local businesses and households."[275] Such a finding would be consistent with legislation and regulation in other states that have addressed this issue.[276]

DTE Electric Company, another Michigan utility company, and Consumers Energy Company submitted their comments jointly.[277] Their service areas cover the majority of Michigan's lower peninsula. They stated that the benefits of EVs are numerous and that Michigan has lagged behind many other states in the deployment of EV charging infrastructure.[278] They proposed that having utilities involved in EV infrastructure deployment will: (1) accelerate electric transportation adoption; (2) reduce the cost to site hosts that may have previously been prohibitively expensive; (3) ensure that EV charging infrastructure is installed according to "smart charging" goals; and (4) ensure that EV chargers are installed, operated and maintained in a safe manner.[279] In addition, the utilities urged the commission to embrace education and outreach programs to facilitate EV adoption in Michigan.[280] The utilities proposed partnering with automakers, local businesses, retail facilities, and sports stadiums to advance EV usage in Michigan.[281]

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273. Commission's Own Motion to Open a Docket, Case No. U-18368 at 3–4, 7 (Mich. Pub. Serv. Comm'n July 31, 2017) (comments of ChargePoint, Inc.).

274. *Id.* at 7.

275. *Id.*

276. *Id.*; *see also* Young et al., *supra* note 83, at 300–01 (citing California, New York, and "[a]pproximately 15 other states, including Colorado, Florida, Illinois, Maryland, Massachusetts, Virginia, and Washington," that "have exempted EV charging stations or their owners and operators" of charging stations from state public utility regulation).

277. Commission's Own Motion to Open a Docket, Case No. U-18368 at 2 (Mich. Pub. Serv. Comm'n July 31, 2017) (comments of DTE Elec. Co. & Consumers Energy Co.).

278. *Id.* at 13, 17.

279. *Id.* at 15–16.

280. *Id.* at 17–18.

281. *Id.*

The Sierra Club, Natural Resources Defense Council, The Ecology Center and the Environmental Law & Policy Center filed joint comments.[282] They asserted that there are many benefits to EV adoption in Michigan, but specifically mentioned: (1) downward pressure on retail electricity rates and grid management; (2) carbon dioxide and criteria pollutant emissions reductions; and (3) reduced petroleum dependence.[283] The environmental groups also warned that the lack of EV charging infrastructure and lack of customer education about EVs act as barriers to entry to many potential EV buyers. Lastly, the environmental groups summarized for the commission the PG&E, SCE, and SDG&E EV charging models developed in California, both as a useful reference point for the commission and to illustrate different approaches for utility rate recovery.[284] Following the Commission's investigative proceeding, in May 2018, Consumers Energy Company filed a proposal for a three-year, $7.5 million pilot infrastructure project as part of a $58 million overall rate increase request.[285] In July 2018, DTE Energy filed a $328 million general rate increase request that included a $13 million EV charging pilot program.[286]

Michigan provides an example of a state commission taking the initiative to bring together stakeholders to develop broadly applicable regulations and policies governing utility investment in EV charging infrastructure. This approach is a potential option in non-ZEV states that do not have the benefit of existing legislative policies on utility investment in EV charging. It allows a commission to conduct a public forum that is neither a rulemaking proceeding nor an adjudicative proceeding. The Commission can use the results to adopt regulations that can be used in future proceedings or to decide specific utility proposals even in the absence of formal regulations. Moreover, such a proceeding offers a template for the legislature to adopt later, if it chooses, as was the case in Massachusetts.

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282. Commission's Own Motion to Open a Docket, Case No. U-18368 at 1 (Mich. Pub. Serv. Comm'n July 31, 2017) (comments of Sierra Club, Nat. Res. Def. Council, The Ecology Ctr. & Envtl. Law & Pol'y Ctr.).

283. *Id.* at 10.

284. *Id.* at 19–24.

285. *See* Jay Greene, *Consumers Energy Files Rate Request, Electric Vehicle Charging Station Plan with State*, CRAIN'S DETROIT BUS. (May 16, 2018, 2:51 PM), http://www.crainsdetroit.com/article/20180516/news/660826/consumers-energy-files-rate-request-electric-vehicle-charging-station.

286. Application of DTE Elec. Co., Case No. U-20162 at 2, CS-40 (Mich. Pub. Serv. Comm'n July 6, 2018) (application); *see* Jay Greene, *DTE Proposes Rate Increases, Electric Vehicle Plan*, CRAIN'S DETROIT BUS. (July 6, 2018, 5:11 PM), https://www.crainsdetroit.com/article/20180706/news/665451/dte-proposes-rate-increases-electric-vehicle-plan; Jeffrey Tomich, *Detroit Utility Pursues Ambitious EV Charging Pilot*, ENERGYWIRE (July 11, 2018), https://www.eenews.net/energywire/2018/07/11/stories/1060088753 (discussing DTE proposal as well as earlier Commission proceedings on EV charging).

3. Utility-Initiated Requests for Rate Recovery for EV Investments: Kansas, Missouri, and Kentucky

In some states there are no statewide policies to reduce GHG emissions from the transportation sector, no policies to encourage EV use or utility investment in EV charging infrastructure, and to date, no commission initiative to conduct a state-wide proceeding on utility investment in EV charging. Nevertheless, even in those states, utilities still recognize that widespread EV adoption may provide a new source of utility revenues as well as offer benefits for customers. In this situation, it is often the utilities that are left to make the case to state commissions for why they should be able to invest in EV charging infrastructure and receive a rate of return on those investments. To date, these efforts have been met with some skepticism because there is neither a regulatory framework for the state commission to evaluate utility proposals nor any direction from the state legislature regarding the benefits of EV adoption and EV charging to the state's utility customers. The utility proposals in Kansas, Missouri, and Kentucky, discussed below, illustrate the arguments utilities have made in this context and the limited success of such efforts to date.

i. Kansas and Missouri

In 2015, Kansas City Power & Light ("KCP&L") announced its "Clean Charge Network" project that would involve building over 1,000 EV charging stations in the Kansas City region, covering the states of Kansas and Missouri.[287] KCP&L first petitioned the Kansas State Corporation Commission to open a general investigation into EV charging stations, but the commission limited the scope of the docket to evaluate only KCP&L's proposal.[288] As of 2018, Kansas does not have any statutes or regulations relating to EV charging stations.

KCP&L's proposal addressed three different types of costs relating to EV charging: energy, capital, and operation and maintenance costs associated with the charging systems.[289] Pursuant to the agreements that KCP&L made with the host locations, the hosts would pay for all of the energy costs for two years.[290] In addition, KCP&L partnered with Nissan, which agreed to pay for the energy costs for fifteen Level 3 DC fast charging stations for the first two

287. *KCP&L Becomes Electric Vehicle Infrastructure Leader*, KCP&L (Jan. 26, 2015), https//www.kcpl.com/about-kcpl/media-center/2015/January/kcpl-becomes-electric-vehicle-infrastructure-leader.

288. Kan. City Power & Light's Application to Deploy and Operate Its Proposed Clean Charge Network, Docket No. 16-KCPE-160-MIS (State Corp. Comm'n Kan. Feb. 2, 2016) (order opening docket).

