SC Electric Vehicle Stakeholder Recommendation Discussion Notes
October 2021

Please note that this is a working document that reflects the discussions of the Working Groups. These summaries do not necessarily reflect consensus among the members of the working group. This document has been included as a resource to inform and provide context for future consideration of the final recommendations resulting from the Electric Vehicle Stakeholder Initiative.

Working Groups:

- Education, Outreach, and Workforce Development
- Equity and Accessibility
- EV Infrastructure
- Incentives and Financing
- Public Entities

SC Electric Vehicle Stakeholder Initiative

Education, Outreach and Workforce Development Working Group

Working Group(s)
Education, Outreach and Workforce Development

Recommendation Number and Title
Recommendation 1: Develop a statewide committee to facilitate conversations, education, and awareness as we work together to build out the industry in South Carolina.

Recommendation Summary
There is a need for a statewide committee to facilitate conversations, education, and awareness as we work together to build out the industry in South Carolina. This will serve a similar role as the SC Solar Council serves today. While the structure of the proposed committee is to be developed, it will include a broad swath of interested parties, including OEMs, dealers, interested community members, manufacturers, and NGOs. The committee would also serve as a speaker's bureau who represent various perspectives and can support education sessions and lunch & learn type opportunities. It is recommended that the proposed committee be housed at the SC Automotive Council.

Background
Utilizing the SC Automotive Council to facilitate education and awareness for stakeholders engaged and interested in the electric vehicle space will allow for the opportunity to build upon work that is already taking place. South Carolina's vital automotive industry provides a strong current landscape for enhancing education and awareness around electric vehicles. The industry, it's suppliers across the supply chain, non-profits and other community organizations as well as individual community members can benefit from utilizing the South Carolina Automotive Council's current structure and existing network to facilitate education and conversation as the electric vehicle and mobility industry continues to grow and develop. This recommendation addresses challenges of providing education to interested parties, allowing for insightful conversations and collaboration between stakeholders, and building continued awareness of this industry, while seeking to leverage the opportunities it creates and also address current and emerging challenges. The South Carolina Automotive Council was established over a decade ago and has strong existing ties to industry (OEMs, Tier 1, 2 and 3 suppliers / service providers), leading academic and research institutions, test facilities, state and federal peer organizations and other entities directly tied to the electric vehicle industry. The Council routinely conducts events (virtual and in-person), ranging from large conferences to webinars and calls, and is

well-positioned to broaden its current education and awareness activity to additional interested parties and partners, while leveraging existing relationships to bring relevant content and conversations to these broader audiences.

There are many state and federal organizations that are actively focused on advancing electric vehicles, as well as enhancing education and awareness in their communities and networks.

This effort would be a statewide initiative as it impacts South Carolina's overall industry and economy and aim to ensure collaboration and reduce duplication of efforts. The committee will also include those outside of the Auto Council such as representatives from disinvested communities, state agencies, advocacy groups, and EV businesses.

The target sector would be reach across all categories (light, medium, and heavy duty) as relevant.

Summary of Assessment Criteria

- *Ability to implement:* In many ways this recommendation is already being implemented and would be built upon as we move forward.
- *Ensures equitable access for all:* Through webinars, calls, etc. we would aim to provide equitable access to these discussions as well as flexibility for participation virtually.
- *Promotes economic development and retention:* This recommendation will provide education and awareness of the advancement of this industry and support of our existing industry in South Carolina.
- *Education and awareness considerations:* This effort clearly addresses enhanced education and awareness of this topic.
- *Benefits to workforce development:* Promotes discussion of workforce development related to this industry.

Implementation Logistics

Timeline:

- *What needs to happen in the near / medium / long term?*
  Near term – leverage existing planned events, etc. to this broader audience
  Medium term – continue to engage additional stakeholders and build on activity
  Long term – access and tailor activities to reflect evolution of electric vehicle industry
- *What is a reasonable start date? End date?*
  Reasonable start date (happening now) – end date (ongoing)

Costs:

- *Identification of funding sources (if known)*
  Ongoing work currently funded through private funding.
- *How likely is this initiative to get funded (High/Medium/Low)?*
  Currently funded through the SC Manufacturer's Alliance Automotive Council.
- *What are the additional resources needed (staff, etc.)?*

Currently taking place through existing staff resources

Key Actors & Action Required:

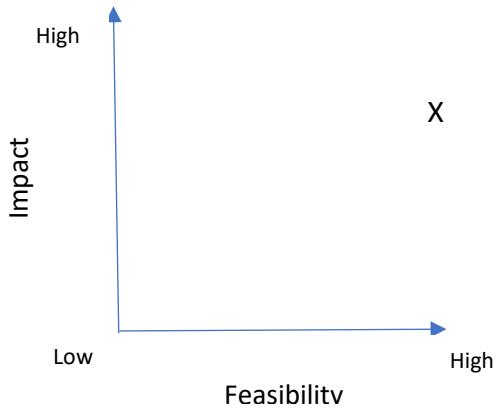
- *Lead advocating organization*
  South Carolina Automotive Council
- *Lead implementing organization*
  South Carolina Automotive Council
- *Other key* players
  Industry (OEMs, Tier 1, 2 and 3 suppliers / service providers), leading academic and research institutions, test facilities, state and federal peer organizations, disinvested communities, state agencies, advocacy groups, EV businesses, and other entities directly tied to the electric vehicle industry
- *Ease and speed of implementation (H/M/L) and explanation*
  High. A great deal of this activity is already occurring.

Prerequisites and complementary recommendations

- *Is legislative action required?*
  The South Carolina Automotive Council works closely to educate policymakers on many topics, and this area will remain one of those topics; however, there is no action required to implement this ongoing work.
- *Is another external entity's action required?*
  This activity is currently ongoing, however, other external partners would be engaged.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 2

SC Electric Vehicle Stakeholder Initiative

Education, Outreach and Workforce Development Working Group

Working Group(s)
Education, Outreach and Workforce Development

Recommendation Number and Title
Recommendation 2: Develop and fund an EV workforce development plan for the state.

Recommendation Summary
A comprehensive workforce development plan for South Carolina is needed to attract and retain talent in the state. The proposed plan may include: • Funding to conduct asset mapping / industry market survey to determine what's needed of the state to ensure that these industries are succeeding. • Creating curriculum for EV installation certification; electrician program for charging maintenance and installation; training for independent mechanics; training for state & municipal fleet managers; training for charger installers and servicers • Evaluating options for promoting EV-focused small businesses

Background
SC has been successful at recruiting companies who are, or plan to produce electric vehicles, including the supplier base. Currently, there are little to no training models and/or certificates available statewide and nationally. In order for SC to continue to be competitive, the state needs to ramp up training delivery models for the manufacturing sector, dealership, and the installation of charging stations, without creating job losses within the current automotive workforce. Challenges to this include: • Identifying industry/stakeholder needs and/or skills required; • Conducting an asset map of the existing training curriculum statewide. This should be able to be adjusted to meet the needs of the industry, current EV training statewide and nationally at the certificate, Associate and 4-year level; and last but not least, funding. Currently, the Electric Vehicle Training Infrastructure Program, available nationwide, can be delivered through local technical and community colleges however, statewide implementation would probably be costly. Additionally, Clemson has a Minor in Electrification of Transportation and could this be replicated in other SC Four Year settings.

Although this will ultimately impact the entire state, the current focus should be on geographic locations that currently are producing vehicles or where dealerships are located, as applicable.

Since SC does not have a comprehensive workforce strategy, having one for the EV industry could be the pilot to conducting one for all industries located in SC.

Summary of Assessment Criteria

As mentioned in the summary, SC has already been successful in recruiting companies as it relates to EV. Therefore, educating the public on the types of jobs that are and will become available as well as training opportunities, scholarships and funding for the development and deployment of training is essential. Articulating skills transferability would also be beneficial.

Implementation Logistics

Initially, a proposed cost estimate would have to be established then identify funding sources. If funded with public sector dollars, procurement would potentially dictate the timeframe in which to begin the work of a statewide plan. Additionally, there are other proposed initiatives to evaluate and implement EV related activities and this may impact the timeline of implementing the recommendation.

Once funding solutions are identified, the key actors and actions would be the appropriate stakeholders from the industry and education sectors who will be instrumental in evaluating and proposing new curriculum and/or certificates.

Ideally, the strategy would propose short-, medium- and long-term solutions to provide awareness and develop training and curriculum to meet the needs of SC industry.

Prerequisites and complementary recommendations

This recommendation will not need legislative of Public Service Commission action. SC Commerce, and SC Department of Employment and Workforce will be entities to act on this recommendation.

Implementation/Benefit Comparison matrix

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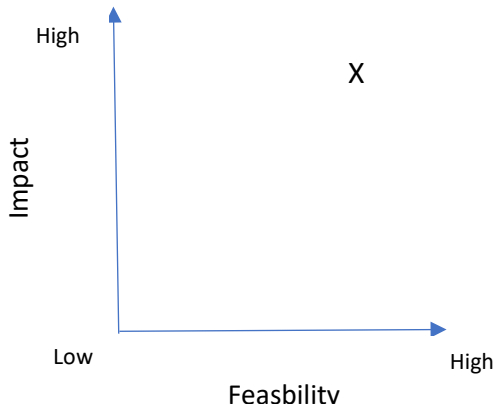

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Recommendation 3

SC Electric Vehicle Stakeholder Initiative

Education, Outreach and Workforce Development Working Group

Working Group(s)
Education, Outreach and Workforce Development

Recommendation Number and Title
Recommendation 3: Develop and fund a brand-agnostic awareness campaign for the state.

Recommendation Summary
Developing and funding a brand-agnostic awareness campaign can encourage adoption of electric vehicles in South Carolina. The proposed strategy could include: • Messaging research (particularly targeting individual buyers and fleet managers), • SC-specific educational/animated videos; • Attending in-person events; • Developing a mobile EV discovery center; • Translating written materials; • Leveraging existing youth programming on EVs; and • The plan would also include an outreach plan for harder to reach populations in the state.

Background
A marketing strategy/awareness campaign in South Carolina could be multi-faceted, targeting various populations to increase EV adoption in the state. - Conducting messaging research is an important first step to understand what messages resonate with South Carolinians. The research might focus on segments of the population, such as the fleet managers, dealers, low-income consumers, consumers in rural areas. - The campaign may narrow-in on specific barriers, such as cost for consumers or how EVs can be promoted by dealers. - Developing SC-specific educational/animated videos informed by messaging research could be a useful tool in engaging consumers. It may be possible to work with local news outlets and influencers to distribute videos to a wide audience. A promising example is In Charge, a series produced by the Tennessee Valley Authority. - Leveraging existing youth programming focused on EVs may make EVs more accessible. Comparable programming exists currently focused on solar (Solar for Schools) and recycling. The programming should be made available to South Carolina teachers and educators in after school and out-of-school learning places. - To ensure equitable adoption of electric vehicles in the state, a plan for reaching low-income, rural and BIPOC consumers is merited. This may be achieved by:

- Attending or enabling in-person events in rural or underserved regions;
- Developing of a mobile EV Discovery Center that can be used at in-person events;
- Translating written outreach materials; and
- Applying a mobility equity framework (Greenlining Institute has an example)

Summary of Assessment Criteria

- *Ability to implement:*
  - An implementing organization needs to be chosen and some funds would be required to conduct messaging research and oversee the campaign. This recommendation does not require legislative or regulatory approval.
- *Ensures equitable access for all:*
  - This recommendation has the potential to increase uptake of electric vehicles among consumers by addressing misinformation an information asymmetries. If implemented with disinvested communities in mind, it can help broaden access for all.
- *Benefit to vulnerable or disinvested communities:*
  - Though this recommendation can increase awareness and access to electric vehicles, it does not explicitly benefit vulnerable or disinvested communities.
- *Promotes economic development and retention:*
  - By marketing the state as EV ready, South Carolina is well-positioned to host companies focused on building out EV infrastructure and creating jobs in the state.
- *Education and awareness considerations:*
  - Education and awareness is at the core of this recommendation – there are no further considerations beyond what's outlined already in this document.
- *Benefits to workforce development:*
  - This recommendation does not explicitly benefit workforce development, but it can help bring more awareness to the workforce impacts of electric vehicle infrastructure.
- *Provides additional co-benefits:*
  - This recommendation can introduce various types of EVs at different price points and can combat messaging that EVs aren't accessible for all.

