UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

Electrification and the Grid of the Future) AD21-12-000

Request to Accept Late-Filed Comments and Post-Technical Conference Comments of the R Street Institute

Pursuant to Notice Inviting Post-Technical Conference Comments, issued on May 17, 2021 by the Federal Energy Regulatory Commission (FERC or Commission), the R Street Institute (R Street) hereby submits post-workshop comments to the technical conference to discuss electrification and the grid.

Electrification presents opportunities and challenges to bulk electric system economics and reliability. Proper regulatory policy, such as that reducing participation barriers for distributed energy resources (DERs) and properly signaling demand flexibility, can enhance system planning and operations. Reducing barriers to electrification also provides environmental benefits because, generally, electrifying transportation and industrial processes displaces higher emitting fuels.

I. Request to File Late Comments

R Street submits a request to FERC to accept these late-filed comments. FERC's Rules of Practice and Procedure do not require a motion to be submitted in an "informal rulemaking proceeding."[1] In the absence of such requirement, R Street, instead, requests that FERC accept these late filed comments into the record of this proceeding. Due to the stage of this proceeding, and the nature of FERC's request for comments, R Street submits these comments to provide additional input into the record, does not prejudice any party, and accepts the record developed to date.

II. Introduction

A. Background

[1] 18 C.F.R. §385.212.

On April 29, 2021, FERC convened a technical conference on the impacts of electrification on the electrical grid. The technical conference had four panels.[2] On May 17, 2021, FERC issued a notice seeking post-technical conference comments with a focus on the same four topics:[3]

- Projections, Drivers, and Risks of Electrification
- Infrastructure Requirements of Electrification
- Transmission and Distribution System Services Provided by Flexible Demand
- Local, State, and Federal Coordination

B. About R Street Institute

R Street is a nonprofit, nonpartisan public policy research organization. Our mission is to engage in policy research and outreach to promote free markets and limited, effective government. We favor regulation that is transparent and applied equitably, as well as systems that rely on price signals rather than central planning. At the same time, we recognize that natural monopolies and externalities are real concerns that governments must address. We offer research and analysis that advance the goals of a more market-oriented society and an effective, limited government, with the full realization that progress takes time.

As one of the preeminent free-market entities in the United States, R Street has a unique perspective regarding the impacts of electrification on retail and wholesale alignment and market growth; effects of electrification on demand growth and forecasting; and market opportunity to develop and provide customers with resource and technological needs.

C. Communications

Correspondence and communications regarding this filing should be addressed to the undersigned as follows:

Devin Hartman[4]
Director, Energy and Environmental Policy
Resident Senior Fellow
R Street Institute
1212 New York Avenue, NW, Suite 900
Washington, D.C. 20005
Tel: (630) 399-4053
Email: dhartman@rstreet.org

Chris Villarreal
Associate Fellow
Energy & Environmental Policy
R Street Institute
9492 Olympia Drive
Eden Prairie, MN 55347
Tel: (415) 680-4224
Email: cvillarreal@rstreet.org

[2] *Electrification and the Grid of the Future*, Supplemental Notice of Technical Conference, Docket No. AD21-12-000 (April 28, 2021). https://www.federalregister.gov/documents/2021/05/04/2021-09358/electrification-and-the-grid-of-the-future-supplemental-notice-of-technical-conference.

[3] *Electrification and the Grid of the Future*, Notice Inviting Post-Technical Conference Comments, Docket No. AD21-12-000 (May 17, 2021). https://cms.ferc.gov/sites/default/files/2021-05/AD21-12-000-TC-Comments.pdf.

[4] Person designated for service.

D. Comments

R Street provides comments on the following questions, as prepared by FERC.

Projections, Drivers, and Risks of Electrification

1. What are the main drivers of electrification? Is the shift from using non-electric sources of energy to using electricity more pronounced in certain sectors or industries? How might public policy, energy costs, and technology drive electrification in the future?

Electrification is being driven by federal and state policy. These policies focus on improving supply-side economics in the transportation and industrial sectors, and demand by end-use customers.