289. Application of Kan. City Power & Light Co. for Approval of Its Clean Charge Network, Docket No. 16-KCPE-160-MIS at 10–12 (State Corp. Comm'n Kan. July 15, 2016) (initial post-hearing brief).

290. *Id.* at 4.

years.[291] After that time, the EV owner would pay for charging at a set rate per kilowatt-hour or, in the alternative, based on time spent charging.[292] The capital cost for the project was $16.6 million, with $5.6 million of that budget going to the utility's service territory in Kansas and the remainder going to the utility's service territory in Missouri.[293] The estimated operation and maintenance cost per year was $250,000, with $78,000 representing the cost for the Kansas jurisdiction.[294] KCP&L proposed that these capital and operation and maintenance costs be included in its rate base, translating into a $0.10–$0.15 monthly increase in customer bills.[295]

KCP&L argued before the commission that it was appropriate and necessary to include the capital costs and operation and maintenance costs in its rate base.[296] It argued that the proposal was necessary because home charging was insufficient to support EV adoption and that the project had already encouraged EV ownership in Kansas.[297] KCP&L contended that all utility customers would benefit from the project because EV adoption would offer environmental benefits, macroeconomic benefits, and increased usage of the KCP&L grid.[298] The utility analogized the EV charging project to extending transmission lines to new neighborhoods where the costs are socialized because the build-out ultimately improves reliability of the grid for all customers.[299] The utility also analogized its investment in EV charging to the early investment in the Internet, for which the telephone companies obtained some ratepayer recovery.[300] The utility recognized that there were no statutes to provide a framework for the request it was making to the commission and stated that it wished to work with commission staff and others to bring about legislative change in this area.[301] But it also argued that Kansas should not "stand still" while the rest of the country moves forward in developing EV charging infrastructure.[302]

The Commission rejected these arguments. It found that KCP&L had not met its burden of proof to establish the need to include the capital costs and

291. *Id.* at 10.

292. *Id.* at 10–12; Kan. City Power & Light Co.'s Application to Deploy and Operate Its Proposed Clean Charge Network, Docket No. 16-KCPE-160-MIS Attachment C (State Corp. Comm'n Kan. Feb. 2, 2016) (application) (providing the proposed charging rates).

293. Application of Kan. City Power & Light Co. for Approval of Its Clean Charge Network, Docket No. 16-KCPE-160-MIS at 4 (State Corp. Comm'n Kan. July 15, 2016) (initital post-hearing brief).

294. *Id.* at 10.

295. *Id.* at 31.

296. *Id.* at 13.

297. *Id.* at 8–9.

298. *Id.* at 20–26.

299. *Id.* at 32–33.

300. *Id.* at 33–34.

301. *Id.* at 34–35.

302. *Id.*

operation and maintenance costs in its rate base.[303] The commission found, based on a staff recommendation, that private EV charging hosts should be absorbing the infrastructure cost rather than utility customers.[304] The Commission also found lack of evidence of a demand for so many EV charging stations, since most EV owners charge their vehicles at home, and that EV "range anxiety" is decreasing without additional chargers because of improved EV battery technology.[305] Moreover, the Commission had concerns regarding cross-subsidization of customers. It found that customers in counties without charging stations would be subsidizing customers in counties that had charging stations, and that lower income utility customers would be subsidizing higher income utility customers who were the most likely to be able to afford an EV and benefit from the EV charging stations.[306] Finally, the Commission found that the project's environmental benefits were questionable, given that a full EV charge results in power plant emissions that are roughly equivalent to emissions a gasoline powered vehicle produces, at least in a state like Kansas that still relies heavily on coal to generate electricity.[307]

In Missouri, the outcome was similar. Like Kansas, there are no statutes or regulations governing EV charging stations in Missouri as of 2018. The only statutes refer to tax credits given to host sites for having EV charging stations on their property,[308] and the only regulations that reference EVs are vehicle emissions regulations.[309]

At KCP&L's request, the Missouri Public Service Commission opened a docket regarding the utility's Clean Charge Network in December 2015, and directed Commission staff to gather evidence and report on the legal and policy issues related to whether KCP&L should be able to recover costs associated with EV charging investments.[310] In August 2016, the staff issued a final report summarizing the information collected from interested parties. The staff recommended that the Commission find that it has authority to regulate EV charging stations and rates, but that "[c]aptive ratepayers should

303. Kan. City Power & Light Co.'s Application for Approval of Its Clean Charge Network, Docket No. 16-KCPE-160-MIS at 7 (State Corp. Comm'n Kan., Sept. 13, 2016) (order denying application).

304. *Id.* at 10.

305. *Id.* at 12.

306. *Id.* at 14–15.

307. *Id.* at 15. For additional details on the "life cycle emissions" associated with EVs, and how that impacts the environmental benefits of EVs as compared to internal combustion engine vehicles, see generally Klass & Heiring, *supra* note 47 (discussing how life cycle emissions of EVs differ depending on whether they are driven in a state that uses a high or a low percentage of coal to generate electricity).

308. MO. REV. STAT. § 135.710 (2018).

309. MO. CODE REGS. ANN. tit. 10, § 10-5.381 (2012).

310. A Working Case Regarding Elec. Vehicle Charging Facilities, File No. EW-2016-0123 at 2 (Mo. Pub. Serv. Comm'n Dec. 2, 2015) (order opening a working case).

not be required to pay for charging station networks that will only directly benefit a small number of ratepayers."[311]

Following the issuance of the staff report, KCP&L sought to recover the costs of its EV charging investments in its next general rate case. The utility contended that the commission had the power to regulate EV charging stations, and that KCP&L should be able to recover operation, maintenance, and capital expenses for its Clean Charge Network project from customers because such costs were "prudently incurred."[312] In addition, the utility asserted that all customers, even those that do not own an EV, would benefit from the project as a result of the air pollution reduction, economic development benefits, and grid enhancement benefits.[313] The Sierra Club, Natural Resources Defense Council, and other environmental groups that intervened argued that KCP&L should be able to recover the costs of its investments in the charging stations from customers if KCP&L's investments were in the public interest.[314]

In a May 2017 order, the Commission rejected jurisdiction over EV charging stations and rate recovery for the proposal.[315] Contrary to staff's recommendation, "the Commission [found] that EV charging stations are not 'electric plant[s]' as defined in the statute because they are not used for furnishing electricity for light, heat, or power."[316] The Commission found that the charging service is the product being sold and the battery in the vehicle is the power source.[317] The fact that the laundromat provides electric dryers to customers "does not mean the laundromat's dryers [themselves] are [an]

311. MO. PUB. SERV. COMMISSION, CORRECTED STAFF REPORT, A WORKING CASE REGARDING ELECTRIC VEHICLE CHARGING FACILITIES 29 (2016), https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=EW-2016-0123&attach_id=2017002326.

312. Application of Kan. City Power & Light Co. for Approval of Its Clean Charge Network, Docket No. 16-KCPE-160-MIS at 49–52 (State Corp. Comm'n Kan. Mar. 22, 2017) (initial post-hearing brief).