Implementation Logistics

Timeline:

- *What needs to happen in the near / medium / long term?*
  - Short term: need funding for messaging research, staff time to conduct in-person events, translation, etc.;
  - Long-term: need to adjust messaging as the market shifts.
- *What is a reasonable start date? End date?*
  - Start date: immediately
  - End date: 1-2 years

Costs:

- Costs are unknown at this time.

Key Actors & Action Required:

- *Lead implementing organization:*
  - SC Energy Office or contracted entity
- *Other key players:*
  - Co-Ops, OEMs, local governments
- *What are potential unintended consequences?*
  - If not properly researched, messaging may not reach intended populations and may lead to wasted resources. Messaging could also reinforce ideas that EVs are inaccessible if not properly conducted.
- *Ease of implementation (H/M/L) and explanation:*
  - High (easy to implement) – no real barriers, nearly all stakeholders stand to benefit.
- *Speed of implementation (H/M/L) and explanation:*
  - Medium – will take a little while to conduct research and host events.

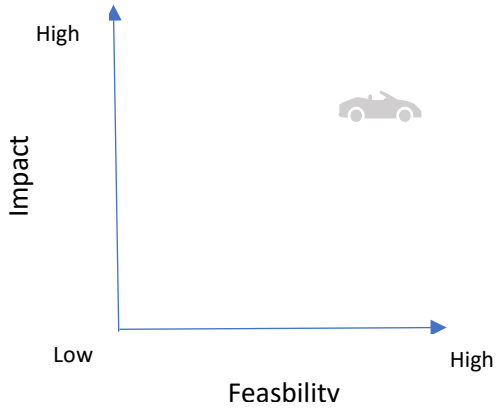
Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required?*
  - No legislative action required
- *Is SC Public Service Commission action required?*
  - No PSC action required
- *Is another external entity's action required?*
  - Funding for implementation is required.
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)?*
  - No
- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?*
  - EOWD Recommendation 5 (to create a virtual hub) needs to happen in conjunction with this recommendation
- *Does this recommendation need to occur prior to another's implementation? Which one(s)?*
  - No

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Resource:
[EV Charging FAQs: What You Need to Know to Charge Your Electric Car]

Recommendation 4

SC Electric Vehicle Stakeholder Initiative

Education, Outreach and Workforce Development Working Group

Working Group(s)
Education, Outreach and Workforce Development

Recommendation Number and Title
Recommendation 4: Work with the overall value chain to promote an effective, fair transition to electric vehicles.

Recommendation Summary
There is a need to proactively work with the overall value chain to promote an effective, fair transition to electric vehicles, particularly focusing on dealers and dealer industry associations. This would include working together to think through new business models to overcome potential losses and developing educational materials to bring auto dealers, service stations and independent mechanics along in this transition proactively.

Background
As the interest in electric vehicles increases throughout the state, there is a need for the automotive industry and those serving the industry to be better informed about the benefits an EV brings. Target audience / Target sector: automotive retailers and industry associations, service stations and independent mechanics. Challenges addressed: While consumer acceptance is growing, the industry needs to be the conduit for educating the general consumer. The majority of retailers today are still reluctant to promote EVs due to their lack understanding. This should be a state-wide initiative. Current status in South Carolina: SC ranked 31 with a 0.4% of the national share of used EVs compared to California, which ranked 1 with the national share of 25.1% in 2020 (HIS Markit data). EVs accounted for 1.8% of all new car registrations in 2020. While these numbers are expected to increase in the coming years, the US has a long way to go in order to prepare for an all-electric future. International Energy Agency projects that by 2030, around 30% for all cars on the road are expected to be battery-powered EVs.

Summary of Assessment Criteria

National Automotive Dealers Association and the SC Automotive Dealers Association have ramped up their training/education efforts around EVs. Current training includes general sales and consumer education (EV value proposition, high tech features, consumer incentives, charging infrastructure, home install); and operational training (high voltage safety for techs, vehicle lift safety, battery pack diagnostics, etc.).

Implementation Logistics

Timeline:

- Near term: work with NADA/SCADA to support them on their training/education to dealers, service techs and consumers. Understand gaps, and help to fill them by providing resources they may not currently have access to.
- Mid-term: work with other industry associations to plan training/education sessions; identify trainers from both public/private sectors
- Long-term: hold training sessions throughout the state to cover target audiences with resources.

Costs:

- Costs should be shared between public and private sectors. Identify federal/state grant opportunities for workforce development and education; ask private sector to support through sponsorships/public relations activities.

Key actors and actions required:

- State energy office should be the conduit to bring resources together, including key stakeholders from both public/private sectors.

Prerequisites and complementary recommendations

There is no legislative or Public Service Commission action required, and there are no other recommendations that need to intersect with this recommendation. NADA and SCADA are entities that will be integral to moving this recommendation forward.

Implementation/Benefit Comparison matrix

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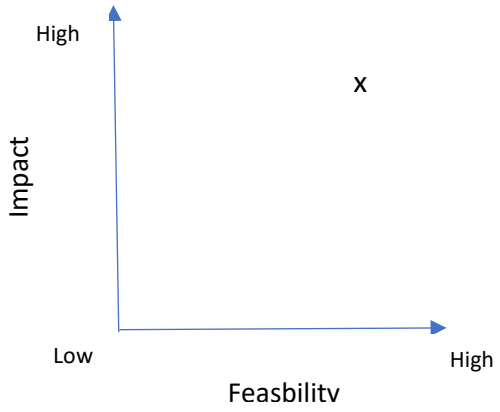

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Recommendation 5

SC Electric Vehicle Stakeholder Initiative

Education, Outreach and Workforce Development Working Group

Working Group(s)
Education, Outreach and Workforce Development

Recommendation Number and Title
Recommendation 5: Create an online resource hub, to serve as a one-stop shop for various audiences, such as job-seekers, potential owners, dealers, and fleet managers.

Recommendation Summary
There is a critical need to create an online resource hub which would serve as a one-stop shop for various audiences, such as jobseekers, potential owners, dealers, and fleet managers. The site would aim to provide education and address misinformation about electric vehicles and serve as a neutral, trusted source of information on EVs in the state.

Background

- *Challenges addressed*
  - This recommendations seeks to address a gap in knowledge in regards to electric vehicles in South Carolina; providing a non-biased governmental source of information to provide to private consumers, fleet managers, those looking for employment and understanding of the EV ecosystem in SC.
- *Current status in South Carolina (does this already exist?)*
  - A site like this does not currently exist in South Carolina; an example model of what a site could look like, is the South Carolina Energy Office's Solar.SC.Gov website.
- *Examples from other states (if applicable)*
  - Other states have taken advantage of funding through the Drive Electric USA program; creating Drive Electric Colorado, Drive Electric Tennesse, Drive Electric Georgia, etc.; establishing non-biased information and outreach for EVs.
- *Is this a statewide or local initiative?*
  - This initiative will be statewide; coordinated through the SC Energy Office.
- *What is the target sector (light-duty/medium-duty/heavy-duty/all)?*
  - All

Summary of Assessment Criteria

- *Ability to implement:*

- The ability to implement resides with staff capacity within the SC Energy Office and ORS. Funding for Drive Electric USA programs would have to be provided by state or private match to federal funding.

- *Ensures equitable access for all:*
  - This website would be ADA compliant with alternative text and screen-reader capability. Language will also be developed to be accessible to a basic reading level.
- *Benefit to vulnerable or disinvested communities:*
  - This platform will include information regarding MUDs, and used EVs will be contained within the site.
- *Education, awareness, and workforce development considerations:*
  - This site would retain information about workforce and education programs related to EVs and infrastructure.
- *Provides additional co-benefits:*
  - Accessibility of knowledge and introduction to EVs from a trusted source can lead to energy cost burden reductions and air quality improvements in South Carolina.

Implementation Logistics

Timeline:

- *What needs to happen in the near / medium / long term?*
  - At least a 9-12months to develop a site.
- *What is a reasonable start date? End date?*
  - Launch in 2023 and update as needed.

Costs:

- Funding for the site can be through SC Energy Office funding.

Key Actors & Action Required:

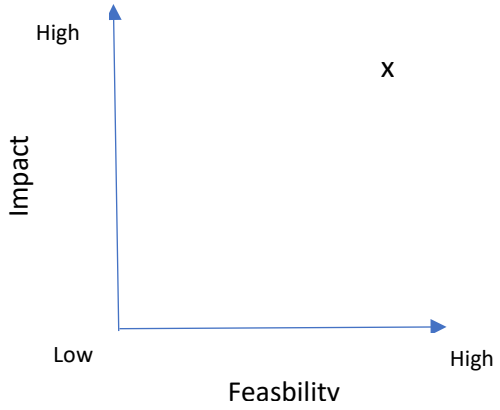
- The SC Energy Office will be the lead. Additional stakeholders such as such as jobseekers, potential owners, dealers, and fleet managers will also be part of the development process.

Prerequisites and complementary recommendations

This recommendation will not require any legislation or SC Public Service Commission action. The SC Energy Office will take the lead, and the recommendation should be developed in conjunction with the EV awareness campaign recommendation.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 6

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
EV Equity and Accessibility

Recommendation Number and Title
Recommendation 6: Ensure EV charging incorporates requirements beyond minimum Americans with Disabilities Act (ADA). (“ADA plus”)

Recommendation Summary
This recommendation seeks to implement design considerations for persons with disabilities when deploying EV charging stations within South Carolina. This recommendation will outline necessary considerations to ensure an equitable and dignified user experience for EV owners who may interact with a handicap accessible EV charging station. This guidance will apply for all state-funded deployments of charging stations and provide standards for private developers.

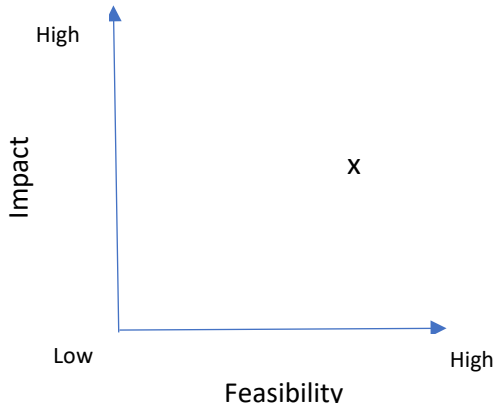
Background
While there are requirements for parking spaces and infrastructure, many of these requirements still to do not address individual needs. ADA compliant is not necessarily accessible. This recommendation will target light-duty vehicles that personal consumers would be using to transit across South Carolina. Questions to be answered are: • What exists in SC? What happens now in multi-family housing? • What requirements have other states have implemented? Minnesota (Installation Requirements for Electric Vehicle Charging Stations), California This would be a Statewide initiative possibly through organizations such as SCDA, SCDHEC, and/or SCEO. Additional Resources: • The Parking Professional: Accessibility and EV Charging Stations • Elevated Utility/Light Pole 3704 (Demonstration) • ACCESSIBILITY AND EV CHARGING STATIONS • Understanding the Need for ADA Accessible EV Charging Stations • Autonomous Vehicles: State of the Technology and Potential Role as a Climate Solution • ADA Requirements for Workplace Charging Installation

Summary of Assessment Criteria
While there are ADA requirements for parking/infrastructure, additional requirements to increase accessibility will help ensure equitable access to disabled/vulnerable individuals. There are also champions that will assist advocating for these requirements.

Implementation Logistics
The first steps will be to determine what exists in SC and what other states have implemented. Once the research had completed, SC requirements can be developed and implemented. This may require legislation and/or local government requirements. Costs for implementation may include additional infrastructure costs and/or space. Confer with code experts and disability experts. Someone with EV experience. State provide guidance/guidelines to public entities, include in PlugIn SC guidance Part of guidance – State funded programs include ADA Plus requirements, RFPs Suggest goal of 90% ADA Plus? Does ADA dictate already?

Prerequisites and complementary recommendations
This recommendation may involve more local requirements after requirements are established. This may possibly then align with recommendations for public entities related to EV infrastructure implementation.

Implementation/Benefit Comparison matrix
Using the information provided above, place the recommendation on this matrix:



SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Equity and Accessibility

Recommendation Number and Title
Recommendation 7 – Develop a process to reduce barriers to participation in the electric vehicle decision-making process.