<u>Policy</u>

Most states currently have some form of a renewable energy or emissions reduction statute that requires its electric utilities to build or procure cleaner types of generation.[5] In addition, these states may seek emissions reduction options from sectors other than electric, most notably in the transportation sector. This means that there are a number of states looking to do two things: clean up their electricity generation mix, and shift transportation fuels from gasoline to electricity. For the transportation sector, this can result in stricter tail-pipe emission requirements, or a requirement that a certain percentage of cars be electric, which will impact demand for electric vehicles (EVs). Thus, R Street expects the electric vehicle market to continue to grow over the next decade. Federal and state governments have also promoted incentives to encourage customers to adopt electric vehicles. Such subsidies are increasingly being put into place to encourage fuel switching, such as replacing a natural gas water heater with an electric one, or encouraging the adoption of fuel pumps.

<u>Improving Supply-side Economics</u>

Technological advances have improved the performance and lowered the costs of electrification in the transportation and industrial sectors. In the transportation sector, battery prices have fallen by about 80 percent the past decade, while the expansion of charging infrastructure has bolstered access to charging equipment.[6] Incremental improvements in electrifying processes for heat and fueling boilers are expected to improve the outlook for industrial electrification, but cost is a key challenge—and one that is heavily dependent on the

---

[5] "State Renewable Portfolio Standards and Goals," National Conference of State Legislatures, August 13, 2021. https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

[6] McKinsey Center for Future Mobility, "Electrification," McKinsey & Company, Last Accessed August 13, 2021. https://www.mckinsey.com/features/mckinsey-center-for-future-mobility/overview/electrification.

price of electricity.[7] Contrary to conventional economic wisdom, electrification may extend beyond what the hard cost-benefit optimization would suggest because many consumers are willing to pay a premium for a lower emissions profile.

Customer Adoption

Customers—residential, commercial and industrial—are pursuing transportation and industrial electrification for a variety of reasons, including superior end-user performance and a lower emissions profile. These goals can be met by signing onto utility green tariff options; electrifying their own practices; signing up for third party provision of carbon free resources—assuming availability of retail choice or freedom to directly procure such resources; and electrifying their own practices. For example, a number of school districts and local transit authorities are looking to use more electric buses rather than expanding use of diesel or natural gas buses.[8]

> 2. What technologies are commercially available and currently being deployed to electrify different sectors or industries? What sectors and industries are driving the implementation of these technologies and how are they implementing them? How quickly are these technologies being deployed, and are there regional differences in the scope and rate of deployment?

R Street provides no comment to this question.

> 3. How is electrification expected to affect electricity demand growth in the short term and the long term? How might electrification change electricity demand in the future in terms of daily and seasonal demand patterns, absolute magnitude of electricity demand on average, and during peak periods?

As discussed more fully in response to Question 9, R Street anticipates that greater electrification may have significant impacts on electricity demand and traditional planning assumptions. Notably, in cold weather states that typically rely upon natural gas for heating demand, as natural gas is replaced with electricity heating sources, assumptions around lower electricity consumption, based on historical use of natural gas for heating demand, will have an impact on how the system is planned.

There are potential benefits and ways to minimize substantial impacts. For example, implementing time-of-use rates for electric vehicle charging can encourage charging to occur during low-use or low-cost periods of time.

---

[7] Jeffrey Rissman, *et al.*, "Technologies and policies to decarbonize global industry: Review and assessment of mitigation drivers through 2070," *Applied Energy* 266: pp. 7, 14-15 (May 15, 2020). https://www.sciencedirect.com/science/article/pii/S0306261920303603.

[8] See, *e.g.*, https://www.wric.com/news/local-news/chesterfield-county/chesterfieldchesterfield-county-schools-adds-two-electric-school-buses-to-fleet-county-schools-adds-to-electric-school-buses-to-fleet/; https://www.philasd.org/blog/2021/06/15/electricschoolbuses-2/; https://www.blue-bird.com/about-us/press-releases/197-first-electric-school-buses-deployed-in-the-state-of-texas.