313. *Id.* at 51–52.

314. *See* Kan. City Power & Light Co.'s Request for Auth. to Implement a Gen. Rate Increase for Elec. Serv., File No. ER-2016-0285 at 5 (Mo. Pub. Serv. Comm'n Mar. 22, 2017) (joint initial post-hearing brief of Renew Mo., Sierra Club, & Nat. Res. Def. Council).

315. Kan. City Power & Light Co.'s Request for Auth. to Implement a Gen. Rate Increase for Elec. Serv., File No. ER-2016-0285 at 42–47 (Mo. Pub. Serv. Comm'n May 3, 2017) (report & order).

316. *Id.* at 45; *see also* MO. REV. STAT. § 386.020(14) (2000) (defining "electric plants" as "all real estate, fixtures, and personal property operated, controlled, owned, used or to be used for or in connection with or to facilitate the generation, transmission, distribution, sale or furnishing of electricity for light, heat or power"); Kan. City Power & Light Co.'s Request for Auth. to Implement a Gen. Rate Increase for Elec. Serv., Case No. ER-2016-0285 at 36–37 (Mo. Pub. Serv. Comm'n April 4, 2017) (staff's reply & true-up brief) (setting forth the Commission staff opinion that the commission has jurisdiction over EV charging stations when the electricity is being provided by a regulated utility like KCP&L because the charging station "is a specialized device designed for consumers to use to deliver electricity to their electric vehicle battery to power the vehicle's functions" and expressing "serious concerns" with the legality of the commission's position).

317. Kan. City Power & Light Co.'s Request for Auth. to Implement a Gen. Rate Increase for Elec. Serv., File No. ER-2016-0285 at 45 (Mo. Pub. Serv. Comm'n May 3, 2017) (report & order).

electric plant."[318] The Commission warned that if EV charging stations were part of utility services, commission jurisdiction would potentially extend also to smart phone charging kiosks, RV parks allowing connections to electricity, or other similar services that would then also be subject to rate recovery.[319] The Commission went on to find that KCPL could include equipment such as "distribution lines, transformers, meters," and any other equipment "necessary to provide electric service to an owner of an EV charging station" in the rate base; what could not be recovered, however, was the costs associated with the EV charger itself.[320]

Also in 2016, Ameren Missouri, another investor-owned utility in Missouri, proposed a pilot program to install six "charging islands" on I-70 between St. Louis and Boonville, with an additional station located in Jefferson.[321] The proposal indicated that "Ameren Missouri would obtain an easement . . . from each of the site hosts" for the EV charging stations.[322] Ameren proposed a time-based tariff for these stations that would charge EV owners $0.17 per minute of charging on a DC fast charger, and $0.20 per kilowatt-hour of charging on a Level 2 charger.[323] Ameren predicted that the infrastructure would cost $600,000.[324] While none of these charges were included in Ameren's general rate case, the utility anticipated that "a small amount of investment related to the project may be added to the rate base through a true-up process."[325] In an earlier filing with the Commission, Ameren asserted that the pilot program would serve the goals of reducing range anxiety and assisting Ameren in gathering data about EVs that would be valuable for all Missouri utilities and the commission.[326] In a decision very similar to the KCP&L rate case, the Commission determined that it did not have the authority to regulate Ameren's proposed EV charging stations under existing statutes because the stations did not fit the definition of an "electric

318. *Id.*

319. *Id.*

320. *Id.* at 46.

321. Bryce Gray, *Ameren Seeks to Install Six Electric Vehicle Charging Stations Along I-70*, ST. LOUIS POST-DISPATCH (Aug. 15, 2016), https://www.stltoday.com/business/local/ameren-seeks-to-install-six-electric-vehicle-charging-stations-along/article_a481ab19-c8a3-55aa-a0f1-47c7ea91a38a.html.

322. Application of Union Elec. Co. d/b/a Ameren Mo. for Approval of a Tariff Setting a Rate for Elec. Vehicle Charging Stations, File No. ET-2016-0246 at 6 (Mo. Pub. Serv. Comm'n Apr. 19, 2017) (report & order).

323. *Id.* at 8.

324. *Id.* at 6 (proposing to install six chargers at a cost per charger of $95,000).

325. Application of Union Elec. Co. d/b/a/ Ameren Mo. for Approval of a Tariff Setting a Rate for Elec. Vehicle Charging Stations, File No. ET-2016-0246 at 6 (Mo. Pub. Serv. Comm'n Aug. 15, 2016) (application for approval of tariff).

326. Application of Union Elec. Co. d/b/a Ameren Mo. for Approval of a Tariff Setting a Rate for Elec. Vehicle Charging Stations, File No. ET-2016-0246 at 3–4 (Mo. Pub. Serv. Comm'n Jan. 6, 2017) (position statement of Ameren Mo.).

plant."[327] The Commission used the same laundromat analogy, reasoning that the dryer provides a "drying service[]," but it is not an electric plant; it similarly found that an EV charging station provides a "charging service" but it is not an electric plant.[328]

In 2018, the Missouri Court of Appeals reversed the Commission, finding that EV charging stations do fall within the definition of an "electric plant" under state law.[329] The court rejected the Commission's analogy to a laundromat and instead used the analogy of a self-service gas station—the relevant transaction is the sale of gasoline to the customer, not "the service of filling the vehicle's fuel tank with gasoline."[330] Likewise, with a utility-owned EV charging station, the court found that the relevant transaction is the sale of electricity to a customer "not the service of charging a battery."[331] The court also found the Commission's policy reasons for declining jurisdiction unpersuasive and remanded the matter to the Commission.[332]

The Kansas and Missouri examples show that utilities see a business case for investing in EV charging stations, but state commissions can be skeptical of utility expansion into the EV charging market in the absence of legislation directing them to do so.[333] Notably, the Kansas and Missouri Commission decisions on jurisdiction over utility investment in EV charging stations run counter to the vast majority of other commissions.[334] Commissions in other states have excluded third-party charging companies from commission jurisdiction because they do not otherwise perform utility functions, but these

327. Application of Union Elec. Co. d/b/a Ameren Mo. for Approval of a Tariff Setting a Rate for Elec. Vehicle Charging Stations, File No. ET-2016-0246 at 10–11 (Mo. Pub. Serv. Comm'n Apr. 19, 2017) (report & order); *see also* Press Release, Mo. Pub. Serv. Comm'n, PSC Lacks Statutory Authority to Regulate Electric Vehicle Charging Stations (Apr. 19, 2017) (quoting the commission's statement that "Ameren Missouri may own and operate EV charging stations in Missouri . . . but it may only do so on an unregulated basis without including those charging stations in its rate base or seeking recovery from ratepayers for any of the costs associated with the construction or operation of those charging stations").

328. Application of Union Elec. Co. d/b/a Ameren Mo. for Approval of a Tariff Setting a Rate for Elec. Vehicle Charging Stations, File No. ET-2016-0246 at 10–11 (Mo. Pub. Serv. Comm'n Apr. 19, 2017) (report & order).