Recommendation Summary
South Carolina needs to ensure that an enhanced community engagement and participation process is put into place to ensure that EV investment decisions, including vehicle incentives, EV infrastructure locations, and other supports reflect the needs and desires of geographically, economically, and racially diverse communities throughout the state. These efforts can and should be used as a model for other community and public participation efforts for all state agencies regarding regulatory, permitting, and spending decisions.

Background
The decision-making process for EV infrastructure, vehicle incentives, and other electrification decisions is currently split between multiple state agencies – creating the need to coordinate a patchwork of policies and spending decisions that duplicate and conflict rather than complement each other. In addition, because of the current multi-agency nature of transportation electrification efforts, community and stakeholder participation are made more difficult as multiple agencies asking for substantial amounts of time and input on a variety of potentially conflicting policies may drive willing participants away. Furthermore, South Carolina state agency public engagement efforts often lack a comprehensive representation of communities throughout the state and often lack sufficient accommodations to facilitate their inclusion. As a result of these compounding items, transportation electrification decisions (as well as many other regulatory and permitting decisions of the state) are likely to be made by a small subset of stakeholders that do not properly reflect the broad viewpoints of South Carolinians. To address these issues, a number of process changes should be made to facilitate inclusion and diversity within the transportation electrification decision-making process. 1. The legislature should create an inter-agency taskforce consisting of DOT, ORS, DHEC, DNR, Department of Commerce, City and County Representation, Public Transit Representation, and Consumer Affairs and task them with coordinating transportation electrification decisions and creating a one-stop location for public

engagement on electrification decisions. The taskforce should be tasked with receiving public input on:

   a. A funding framework and/or principles for EV infrastructure that includes considerations for, but is not limited to, balancing urban/rural infrastructure, low-income access to charging, multi-family access to charging, and public/private charging partnerships;
   b. Fleet transitions to electric vehicles (public and private) and how to prioritize an equitable allocation of funding and incentives which communities and/or fleets and/or entities receive; and
   c. Incentives for consumer-level EV purchases that include consideration for used EVs as well as MSRP caps for vehicles eligible to receive incentives.

2. The State should further coordinate inter-governmental decision-making by creating a registry of state and local governmental agencies, private organizations, and individuals interested in receiving information on transportation electrification. The registry should be advertised multiple times a year so that folks are aware of its existence and opportunity to engage.
3. The State should enhance all public engagement efforts related to permitting and siting – including EV infrastructure – that require the agency and/or applicant to identify stakeholders in the community where the action will occur (including adjacent residents, local elected officials, community-based organizations, and others) and share information in an easy-to-read format using plain language and translated where appropriate.
4. The State should enhance its public engagement efforts to increase the number of public information meetings about various projects and efforts – including EVs. These should complement regulatory-heavy public hearings and should facilitate information sharing about a project and answering questions. Hearings and planning meetings should also be scheduled at times these individuals can attend (i.e. after 5:30 p.m.).

Summary of Assessment Criteria

This recommendation seeks to streamline the public engagement process for transportation electrification. In addition, it seeks to reduce barriers and increase access for public participation in EV and other state agency decisions, thereby increasing access and inclusion. It will ensure greater awareness and understanding of projects through education and provide an easy-to-engage opportunity on key decisions.

Implementation Logistics

Timeline: For much of these issues, legislation must be drafted and adopted. This will require drafting of legislation in the near-term and introduction and passage in 2022 to take advantage of near-term EV infrastructure funding availability. Efforts must start ASAP and should be completed by April or May 2022. Where administrative agencies can make these efforts, they should endeavor to take steps to make their processes more inclusive.

Costs: It is likely that enhanced public participation efforts will increase upfront costs for engagement on a number of projects. However, it is also likely that increased engagement will result in more consensus and therefore less litigation moving forward – thereby reducing appeal and permitting costs for Agencies. It would be difficult to predict the full financial impact of these recommendations, however, until implemented. Additionally, many stakeholder processes provide travel vouchers, meal vouchers, and stipends to encourage community organizations to participate. Many individuals in community organizations have a separate full time job, and participating in these efforts is an additional task. This may be an additional cost that will also help increase participation.

Key Actors & Action Required: EV stakeholders and agencies will be key to advancing these policies. If a strong coalition of organizations collectively supports these efforts, work can begin and get completed relatively quickly.

Prerequisites and complementary recommendations

Legislative action will be required. See recommendation above. It should be noted that the taskforce identified in this recommendation should receive robust community input on a number of the recommendations that are expected to come from this report.

Implementation/Benefit Comparison matrix

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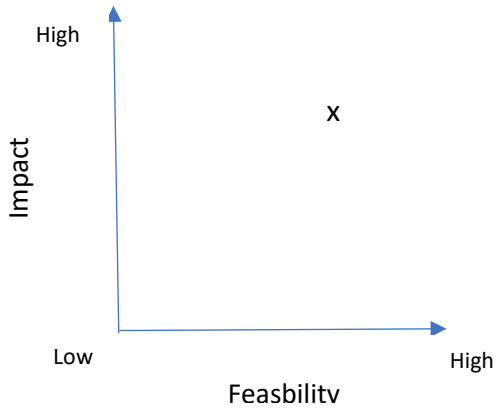


Recommendation 8

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Equity/Accessibility

Recommendation Number and Title
Recommendation 8: Enable the use of EV batteries for resilience purposes during emergencies and instances of sustained power outages.

Recommendation Summary

Enable the use of EV batteries for resilience purposes during emergencies and instances of sustained power outages. State and local government emergency management agencies could benefit from including EV batteries in their efforts to improve public safety and power grid resilience.
 	
Additionally, policy makers can encourage pilot programs to explore "vehicle to grid" and "vehicle to home" strategies to encourage low carbon solutions to resilience challenges.
 	
Recommendations:
• Determine electric power needs of the community during an emergency
  ○ How is it done today?
  ○ Break this down into residential/neighborhood and community levels.
• Design and implement demonstration pilots, evaluate the results, and build on their successes.

Background
Providing electric power in the event of outages through the use of batteries can provide communities with clean solutions to resilience challenges. Batteries can also become an important part of microgrids fueled with fossil generators. Each community is responsible for their emergency response with respect to shelter, food, and transportation. The SC Emergency Management Division (SCEMD https://www.scemd.org/) offers supplemental help when requested and also coordinates with the SC National Guard for resources such as manpower, equipment and generators. Third parties are also used for mobile power. This will be a statewide initiative that requires local support. It is important to enlist one or two communities as stakeholders in the demonstration project targeting light duty vehicles

for residential/neighborhood; and large, medium, and heavy-duty for community emergency shelters with an emphasis on using electric school buses.

Resources/examples:

- EV off grid charger City of Oakland: *https://www.renewableenergymagazine.com/pv_solar/envision-solar-enacts-first-ev-arc-emergency-20200424*
- Using CHAdeMO EV connectors: https://www.chademo.com/emergency-response-v2x/ and using the NISSAN Leaf: https://global.nissannews.com/en/releases/nissan-re-leaf-power-when-its-needed-where-its-needed
- Repurposing used EV batteries – CA: https://microgridknowledge.com/repurposing-used-batteries-electric-vehicles/
- Tesla and Vehicle to Grid https://thedriven.io/2020/05/20/teslas-switch-on-vehicle-to-grid-technology-is-big-news-for-clean-energy-shift/

Summary of Assessment Criteria

Implementation will be significantly to moderately difficult due to technical reasons, the current lack of EVs in a community, lack of V2G standards and fairly high implementation cost.

Because the current system in SC relies on a local community to lead the effort, uneven tax basis may disadvantage communities with a higher proportion of low and moderate income citizens. This technology can have a significant benefit to disadvantaged communities if implemented there.

Implementation of this technology would be part of the larger effort to create resilience in communities most exposed to severe weather and changes in weather patterns and can help support safe places such as resilience hubs in the times of dire need.

If the pilot proves to be successful, it can create a path for future investment in smart charging/smart grid technologies that do not necessarily need to be expensive – but do need to be planned for.

Additionally, this technology will make EVs more available for grid services like peak shaving, absorbing excess generation when solar and wind penetration increases, provides emission free power locally, and is quiet and efficient.

Implementation Logistics

Timeline:

- Near Term: Determine how power outages are handled now and the costs.
- Medium Term: Design and implement pilot programs. Increasing penetration of candidate EVs in the community
- Long Term: Create flexible solutions to adapt to the evolving EV market

- Development of a assessment should be started immediately. Two years will be needed to design and fund pilot programs.

State and federal resiliency funding can be used for the pilot project. Funding will also be dependent upon finding partners willing to cost share to leverage federal and state initiatives. Communities/utilities/etc.

Ongoing costs are unknown. Entities paying for the projects will be affected communities, state, and federal for shelters. The beauty of an effort like this is that it leverages high capital cost equipment (EVs) without having to incur that cost. Purchasing, operating, and maintaining electric vehicles will be by their primary purpose (taking children to school, picking up garbage, etc.). The primary costs will be the interconnection equipment at the shelters, maintaining and testing that equipment. Vehicles for the region.

A benefit to ratepayers is creating a structure (rates, incentives, etc.) where resilience is encouraged throughout the system. This benefits all on the system.

Additional resources and staff expertise and knowledge will be needed from SC EMD, ORS, utility, PSC, and communities. SC EMD and one or two coastal communities (vulnerable communities) will be needed for implementation. Additional key players will be Utilities, FEMA, local fire deparements, and local schools.

An unintended consequence would be failure of a pilot, delayed effort, uneven implementation across the state that creates even more disadvantage to disadvantaged communities (e.g. SC public education opportunities by county)

Ease of implementation will be low because it requires expertise, multiple stakeholders any of which could hinder the effort. Speed of implementation is low to medium. This is dependent upon funding, and availability of EVs – either community or county/state owned.

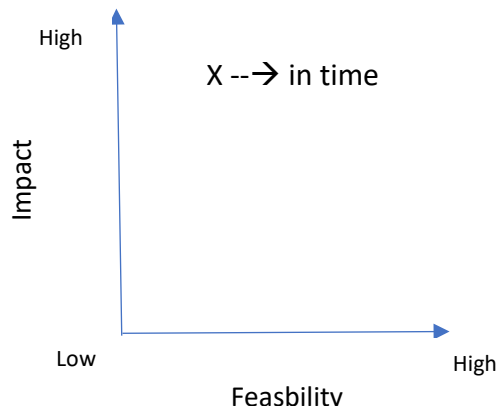
Prerequisites and complementary recommendations

No legislative action is required through the pilot phase – possibly if funding is needed for SC EMD on a larger program. SC Public Service Commission action will be required if the pilot is funded through an investor owned utility; or if the utility blocks efforts of a community to create a microgrid. Additionally, the Utility, a community/county for emergency shelter pilot, and a neighborhood for a small microgrid, will be needed.

This recommendation could leverage efforts done in the peak shaving recommendation from the infrastructure working group.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Resources:
https://www.epa.gov/greenvehicles/what-if-electric-school-buses-could-be-used-supply-power-when-duty

Recommendation 9

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
Equity/Accessibility

Recommendation Number and Title
Recommendation 9: Support the adoption of E-Bike Implementation

Recommendation Summary
E-bikes are a good option for those with limited income that are a few miles from their destination. Considerations to address are: how e-bikes are helping other communities both urban and rural, possible rebates, infrastructure needs, availability, bike share, etc. E-bikes improve accessibility and mobility for communities instead of dependence on diesel vehicles - good for community health/transport.

Background

Because electric cars and trucks are beyond the financial means for many low and middle-income families a more inexpensive electric vehicle should be available. One option is electric bikes which are more affordable. If they are cargo bikes, an additional person can be seated or a basket can be added to hold packages such as food from shopping, etc.

To make the bikes more affordable, partnerships with electric bike manufacturers or the state of SC to provide incentives such as rebates or tax credits as an incentive for people to purchase bikes may be an option. There are also community-based organizations, churches, and businesses that can provide electric bike-sharing services much like many cities already provide in the US for gasoline-powered vehicles or non-electric bicycles.

This community-led solution can also provide entrepreneurial opportunities and jobs for installing charging stations as well as providing electric bicycles.