R Street does anticipate that many of the short-term impacts from electrification will occur on the distribution and retail level. Policies such as time-of-use rates and distribution grid modernization will go a long way in minimizing any negative impacts from electrification on the electric system.

4. How might electrification affect marginalized communities? What are the environmental justice considerations associated with electrification?

Marginalized communities are disproportionally affected by fossil fuel-related emissions. Individuals in these communities are particularly burdened by irregular heartbeats and decreased lung function compared to the population at large.[9] Electrification—when implemented properly—offers the possibility of rectifying the aforementioned public health concerns.

Realizing this outcome requires pragmatic public policies that consider—among other things—optimal consumer choices. This should include, particularly in regard to land transportation, the near-term prioritization of hybrid electric vehicles and battery electric vehicles as a mechanism to reduce emissions.

R Street recently released a paper looking at the demographic and sociological impact from transportation electrification.[10]

5. What are the cybersecurity, reliability, and operational risks and/or benefits associated with specific technologies and industrial processes solely dependent on electricity and the corresponding change in electricity demand?

R Street provides no comments to this question.

Infrastructure Requirements of Electrification

6. What type of infrastructure investments are required to address the respective challenges of electrification (i.e., additional generation, local, regional or interregional transmission, and distribution investments)?

The electricity system was designed to deliver electricity from generation facilities located away from load centers, and send electricity one-way into the distribution system. Over time, this system came to include peaker plants, located closer to load, and demand side resources, such as energy efficiency and demand response. The system was also designed to split jurisdiction between state and federal: areas of the grid above 100 kilowatts (kW) are, generally, considered to be within jurisdiction of the federal government, and the system below 100 kW is under state jurisdiction. With the growth of distributed energy resources, much of the immediate impacts are occurring at the customer and distribution level, which is under state

---

[9] Ashley Nunes, *et al.*, "Near-term policy pathways for reducing car and light-truck emissions," *Environmental Research Letters, IOP Science* 16:6 (June 14, 2021). https://iopscience.iop.org/article/10.1088/1748-9326/ac04d9.
[10] Ibid.

jurisdiction. However, in larger numbers, impacts will transition to the bulk power system as larger generation resources will have to operate in a different manner. Transmission will also be needed to facilitate larger generation resources, like wind, and to transfer excess generation from the distribution system to other areas. These new uses of all electricity infrastructure may exacerbate or create new constraints on the transmission system, as well as relieve system constraints.

In order to support a more highly electrified system, new tools will be needed at both the distribution and bulk power system level. Better coordination between distribution and the bulk power system will be important to maintain balance. This might include more development of a distribution system operator architecture, which would ensure the sufficient exchange of information between distribution system and bulk power system; better coordination between federal and state regulators on goals and planning functions; and the expansion of regional transmission organizations (RTOs) to areas of the country without an RTO.

As an example, consider the impacts from increased transportation electrification. At a high level, sufficient transmission capacity supports high levels of electrification.[11] Transportation electrification will be higher in urban areas that often have transmission import constraints. This can elevate the cost of electrification, making infrastructure that alleviates local congestion more valuable. Policies that unlock demand flexibility to utilize electrification technologies as non-wires alternatives in transmission planning and operation will also be useful. This also has implications at the transmission macro level as interregional exchanges are projected to increase with electrification.[12]

> 7. What approaches are transmission owners and system operators taking to cost-effectively meet the infrastructure requirements of projected electrification in the current transmission, interconnection, and resource adequacy planning processes? How do these approaches consider reliability, and what impacts do those considerations have on the need for infrastructure investment for electrification?