329. Kan. City Power & Light Co.'s Request for Auth. to Implement a Gen. Rate Increase for Elec. Serv. v. Mo. Pub. Serv. Comm'n, No. WD 80911, 2018 WL 3730901, at *10 (Mo. Ct. App. Aug. 17, 2018).

330. *Id.* at *7.

331. *Id.* at *8.

332. *Id.* at *10.

333. *See, e.g.*, Karen Uhlenhuth, *Another Midwest Utility Dealt a Setback on Electric Vehicle Charging Stations*, ENERGY NEWS NETWORK (Apr. 24, 2017), https://energynews.us/2017/04/24/midwest/another-midwest-utility-dealt-a-setback-on-electric-vehicle-charging-stations (discussing Missouri proceedings and the difficulty of obtaining commission approval for utility investment in EV charging stations in some Midwestern states).

334. *See* Young et al., *supra* note 83, at 300–01 (discussing states that have exempted non-utility charging companies from regulation but still recognize commission jurisdiction over utilities that engage in EV charging investments).

commissions have nevertheless asserted jurisdiction over utility investments in EV charging to allow cost recovery and to ensure that rates are just and reasonable.[335] Moreover, because of the Missouri and Kansas jurisdictional rulings, the Commissions did not open a docket to investigate utility involvement in EV charging when they rejected the utility proposals, as the Michigan Commission had done. By finding that EV charging could not be an "electric plant," there would be no reason for the Kansas and Missouri Commissions to consider utility involvement in EV charging any further, at least not without revisiting their jurisdictional determinations, or without legislative action expressly creating jurisdiction. Even if the Missouri Court of Appeals decision on jurisdiction over utility investment in EV charging is allowed to stand, the Commission's initial reluctance to assert jurisdiction illustrates how state regulatory action or inaction can play a significant role in the extent and timing of EV charging development and the role of utilities in that development.

ii. Kentucky

Like Kansas and Missouri, Kentucky does not have any statutes or regulations governing EVs or EV charging infrastructure. Nevertheless, as described below, Louisville Gas & Electric ("LG&E") and Kentucky Utilities ("KU") sought approval for small-scale EV charging projects from the Kentucky Public Service Commission and, unlike in Kansas and Missouri, the commission approved the projects.[336]

In 2015, the two utilities filed an application with the state commission for authorization to install and operate EV charging stations, approval of related tariffs, and a depreciation rate for the stations.[337] The utilities stated that local governments and customers had informally approached them in recent years about offering charging stations. The utilities proposed two tariff rates, summarized as follows:

- EVSE-R: "Under proposed Tariff EVSE-R, the charging station would be located on the customer's side of the meter, with the charging station energy usage measured by the site host's existing meter and billed at the site host's tariffed energy rate."[338]

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335. *Id.*; *see also* NEV. REV. STAT. § 701B.670(5) (2017) (directing utilities to develop programs for EV charging); *id.* § 704.021(11) (excluding from public utility regulation "[p]ersons who own, control, operate or manage a facility that supplies electricity only for use to charge electric vehicles"); Rulemaking to Implement the Provisions of Senate Bill 145 (2017), Docket No. 17-08021 at 12–13 (Nev. Pub. Utils. Comm'n May 11, 2018) (order) (asserting Commission jurisdiction over charging stations owned and operated by Nevada utilities but exempting non-utility charging companies from utility regulation).

336. Application of Louisville Gas & Elec. Co. & Ky. Utils. Co., Case No. 2015-00355 at 1 (Ky. Pub. Serv. Comm'n Nov. 23, 2015) (order).

337. *Id.*

338. Application of Louisville Gas & Elec. Co. & Ky. Utils. Co., Case No. 2015-00355 at 2 (Ky. Pub. Serv. Comm'n Apr. 11, 2016) (order); *see also* Press Release, Ky. Pub. Serv. Comm'n,

- EVSE: "Under proposed tariff EVSE, the charging station would be directly connected to LG&E's or KUs facilities outside of the customer's meter. As the energy used under Tariff EVSE is not metered, an assumed amount of energy usage is included in the monthly fee."[339]

The tariffs provide that the owner pays for the charging station installation, but that the utility owns and maintains the stations. The site owner then pays a monthly fee to the utilities "calculated to recover the charging station's cost, maintenance expenses, taxes, a return on LG&E/KU's investment through an overall levelized carrying charge, and for Tariff EVSE, the cost of expected electricity usage."[340] The site host would be able to charge users an amount sufficient to recover the installation cost, monthly fees, and any other cost associated with the station. The site host, however, is not allowed to make a profit on the energy. In addition, the site host must agree to host the stations for five years.

In addition to the tariffs above, the utilities proposed Tariff EVC, under which "LG&E and KU would install up to ten charging stations in each of their certified territories, primarily at publicly accessible areas such as public parking lots, parking garages, and public streets."[341] The utilities "state[d] that the total capital expenditure for the installation of the EVC charging stations is not expected to exceed $500,000 and will not result in increased rates to their customers."[342] Under this tariff, the charging stations would have a per-hour charging fee to recover the cost, installation, maintenance, taxes and a return on the utility investment. The utilities selected ChargePoint to provide the Level Two chargers for the project. In addition, the proposal included annual reporting requirements that the utilities would provide to the Commission.

In an April 2016 order, the Commission approved the tariffs as appropriate and reasonable.[343] In its order, the Commission recognized the need for EV charging infrastructure in the state:

> The Commission likewise believes there is a need in the Commonwealth for a developed infrastructure of electric vehicle charging stations to serve the growing number of electric vehicle owners. LG&E/KU's proposed tariffs, along with the associated cost-

PSC Approves Electric Vehicle Charging Stations, at 1 (Apr. 11, 2016), https://psc.ky.gov/agencies/psc/press/042016/0411_r01.PDF (discussing two possible scenarios that involve charging stations on the property of a non-residential customer).

339. Application of Louisville Gas & Elec. Co. & Ky. Utils. Co., Case No. 2015-00355 at 2–3 (Ky. Pub. Serv. Comm'n Apr. 11, 2016) (order).

340. *Id.* at 3.

341. *Id.* at 4.

342. *Id.*

343. *Id.* at 10.

> based rates which ensure there are no cost shifts to other customers, are a strong first step in achieving that goal.[344]

Thus, Kentucky is an example where the state regulator approved utility investment in EV charging infrastructure without a mandate from the legislature or existing Commission rules. Rather than opening an investigative docket, the Commission ruled on the request presented to it, and allowed the utilities to provide customers with a service the Commission recognized was important. Unlike Kansas and Missouri, the Kentucky Commission did not see EV charging as being outside of the Commission's jurisdiction or, more importantly, outside of the services an electric utility could provide to customers.[345] Accordingly, Kentucky is an example that can be useful in other states that do not yet have statutes and regulations governing EV charging. Nevertheless, this approach is likely limited to smaller, pilot projects, rather than large-scale investments with higher overall costs to utility customers. Indeed, the Kentucky proposal of $500,000 was far smaller than the utility proposals of $16.5 million in Missouri and $5.6 million in Kansas.[346] Even more important, based on the approved tariffs, none of the program costs would be passed on to customers that did not use the charging stations.

