Alliance for Transportation Electrification

## ATE: Interconnection Task Force


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# Energizing EV Charging Stations: Issue Brief 1

## Overview of the Interconnection Process


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# Executive Summary

Over the past several years, the sales of electric vehicles for personal, business, public transit and school bus uses have been increasing at a rapid pace. And with many more EVs on the road, the need to charge those vehicles has burgeoned as well. While it may be more of an issue of perception than reality, every survey of EV drivers and potential EV buyers has shown that range anxiety or finding a charging station is one of their top concerns. So even though over 80 percent of charging of personal vehicles is done at home, drivers and potential buyers still need the comfort of knowing that public charging stations are there when needed. As there are a significant number of locations where home charging is not possible (including for example multi-unit dwellings and houses without driveways), ensuring an adequate number of public charging stations is critical if these drivers are to go electric. And to enable drivers who want to take their EVs on long distance road trips, chargers must be available on interstate and state highway corridors. Finally, there are fleet, business, transit and school bus use cases, all of which will depend on chargers being available either at the fleet or buses' home base or along their routes.

In this and subsequent Issue Briefs, we focus on the challenge of deploying publicly accessible commercial (non-residential) charging stations. Our focus is on how to get these stations built, from identification of need to energization for driver use, in the most cost-effective and expeditious manner possible. The interconnection of new commercial loads to the utility system is a complex process that can be challenging in many ways. And while utilities have substantial experience in connecting new loads to the system, EV charging brings some unique characteristics and issues that are new to utilities. Importantly, while the utility is focused on keeping up with growing electrical loads, new distribution generation technology, extreme weather variability, and protection of the grid from cyber and natural hazards, the significant increase in numbers of charging stations requesting interconnections with utilities is putting increased stress on already stretched utility staff. In other words, the acceleration of clean transportation strategies and deployment of new charging stations is a positive trend, but the staffs of both utilities and EVSPs (EV service providers) and vendors are being stretched to the maximum to meet these new demands.

Nevertheless, if the EV market continues to grow at its current pace, it is imperative that charging station developers, host sites, and utilities work together to ensure that infrastructure can expand in tandem with market demands. This Issue Brief is the first in a series that will help to address the issue of how we can accelerate the process for getting EVSEs energized or interconnected with the electric grid[1]. We use the term "interconnection" broadly as a way of describing how a host site or EV service provider seeks interconnection with the electric distribution grid, like how solar, renewable, and behind the meter resources request interconnection. For an EV charging station to seek electric service and ultimately become energized, it requires many tasks and steps that we describe in this paper that require compliance with Commission rules and procedures as well as legal approvals. In the series, we will describe the steps needed to get to energization, potential hurdles in those steps, and some best practices to get the step completed. The intent is not to go into substantial detail but to provide a high-level view of what must be done, how it can be approached, and some best practices. These proposed best practices are bolded throughout the report. A bibliography is provided for those seeking more detailed information.

In this first Issue Brief, we provide an overview of the whole interconnection process, while in subsequent papers we will focus on steps described here in further detail.

***DEFINITIONS***

*Just like any other industry, the EV charging space has its own jargon and technical terms which will be used in this paper and are important to understand when reviewing the references that are cited in this Issue Brief.*

*We present some of these more commonly used terms here:*

***ELECTRIC VEHICLE SERVICE EQUIPMENT (EVSE) –***
*generally refers to the actual EV charger which is connected on one side to the utility meter and on the other side to a charging cord, which is plugged into the EV for charging. There are three basic types of chargers – Level 1 which is standard 120V and does not require any special equipment, Level 2 which is 220 V and requires special wiring, and Level 3 which is Direct Current Fast Charging or DCFC and and provides very fast charges at potentially high power (up to 350 kW).*

***ELECTRIC VEHICLE SERVICE PROVIDER (EVSP) –***
*the owner and operator of the charging station that provides and bills for the charging service and pays the utility bill for electricity purchased.*