In order to effectively plan for a future with greater electrification, there is a need for better evaluation of non-traditional resources, including distributed energy resources. Currently, the solution to meet a need remains to build something—generation or transmission—without considering whether other resources are available to help address that need. The role of demand response continues to remain underdeveloped across the country even as FERC issues policies to enable greater opportunities for demand response. For electrification, if system operators and transmission owners are not fully capturing the value that DER can provide, then the system loses efficiency in planning and in leveraging more types of resources. This

---

[11] Ella Zhou, *et al.*, "Electrification Futures Study: Power Systems Operation with Newly Electrified and Flexible Loads," National Renewable Energy Laboratory, at p. 12 (June 17, 2021). https://www.nrel.gov/docs/fy21osti/80167.pdf.

[12] Ibid.

undervaluation of DER can be addressed by encouraging system operators to better account for the potential of DER to assist in planning for greater amounts of electrification.

A challenge to making this a reality remains the incentives that transmission owners have in RTO governance. FERC may want to consider ways in which to address the role governance plays in how an RTO addresses these future planning scenarios, especially those situations where new, non-utility entrants offer products that displace or reduce the use of infrastructure that may otherwise be built by transmission owners.

> 8. What measures are being taken to identify and align the costs of investments needed for electrification with the beneficiaries?

R Street provides no comment to this question.

> 9. What, if any, existing regulatory and/or tariff requirements act as barriers to, or otherwise do not consider, electrification and its associated growth in demand? For example, does the scenario modeling in current regional transmission planning processes reflect increased demand due to electrification driven by market trends and public policies?

With greater amounts of electrification, there are a number of areas where existing assumptions and practices regarding planning may be impacted.

First, in regions with significant amounts of natural gas home heating, electrifying home heating may cause a substantial increase in electrical demand in winter. In these cases, utilities that may currently be summer peaking may find themselves to be a winter peaking system. This would have a substantial impact on resource adequacy and the manner in which utilities and RTOs plan and operate their systems. If an area anticipates using late winter and early spring as times for generation maintenance, there are fewer opportunities for generation to go off-line for maintenance if the grid now has similar sized winter and summer peaks.

Second, with greater amounts of electrification, the need for more flexible resources grows. Increasingly, gone are the days of forecasting for 1 in 10 or 1 in 100 event planning scenarios, where a reserve margin can be constructed to ensure sufficient resource adequacy for these or other limited number of peak days. Rather, the system will require highly flexible resources, such as demand response and energy storage, to manage ramp rates, better integrate variable resources and assist in the operation of a reliable system. With more distributed energy resources, this need for flexibility increases—be it from the bulk power system side or the distribution side. To the extent this flexibility can be provided at the distribution level, FERC should identify opportunities and means to ensure that those wholesale benefits are captured and available for compensation.

Electrification is very important to examine for resource adequacy and transmission planning and operations; it may constitute the largest load growth driver, and its load shape and responsiveness present unique challenges and opportunities. For example, under a limited demand flexibility framework, electrification may result in higher, sharper and more frequent system demand peaks, whereas a system enabling demand flexibility can enhance operational efficiency.[13]

Third, RTOs vary in their inputs and methods for projecting load growth and location. The spatial component of load growth from electrification deserves special scrutiny, because it will be disproportionately concentrated in load pockets from transportation growth. This sector is especially important to model correctly because it dominates the incremental growth in projected electricity demand and its load shape is dependent on numerous factors like regulatory frameworks for demand flexibility.[14] This introduces a great deal of uncertainty into coincident peak estimates, which is the basis of resource adequacy and transmission planning processes. Industrial electrification is likely to follow a more gradual and dispersed footprint.

Fourth, utilities and RTOs underutilize distributed energy resources, especially demand response, in their resource adequacy and transmission planning processes. RTOs have a significant need to expand market opportunities and products where demand response can participate on a more level playing field compared to traditional generation. While part of this can be attributed to retail and state-level rules, when demand response is put into the market, it is often bid in at a price cap or included only as emergency products. While FERC has made significant policy strides with Orders 745[15] and 2222,[16] opportunities for demand response to be an active participant in RTO planning remains frustratingly limited.

Lastly, while FERC has less authority outside organized wholesale markets, there remains a significant lack of transparency and visibility in these non-organized markets. With greater amounts of electrification, creating greater opportunities for price discovery at a transmission level in these markets would be beneficial for a number of users, including developers, distributed energy resources providers and customers. In other words, FERC should not limit its concerns on the impact of electrification to organized markets.