See below for incentive option examples:

- Contra Costa County, CA - $150 rebate, $300 for low-income households
- City of Healdsburg, CA - $700 rebate/residence (includes tiers)
- San Diego County, CA – loan to own – provide insurance, track and report mileage for 2 years then the bike is yours.
- Santa Clara, CA – Silicon Valley Power – 10% rebate up to $300, additional $200 if in Financial Rate Assistance Program
- LA, Orange, Riverside, and San Bernardino Co, CA – South Coast Air Quality Management District – based on a trade-in and income-based. Voucher up to $7,500.
- Austin Energy – rebates – up to $300 for individuals, $400 for fleets

The aforementioned examples will provide a framework for programs that will fit South Carolina's demographics. New Alpha Community Development Corporation is currently planning to interact with the Automotive Council's Charging Forward in SC web series and initiative to explore other options to ownership and accessibility of EVs and e-bikes.

New Alpha Community Development Corporation also is working to provide equitable accessibility for low- and middle-income communities. They are providing electric bike share-a-ride programs so low- and middle-income people will become familiar with non-fossil fuel transportation and have accessibility to charging stations. When the cost of electric cars and trucks is reduced and rebates and/or tax credits are established there will be incentive to purchase e-vehicles.

In small South Carolina urban cities and towns, there is often no local public transportation. What regional public transportation that is available is often sporadic and is not available after working hours. In rural communities, there is generally no public transportation

whatsoever. Communities can benefit from a share-a-ride program that is in essence a community based public transportation system.

Rebates will be the best option for low- and middle-income families. Tax credits will be beneficial only to those who owe taxes to the South Carolina Department of Revenue. Any low and middle income people generally receive income tax refund checks and are not eligible to receive the benefits from tax credits.

New Alpha is addressing infrastructure needs by installing charging stations at the location(s) where the e-bike share-a-ride program will be sited. They will be installing GPS tracking devices, a website for monitoring the e-bikes and receiving payments. Mobile solar generators will also be available for emergency charging of the e-bikes. Safety equipment and liability insurance will also be covered.

The e-bike share-a-ride program will available in environmental justice communities, along outdoor recreational sites and downtown shopping and tourism locations, and tourism areas. After this pilot, the program can replicated in other cities in addition to the City of Florence.

Communities with health disparities such as asthma, proximity to interstate and state highways and with sizable population of people who lack transportation, seniors, and disabled will be prioritized.

Summary of Assessment Criteria

This recommendation was rated high on all assessment areas including co-benefits. E-bike incentives will help reduce the cost of the bikes. The bikes can serve as reliable transportation for shopping, work, or complement the first/last mile for those using public transportation. Freedom of mobility and bike share programs are additional possibilities.

There will be additional co-benefits in addition to those using the e-bikes share-ride program. Those benefits include: the creation of jobs to install the charging stations, internet and software development, maintenance and repairs of the e-bikes, sales and marketing, and the possibility of attracting an e-bike manufacturing facility to South Carolina. This will allow environmental justice communities residents with a legacy of poverty and pollution to benefit as South Carolina transitions from a fossil fuel-based economy to a clean renewable energy economy.

New Alpha Community Development Corporation will benefit from the amplification and replication of their electric bike share-a-ride program that will be implemented in January 2022, with funding from the Energy Foundation. This funding along with potential funding from the state of South Carolina will allow other communities besides the City of Florence to benefit from transportation freedom.

Implementation Logistics

Next steps will be to determine where a program would be housed. With the state, local government, utility, etc. If with the state, legislation may need to be passed. With local government council or board approval may be needed. With utilities, the PSC will be involved. Manufacturer incentives can be handled by each company.

The SC Department of Transportation can provide guidance on safety logistics, and Complete Streets guidance can also be used as a reference.

Costs for a rebate can be from the state, manufacturer, or utility depending on where the program is housed.

New Alpha CDC is currently conducting an assessment of the most viable locations in the City of Florence to establish the e-bike share-ride program. New Alpha CDC will do so in partnership with the City of Florence, and the cities' resilience and sustainability commission. The next logistical steps will be to partner with Duke Energy to connect the charging station to the utilities electrical grid. The physical infrastructure will be put in place for the operation of the e-bike program, to be followed by marketing and sales promotion.

The promotions will not only encourage people to participate in the share-ride program but also encourage potential owners to access rebates and purchase vehicles for themselves. To create rebates, there will have to be alignment with the bike manufacturers, legislatures, and the public service commission.

Additional ride share program logistics include mapping to determine communities and locations, safety, reducing vandalism, and reducing the opportunity for theft.

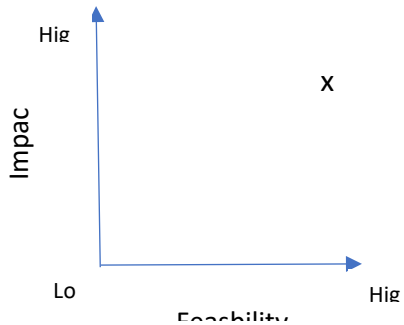
Prerequisites and complementary recommendations

Prior to full implementation, additional stakeholder engagement for determining the best route to an incentive will be necessary.

Since New Alpha CDC will be launching its e-bike share-ride program with startup capital provided by funders, there is no other working group involvement that is necessary as a prerequisite. The public service commission may have to be involved in order to approve utility involvement in the program. However, this should not be a prerequisite, as charging stations are currently in existence throughout the entire state. There will be a need for PSC involvement if the utilities e-bike manufacturers and/or legislature branches offer state tax incentives or rebates in addition to those that may be offered by manufacturers.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 10

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
EV Equity and Accessibility

Recommendation Number and Title
Recommendation 10: Implement an "EV for schools" education program for Title I schools.

Recommendation Summary
Explore the opportunity to target Title I schools with EV for Schools.

Background
As electric vehicle implementation increases in South Carolina, it is important to ensure the equitable access of EV benefits to communities that are not among the groups of EV first adopters. One way to increase this access is through education. Through this recommendation, South Carolina will explore the adoption of a program model based on Austin Energy's EVs for Schools program. Through this program, a utility installs an EV charger at a Title I school and provides curriculum to the schools to teach about the technology. When these students are able to drive, they will most likely be driving electric vehicles. Education about this technology is one way to ensure they are prepared for this transition. There is also the possibility of implementing electric driver's education cars through this program.

Summary of Assessment Criteria
The adoption of this recommendation is designed to help overcome barriers to EV access experienced by low- and moderate-income communities. This will help ensure greater access to this emerging technology, benefit vulnerable or disinvested communities, and provide education and awareness to the students, teachers, staff, and visitors. This educational effort will help promote workforce development, and help bringing about greater EV adoption and related benefits.

Implementation Logistics

This recommendation can be implemented by any organization with the funding and will. Austin Energy's program is implemented through the municipal utility. In SC, possible entities could be the state (with possible federal funding from the infrastructure/budget reconciliation legislation) or utilities through their foundations. This would be similar to the solar for schools programs Santee Cooper and Dominion offer and would be for SC Title I Schools.

Title 1 is the largest federally funded educational program. The program provides supplemental funds to school districts to assist schools with the highest student concentrations of poverty to meet school educational goals. A title 1 school is a school receiving federal funds for Title 1 students.

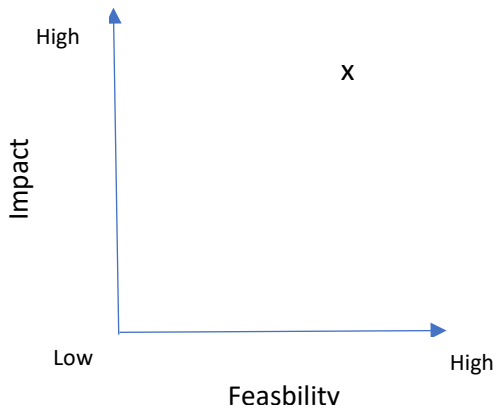
Program costs will include those costs associated with the purchase, installation, and maintenance of a charger, curriculum development, and the possibility of contracting with an entity to help implement the program. Austin Energy worked with ChargePoint and Smart Charge America for the chargers and installation, and EcoRise for the curriculum. Potential unintended consequences may be a Utility rate increase if not funded by the utility's foundation.

Prerequisites and complementary recommendations

There are no prerequisites or complementary recommendations. There may be SC Public Service Commission action if at utility decides to undertake such a program outside of their foundation.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Incentive to parents – can park and charge and pick up your child first (car rider line)

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Equity and Accessibility

Recommendation Number and Title
Recommendation 11 – Encourage vehicle electrification in areas disproportionately impacted by vehicle-related health & noise impacts.

Recommendation Summary
Target vehicle electrification in areas disproportionately impacted by vehicle-related health & noise impacts. Encouraging vehicle electrification of all classes in these locations through incentives and other policies will reduce healthcare costs and the environmental burdens on impacted communities.

Background

This recommendation addresses the disproportionate air and noise pollution burden that BIPOC and low to moderate income communities face from a high concentration of fossil fuel-powered vehicles. These communities are primarily located near industrial facilities, highways, ports and other high-traffic, high-congestion areas. This pollution contributes to health and quality of life issues for people in impacted communities.

Prioritizing electrification in these impacted communities will help to address environmental injustice and would constitute an equitable deployment of electric vehicles.

South Carolina does not currently have programs or policies that enable prioritized electrification in air and noise pollution-impacted communities. Other examples of this type of work is available in other states. California and New York targeted ports for electrification. These ports are in environmental justice communities. For example the 'Shore-to-Store' project in Los Angeles which has more than a dozen public and private sector partners involved is aimed at demonstrating the electrification of Class Eight trucks.

This recommendation could take the form of a local, state, or regional initiative. While the electrification of all types of vehicles would be beneficial, it is likely that focusing on medium to heavy duty vehicles would bring about the greatest reductions in air and noise pollution for impacted communities. Targeting public and private fleets would be very likely under this recommendation.

Additionally, SC can avoid non-compliance with NAAQS by electrifying transportation. Rock Hill is a maintenance zone, areas in Charleston port traffic area are also maintenance zones.

Resources:
Cleaner by the mile: Electric trucks can have outsized environmental and health benefits

How Electrifying Trucks Can Help Roadside Neighborhoods Breathe Easier

Summary of Assessment Criteria

- *Ability to implement:* While funding is available to support the research needed for this targeted approach, new policies will be required ensure electrification efforts are focused in these communities. This is a large financial and logistical undertaking that will require participation from many diverse stakeholders. The natural vehicle replacement cycle will cause this to be a decade-long undertaking, but vehicles are available to begin the transition now.
- *Ensures equitable access for all:* Electrifying vehicles in EJ communities specifically targets those most at-risk from poor air quality. The goal is not necessarily access for all, but rather access for those most in need.
- *Promotes economic development and retention:* Electrifying transportation will require charging infrastructure, which is short-term economic development, and job retraining to service and maintain electric vehicles. The skills will be required more widely in years to come, and such training therefore constitutes beneficial economic development through job training.
- *Addresses public health and environmental considerations:* Targeting electric vehicles to areas with poor air quality by definition improves public health and environmental considerations.
- *Education and awareness considerations:* Although this recommendation does not directly result in education, electrifying vehicles that travel through communities are a visible and tangible means of improving health and air quality. Such efforts therefore increase awareness.
- *Benefits to workforce development:* As discussed above, job retraining to maintain and service electric vehicles is an important career path. More electrical infrastructure will also be required to support EVs, and electrical training will be a valuable workforce development initiative. Many may lose jobs during this transition because of reduced maintenance needed for electric vehicles. An electric vehicle career path and retraining would be a way to mitigate this loss.
- *Provides additional co-benefits:* Yes – reduces GHG Emissions, improves air quality and community health.