***EV STATION DEVELOPER OR CUSTOMER –***
*The entity that seeks interconnection of the EVSE to the utility grid. The developer or customer (used interchangeably here) may be the EVSE, EVSP, or Host Site, or can be a contractor that builds the station and turns the ownership and operation over to another party that becomes the EVSP.*

***HOST SITE –***
*the owner (or lessee) of the property at which the charging station is located. The Host Site may or may not be either the developer or EVSP but must have contractual arrangements with those parties.*

***NETWORK OPERATOR –***
*Many EVSEs are networked as part of an overall system of chargers owned or operated by the EVSP and require network services to operate their charging networks and connect to back office operations for billing and other services. Network operators may provide many other services such as managed charging, and again may or may not be affiliated with the EVSP.*

[1] In this paper, we use "energized" and "interconnected" interchangeably, although interconnection, particularly in cases where provisions are made for vehicle to grid operations, may involve extra steps.

# Roles of the Parties

In the context of a proceeding before the California Public Utilities Commission (CPUC)[2], Pacific Gas & Electric on behalf of the Joint California Investor-Owned Utilities presented a ***"General EV Customer/IOU Journey Map"*** that provides as excellent overview of the roles of both the customer (or developer) of the charging station and the local utility from initial application to final energization. ***This map is presented as Figure 1 on the next page.***

The map lays out the tasks that either the customer (green), the utility (blue) or both (blue and green) perform throughout the EV charging energization process, which does not include potential facilities at the site such as onsite energy storage or solar generation. This map represents a generalized process and again may vary by location and by utility. For example, some utilities may assist in the steps to a greater or lesser degree here. And the formality of the application itself will vary. It is also important to point out that some customers may wish to take on more of the process steps when feasible to speed up the process, due to the fact mentioned earlier that utilities may have a backlog of energization requests for EV charging.

In general, the customer is responsible for submitting an application to the utility for service energization – the information required in such application will vary but is outlined under "Application Readiness" above the map in Figure 1.

Once an application has been submitted and reviewed by the utility, the utility will respond with estimates of costs that will need to be paid by the customer. If the customer wishes to proceed, the utility and customer will negotiate a contract which specifies in detail the obligations of the customer, utility, site host (if different) and any other involved entities. Upon finalization of the contract, the customer will be responsible for meeting all pre-construction legal requirements including zoning, easements and land use authorizations, and all local and state approvals required. These typically must be acquired before construction is scheduled. Once all pre-construction approvals are obtained, the utility and customer (or their contractors) may proceed to construction of their contracted portions of infrastructure and utilities will proceed with construction for which they are responsible.

[2] California Public Utilities Commission. "Joint IOU Public Workshop on EV Charging Infrastructure," March 28, 2022.

# General EV Customer / IOU Journey Map

*Process varies by IOU

- CUSTOMER TASK
- UTILITY TASK
- BOTH

## APPLICATION READINESS

Do I have a specific location identified?

Do I have the information and documents required, such as

- Forecasted load/charge cut sheets
- Site plans with all utilities identified (gas/water/sewer/phone, etc);
- Single line diagrams
- Existing easements
- Landscaping/drainage