Transmission and Distribution System Services Provided by Flexible Demand

10. What grid services can newly electrified resources provide or otherwise facilitate?

   a. For example, what grid services can consumer electric vehicles or electric vehicle fleets most effectively provide today? What is the current state of development for vehicle-to-grid technologies, and will further advancements enable consumer

[13] Ibid. at pp. 4, 23.
[14] Ibid. at p. 4.
[15] *Demand Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, 134 FERC ¶ 61,187, *order on reh'g and clarification*, Order No. 745-A, 137 FERC ¶ 61,215 (2011), *reh'g denied*, Order No. 745-B, 138 FERC ¶ 61,148 (2012), *vacated sub nom., Elec. Power Supply Ass'n v. FERC*, 753 F.3d 216 (D.C. Cir. 2014), *rev'd & remanded sub nom., FERC v. Elec. Power Supply Ass'n*, 136 S. Ct. 760 (2016).
[16] *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 2222, 172 FERC ¶ 61,247 (2020), *order on reh'g*, Order No. 2222-A, 174 FERC ¶ 61,197, *order on reh'g*, Order No. 2222-B, 175 FERC ¶ 61,227 (2021).

electric vehicles or electric vehicle fleets to provide additional grid services in the future?

A key consideration for electric vehicles is the voltage at which these cars charge. DC Fast Chargers (DCFC) may be less likely to provide meaningful grid services, since the nature of that charging is short-term and more necessary for the vehicle owner. It may be that the customer is on a road trip and needs the use of a DCFC to continue their road trip, so being part of a multi-hour demand response program will not work for that customer. Nevertheless, DCFC may still be responsive to grid needs and prices, they may just be less responsive than other types of managed charging, such as fleets, commercial, and residential. On the other hand, fleet vehicles might be ripe for demand response or acting as an energy storage resource responding to a local or system need for a variety of hours.

To the extent that any of these examples are capable of responding similarly to other thermal units, these resources should be allowed to participate in the same manner as other resources. FERC has repeatedly recognized this in multiple orders, such as Order 841[17] and 2222.

b. What other types of newly electrified resources can currently provide grid services, and what grid services can they most effectively provide? For example, can grid-interactive buildings be meaningful sources of flexible demand?

R Street believes that many of these other resource types will more effectively participate when aggregated and bid directly into wholesale markets. Orders 745 and 2222 already deal with aggregation of resources to provide demand response or other services, so long as the market and aggregators can manage customer demand and meet the technical requirements of the RTO, then any electrified resource should be allowed to provide grid services.

c. What, if any, newly electrified resources cannot currently provide grid services, but may be able to in the future? What barriers must be overcome for that to occur?

Existing barriers to entry include extensive and expensive metering and telemetry requirements; participation barriers raised by RTOs or utilities; and availability of appropriate price signals.

11. What technological capabilities (e.g., interoperability) are required for newly electrified resources to provide grid services? What is the current state of development for these capabilities? What could speed up or slow down such development?

R Street provides no comment to this question.

---

[17] *Elec. Storage Participation in Mkts. Operated by Reg'l Transmission Orgs. and Indep. Sys. Operators*, Order No. 841, 83 FR 9580 (Mar. 6, 2018), 162 FERC ¶ 61,127 (2018), *order on reh'g and clarification*, Order No. 841-A, 84 FR 23902 (May 23, 2019), 167 FERC ¶ 61,154 (2019), *aff'd sub nom., Nat'l Ass'n of Regul. Util. Comm'rs v. FERC*, 964 F.3d 1177 (D.C. Cir. 2020).

12. What challenges exist to deploying newly electrified resources to provide grid services in the RTO/ISO and non-RTO/ISO regions?