4. Rate Recovery for Utility Investments in EV Charging Through Rate Case Settlements: Florida and Ohio

Another approach to utility investment in EV charging infrastructure is to make the investment a part of a general utility rate case settlement. In this setting it is often nonprofit environmental groups or the utility itself that proposes that the utility make a significant EV investment in exchange for concessions on other contested issues in the rate case. Florida and Ohio provide examples of this approach.

In 2017, Duke Energy Florida ("DEF") filed an application with the Florida Public Service Commission to approve a settlement agreement reached between DEF, the Office of the Public Counsel, the Florida Industrial Power Users Group, the Florida Retail Federation, White Springs Agricultural Chemists, Inc., and the Southern Alliance for Clean Energy.[347] The settlement agreement addressed a wide range of disputed issues, including the Levy Nuclear Project and the utility's fuel adjustment clause, as well as an EV charging pilot program.[348] With regard to EV charging infrastructure, the settlement agreement provided in part that DEF would "purchase, install, own, and support" EV charging equipment at DEF customers' locations at a

344. *Id.*

345. *See supra* notes 315–20, 327–28 and accompanying text.

346. *See supra* note 293 and accompanying text.

347. Duke Energy Fla., LLC's Petition, Docket No. 20170183-EI at 2 (Fla. Pub. Serv. Comm'n Aug. 29, 2017) (petition).

348. *Id.*

cost of up to $8 million, plus reasonable operating and maintenance expense, for a minimum of 530 EV chargers and related equipment.[349] This investment would be part of a five-year pilot program, with ten percent of the stations installed in low-income communities.[350] DEF would also establish program funding for market education and outreach and would initiate a separate proceeding to seek approval of a permanent EV charging station program within four years of the settlement.[351] The Commission approved the revised settlement agreement in November 2017.[352]

An Ohio rate case involving American Electric Power Ohio ("AEP Ohio") used a similar approach. In that case, in August 2017, AEP Ohio filed a Joint Stipulation and Settlement Agreement with the Public Utilities Commission of Ohio that included $10 million for an EV charging infrastructure pilot program.[353] The program includes a four-year rebate program for up to 75 DC fast chargers and 300 Level 2 chargers in the utility's service territory.[354] AEP Ohio will not own or receive a return on investment for the charging stations, but can recover a five percent administration fee for handling the rebate program and may seek approval for a return on investment for additional charging station investments in future proceedings.[355] The program "require[s] charging stations to include networking capabilities for data collection."[356] According to the Sierra Club, which was a party to the settlement, the program would allocate $5.8 million to DC fast charging stations and "$3.7M for level 2 charging in multi-unit dwellings, workplaces, and public locations, including a carve out for deployment in disadvantaged communities."[357] The Sierra Club also stated that "[f]or scale, AEP's spending by customer ($10M for 1.5M customers) would be on par with programs approved to date for California's investor owned utilities ($195M for ~22.5M customers)."[358] The Commission

349. *Id.* at 33–34.

350. *Id.* at 34–35.

351. *Id.* at 35–37.

352. Duke Energy Fla., LLC's Application for Ltd. Proceeding, Docket No. 20170183-EI at 5 (Fla. Pub. Serv. Comm'n Nov. 20, 2017) (order); *see also* Robert Walton, *Duke to Install 530 EV Chargers in Florida, Study Grid Integration*, UTIL. DIVE (Oct. 4, 2018), https://www.utilitydive.com/news/duke-to-install-530-ev-chargers-in-florida-study-grid-integration (discussing DEF's implementation of its program).

353. *See* Application of Ohio Power Co., Case No. 16-1852-EL-SSO at 14–20 (Pub. Util. Comm'n Ohio Aug. 25, 2017) (joint stipulation & recommendation).

354. *See id.*

355. *Id.*

356. *E3 Analysis Supports AEP Ohio in Settlement of Proposed EV Infrastructure Pilot*, ENERGY + ENVTL. ECON. (Oct. 17, 2017), https://www.ethree.com/e3-analysis-supports-aep-ohio-in-settlement-of-proposed-ev-infrastructure-pilot.

357. *Expanding Utility Engagement with Electric Vehicle Charging Infrastructure*, SIERRA CLUB, https://content.sierraclub.org/environmentallaw/news/expanding-utility-engagement-electric-vehicle-charging-infrastructure (last visited Sept. 28, 2018).

358. *Id.*

approved the settlement in 2018,[359] making it the largest investment in EV charging infrastructure in the Midwest at that time.[360]

There are benefits and drawbacks to the rate case settlement approach to utility investment in EV charging infrastructure. The benefits are that it allows a fairly significant investment in EV charging infrastructure in states that do not yet have any statutory or regulatory mandates for utility involvement or rate recovery. Rather than having to address the issue of utility investment in EV infrastructure broadly with regard to all utilities and all customers in the state, regulators can consider a particular dollar amount of investment for a single utility and consider the benefits and drawbacks in that more limited context. This adjudicative process allows for a robust pilot project that both builds important EV charging infrastructure in the short term and allows interested parties to learn from that experience and apply it to future proceedings in the longer term. On the other hand, the individual rate case settlement approach to utility investment in EV charging has its drawbacks in that it is a one-off, ad hoc procedure that does not necessarily provide precedent for the next rate case or next utility proposal.

On the whole, the rate case settlement approach is a helpful strategy in non-ZEV states that may be ambivalent about supporting EV adoption as a tool to address climate change and air pollution. However, these states may find utility efforts to expand their offerings to customers through EV charging infrastructure to be an acceptable policy and business matter. In other words, this approach to utility investment does not create an ideal framework for large-scale, multi-utility investment within a state, but it allows utilities and policymakers to support short-term investment without legislative assistance or an extensive regulatory investigative proceeding.

V. EVALUATING THE UTILITY ROLE IN EV CHARGING INVESTMENT

This is a critical moment in transportation electrification in the United States. As of 2018, several ZEV states and numerous non-ZEV states have recognized that EVs may soon become a major part of the nation's transportation system. This requires state legislators and regulators to determine what policies to adopt, and requires EV stakeholders to engage with state legislatures and regulators to develop new policies designed to create a system that best advances their interests—whether those stakeholders are electric utilities, the auto industry, private EV charging companies, individual consumers, site hosts, or environmental groups. In each state, a combination of existing legislative authorizations, utility commission rules, and utility commission adjudicative decisions create the foundation on which

359. Application of Ohio Power Co., No. 16-1852-EL-SSO at 126–27 (Pub. Util. Comm'n Ohio Apr. 25, 2018) (opinion & order).

360. *See* Jeffrey Tomich, *AEP Approved for EV-Charging Rebates as Part of Ohio Rate Plan*, ENERGYWIRE (Apr. 26, 2018), https://www.eenews.net/energywire/2018/04/26/stories/1060080157.

utility proposals will be evaluated and new policies will be added. As the states continue down this path, it is inevitable and desirable that they consider fully what other states are doing in creating their own policies and evaluating utility proposals.