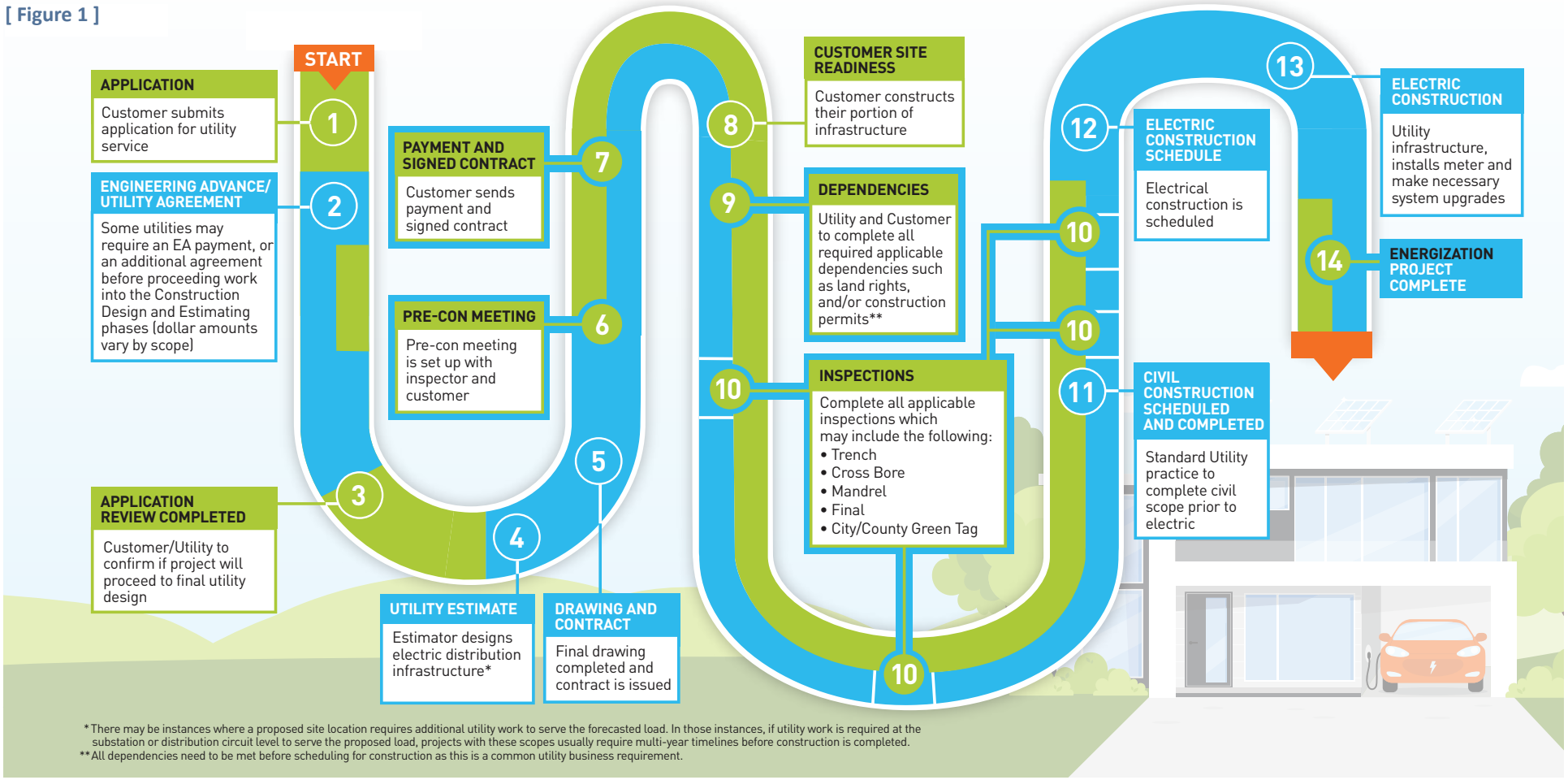
## KEYS TO SUCCESS

Understand applicable Utility Standards and Processes

Open communication with jurisdictional authorities

Project support from site host or landlord

[ Figure 1 ]




*There may be instances where a proposed site location requires additional utility work to serve the forecasted load. In those instances, if utility work is required at the substation or distribution circuit level to serve the proposed load, projects with these scopes usually require multi-year timelines before construction is completed.

**All dependencies need to be met before scheduling for construction as this is a common utility business requirement.

# Pre-Planning of EV Infrastructure

While not explicit in Figure 1, an important part of the energization process begins well before a formal application is made by the customer. There are steps that both the utility and customer should take to help smooth the process even before the customer decides it wants to invest in an EV charging station.