A number of existing challenges are already being addressed by FERC in other proceedings. In particular, FERC Order 2222 requires RTOs to develop tariffs and rules allowing aggregators of distributed energy resources to directly participate in wholesale markets; Order 841 allows for the participation of energy storage in wholesale markets; Order 745 allows for the direct participation of demand response and aggregators of demand response in wholesale markets. More recently, FERC issued a Notice of Inquiry regarding the state opt-out for demand response aggregators. These efforts address the structural barriers for participation of electrified resources that are capable of providing grid services from participation in wholesale markets. There are other challenges that remain, such as metering and telemetry requirements for smaller resources; ensuring that aggregators have adequate access to customer usage data to work with customers; and making sure RTOs allow these resources to be treated similarly to generation resources.

In non-RTO regions, opportunities remain largely confined to existing or potential retail products that will likely be provided by the incumbent monopoly load service entity. Without an organized market to support price discovery and transparency, thus lowering barriers to entry for aggregators, it will be up to the states to develop products and opportunities for the creation of new products. States will also determine how those products and services will be included in transmission or bulk power system efforts.

Compared to aggregators, large consumers often do not face the aggregation constraints of distributed energy resources for electrification purposes, but they can still face overly restrictive size threshold and narrow resource requirement rules. These typically apply in RTO regions, as non-RTO regions often preclude industrial and other resources from providing grid services irrespective of their capabilities. Generally, RTO regions provide more transparent economic signals and transmission access than non-RTO regions, which enables a far greater potential for non-utility owned resources to provide grid services.

13. What barriers, if any, exist to newly electrified resources providing grid services in wholesale or retail markets?

Many electrification pathways enable consumers to self-provide power, which is especially valuable as a reliability backstop. Thus, reliability policy that continues to treat all firm load the same can discourage electrification because consumers cannot select differentiated reliability products. Consumer willingness to pay for central service reliability decreases with a physical backstop, but preferences cannot be expressed in the marketplace other than through very limited demand response products. Thus, consumers cannot capture the would-be cost savings of a lower quality central product, which limits the avoided costs of electrification options.

Local, State, and Federal Coordination

14. What role can coordination among local, state, and federal governmental entities play with regard to electrification?

Coordination across these entities will be necessary to ensure that the system is planned and operated in an efficient manner. With electrification largely occurring at the retail level, local and state governments will play a significant role in how and in what time-frame electrification will occur. The impacts of those efforts will then be felt at the wholesale level as customer demand changes, flexibility needs increase, and wholesale market structure, transmission planning, and resource adequacy respond to these changes. Some areas may see significant changes to peak use.

The opportunities and challenges electrification holds underscore the imperative of addressing the wholesale-retail disconnect. The Commission and states should endeavor to pursue efforts that harmonize policy initiatives to enable demand flexibility and broader DER resource participation. Ensuring the temporal and spatial granularity of wholesale price signals flows through retail rates accurately is important to lower electrification costs; signal optimal electrification adoption configurations and behavior; improve integration economics; and enhance bulk system reliability.

15. What planning and coordination among local, state, and federal governmental entities is necessary to facilitate the provision of grid services by newly electrified resources in a way that maximizes benefits to the grid while decreasing the potential reliability, operational, and cybersecurity risks that electrification could pose?

It may be best for FERC to wait to address this question until completion of RTO tariffs in response to FERC Order 2222. With new grid services enabled by FERC Order 2222 in organized markets, there may be some important lessons learned or areas of further guidance by FERC.

16. Regional initiatives and multi-state cooperation efforts have formed in recent years to coordinate EV charging infrastructure deployment. What can we learn from those efforts and what role, if any, does the federal government play in supporting those efforts?

R Street provides no comment to this question.

17. How can interoperability protocols and standards be coordinated across local, state, and federal jurisdictions?

Interoperability is an important component in ensuring that investments made by utilities are built upon open standards with public testing and certification requirements. The National Institute of Standards and Technology (NIST) recently issued the “Smart Grid Interoperability Framework, Volume 4,” which includes new materials to support on-going development of interoperability.[18] For example, NIST identifies the use and role of interoperability profiles, which take a sub-set of requirements from multiple standards and creates a profile to support conformance and interoperability. The use of interoperability profiles may be a key component to ensure that technologies work across utility systems and across states, including the ability to receive a price, send total consumption, and whether to participate in a demand response program.