As the Michigan commission stated in its 2017 order, one of the important issues to be addressed with regard to the role of electric utilities was "[w]hat approaches are other states pursuing with respect to reducing market barriers in the deployment of residential and public charging stations and what are the pros and cons if Michigan were to adopt components of these approaches?"[361] Thus, as each state acts, other states are watching, which is both appropriate and desirable in our "laboratories of democracy."[362] Moreover, it is not only California and the ZEV states that have created statutory and regulatory policies to promote transportation electrification and evaluate utility investment proposals that support such policies. Nevada has done so as a legislative matter, Michigan is considering new regulatory policies at the commission level, the Kentucky Commission has approved at least one utility proposal, and the Ohio and Florida Commissions have authorized rate settlements that will likely set the stage for future utility investments. This means that there are states in every part of the country—with very different politics regarding climate change and other important political issues—that can serve as models for states with varying viewpoints considering this issue for the first time.

The diversity of state legislative and regulatory approaches allows for an evaluation of patterns and lessons that are instructive for *all* states considering utility investment in EV charging infrastructure, especially while the states anticipate a massive infusion of funding from the VW settlement for clean transportation projects in general. Indeed, the billions of dollars the VW settlement has made available to states provides a unique opportunity to engage state legislatures, environmental agencies, and utility commissions, as well as nonprofits, and various industry groups to develop programs, policies, and pilots, even in states that might otherwise be indifferent to or actively oppose both decarbonization efforts and transportation electrification. For instance, oil and gas states like Louisiana, Texas, and Oklahoma are not necessarily looking for ways to enhance alternatives to gasoline, diesel fuel, and other oil-based transportation fuels. Nevertheless, these states, like others, are creating plans, task forces, and programs to use the money to reduce vehicle emissions in general and facilitate transportation electrification specifically.[363] These efforts will necessarily spur businesses,

361. Commission's Own Motion to Open a Docket, No. U-18368 at 6 (Mich. Pub. Serv. Comm'n Apr. 28, 2017) (order).

362. *See supra* note 237.

363. *See, e.g.*, David Iaconangelo, *VW Settlement Cash Puts Onus on States*, ENERGYWIRE (May 7, 2018), https://www.eenews.net/energywire/stories/1060080947; Sam Karlin, *Louisiana Eyeing Clean Energy Projects with Volkswagen Settlement Money*, GREATER BATON ROUGE BUS. REP. (Jan. 18, 2017),

including electric utilities, to engage the public and regulators in additional electrification projects.[364] Thus, across the country, in red states and blue states, in oil and gas states and coal states, and in all states in between, all eyes are on ways to transform and rethink the options for electrifying many aspects of the transportation sector. Such a transformation will require a mix of legislation, regulation, investigation, stakeholder engagement, public education, and a range of industry investment opportunities. Although it is primarily state environmental agencies that will develop the plans to spend the VW settlement money allocated to the states, with regard to electric utility investment, it will be state legislatures and utility commissions that will be the primary actors. The remainder of this Part turns to the role of state legislatures and utility commissions. This Part will discuss the types of actions state commissions can take, both with and without accompanying state legislation, to evaluate utility investment proposals in EV charging, the roles of other stakeholders, and how to ensure all members of the public, not just EV owners, will benefit.

A. JURISDICTIONAL QUESTIONS AND ESTABLISHING REGULATORY FRAMEWORKS

First, state legislation is helpful, although not always necessary, to avoid the jurisdictional questions that plagued the proceedings in Kansas and Missouri regarding whether a commission has authority over utility EV charging investments and whether private charging companies can avoid being regulated as utilities. Many state utility commissions have answered these questions in a way that supports investment in transportation electrification based on existing, broad authority in their state statutes. But if a commission is reticent to act in the absence of legislative direction, the legislature can, if it wishes, step in and enact targeted legislation. Such legislation could be similar to that enacted in Nevada, Massachusetts, or other states discussed above that establish commission jurisdiction over utility investment in EV charging, establish general principles for commission evaluation and approval of utility proposals for EV charging investment, and confirm that site hosts and private EV charging companies will not be

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https://www.businessreport.com/article/louisiana-eyeing-clean-energy-projects-volkswagen-settlement-money; Jeff Mosier, *Electric Vehicle Backers Make Case for Texas to Put Millions into New Charging Stations*, DALL. NEWS (Feb. 26, 2018), https://www.dallasnews.com/business/autos/2018/02/26/electric-vehicle-backers-make-case-texas-put-millions-new-charging-stations; Jeff Mosier, *Texas Is Figuring Out How to Spend $209 Million from Volkswagen Settlement*, DALL. NEWS (Dec. 4, 2017), https://www.dallasnews.com/business/autos/2017/12/04/texas-figuring-spend-209-million-volkswagen-settlement; *Public Service Commission OKs Electric-Car Charging Stations*, LEXINGTON HERALD LEADER (Apr. 11, 2016, 4:10 PM), https://www.kentucky.com/news/state/article71164757.html.

364. *See, e.g.*, Leslie A. Pappas, *Pennsylvania Directs Volkswagen Money to Cleaner Transportation*, BLOOMBERG ENV'T (May 10, 2018, 3:26 PM), https://news.bloombergenvironment.com/environment-and-energy/pennsylvania-directs-volkswagen-money-to-cleaner-transportation (discussing plans of several states to use VW settlement funds).

regulated as utilities for providing EV charging services.[365] Beyond these foundational questions, however, state legislatures may not be the best institutional actors to address the more specific circumstances under which state commissions should approve utility EV investment proposals. Such decisions involve complicated issues of rate design, cross-subsidization of customer classes, equity concerns over the costs and benefits of utility investment in EV charging to lower-income communities, and the like. In this regard, state regulatory commissions are the relative experts, regularly addressing these concerns in a variety of contexts relating to electricity and natural gas service. Thus, in the absence of providing general guidance, legislatures should direct state utility commissions to develop criteria for considering utility proposals for investment in EV charging. Legislators can then adopt those criteria with any desired modifications as a matter of legislative policy at a later time.

B. INSTITUTIONAL COMPETENCE: THE ROLE OF UTILITY COMMISSION RULEMAKING, INVESTIGATION, AND ADJUDICATION

The next question is how should state commissions develop these criteria to apply to utility requests for investment? Here is where commission decisions in other jurisdictions are most instructive. Many of the states that have legislation authorizing utility investments in EV charging relied upon criteria first developed in state commission proceedings, either in response to a single utility proposal or as part of a broader investigative docket. This was the situation in California and Massachusetts, where Commission evaluation of stakeholder interests ultimately set the groundwork for the legislature to provide specific policy directions on utility investment in EV charging.

Likewise, recent regulatory actions in Michigan and other states where commissions opened investigative dockets and held technical conferences follow this trend. Such proceedings allow commissions to work in their adjudicative capacity as fact-finding agencies, hear from all stakeholders, and also solicit input from non-stakeholder industry experts.[366] For instance, in the Nevada, Michigan, and Ohio proceedings, various parties solicited cost-benefit studies of developing EV charging infrastructure specific to that state, as well as the role of utilities in building that infrastructure.[367] Evaluation of this evidence can help inform commission decisions on particular utility proposals, as well as later rulemaking or, ultimately, state legislation.