First is utility grid planning. Transmission and/or distribution system capacity constraints can be a significant cause of delay in getting an EVSE interconnected. This is especially true for DCFC sites that can require a significant amount of grid capacity. To the extent possible, utilities should plan for grid needs resulting from EV market growth. While most capacity upgrades needed will be at the distribution level (feeders and substations), transmission and sub-transmission upgrades are also likely to be needed. ***Utilities may want to consider proactively adding grid capacity in advance of need to reduce the potential for delays, but there are complex economic and regulatory issues with such an approach.*** State PUCs currently may require utilities to demonstrate that the additional load is committed before improvements can be authorized, to mitigate the potential for utility overbuilding and stranded assets. To help address these concerns, Commissions will need to be engaged and aware of the need for such advanced investment. Additionally, utilities will need assurance of the potential to recover costs for such investments in a predictable and timely way. Utilities may face prudency issues when making strategic investments in advance as well as the potential risk of stranded assets. Traditionally, utilities have relied on significant historical data from customers as well as weather and other variables to project loads and resources in the future. However, there is uncertainty over how accurate demand forecasts are when utilities in this new and emerging area of projecting the scope and location of EV charging loads. The technology around tracking public charging, both by the OEMs and the EV charging providers, is still growing and changing rapidly. Accordingly, some Commissions may reject utility requests to proactively upgrade their grid infrastructure in order to support future capacity needs, yet others may be inclined to approve such proactive infrastructure investments if directed by the Legislature or if they are consistent with state public policies to decarbonize and reduce air pollution.

One concern that has been expressed by EVSPs is that utilities often have incorporated low EV adoption scenarios in their traditional load forecasting and IRP (integrated resource planning) activities. Another concern expressed is that utility planning is typically done at a system level rather being locationally based. For example, utility planning may not be accurately reflecting DCFC highway charging that is growing rapidly across the country and will continue to grow as a result of substantial Federal funding from the Infrastructure Investment and Jobs Act of 2021. An important fix is to begin to incorporate real market data into those planning efforts. Customers – particularly large EVSPs and fleets and auto and truck OEMs could help by offering data packages to utilities as well as forward-looking EV product plans and forecasts for zero-emission vehicles (ZEVs). Unfortunately, the planning horizon for customers is much shorter than utility planning horizons – 1-3 years versus 5-20 years. But any information customers can provide about their plans – even if very tentative – can be helpful to utility planning efforts. Some locations will be obvious – for example, airports are likely to require significant capacity to support charging needs at rental car locations. ***Utilities, getting information from multiple sources, including their own field engineers, may be able to determine those areas that are likely to see substantial numbers of new charging stations and plan accordingly.*** DCFC stations also are likely to require

distribution transformers and other equipment that is in short supply.

Second, utilities might make hosting capacity maps available to customers to help in site selection. Such maps should be dynamic, up to date, and should indicate at least as a general matter, locations on the utility system that may be able to accommodate increased load versus other areas of the system. It is important to note that such maps have their limitations – primarily because each customer load will have differing impacts on the system dependent on size and potential utilization. But such maps can provide some guidance to potential customers and utilities are beginning to offer them in some locations.[3] In areas with potential capacity constraints, the standard practice is usually first-ready first-served (and "ready" means that the host site/EVSP has met all the necessary requirements), but EVSPs have mentioned seeking alternative approaches.

Third, utilities should have a transparent process in place for helping the customer through the interconnection process. ***A best practice is for the utility to have a single point of contact (SPOC) listed on its website or known to customer service representatives of the utility. Another best practice is that once contact is established, the utility assigns a project manager and team that will work with the customer to help in site selection, local zoning and permitting, preparing the formal application, contracting, construction and all the other steps indicated in Figure 1.*** New York, for example, requires utilities to have a dedicated EV team. The aim should be to eliminate any confusion to the customer on how to get started and who is responsible for what along the way.

Fourth, having adequate staffing in utilities, EVSPs and government code enforcement and permitting agencies is essential to being able to complete the interconnection process in reasonable time frames. There are problems in finding the right technical expertise – particularly distribution engineers – needed to design and construct charging stations. Even after hiring, substantial training is needed. Corporate land and real estate departments are typically not staffed to deal with new easement and access applications that will be coming with the increasing need for charging. With the increased amount of public funding become available, new EVSP entrants to the market may not have the internal expertise and understanding to address all aspects of the utility interconnection process.