Implementation Logistics

Timeline:

- *What needs to happen in the near / medium / long term?*

    - In the near term, robust mapping data are needed to identify areas / communities with high vehicle-related health and noise impacts. In the medium term incentive structures and policies need to be developed to encourage electrification in these areas. In the long term these programs need to be evaluated and adjusted for continued improvement. We suspect most of the mapping data are available and we can quickly move to the medium term.
- *What is a reasonable start date? End date?*
    - This could start immediately with assembling mapping data (southeast map) and could be implemented in the next 2-3 years as policy. This process would likely continue for the next one to two decades.
        - Resources
            - E-DRIVE Tool (EV fast charger infrastructure tool).
        - Map - http://blogs.edf.org/energyexchange/2021/10/14/new-mapping-tool-could-help-communities-policymakers-prioritize-clean-transportation-solutions/

Costs:

- *Identification of funding sources*
    - US EPA (Environmental Justice and Air Research Grants), Federal and state funds, with lower total cost of ownership vehicles are expected to be economical – so special funding sources will not be required.
- *How likely is this initiative to get funded (High/Medium/Low)?*
    - High – as more electric vehicles come to market and compare favorably on a total cost of ownership basis they will be purchased.
- *What are the upfront costs (and who pays)?*
    - Upfront costs – The cost of vehicles and infrastructure
    - Who pays – owner/company
- *What are the ongoing costs (and who pays)?*
    - The ongoing costs are small. In the case of a government fleet management for example a portion of an FTE may be dedicated to monitoring and ensuring distribution according to policy.
- *What are the additional resources needed (staff, etc.)?*
    - Staff to increase awareness of the problem of poor air quality & noise and that EVs that mitigate these issues are available.

Key Actors & Action Required:

- *Lead advocating organization:*
    - CVSC, SACE, EV Manufacturers, Environmental Justice Groups
- *Lead implementing organization:*
    - DHEC (Scott Reynolds), State Fleet Management, SC DOT
- *Other key players:*
    - Electric Utilities, state facilities, COGs (regional transit), SC Port Authority/Palmetto Railways, municipalities (electric bus fleets, best practices/lessons learned)
- *Ease and speed of implementation (H/M/L) and explanation –*

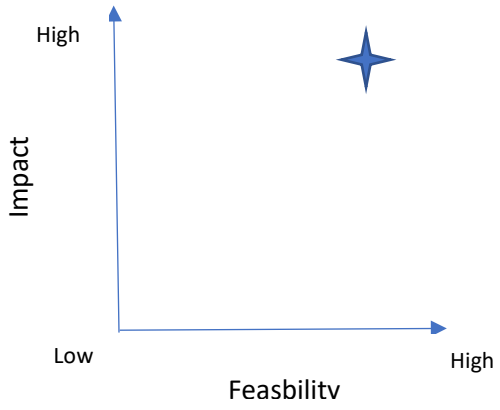
- High but slow, vehicles have long natural replacement cycles which makes this easier but will be slow.

Prerequisites and complementary recommendations

- *Is legislative action required?*
  - Potential action could be to require a minimum percentage of vehicles to be replaced with EVs in areas with poor air quality / noise pollution issues. This action could also require priority electrification investment in these areas.
  - Legislation could also direct the PSC to direct utilities to reduce costs through measures such as waiving line extension policies and providing incentives for behind the meter infrastructure.
  - Development of a clean truck replacement program – study, how much will this cost – may see appropriations (federal), projects need to be shovel ready
- Is SC Public Service Commission action required?
  - Yes, it would be required for utilities to incentivize this EV charging infrastructure.
  - Rate structures for heavy duty vehicles
- Does another working group's recommendation need to occur prior to implementation? Which one(s)?
  - Infrastructure
- Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?
  - Possibly infrastructure/rates

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Equity and Accessibility

Recommendation Number and Title
Recommendation 12: Determine the feasibility of EV infrastructure implementation at existing and new low- and moderate-income dwellings.

Recommendation Summary
Determine the feasibility of EV infrastructure implementation at existing and new low- and moderate-income dwellings. It is important that this sector of the housing market is not left behind as EV charging infrastructure is developed across the state.

Background

This recommendation will address the feasibility of supporting the adoption of EV infrastructure at new and existing multi-unit dwellings. Support options include:

- Low-Income Housing Tax Credit (LIHTC) incentives
- Public housing authorities (administrators of Housing and Urban Development (HUD) programs) providing chargers or requiring contractors to do so.
- Utility multi-family programs

Long term maintenance (who pays) should also be addressed.

As EV adoption increases, it is imperative that infrastructure is available to all individuals including those living in low- and moderate-income multi-family housing where charging infrastructure installations are more challenging. EV charging subsectors, for example, single family homes, will be easier to serve than multifamily homes where space is limited, and parking space is either shared or unavailable.

Occupants of multi-family housing, especially those in subsidized housing, are less likely to be able to afford to pay for the installation of personal charging equipment. Supports for building owners may be one means of supporting EV charging in this context. Utility programs are another approach. They will need to recognize these specific challenges and be prepared to make investments that encourage property owners and occupants to overcome these barriers.

For LIHTC, the feasibility depends on instance and who/how they are paying. There also will be possible pushback from developers. Implementation depends substantially on the type of

housing. LIHTC properties are privately maintained and receive capital funding from SC Housing via syndication for construction and preservation; this is the only major source of new affordable housing development.

Project-based Section 8 is also privately maintained and receives operating support from HUD under decades-old contracts. Traditional public housing is owned by local housing authorities and receives funding from HUD, though this is increasingly uncommon.

Summary of Assessment Criteria

During the assessment of this recommendation is was noted that this recommendation will be a step towards ensuring equitable access to EV implementation by providing EV ready infrastructure at multi-unit dwellings.

Tangential benefits to increased access/infrastructure are increased workforce needs to install and maintain this infrastructure, reduced need to purchase gas, improved air quality and accessibility, and promotion of community health.

Implementation Logistics

To implement this recommendation, in the near-term will require a better understanding of the status of utility companies in making EV investments more broadly, and equity-related investments, more specifically. There are numerous examples of utilities around the country being enlisted in this effort.

It will also require a determination as to whether it is feasible to work with existing programs through LIHTC and/or public housing. This will involve meeting with these organizations and determining whether there is a way to include incentives for EV infrastructure.

With regard to using the tax code to incent building owners, the most promising source of funding would be simply rolling the cost of chargers into the “eligible basis” of a LIHTC property, meaning that its costs can be paid by the value of the tax credits during construction or preservation. It is not yet established whether chargers qualify. If they do, then developers will likely have limited objections; if they don’t, then any requirements from SC Housing to install them will be seen as an unfunded mandate. Aside from this, it is not clear what other options there may be, since affordable housing providers are often extremely cash strapped. Private financiers, local housing trust funds, and other providers of capital could also finance charger installation during a LIHTC transaction.

Upfront costs will include the initial purchase and installation of chargers. After installation, property owners would need to maintain chargers out of existing cash flow.

Implementing organizations include SC Housing, Public housing authorities throughout South Carolina. Additional key players may include housing developers, private financiers, local housing trust funds, and other providers of capital.

As a potential barrier, there is sometimes a perception among the public and politicians that affordable housing is “too nice” and provides luxuries that are undeserved, essentially arguing that there should be stronger disincentives to being poor. While electric infrastructure will likely soon be seen as essential, it could be considered superfluous today. Also, even if fully funded, there could be pushback against any requirement to provide chargers based on skepticism of the negative impacts of pollution, climate change, etc. from some groups.

For utility program, there will be Utility/PSC review of the tariff supporting the installation of MFAH EV charging infrastructure.

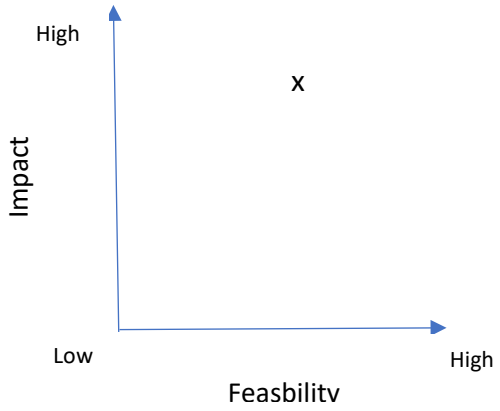
Additionally, what will be the charge level needed? Level 1 or 2? How much will this cost? Will a bring your own charger program work? There is a cost barrier. Once you address access at the facility, then there is the question of cost if you implement bring your own charger.

Prerequisites and complementary recommendations

Initial discussion will be through SC Housing and South Carolina Public housing organizations and utilities.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



External FW _ _ EVs in MUD Resources for

EV WG Meeting Slides (MUDs, annotat

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 13 - Create a Statewide Electrification Roadmap

Recommendation Summary

Through this roadmap, the state will:

- Develop goals to promote auto industry, tourism, and economic development;
- Develop energy generation programs that incentivize generation for alternative fuels – such as solar for EVs /DERs; and
- Determine the appropriate involvement of PSC/legislature to advance EVs and Infrastructure.

Background

This recommendation is a combination of recommendation ideas as noted below:

Need for state-level guidance/support and regulations

- Create a State Electrification Roadmap - included but not limited to placement of charging infrastructure, goals to promote EVs and attract economic development, the creation of workforce development programming, educational briefings to decision makers - such as PSC/statehouse/regulators, defining what is the role of utilities, identify funding sources, and deploying sustainable incentives that drive items at scale and decrease the cost of unit in long run

Need for state-level guidance/support and regulations

- Identify and align state and local transportation planning with what is happening in the region, nationally, and from manufacturers
- Direct state entities to take advantage of existing and available federal resources for alternative fuel vehicle and infrastructure deployment, to reduce extra burden for local revenue generation
- Develop/study a fuel program that incentivizes programs that generate alternative fuels not limited to EVs, revenues from production/generators/sellers can feed into revenue streams and incentives for MD/HD vehicles.

Engaging utilities

- Determine what is the appropriate amount of utility involvement in SC through legislation or PSC.

Electrification of transportation offers a variety of advantages to states, but the inherent barriers to EVs mean that state action is needed to realize the greatest benefits and avoid pitfalls. Transportation electrification requires coordination among state agencies of transportation, air quality and environment, commerce, tourism, energy, and public utility commissions.

A comprehensive state electrification roadmap (EV roadmap) will ensure that the benefits of transportation electrification are shared equitably by all residents of South Carolina – including the most vulnerable communities, regardless of their circumstances. Ensuring this requires the recognition of persistent challenges; (1) the pervasive need for meaningful access and the opportunity to participate in relevant decisions; (2) that there are barriers to the ability of many communities to enjoy the benefits of electrification programs; (3) lack of charging infrastructure; and (4) lack of financial incentives for EVs and charging infrastructure.

To ensure that transportation electrification programs can meet the needs of all energy consumers, an EV Roadmap should start by considering existing charging infrastructure, programs and state goals, including whether the programs currently being delivered are meeting equity goals. Second, the EV Roadmap should improve opportunities for meaningful engagement, so that the South Carolina EV Roadmap can be intentional in its design of an equitable transportation electrification plan for the state.

- Examples from other states
  - TX HB 2221 introduced the concept of an electric transportation council to create a transportation electrification plan
  - Michigan stakeholders recommended a Transportation Electrification Plan to the Council on Climate Solutions. See Recommendation 1 under "Transportation and Mobility Workgroup".

Summary of Assessment Criteria

Recognizing the opportunity presented by EVs, many states are taking action. In early 2019, 48 states plus the District of Columbia took action on regulation, financial incentives or market development initiatives related to electric vehicles. Electrification of transportation offers a variety of advantages to states, but the inherent barriers to EVs mean that state planning and action is needed to realize the greatest benefits and avoid pitfalls. The absence of a plan doesn't mean that EVs won't be adopted; it just means that the effects of EV

integration will be more prone to unintended consequences for state citizens, electricity customers, the environment and EV owners.

According to the American Society of Civil Engineers transportation report card, 41.7% of U.S. households have only one vehicle or less and could benefit from transit options, and **45% of Americans** have no access to transit. An EV Roadmap that meets the needs of all South Carolina citizens can address the pervasive need for meaningful access and the opportunity to participate in relevant decisions by all citizens; and explicitly overcomes barriers to the ability of many communities to enjoy the benefits of electrification programs. Consequently, the process for drafting and adoption of a South Carolina EV Roadmap needs to be inclusive to enable planning and development of electrified transportation that addresses needs of all South Carolina residents. In creation of the EV Roadmap, input should be solicited from stakeholders including, but not limited to, environmental justice advocates, low-income advocates, the public service commission, the state air agency, electric investor-owned utilities, local publicly-owned electric utilities, state and local transportation and transit agencies, charging infrastructure companies, climate groups, consumer advocates, automobile manufacturers, labor unions, convenience stores, and interested members of the public.