Finally, even in the states that have not opened investigative dockets, state commissions can gain valuable expertise and collect important data while

365. See *supra* Part IV for a discussion of various states' legislation.

366. For a discussion of the range of adjudicatory and investigative proceedings available to state public utility commissions, see generally ARI PESKOE, ALTERNATIVE DISPUTE RESOLUTION AT PUBLIC UTILITY COMMISSIONS (2017).

367. *See, e.g.*, M.J. BRADLEY & ASSOCS., *supra* note 53 (analyzing the costs and benefits of more PEVs in Michigan).

evaluating a utility's general rate case—as was the case in Massachusetts, Kansas, Missouri, and Kentucky—or when evaluating proposed general rate case settlements, as happened in Ohio and Florida. These proceedings are necessarily narrower in scope than an investigative docket, since commissions may exert less control in shaping the questions to be asked and the data they receive. Instead, they would be acting primarily in a reactive role to a utility proposal or a multi-party proposed settlement. On the other hand, utility-driven proceedings can result in more immediate action than investigative dockets because they present a firm proposal for a commission decision. Such a decision, if favorable, allows the proposing utility to begin work more quickly, which, in itself, provides additional data for future proposals. Moreover, even in utility-initiated proposals, there is the opportunity for third-party expert data analysis to be presented to the commission in support of the proposal—whether in a contested case proceeding or other adjudication —and that data can be used in future proceedings.[368]

There is a rich academic literature, which reflects decades of court decisions, that describes the respective benefits of agency rulemaking and adjudication, and why an agency or commission may decide to pursue either method for decision-making. In general, agency rulemaking proceedings are forward-looking, policymaking exercises that are similar to statutes legislatures enact in that they provide a forward-looking, general standard of conduct for similarly situated regulated parties.[369] Some recognized rulemaking benefits are that they can provide clearer standards for regulated parties which, in turn, can enhance fairness, provide notice of what is permissible and impermissible, better ensure like treatment of similarly situated regulated parties, and increase efficiency by resolving an issue in a single proceeding rather than in multiple adjudications.[370] Rulemaking can also benefit from broad, public input from interested parties and can be an efficient means of resolving policy issues that are likely to reoccur on a regular basis.[371]

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368. For instance, in the Ohio settlement proceedings, the parties engaged in significant discussions, discovery proceedings, and information exchanges before arriving at the proposed settlement. *See* Application of Ohio Power Co., 16-1852-EL-SSO at 1–3 (Pub. Utils. Comm'n Ohio Aug. 25, 2017) (joint stipulation & recommendation). As part of those discussions, stakeholder commissioned third party studies of the costs and benefits of EV adoption in AEP's Ohio service territory. *See* ENERGY & ENVTL. ECONS., COST-BENEFIT ANALYSIS OF PLUG-IN ELECTRIC VEHICLE ADOPTION IN THE AEP OHIO SERVICE TERRITORY 1 (2017).

369. M. Elizabeth Magill, *Agency Choice of Policymaking Form*, 71 U. CHI. L. REV. 1383, 1386 (2004).

370. *See* Nat'l Petroleum Refiners Ass'n v. FTC, 482 F.2d 672, 690–91 (D.C. Cir. 1973) (describing advantages of rulemaking and adjudication); Magill, *supra* note 369, at 1403–04 n.69; Richard J. Pierce, Jr., *Rulemaking and the Administrative Procedure Act*, 32 TULSA L.J. 185, 188–89 (1996); David L. Shapiro, *The Choice of Rulemaking or Adjudication in the Development of Administrative Policy*, 78 HARV. L. REV. 921, 930–42 (1965).

371. *See Nat'l Petroleum Refiners Ass'n*, 482 F.2d at 681–90; Robert L. Glicksman & David L. Markell, *Unraveling the Administrative State: Mechanism Choice, Key Actors, and Regulatory Tools*, 36 VA. ENVTL. L.J. 318, 339–42 (2018).

Agencies and commissions can also act using their adjudicative authority, which allows them to engage in fact finding like a common law court to resolve a particular matter that applies to a particular party or parties to the adjudication.[372] The adjudication can resolve the particular matter and also act as precedent for any similar matter that comes before the agency or commission.[373] Some issues before an agency or court may be more suited to adjudication than rulemaking, particularly if the agency cannot foresee all the problems that may be resolved, does not have sufficient experience or expertise with a particular issue to make a general rule, or wishes to retain the flexibility to address problems as they arise on a case-by-case basis.[374] Agencies and commissions may also opt for adjudication over rulemaking if they wish to act more quickly, as the rulemaking process is often a much longer, more procedure-laden process that may defer the benefits of a new policy than could otherwise be implemented more immediately through adjudication, at least in regard to the parties involved in the adjudication.[375]

Moreover, although commissioners in a few states are elected, public utility commissions in the vast majority of states are independent commissions like independent federal commissions such as the Federal Energy Regulatory Commission and the Federal Trade Commission.[376]

In contrast to an executive branch agency headed by a single commissioner who serves at the pleasure of the governor, independent commissions in most states act through a multi-member body, with each commissioner appointed by the governor for a specified period of time and who can be removed only for cause. Most state commissions also have political balance requirements and possess budget, communication, and decision-making authority separate from the executive branch.[377] One of the hallmarks of an independent agency or commission is that it develops expertise in the

372. Jeffrey J. Rachlinski, *Rulemaking Versus Adjudication: A Psychological Perspective*, 32 FLA. ST. U. L. REV. 529, 529–30 (2005); Glicksman & Markell, *supra* note 371, at 341–43.

373. Magill, *supra* note 369, at 1386.

374. Glicksman & Markell, *supra* note 371, at 341–43.

375. *Id.* at 22 ("Agencies may prefer to set policy through adjudication if they anticipate that doing so through rulemaking will take too long and defer the benefits of the new policy."); ROBERT L. GLICKSMAN & RICHARD E. LEVY, ADMINISTRATIVE LAW: AGENCY ACTION IN LEGAL CONTEXT 408 (2d ed. 2015).