There are some steps that can be taken to ensure an adequate work force for dealing with interconnection requests:

- ***Utilities and EVSPs should support educational programs in community colleges and technical schools.***
- ***Budgets for staffing by utilities are typically considered in general rate cases which are considered to be an O&M expense. Utilities should seek to ensure sufficient budgets for dedicated staff and Commissions and governing bodies should give such budgets favorable consideration.***
- ***Utilities should provide education and outreach to site hosts and EVSPs on the requirements of the process.***
- ***With increasing applications, utilities should have a dedicated group to work on process, especially with federal funding and expectations for increased growth.***
- ***Where possible, some functions might be outsourced.***

Finally, to the extent possible, ***customers working with their utilities may want to initiate design and pre-engineering work even before formal applications are submitted.*** Such pre-work will shorten the time frames in the energization process attributed to the design and engineering process. Assuming the customer decides to proceed, a contract will be negotiated detailing who has what responsibilities and the allocation of costs.

[3] Dominion Energy in Virginia and South Carolina are currently testing beta versions of such maps. DTE Energy in Michigan has been ordered to develop such maps. CPS Energy in San Antonio TX has also developed hosting capacity maps as a means to assist commercial EVSPs in siting selection.

# Site Selection Process

The first step in the interconnection/energization process is the decision by a customer to install charging and the selection of a site for the installation. If it is a site host desiring to add charging to their existing business, site selection is straightforward. The site host will in most cases hire a third party to install the chargers and conduct many if not all of the energization tasks. The site host or its contractors will need to contact the local utility to ensure that capacity is available for the site (which may depend on charging level and number) and to begin the interconnection process. It will also need to ensure that charging fits within the allowable zoning for its property or seek rezoning. Some states and localities require a public process and/or hearing to approve zoning requests which can add weeks or even months to the process. ***Local governments should develop streamlined processes to approve zoning applications from EVSPs, particularly in areas that already have zoning of a compatible nature.***

But many EVSPs may want to site chargings stations in specific locations or areas without a specific site host lined up. EVSPs seeking federal funding under the federal National Electric Vehicle Infrastructure (NEVI) program for example will need to locate in areas specified by the funding rules and state request for proposal (RFP) requirements. Utilities owning and operating charging stations may be limited by the specifications of the programs approved by their Commissions (for example, utilities may be required to focus on rural areas, or underserved areas in metropolitan areas such as low-income and multi-family units) And of course all EVSPs will be seeking sites that will likely be profitable in the short or medium term required by their investors. EVSPs may seek out potential site hosts such as gas stations, convenience stores, shopping centers, malls, big box stores, and the like. Some EVSPs may want to use greenfield sites.

There are a variety of factors associated with desired site location that will affect the costs of installation that will also need to be taken into account. For DCFC, sites that have primary service (transmission or sub-transmission) will be more attractive than those with secondary service. Distance from the nearest distribution pole or service drop and the electrical panel, availability of parking spaces at the EVSE location, are there major obstacles between service panel and EVSE, what hours will drivers have access to the charger (NEVI requires 24 hour access), are there security concerns – is lighting feasible, can ADA access and parking requirements be met, among other factors. Room for future expansion should be considered along with the capacity of the electric grid at the location to support futureproofing.

In choosing preferred locations, the attitudes and requirements of local governments can also be important. The number and types of permits and approvals required vary greatly among locations and may make a difference in where an EVSP decides to build. Some localities are actively seek charging stations and are willing to work with applicants. ***Local governments should be encouraged to have staff especially trained and dedicated to help EVSPs through the local approvals processes.***

# Application Process

Once a site has been selected, the formal application process may begin. Every utility will have a differing application process, but much of the information required is likely to be similar. Again, a best practice is for the utility to have a single point of contact and project manager to help the customer through the process. ***The job of the utility project manager should include walk-throughs with the customer at the site, help with the application and associated line drawings, help with easements and other permits required, serving as a go between with field distribution engineering, and associated functions.*** The project manager should also identify any potential problems as soon as possible.