In addition, the National Association of Regulatory Utility Commissioners (NARUC) has made available to state regulatory commissions a number of materials, including educational and training materials, so that state regulators can also begin asking important questions around interoperability.[19]

Interoperability covers a wide-swath of the electrification discussion, from data access and formatting interoperability, to communications interoperability, to metering and telemetry. In each of these cases, interoperability is promoted by the use of and reliance upon open standards. These standards include OpenADR, which provides demand response messaging to equipment like smart water heaters or electric vehicles, IEEE 2030.5, which is a communications standard between technologies, such as between AMI and an EV charger, or Green Button Connect My Data, which provides data in a common format and access to data in a common process. To an extent, these conversations are already occurring at the RTO level as RTOs seek to develop tariffs in response to FERC Orders 841 and 2222. State commissions are leveraging tariffs for EV infrastructure, utilization of AMI, enablement of new demand response programs and other policy developments.

Interoperability should be built in as a foundational component of the electricity system. Relying on proprietary standards rather than open standards will raise unnecessary barriers to entry; raise costs for developers and customers; minimize benefits from electrification; and frustrate customers. For customers, the ability to drive an EV from one utility to another—and having the new utility actually function with the EV—is vital to easing this transition.

18. What coordination efforts among local, state, and federal governmental entities have been most effective in addressing electrification? How could those coordination efforts be improved?

The Commission's new Joint Federal-State Task Force on Electric Transmission is an encouraging vehicle to drive coordination efforts. Electrification should be rolled into the Task Force agenda.[20] However, not all elements of electrification can be remedied by the scope of

[18] Avi Gopstein et al, "Framework and Roadmap for Smart Grid Interoperability Standards, Release 4.0," NIST, NIST Special Publication 1108r4 (February 2021). https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1108r4.pdf.

[19] Kerry Worthington et al., "Smart Grid Interoperability: Prompts for State Regulators to Engage Utilities," NARUC (April 2020). https://pubs.naruc.org/pub/28950636-155D-0A36-313C-73CCEA2D32C1.

[20] *Joint Federal-State Task Force on Electric Transmission*, 175 FERC ¶ 61,244 (June 17, 2021).

this Task Force, nor is a dedicated Task Force on electrification necessarily warranted. For example, a successor to the transmission-focused Task Force could be another comparable effort focused on DER integration, including an emphasis on demand-side resources.

Beyond state utility regulators, the Commission may seek to engage other state officials charged with meeting state clean energy or environmental objectives. States generally hold a "grid first" perspective as the gateway to reducing other sectors' emissions via electrification. Since reducing emissions in the transportation and industrial sectors is particularly sensitive to abatement costs, the Commission should keep in mind that electricity reforms that lower electricity costs and more accurately reflect real time grid conditions will let these sectors optimize their electrification options.

III. Conclusion

The R Street Institute supports FERC's efforts to chart a smooth and favorable course towards electrification in the United States. As state policies continue to evolve and promote greater amounts of electrification, understanding those impacts on the bulk power system will be important. FERC's technical conference and interest in additional comments on the topic shows FERC's leadership on this important evolution.

Respectfully submitted,

/s/ Christopher Villarreal___________

Christopher Villarreal
R Street Institute
1212 New York Avenue, NW, Suite 900
Washington, D.C., 20005
Telephone: (415) 680-4224
Email: cvillarreal@rstreet.org

Dated at Washington, D.C.
This 18th Day of August 2021

CERTIFICATE OF SERVICE

The undersigned hereby certifies that one copy of the foregoing pleading has this day been served in a manner permitted by Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010) on each person whose name appears on the Official Service List compiled by the Secretary in this proceeding.

/s/ Christopher Villarreal
Christopher Villarreal

Dated at Washington, D.C.
This 18th Day of August 2021.