376. Boyd & Carlson, *supra* note 111, at 825–26 (describing appointed and elected PUC commissioners).

377. *See, e.g.*, Rachel E. Barkow, *Insulating Agencies: Avoiding Capture Through Institutional Design*, 89 TEX. L. REV. 15, 56–59 (2010); Kirti Datla & Richard L. Revesz, *Deconstructing Independent Agencies (and Executive Agencies)*, 98 CORNELL L. REV. 769, 784–812 (2013) (summarizing the "hallmarks" of independent agencies); Paul R. Verkuil, *The Purposes and Limits of Independent Agencies*, 1988 DUKE L.J. 257, 262–63; Eric Fitz, *New Database Provides a Window Into Public Utility Commissions in All 50 U.S. States*, ADVANCED ENERGY ECON. (July 9, 2013, 11:44 AM), https://www.aee.net/articles/new-database-provides-a-window-into-public-utility-commissions-in-all-50-u-s-states (describing database with information on all 50 state utility commissions and link to database called "The PUC Portal").

subject matter and can more cost-effectively engage in "reflective decisionmaking" on "complex matters."[378] Moreover, as Professor Paul Verkuil has observed, independent agencies have the same tools available to them to decide cases as other agencies, such as adjudication, rulemaking, or civil prosecution, but "[w]hat is unique about independent agencies is that they perform the executive functions of policymaking and prosecution through an organizational scheme that was designed with the adjudicatory function in mind."[379]

Professor Shelley Welton has highlighted the important role that independent state public utility commissions have played in recent years in expanding "energy democracy" through broader stakeholder input and, in some cases, developing clean energy policy.[380] Welton documents that commissions are no longer focused solely on setting revenues for utilities through traditional rate cases, but instead initiate a range of proceedings and stakeholder collaborations that "allow for a wider lens onto policy questions of social import."[381] These utility proceedings create "a more dialogic model, intended to spark creativity toward new solutions and compromises."[382]

With these basic principles in mind, the Massachusetts Department of Public Utilities' approval of Eversource's proposal for EV charging investment described in Part IV is a good example of how an adjudicatory proceeding can be a constructive forum for both long-term policy development and more immediate short-term investments in the context of utility investment in EV charging. In that proceeding, the Department rejected the State Attorney General's request to conduct a broader, statewide investigation into utility investment in EV charging and rate design before approving the utility's $45 million investment proposal.[383] Instead, the Department agreed with Eversource, environmental groups, and private charging companies that it should approve the proposal in front of it and form a working group for more general issues involving investment and rate design that would be applicable to all of the state's utilities.[384] The decision allowed approval of an immediate, $45 million utility investment in EV charging, created a precedent that could apply to other utilities with similar investment proposals, and set the stage for prospective rulemaking proceedings. Such a decision could be justified by the fact that the Department had already addressed many of the jurisdictional issues surrounding utility investment in EV charging, and thus may have felt comfortable evaluating Eversource's proposal without addressing *all* EV charging issues that might apply to *all* of the state's utilities.

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378. *See* Verkuil, *supra* note 377, at 262–63.
379. *Id.* at 263.
380. Welton, *supra* note 20, at 625–27.
381. *Id.*; *see also* Boyd & Carlson, *supra* note 111, at 880–81 (discussing state PUC innovation).
382. Welton, *supra* note 20, at 627.
383. *See supra* notes 216–22 and accompanying text.
384. *Id.*

By contrast, when faced with a similar utility investment proposal in Michigan, the Michigan Public Service Commission rejected the proposal in favor of a formal, stakeholder proceeding.[385] This also can be seen as an appropriate pathway because Michigan had not yet engaged in the type of formal, commission-led investigative process with stakeholder participation that had already occurred in Massachusetts with regard to at least some of the issues associated with utility investment in EV charging. Thus, the Michigan stakeholder proceeding, and similar proceedings underway in other states, can be seen as the precursor to agency adjudicatory proceedings that can consider and approve individual utility proposals and, perhaps sometime later, the groundwork for more general rulemaking proceedings.

The Massachusetts proceedings illustrate how evaluation and analysis in an adjudicatory proceeding, with input from experts and stakeholders, can be better suited to developing specific policies for utility investment in EV infrastructure than either utility commission rulemaking or legislative action. This is particularly true after a state legislature or state commission has made the more basic policy determination that at least some utility investments in EV charging may be in the public interest and subject to rate recovery. Once that initial question is addressed, an incremental, case-by-case commission-driven approach seems particularly fitting at the outset because EV charging—a service that does not fit neatly into traditional utility functions—is in many ways a novel issue for regulators. While it certainly provides individual consumers with a "service," many questions remain regarding whether utilities are the best entity to provide that service, both now and in the future. What if today's EV chargers become outdated in just ten years? Will utility customers be left with significant stranded costs[386] and forced to pay for infrastructure that no longer has value? And beyond those questions, if any utility proposals are approved, there will need to be in-depth and lengthy commission proceedings regarding appropriate rate design, scope, and cost recovery. In other words, the novelty of the issue explains, in part,

385. *See supra* notes 256–72 and accompanying text.

386. "[S]tranded costs are those investments that a utility has incurred to meet its obligation to serve customers with an expectation of cost recovery through rates, but which can no longer be recovered due to a change in the industry." Emily Hammond & Jim Rossi, *Stranded Costs and Grid Decarbonization*, 82 BROOK. L. REV. 645, 646–47 (2017). Stranded costs can also be described as "[e]xisting energy infrastructure that retains some useful life, but that can no longer generate initially expected revenue due to regulatory shifts, market forces, or innovation." *Id.* at 647; *see also* RICHARD J. CAMPBELL, CONG. RESEARCH SERV., R43742, CUSTOMER CHOICE AND THE POWER INDUSTRY OF THE FUTURE 18–19 (2014) (describing utility concerns regarding stranded costs in electric power plant investments as more retail customers self-generate electricity through rooftop solar); CONG. BUDGET OFFICE, ELECTRIC UTILITIES: DEREGULATION AND STRANDED COSTS 3–7 (1998) (discussing how utility can be faced with stranded costs associated with uneconomical power plants after deregulation results in lower wholesale electricity prices due to increased competition and technological developments); Severin Borenstein, *Who's Stranded Now?*, ENERGY INST. AT HAAS (Jul. 18, 2016), https://energyathaas.wordpress.com/2016/07/18/whos-stranded-now (discussing who should cover the stranded utility costs).

why states are experimenting, why there is not yet necessarily one "right" approach, and therefore why utility commissions should be central actors in policy developments in this area. As this Article illustrates, these conclusions hold true regardless of the politics of the state or its official position on issues related to climate change and environmental protection.

VI. CONCLUSION

This Article evaluates the range of approaches states have taken toward utility investment in EV charging infrastructure at a critical time in transportation electrification. The next several years will see a major investment by automakers in EV technology along with the first infusion of VW settlement funds to states and cities to fund transportation electrification. In response to those trends and existing state climate, clean air, and transportation policies, electric utilities are developing major EV charging proposals and are bringing those proposals to state utility commissions around the country. This Article examines these developments in the states and also considers broader principles of institutional competence with regard to a range of decisions in this area. Specifically, this Article concludes that state utility commission adjudicative and investigative proceedings should play a major role—along with state legislation and agency rulemaking—to develop the framework governing utility investment in EV charging. These adjudicative and investigative proceedings allow stakeholders, third-party experts, and others to submit testimony, exchange arguments, work with commission staff and each other, and otherwise develop proposals for commission submission or approval. Such a process allows utilities and the private sector to begin to build EV charging projects now, while at the same time providing experimentation, precedent, and a basis of authority for other utilities and states to consider in making their own decisions on similar issues. Even more fundamentally, using this process to create a role for electric utilities in transportation electrification allows policymakers, scholars, and stakeholders to reimagine and redefine the role of electric utilities at a time when the generation, delivery, and consumption of electricity are experiencing rapid change.