Inclusive planning is necessary to ensure that vulnerable and disinvested communities have meaningful access and opportunity to participate in creation of the EV Roadmap. Targeted investment in electrified transportation, particularly for medium and heavy-duty vehicles could also decrease harmful emissions in vulnerable communities. Low- and moderate-income (LMI) communities and communities of color, especially those located near transportation corridors, are disproportionately affected by transportation-related emissions of PM2.5. Research shows that the proximity and exposure to truck-related emissions in certain neighborhoods “leads to environmental justice questions related to air pollution and public health.”

LMI communities are often located in very close proximity to roadways because property values in those areas are likely to be lower. The CDC has found that racial and ethnic minority communities, foreign-born people, and people who speak a language other than English at home represent the highest percentage of people living within 500 feet of a major highway. The most effective way to improve air quality for communities near roadways, according to the EPA, is to “reduce the emissions of each vehicle on the road and the number of vehicle miles driven.” Vehicle electrification can reduce emissions.

The premise of this recommendation is that with accessible EV charging that benefits all communities in South Carolina, including low-income and rural communities, EV adoption will accelerate. More EVs in South Carolina can bring economic benefits to EV owners, utility ratepayers and the public, and then create economic development opportunities. Transportation electrification benefits EV owners, because over the lifetime of a vehicle, EV owners save money because EVs are cheaper to operate and maintain than gasoline- or

diesel-fueled vehicles. Additionally, EVs benefit utility ratepayers. Evidence from California and the northeast indicates EVs have increased utility revenues more than they have increased utility costs, leading to downward pressure on electric rates for EV-owners and non-EV owners alike.

Communities and businesses that host public charging stations may also see economic benefits as EV drivers eat or shop while their vehicles charge. In Minnesota, a study found that installing 150 EV chargers would generate $14.2 million in economic activity, including $4.6 million in labor income. A study of charging stations in New York found that retail locations earned additional revenue that increased the profitability of hosting a charging station between 7 and 250%.

Additionally, a supportive environment for EVs in South Carolina could attract new companies and business to the state and region. The statewide construction of charging infrastructure needed to support electric vehicles, including public and private charging stations, can also be expected to stimulate the state's economy and robust tourist industry. Tourists from other states, will increasingly be driving EVs, and need supportive charging infrastructure. A robust EV charging infrastructure will benefit South Carolina residents, and tourists alike.

This recommendation would increase the speed of adoption of electric vehicles in South Carolina and has significant environmental benefit potential. Tailpipe emissions are responsible for 53,000 premature deaths each year in the U.S., more even than power plant emissions. They contain particulate matter, nitrogen oxides (NOx), and volatile organic compounds, and contribute to ozone formation. Exposure to these pollutants leads to serious illness and premature mortality. Because EVs do not generate tailpipe emissions, they result in a net reduction in air pollutant emissions, even when charged in electric systems that rely heavily on fossil fuels.

In addition to the greater efficiency of EVs, electrifying transportation can also help facilitate greater grid flexibility. Because EVs are flexible in when they can be charged and used, they can function like batteries. This enables grid managers to shift load to times when there is less demand for electricity, and when generation is often cleaner. EV charging flexibility can also be used to capture variable renewable generation that might be otherwise curtailed, giving managers the ability to integrate and use variable renewable energy, avoid unnecessary system upgrades, and get a greater return out of their current electric distribution systems. Consequently, increased vehicle electrification can lead to increased

utilization of renewable energy and decrease harmful emissions from the electric grid. This in turn helps to improve air and water quality in South Carolina.

Using electricity to power transportation leverages changes in the electricity sector to create local jobs. Clean energy jobs are growing in every state and frequently increase at a greater rate than the overall employment rate. Greater EV adoption and charging will only increase these employment prospects. In South Carolina, automotive manufacturers and several technology companies and investors are planning on building or transforming manufacturing facilities that will sustain thousands of new jobs. The statewide construction of charging infrastructure needed to support electric vehicles, including public and private charging stations, can also be expected to stimulate the state's economy and boost job growth.

Multiple studies suggest that the U.S. could see between 52,000 to 109,000 net new jobs annually between 2015 and 2040, and a $2.5 billion to $9.9 billion increase in gross domestic product annually. The United Auto Workers union supports EVs but is also calling for decision-makers to work with automakers to retool existing facilities and retrain workers to produce new energy vehicles. The U.S. DOE estimates the utility sector will demand 105,000 skilled workers by 2030 as a result of demand for EV charging and distributed generation, and we are on track to fill only 25,000.

Implementation Logistics

An EV Roadmap Council shall be formed to create an EV Roadmap for South Carolina. Members of the council shall include representatives from the following groups and agencies: environmental justice advocates, low-income advocates, the public service commission, the state air agency, electric investor-owned utilities, local publicly owned electric utilities, state and local transportation and transit agencies, charging infrastructure companies, climate groups, consumer advocates, automobile manufacturers, labor unions, convenience stores, and interested members of the public.

The council shall:

(1) Develop a comprehensive plan for the development of public electric vehicle charging infrastructure and associated technologies in this state through the year 2040;

(2) Update the plan biennially; and

(3) Include phased implementation in biennial increments through 2030.

The South Carolina EV Roadmap should include both short- and long-term goals for electric vehicles, charging infrastructure, and associated technologies in this state. The EV Roadmap shall include, at a minimum, the following elements:

(1) An assessment of state EV related incentive programs and determine the sufficiency of such programs for meeting South Carolina's transportation goals. Additionally, the EV Roadmap Council should recommend new programs and outreach efforts that could improve incentives and access to them.
(2) An analysis of barriers to clean mobility in harder to serve areas for electrified transportation, including but not limited to rural, low-income communities and multi-unit dwellings, and options for addressing these barriers.
(3) Identification of areas where additional publicly accessible electric vehicle charging infrastructure is needed to ensure that the vehicle choice of South Carolina residents is not constrained by a lack of access to adequate public electric vehicle charging infrastructure;
(4) An outline and time schedule for the provision of safe, dependable, serviceable, and operational public electric vehicle charging infrastructure. This should be sufficient to meet and enable future demand for electric vehicles to enable users of electric vehicles of various classes to travel border to border and community to community on interstate highways and other major roadways and in rural communities, multifamily and underserved communities, town centers, commercial and retail areas, parks and other publicly owned lands.

The plan should also seek to:

(1) Maximize the benefits associated with transportation electrification.
(2) Stimulate competition, innovation, consumer choices in public electric vehicle charging and related infrastructure and services.
(3) Encourage private capital investment, by partnering with Federal grants and utility rebate incentives.
(4) Specify the number and types of electric vehicle chargers per general location and along evacuation routes and at highway rest stops in this state that are needed to meet the requirements above.
(5) Enhance commerce by ensuring an adequate distribution of public electric vehicle charging infrastructure is available throughout the state to stimulate lower cost and lower emissions from heavy duty trucking and delivery services.
(6) Promote the adoption of demand response functions and two-way electricity flow capability in order to allow both load management and vehicle to grid integration for cost savings, grid reliability, and resiliency.
(7) Ensure adequate public electric vehicle charging capacity to facilitate commerce:
    (i) At or near the borders of this state.
    (ii) In or near airports, rail yards, and seaports.
    (iii) At warehouse complexes and truck stops.
    (iv) Enhances accessibility of tourist areas to electric vehicle users.
    (v) Covers any other areas identified by the council.

In developing and updating the plan, the council:
(1) Shall use, to the extent practicable, publicly available electric vehicle projections and models based on industry standards to determine, for each year, the percentage and number of electric vehicles by vehicle class that are expected on roadways in this state and the number of electric vehicle chargers that are needed to ensure that there is comprehensive and adequate access to public electric vehicle charging infrastructure in this state; and

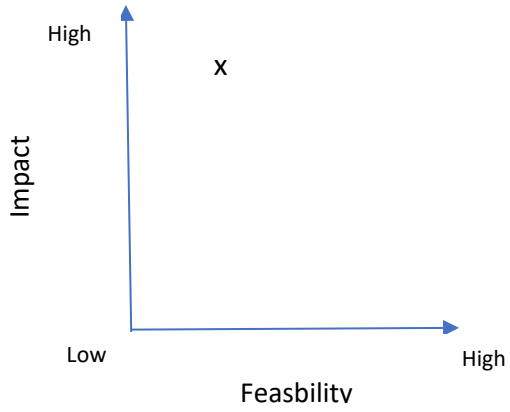
(2) May rely on scenarios provided by the relevant state entity or other information from appropriate sources for the percentage and number of electric vehicles by vehicle class on roadways in this state by year.

Prerequisites and complementary recommendations

- Is legislative action required?
  - Either legislative or Executive Action could create the EV Roadmap Council and provide authorization to create the plan, consistent with the above recommendations.
- Is SC Public Service Commission action required?
  - A representative of the SC PSC is recommended to be a member of the EV Roadmap Council.
- Is another external entity's action required?
  - Various state agencies should be included in or consulted in the EV Roadmap Council and recommendations.
- Does another working group's recommendation need to occur prior to implementation? Which one(s)?
  - This recommendation likely addresses some of the recommendations of other groups. This recommendation is not dependent on other action.
- Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?
  - This recommendation includes recommendations from the equity work group and the charging infrastructure work group.
- Does this recommendation need to occur prior to another's implementation? Which one(s)?
  - Other recommendations may be improved by virtue of the comprehensive planning included in this plan.

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 14 – Expand the SC Alternative Fuel Infrastructure Tax Credit.

Recommendation Summary
Expand the SC Alternative Fuel Infrastructure Tax Credit to include electric charging stations and other alternative fuels (EPACT 1992/2005). Expand from propane and natural gas to include more alternative fuels https://afdc.energy.gov/laws/11720.

Background

- Challenges addressed
  - Currently small and large businesses are hindered from deploying electric vehicle stations because of the high capital costs of installation and equipment purchase for DC Fast Chargers and Level 2. Furthermore, residents can face costs for installing Level 2 chargers that present a barrier to adoption.
- Current status in South Carolina
  - South Carolina currently hosts an Alternative Fuel Infrastructure Income Tax Credit (Reference South Carolina Code of Laws Section 12-6-3695) that provides a 25% income tax credit towards the purchase, construction, and installation of alternative fueling infrastructure. This Income Tax Credit is limited to only propane and natural gas.
- Examples from other states (if applicable)
  - Refer to the AFDC State Laws and Incentives site.
- Is this a statewide or local initiative?
  - This incentive would seek to be a statewide initiative benefiting all South Carolinians.
- What is the target sector (light-duty/medium-duty/heavy-duty/all)?
  - This incentive would benefit all sectors from private residents utilizing light-duty vehicles to fleets using heavy-duty tractors.

Summary of Assessment Criteria

- Ability to implement:
  - This recommendation would require actions of the South Carolina General Assembly to amend the current legislation. An amendment to broaden the description of alternative fuels would prevent the government from picking "winners and losers".
- Ensures equitable access for all:
  - This expansion of the tax credit would ensure equitable access from private citizens to companies within South Carolina.
- Benefit to vulnerable or disinvested communities:
  - While this expansion of the tax credit would not directly benefit these communities, it could as fleets replace high-cost operation diesel vehicles with lower-cost operation electric vehicles that provide air and health benefits to these communities.
- Promotes economic development and retention:
  - Availability to more charging will help break down barriers for consumers and fleets to get into EVs which can ultimately help them lower fuel and maintenance costs on their vehicle. This cost shift can provide more to local economies by reducing transportation cost burdens families experience in South Carolina.
- Addresses public health and environmental considerations:
  - This recommendation does not explicitly address public health and environmental concerns, there may be added consideration for a higher incentive for stations that can provide certification they are powered/offset by renewable or negative-carbon intensity generation sources; not limited to renewable natural gas, renewable propane, and solar.
- Education and awareness considerations:
  - Increase in charging infrastructure and EV adoption will encourage automotive OEMs to ship cars to SC, increasing the available options of vehicles to purchase to consumers.
- Benefits to workforce development:
  - There is a plethora of industries within South and North Carolina that manufacture vehicle and charging components for electric vehicles. An expansion of charging infrastructure will support a robust manufacturing base in the Carolinas.

Implementation Logistics

Timeline:

- What needs to happen in the near / medium / long term?

    - Stakeholders will need to find champions to move this cause forward. The General Assembly will need to introduce legislation to amend Section 12-6-3695.
- What is a reasonable start date? End date?
    - A reasonable start date would be as soon as possible within the General Assembly to support South Carolina businesses and residents.