***Another best practice is ease of access to applications and to provide help in completing them.*** Some utilities are beginning to post their applications, or links to them, on their web pages. For example, Salt River Project (SRP) in Arizona has a web intake form posted. SRP also identifies typical costs on its website to help the customer. DTE Energy (DTE) has "Electric Checklists and Guides" on its Commercial Customer Charging Forward website, with a ten-step process identified. Accounts for larger projects are "assigned" to project managers to help guide customers through the process. DTE also prioritizes waitlist applications for "Charging Forward" applicants at sites with available capacity. The DTE Charging Forward Team initiates service requests, since most of required documentation is collected up front through the application. Southern California Edison (SCE) established a dedicated design and project management team to focus on EV charging infrastructure – its Transportation Electrification Project Management (TEPM) team. SCE's TEPM provides a single point of contact for customers with commercial EV requests, and who are not already participating in one of the company's TE programs.

After an application is submitted, the utility will review and begin the studies it needs to do to ensure feasibility. In some cases, the utility will require a payment to cover the costs of these studies and application review. The utility's distribution field engineers will conduct site inspections and ensure that either the grid capacity at the site is sufficient or what upgrades would be needed.

The next step is for a contract to be negotiated between the utility and customer specifying the responsibilities of each and who is responsible for which costs. Before construction can begin, however, the customer (with help from the utility) needs to obtain the necessary easements, permits, and permissions.

# Land Acquistion and Access (Easements) and Permits

Land acquisition and permitting is one of the major soft costs in building charging stations and also one of the major sources of delays. We will cover these issues in more detail in a future Issues Brief.

One of the major sources of delay in energizing charging stations has been the easement process. In its simplest terms, an easement is a limited property interest that allows the holder of the easement to use the property of a land-holder for the limited use specified in the easement document. They are almost always needed for charging stations because utility wires, trenching for the wires, transformers, utility panels, EVSEs themselves, and other land required for construction is done using the property of third parties – often the site host, but possibly other parties that electrical wires will need to cross including possibly public rights of way. The easement also grants utility access and control should it need to repair or replace the equipment on the easement grantor's property. Easements should also grant EVSPs access for their owned equipment. Easements can be granted for the entire property or just for the charging infra-structure locations. An alternative to easements is a license agreement, where the property owner transfers certain rights to the utility and EVSP through a contract. A license agreement may be faster than the process for easements and thus may be attractive in some cases, but is not always allowed. Some utilities are beginning to work on a license agreement process. Another alternative to an easement, is a lease of land, where the landowner gives up certain rights in exchange for payment. Further, there are some jurisdictions (either States or local governments) where easements are not required – the utility may have a statutory permission to install and grant of access to its equipment, for example.

Because each easement may require negotiation between the landowner/site host, EVSP (if different), and utility, it may become a source of potential delay in the energization process. Landowners may have different require-ments they need for the easement. One solution that has been suggested is for the utility to have standard easement language or a land access/quitclaim agreement available on their website. Pacific Gas & Electric, for example, uses standard language agreements with EVSPs a great deal and it has been shown to save time and resources. The access agreement is modeled after PG&E lease language which can be inserted in site host agreements instead of the going through the easement process. SCE established standard easement agreements as well as quitclaim language in the event that an easement needed to be ter-minated. It's important to not, however, that some states require easements for utilities. ***Standardized easement language or access/quitclaim agreements have been cited by many EVSPs as a best practice and it can save time, but it is not a panacea.*** The site host/landowner will likely have their own thoughts, and some areas are particularly difficult to negotiate. Landowners typically don't want easements to last longer than the EVSP contract (easements typically last in perpetuity as utilities want to mitigate issues related to property being sold and lease language no longer being valid). Indemnification is usually difficult to deal with, and businesses typically want assurances regarding potential interrup-tion of their operations. Thus, negotiation is usually required even with standard language.