Costs:

- Identification of funding sources
    - Funding or possibility of tax incentives would come from the SC Legislature and SC Department of Revenue
- What are the upfront costs (and who pays)?
    - Taxpayers could potentially pay with an incentive, which means lower tax burden and less revenue for SC government.
- What are the ongoing costs (and who pays)?
    - The SC Department of Revenue should conduct a Fiscal Analysis of the amendment when it is introduced to provide financial numbers regarding expanding this tax incentive.
- What are the benefits to ratepayers?
    - Higher deployment of EV charging stations will generate higher sales of EVs within the state, which in turn drives high utilization rates of charging stations. With proper load management and response for charging station demand, EVs can place downward pressure on rates to ratepayers as well as health benefits that reduce medical costs for all South Carolinians. Furthermore, the cost shift from paying for gasoline and diesel to lower-cost electricity can be 30% the cost of driving internal combustion vehicles.
- What are the additional resources needed (staff, etc.)?
    - A program to approve alternative fuel infrastructure tax credits already exists.
    - Staff at the SC Department of Revenue and/or SC Energy Office may need to be expanded by a staff person to verify and certify station applications.

Key Actors & Action Required:

- Lead advocating organization
    - EV Charging Providers, Manufacturers, Trade Groups
- Lead implementing organization
    - SC Legislature, SC Department of Revenue
- Other key players
    - SC Energy Office
- Current or upcoming policy action
    - n/a
- Current or upcoming utility action
    - Duke Energy has been given PSC approval to conduct the Electrified Transportation Pilot across Carolina and Progress territory, this includes Level 2 rebates and DC Fast Charger programs

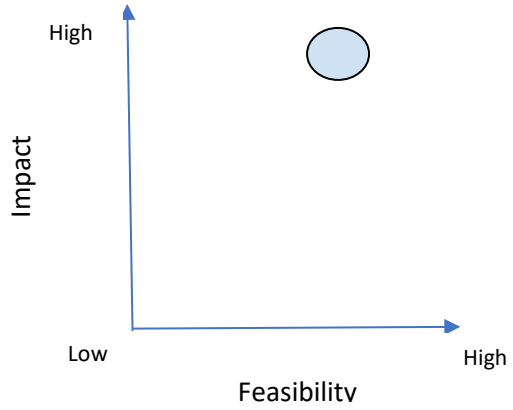
- Santee Cooper has initiated a Level 2 rebate program and has signaled within their IRP that more programs are to be developed that include commercial fleets.
- What are potential unintended consequences?
  - It is possible stations that do not meet criteria will be approved?
- Ease of implementation (H/M/L) and explanation
  - This tax incentive could be easily implemented as it expands an already existing tax incentive program.
- Speed of implementation (H/M/L) and explanation
  - This recommendation has a high speed of implementation with the passage of an amendment within the SC Legislature.

Prerequisites and complementary recommendations

- Is legislative action required? Define required action.
  - Yes. SC Legislature will need to introduce an amendment to amend the existing tax credit.
- Is SC Public Service Commission action required? Define required action.
  - No
- Is another external entity's action required? Define required action.
  - SC Department of Revenue to manage tax credit applications.
- Does another working group's recommendation need to occur prior to implementation? Which one(s)?
  - No
- Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?
  - No (?)
- Does this recommendation need to occur prior to another's implementation? Which one(s)?
  - No

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 15 – Create an industry committee to focus on EV program and rate design.

Recommendation Summary
This recommendation will create a committee composed of fleets, operators, OEMs, charging providers, utilities, environmental justice groups, environmental groups, consumer groups, other community groups, etc. The committee will discuss and learn about EV infrastructure programs such as utilization rate, rate design demand charges, and line extension programs. They also will promote programs that utilize smart charging behaviors using time-varying rates paired with program rollout, and be able to provide testimony to the PSC and others.

Background
This recommendation is a combination of recommendation ideas as noted below: Committee • Create a working committee composed of fleets, operators, manufacturers, and others on how to approach EV rate design – can provide testimony to PSC and others. Infrastructure Needs for Vehicle Classes and Uses • Review research on dwell times for DCFC vs L2 utilization, different use cases – shopping, travel, destination – study utilization on pricing model on station and on user. Infrastructure Needs for Vehicle Classes and Uses • Legislation be proposed that will lead to the development and PSC review of new rate tariffs (including those providing for managed charging, EV time-of-use billing, and make ready infrastructure), modernized line extension policies, fleet electrification infrastructure needs, and customer outreach that will facilitate the adoption of and investment in transportation electrification in South Carolina. Engaging utilities

- Promote utility programs that encourage consumers to change charging behavior or reduce the energy costs incurred by behavior through DERs. Smart charging can create digestible information for consumers and providers
- Encouraging utilities to work collaboratively to study EV fleet demand growth and potential; in regard to proper infrastructure deployment and managed charging could make the grid more efficient (keep peak demand steady and shift charging to off-peak times).

Electrification of the transportation sector has the potential to provide tremendous benefits to consumers, the electric grid, and the environment. Without foundational electricity policies in place, EV load has the potential to strain the grid, drastically increase costs, and increase toxic air emissions. Action is necessary to ensure foundational policies are in place now while EV penetrations are low, so that all the benefits of electrification can be realized in South Carolina.

Because electric vehicles (EVs) can be charged during off peak times and do not use energy from the grid when they are in use, they are inherently flexible and can serve as energy storage. As a result, the power system can serve this new load at cleaner and less expensive times of the day. For example, residential EV loads don't need to charge during the morning and evening peaks when power is more constrained, more expensive, and potentially more polluting. These loads can shift to times of the day when it costs utilities less to meet demand, help avoid overgeneration during the middle of the day, and mitigate the steep ramping needed to serve peak loads.

Shifting the load to less expensive times can produce savings that customers can share in through appropriately designed electricity rates. Energy providers can develop smart charging programs and rate designs to encourage customers to charge their EVs at lower-emission and lower-cost times of the day and year.

When EVs are charged determines whether EVs add to peak load, or help to integrate variable renewable resources such as wind. Rate designs that send signals to EV drivers are key to ensuring EVs are charged at the right time for the grid. Time-varying rates communicate through price signals the times during the day when it is more expensive to produce power and grid assets are stressed (higher rates). Additionally, there are times EV charging would be beneficial to grid management because it would increase utilization of existing assets during otherwise low-usage hours (lower rates).

This flexibility means that EVs can improve the utilization of the transmission and distribution system, shifting loads that would otherwise add to system peaks, which ultimately drive grid investment and increase cost. The need for system upgrades can be minimized if EVs are charged during off-peak periods, either through smart charging, time-of-use pricing, or some combination of both.

Examples from other states found that adding EV load can also contribute to lowering the average cost to serve all customers, not just EV owners. Analysis of EV adoption scenarios in California investor-owned utilities by Energy and Environmental Economics (E3) found that there can be significant utility system benefits from adding EV charging load to the grid when consumers were on time-varying rates. E3 found that utilities' cost to serve the load added by substantial EV adoption was less than the amount of revenue they would bring in from customers charging EVs, thereby producing a net benefit and reducing the cost of providing electricity for all ratepayers.

This committee can also discuss line extension policies and EV tariffs. Electrifying road transportation has impacts on the electric grid. Developing transportation electrification on foundational electricity sector policies, such as time varying rates, and optimization of resources, is key to ensuring transportation electrification provides the greatest benefit to the grid, consumers and the environment. Without cohesive planning between electricity policies and transportation charging needs, EV load and infrastructure needs will be added at a much higher cost than necessary. Evaluating EV infrastructure needs in conjunction with grid capability, and requiring time-varying rates for EV charging, will achieve the transition in a least-cost manner. EV infrastructure needs vary based upon use case. Residential EVSE infrastructure needs may not require significant grid upgrades. There are significant benefits from transportation electrification: downward pressure on customer rates (including low-income) from increased electricity usage from transportation electrification; grid resilience and operational benefits from managed charging and TOU-influenced charging; and substantial avoided local emissions and GHG emissions.

In light of the benefits and infrastructure needs of transportation electrification, we recommend that legislation be proposed that will lead to the development and PSC review of new rate tariffs (including those providing for managed charging, EV time-of-use charging, and make ready infrastructure), modernized line extension policies, fleet electrification infrastructure needs, and customer outreach that will facilitate the adoption of and investment in transportation electrification in South Carolina.

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 16 – Develop voluntary minimum standards for EV chargers and station design.

Recommendation Summary
Through this recommendation South Carolina will develop accessible EV Guidance such as ADA diagrams and specifications, ensure minimum standards are open to allow for maximum flexibility as technology and market develops, and encourage the deployment of identifiable Manual on Uniform Traffic Control Devices (MUTCD) signage to mark EV stations.

Background

This recommendation is a combination of recommendation ideas as noted below:

Infrastructure Needs for Vehicle Classes and Uses

- Promoting and recognizing Plug in SC signage as the standardized signage awareness campaign in SC. EVSE deployers should be aware of and utilize MUTCD-compliant signage when conducting station deployment. Public stations may work with the Energy Office to obtain signage at no-cost through an incentive program.

Need for state-level guidance/support and regulations

- Develop minimum voluntary standards for EV charging infrastructure deployers; not limited to LD/MD/HD vehicles and ADA/consumer protection.

Challenges addressed

- Currently in South Carolina there are no minimum standards for the development of EV stations. This can lead to a patchwork of station designs and elements that may confuse drivers and present hesitancy to you.

Current status in South Carolina

- A voluntary minimum standard does not exist in South Carolina.

Examples from other states

- REV WEST voluntary minimum standards: https://www.naseo.org/Data/Sites/1/revwest_volminimumstandards.pdf

Is this a statewide or local initiative?

- This would be a statewide initiative that could be included within the Plug in SC marketing campaign.

What is the target sector?

- This would mainly focus on the light-duty sector, but consideration for trailers and larger vehicles should be provided to assist station developers.

Summary of Assessment Criteria

Ability to implement:

- There is an ability to implement this. It would take input from private industry and government to generate standards that are appealing and non-burdensome to developers.

Ensures equitable access for all:

- While voluntary, this recommendation would seek to provide a baseline for safety, security, and accessibility for station development.

Benefit to vulnerable or disinvested communities:

- This recommendation would not explicitly benefit vulnerable or disinvested communities, but consideration for guidance for flood-prone areas may be investigated.

Promotes economic development and retention:

- Voluntary Minimum Standards may aid in economic development by reducing uncertainty and providing guidance to station developers.

Addresses public health and environmental considerations:

- Considerations for guidance for EnergyStar chargers and permeable pavement may be provided but this recommendation does not specifically address this.

Education and awareness considerations:

- This recommendation would also seek to provide guidance on utilizing Plug in SC branding and signage from travel corridors.

Benefits to workforce development:

- This would not directly provide benefits to workforce development.

Provides additional co-benefits:

- Improves Air Quality through station development

Implementation Logistics

What needs to happen in the near / medium / long term?

- Energy Office staff should work in the near term to compile standards for a document. This document should be shared with community and charging groups to ensure participatory input.

What is a reasonable start date? End date?

- Begin March 2022 and end of FY22

Costs:

- Identification of funding sources (if known)
    - Funding could come from Clean Cities coalition that is operated through the State Energy Office.

- Financial commitment could be contributed by the state to participate within a Drive Electric education campaign that could develop this document. i.e., Drive Electric USA USDOE program.
- How likely is this initiative to get funded (High/Medium/Low)?
  - This initiative currently retains funding to complete through the USDOE, high.
- What are the upfront costs (and who pays)?
  - Taxpayers through grant funding through the SC Energy Office.
- What are the additional resources needed (staff, etc.)?
  - Additional staff should be hired by the SC Energy Office to continue to manage an expanding portfolio of clean transportation needs within the state.

Key Actors & Action Required:

- Lead implementing organization
  - SC Energy Office
  - Palmetto Clean Fuels
- Other key players
  - Charging providers and community groups
- What are potential unintended consequences?
  - A potential unintended consequence is making standards that are not technologically agnostic or promote guidance that could be outdated in a short time.
- Ease of implementation (H/M/L) and explanation
  - Ease of implementation will come from staff availability (M)
- Speed of implementation (H/M/L) and explanation
  - Speed of implementation should be high, as this will be a short document with voluntary guidance.