While not all easement/access issues are easy to resolve, it has been clear from experience that having standardized language can help ease the process. The EVSP can be of great assistance in moving the process along. For example, the EVSP can conduct the negotiations with the landowner and deal with the utility, as they tend to have developed experience in understanding the issues. Utilities can also help by being prepared for the ever-increasing number of appli-cations that it will see in the near future, not only as a result of NEVI-funded sta-tions but as a normal course of business. The real estate and legal departments of utilities need to be ready for substantial additional workloads in the coming years. ***Another best practice is for the EVSP to be ready indemnify the utility for its equipment in the easement or access agreement to reduce utility risk.***

States can take some actions as well. ***States can enact legislation with model codes and/or permits that localities may adopt. Alternatively, states can set local requirements for codes and permits or set deadlines for local governments to act.*** California's legislature, for example, enacted AB 1236 in 2015 to streamline the permitting process for applicants and establish best practices for permitting and communication requirements.

There are also some federal requirements. For example, ADA compliance and associated parking requirements. ADA compliance is federally mandated but regulated locally. The local government's requirements for ADA compliance can sometimes be unclear and add time to project interconnection. ***Local governments can help by having clear requirements and educational materials to help EVSPs through the process. Some changes to ADA compliance requirements are also needed to streamline approval processes.*** OSHA and National Electrical Code requirements apply to ensure safe operation. Other federal requirements apply directly to NEVI-funded projects that they must meet and demonstrate.[4] Some apply to what standards the EVSE must satisfy, some apply to the specifications for charging stations such as operating hours, others apply to location. These presumably will be incorporated into the RFPs that states issue for charging stations to be funded by NEVI.

Finally, there are thousands of smaller municipal and cooperative utilities that will also need to gear up to work with EVSPs in the permitting process. These utilities are regulated either by a coop Board or a city government. They are probably less prepared than larger utilities as they don't have the staffs to dedicate to these efforts. In these cases, the EVSP may need to take a more active role in helping the utility. But smaller utilities should also gear up resources to deal with requests to install EVSEs in their service territories.

[4] Requirements for charging stations funded by NEVI programs in the states were published in the Federal Register on February 28, 2023, : ***https://www.federalregister.gov/documents/2023/02/28/2023-03500/national-electric-vehicle-infrastructure-standards-and-requirements***

# Supply Chain Issues

Once a contract is signed to construct a charging station, utilities need to acquire the necessary electrical equipment. These needs vary according to the site location, current power capabilities, power level of the chargers, current equipment on site, and other factors. Large DCFC charging stations are often likely to require new distribution transformers to provide service. Utilities also acquire these transformers to accommodate other needs on their system, including distributed generation and normal customer growth. As a result of the Covid-19 pandemic and increasing needs for transformers, as well as limited suppliers, supply chain issues have resulted and are currently one of the major sources of delay in the energization of many charging stations. For example, at the end of 2022 and into 2023 utilities reported experiencing delays of up to two years to obtain a 1000 kVA transformer. Again, we will offer further analysis in-depth in an upcoming Issues Brief soon.

Electrical panels for customers (200 or 400 amps) also have longer lead time. Power sockets have gone from 42 weeks to 68 weeks. Switchgear, which must be customized to the site, has gone from six months to twelve months lead time. There are some indications that the situation has started to ease, but supply chain delays remain a significant barrier to the timely energization of charging stations.

There have been multiple proposals for dealing with supply chain issues. ***One best practice is to standardize the transformers used for charging station installations, whenever possible.*** Right now, utilities may change the specifications for transformers with each order, but it is unclear if customization is necessary. Standardization would make it easier for utilities to develop and maintain inventories. Some have suggested that utilities make their transformer inventories transparent, but there are associated physical security concerns that weigh against such transparency.

Of course, ***a best practice would be for utilities to order transformers and other constrained equipment in advance of need.*** The idea is that utilities would forecast the growth of charging stations in their service area and pre-order to meet those needs. Some utilities are already doing this – Salt River Project and CenterPoint Energy, for example. As noted earlier, forecasting needs is not easy to accomplish, as EVSPs, fleets, and bus systems seldom know their plans more than two to three years in advance, and even those plans change frequently. Regardless, since the charging station requirements and approximate locations are a known need, this equipment should be put in the procurement process now. Additionally, utilities are reluctant to invest substantial sums in equipment for future use without assurances from their Commissions or governing bodies that such costs will be recoverable.

But utilities can and should make such requests to their PUCs. ***Commissions should review and approve requests for pre-ordering supplies that are in shortage when the need for future equipment is demonstrated to a reasonable extent.*** And along the same lines, because some customers are likely to transition their fleets over time – rather than all at once – utilities should seek approval to install ducts, structures and/or equipment at EVSE sites for futureproofing. Specifically, utilities should work with their PUCs to determine on the requirements needed to allow the utility to increase efficiency and mitigate costs by installing the conduit, structures, and/or equipment where appropriate to support the customer's long-term electrification plan. This is especially apt to mitigate the potential future costs of trenching in a roadway or parking lot with asphalt or concrete in order to increase the size of conduit for electrical wiring. The maxim of "only break asphalt once" should apply here.

# Design, Construction and Inspections

Generally, most of the design work can be done before the contract is signed, and in fact in most cases a design will be needed for easement and permit purposes. Getting site plans to utility specifications is taking time in a lot of cases. ***A best practice is for utilities to make their design specifications transparent and communicate those to the EVSP. Utilities should have dedicated design and construction resources to smooth the process.***

The civil work associated with construction is done first followed by the electrical work. ***Utilities should coordinate with the site civil constructor to make the process short as possible.*** Fair warning should be provided to the utility as to when the site will be ready for electrical work. By the same token, the site developer should ensure that inspections are scheduled as required up until the point that the EVSE is ready for energization.

# Timelines for Energization

The overall timelines for the interconnection process can vary widely and will depend on whether it is a Level 2 or DCFC station, the availability of the equipment needed, whether any upgrades to the utility grid are needed, the site location, the preparedness of the utility, EVSP and local governments as well as a variety of other factors. Timelines can vary from two months to two years, or even more. Above we have discussed several steps all the parties can take to minimize the timeline.

There are other steps that can also reduce overall timelines:

- ***Utilities and local governments should develop clear materials on process and timeline for service energization.***
- ***Responsible parties should be designated for each step of the process.***
- ***Data on the cause of delays – particularly where projects are significantly delayed – should be collected to improve the process.***
- ***Where utility upgrades are needed, utilities should try to offer partial service to the site and phase in full service.***
- ***Microgrid, solar and/or battery storage at sites presents complications, but also may reduce the size of any needed upgrade to reduce time delay and also may help with demand charges.***

# Summary

The Interconnection and energization of charging stations Is clearly a complex process requiring cooperation and communication among utilities, site hosts, EVSPs, contractors and governments. It is vital that the EV stakeholders educate the Commissions about both the complexities in these multiple processes, and the chance to streamline them where appropriate. There are certainly steps to be taken to improve the process, although some constraints like supply chain and workforce development are somewhat beyond control of these parties. Everyone needs to collaborate to make the process work, and the recommendations made in this paper may help to make the process easier and faster to ensure that commercial charging station development can keep up with the rapidly growing EV markets.

*This paper has been developed by the Alliance for Transportation Electrification (the "Alliance" or "ATE") under the auspices of its Interconnection Task Force. The ATE is a 501(c)(6) non-profit corporation established in early 2018 and is active in many state proceedings across the country. We engage with policymakers at the State and local government level to remove barriers to EV adoption and to encourage the acceleration of EV infrastructure deployment with a particular emphasis on open standards and interoperability. We currently have about 60 members that include many electric utilities, auto and bus manufacturers, EV charging and service providers (EVSPs), and related trade associations and non-profit organizations. Much of the material in this Brief is gleaned from a series of meetings of the Interconnection Task Force from June 2022 to January 2023. While many of the recommendations come from suggestions at those meetings, we have not attributed them. The co-Chairs of the Task Force are Melodee Black of Southern California Edison (SCE) and Kathy Knoop of General Motors (GM). Bruce Edelston, a Senior Advisor of ATE, took the leading in drafting with assistance from Phil Jones.*

## Bibliography

Below we have referenced a limited number of selected resources that provide more detail on the issues and our recommendations.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