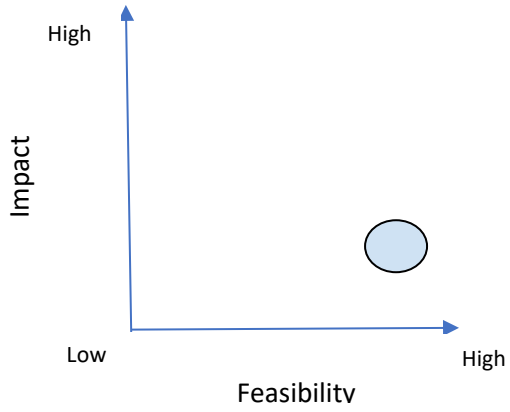
Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

- Is legislative action required? Define required action.
  - No
- Is the SC Public Service Commission action required? Define required action.
  - No
- Is another external entity's action required? Define required action.
  - SC Energy Office - create standards

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 17 – Deploy EV infrastructure along critical corridors.

Recommendation Summary
Develop EV Infrastructure along critical corridors that supports freight, evacuation, transit, and tourism. • Work with SCDOT/SCEMD/FHWA/USDOT/etc. to deploy EV infrastructure along Alternative Fuels Corridors to support personal and commercial travel • Design stations with considerations for all vehicles – including those with trailers • Encourage DERs and storage to reduce grid demand at EV charging sites and provide reliable charging/future proof sites with "modular/scalable" upgrades

Background
This recommendation is a combination of recommendation ideas as noted below: Infrastructure Needs for Vehicle Classes and Uses • Develop EV infrastructure along critical corridors that supports freight and evacuation routes. Work with SCDOT/SCEMD/FHWA/USDOT/etc. to highlight stations during evacuations. Incorporate station design considerations for freight. Infrastructure Needs for Vehicle Classes and Uses • Deploy infrastructure that has open standards. Deploy EVSE that has backing by OEM and proven track record to retain reliability/uptime standards. Infrastructure Needs for Vehicle Classes and Uses • Develop USDOT-designated Alternative Fuels Corridors in SC to facilitate interstate commerce, freight logistics, transit, and passenger travel to promote economic development - included but not limited to identifying and executing transportation and other funding sources to deploy DC Fast Chargers Infrastructure Needs for Vehicle Classes and Uses • Develop infrastructure hubs that can support light-heavy duty vehicles - specifically those near industrial hubs. Behind the gate charging will most likely be preferred for now for HD but could possibly find ways to optimize the utilization by partnering with neighboring facilities.

Understanding Economic Impact (Revenue Models, Rate Impact, Business Growth, Benefits to Consumers etc.)

- Support South Carolina future and current industries - companies have ESGs that need to be met for business and supply chains. If not met, this leaves uncertainty to business models and goals. Support Clean transportation initiatives such as freight and logistics infrastructure corridors.

Need for state-level guidance/support and regulations

- Develop the ability to identify where charging infrastructure should go: vision to include equitable and distributive access to EVSE. Overlay with transportation needs, use needs, and behind-the-meter grid availability – GIS

Engaging utilities

- Encourage infrastructure developments to develop sites with "modular improvements" in mind to future proof sites for higher powered equipment within future deployments. Additionally, allow power-sharing equipment to lower costs

Financial considerations

- Encourage planning across multiple stakeholders to understand power demand needed at charging sites, especially for port/bus/truck locations. Encourage flexibility in systems to allow EVs to soak up power throughout the day. Solar, storage and other DERs can reduce demand at sites.

Challenges addressed

- Currently South Carolina's Alternative Fuel Corridor system is lacking infrastructure for EV on critical throughways that support tourism, freight, evacuation, transit, and tourism. Furthermore, to support local industries and manufacturing hubs in South Carolina, infrastructure should be located near industrial areas and support "behind-the-gate" charging for fleet operations.
- Current status in South Carolina
    - Motorists traveling along major interstates in South Carolina will see alternative fuel corridor signs. These signs indicate routes that are part of a national network of corridors that support alternative fueling infrastructure. The Palmetto Clean Fuels coalition, an initiative of the S.C. Office of Regulatory Staff – Energy Office (Energy Office), worked with the SC Department of Transportation (SCDOT) to install the signs in June 2017.

      In July 2016, the U.S. Department of Transportation Federal Highway Administration (FHWA) called on states to nominate national plug-in electric vehicle (EV) charging and hydrogen, propane, and natural gas fueling corridors along major roadways as a part of the "Fixing America's Surface

Transportation" (FAST) Act. The Energy Office submitted a nomination to designate all major interstates in South Carolina.

- The FHWA designated 55 routes across the U.S. in November 2016 that will serve as the basis for a national network of alternative fuel corridors spanning 35 states. These designated corridors aim to create and expand a national network of alternative fueling, charging infrastructure, and signage along National Highway Systems corridors.

  Parts of I-20, I-26, I-77 and I-85 were designated as "signage ready" in South Carolina; enough infrastructure exists along the designated segments of interstate to facilitate refueling. The FHWA may add more highway sections as additional refueling and charging stations are built.

- Examples from other states
  - VW Settlement - North Carolina
  - Florida EV Roadmap
  - Alabama EV funding - State and VW
- Is this a statewide or local initiative?
  - This would be a statewide initiative involving multiple agencies that connect with economic development, tourism, energy, and transportation.
- What is the target sector (light-duty/medium-duty/heavy-duty/all)?
  - All

Summary of Assessment Criteria

- Ability to implement:
  - The ability to implement these recommendations will take time and funding. It is projected this would be a five-year process to complete the use of federal funds. State funding for EV infrastructure should consider incorporating rural and semi-urban areas that are not near interstate corridors.
- Ensures equitable access for all:
  - Public stations would guarantee access for all, while "behind-the-gate" charging would guarantee access for fleets. Attention needs to be given on siting EV charging infrastructure to make sure communities that have been historically disinvested, are ensured investments.
- Benefit to vulnerable or disinvested communities:
  - This recommendation would not directly benefit vulnerable or disinvested communities but would provide indirect benefits from vehicles in the community that do not have tailpipe emissions.
- Promotes economic development and retention:
  - Developing an Alternative Fuels Corridor network with EV infrastructure would promote economic development through construction, installation, operation and maintenance; as well as helping South Carolina industries achieve

Corporate Sustainability Goals through reducing supply chain logistics emissions.

- Addresses public health and environmental considerations:
  - While not directly addressing public health and environmental considerations, EV charging infrastructure along the interstate network would reduce emissions from light-med-heavy-duty vehicles generating tangible health benefits.
- Education and awareness considerations:
  - South Carolina should utilize Plug in SC to brand and mark stations with signage and branding. Furthermore, efforts should be given to ads to alert the general public of their location and presence.
- Benefits to workforce development:
  - Station installations benefit skilled trade jobs including but not limited to manufacturing, electricians, installers, utility line workers, and operations staff
- Provides additional co-benefits:
  - Cost Savings
  - Improves Accessibility
  - Enhances Resilience Efforts
  - Reduces GHG Emissions
  - Improves Air Quality

Implementation Logistics

Timeline:

- What needs to happen in the near / medium / long term?
  - State transportation agencies need to start identifying locations for siting infrastructure and developing a working group amongst agencies.
- What is a reasonable start date? End date?
  - February 2021-2026

Costs:

- Identification of funding sources (if known)
  - Federal Infrastructure Investment and Jobs Act
    - $13M in Federal + $4M in state match every year over 5 years
  - State funding?
- How likely is this initiative to get funded (High/Medium/Low)?
  - Complete for federal, IIJA has been signed into law.
  - State funding is a medium level in how likely it gets initiated.
- What are the upfront costs (and who pays)?
  - Upfront costs: labor, equipment, maintenance, operation
  - Federal and State Taxpayers
- What are the ongoing costs (and who pays)?
  - Maintenance and operation
  - Federal and State Taxpayers
- What are the benefits to ratepayers?

    - With increased utilization and presence on EV stations, this can bring downward pressure to ratepayers. Stations paired with managed charging can reduce grid demand implications and better utilize existing generating resources. Furthermore, EV infrastructure sites paired with renewable energy and energy storage systems can reduce grid demand during peak periods of demand in relation to charger utilization.
- What are the additional resources needed (staff, etc.)?
    - SCDOT will most likely need to hire staff to implement federal funding requirements.

Key Actors & Action Required:

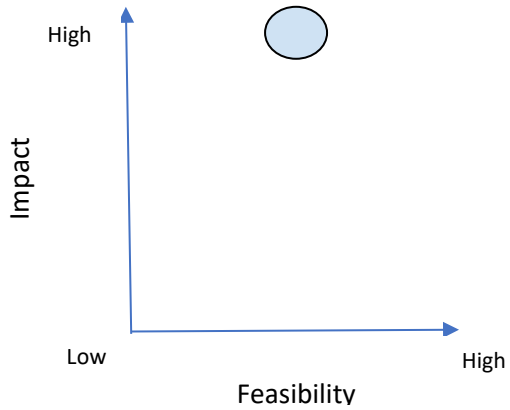
- Lead advocating organization
    - OEMs, Charging providers, drivers and fleets
- Lead implementing organization
    - SC Department of Transportation
- Other key players
    - SC Energy Office
    - SC Office of Regulatory Staff
    - SC Commerce
    - SC Ports Authority
- Current or upcoming policy action
    - There is currently no state policy action on this, but there is federal action including the IIJA.
- Current or upcoming utility action
    - Duke Energy has been given PSC approval to conduct the Electrified Transportation Pilot across Carolina and Progress territory, this includes Level 2 rebates and DC Fast Charger programs
    - Santee Cooper has initiated a Level 2 rebate program and has signaled within their IRP that more programs are to be developed that include commercial fleets.
- What are potential unintended consequences?
    - Unintended consequences can come from the placement of infrastructure in areas where private investment is already being placed. Funds should be used to ensure electrification transportation is available outside just metro areas.
    - Efforts should be made to ensure disinvested and disadvantaged communities benefit.
    - Furthermore, station consideration should take into account safety, security, and accessibility.
- Ease of implementation (H/M/L) and explanation
    - Medium implementation will take understanding federal regulations and developing a proposal process.
- Speed of implementation (H/M/L) and explanation
    - Medium, the IIJA is a five-year act.

Prerequisites and complementary recommendations

- Is legislative action required? Define required action.
  - Yes, legislative action may be required to take advantage of these funds and implement funding from the state budget.
- Is SC Public Service Commission action required? Define required action.
  - No, but rate design elements will most likely need to be investigated to ensure an attractive charging rate and rate recovery structure.
- Is another external entity's action required? Define required action.
  - Utility involvement will be needed for station installations.
- Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?
  - Recommendation 6 – Ensure EV charging incorporates requirements beyond minimum Americans with Disabilities Act **(ADA). ("ADA plus")**

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 18

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
EV Infrastructure

Recommendation Number and Title
Recommendation 18 – Ensure EV Programs benefit multi-unit dwelling (MUD) and encourages electrification in disadvantaged areas.

Recommendation Summary
Ensure EV infrastructure benefits multi-unit dwellers and encourages electrification in disadvantaged areas. ○ Update building codes to facilitate growth at MUDs and commercial developments ○ Encourage upwards of 40% of EV funds go to benefiting disadvantaged communities ○ "Right to Charge" within SC Residential Landlord-Tenant Legislation

Background
This recommendation is a combination of recommendation ideas as noted below: Infrastructure Needs for Vehicle Classes and Uses • Ensure programs encourage electrification within disinvested communities. i.e.: Building codes to facilitate EV growth at MUDs, utility programs that specifically seek to deploy public level 2 chargers and have a goal of > 40% for disinvested communities (incentives for both MUDs and those in mobile homes), available DC fast chargers (DCFC) in these communities to support ride share, and electrification of medium-heavy-duty vehicles Need for state-level guidance/support and regulations • Encourage cities/state to adopt building code readiness, especially with MUDs. Encourage developers with incentives to make EV-ready commercial and home locations. Especially for re-development projects of existing structures. Challenges addressed • Currently the majority of EV users have their vehicles parked overnight within single-car garages within their single-family residences. For electrification to benefit all South Carolinians electrification will need to also benefit those with garaged location. This recommendation seeks to ensure that communities within MUDs are not left behind and reduce the costs of EV charger installation by amending building codes. Current status in South Carolina

- Currently South Carolina does not have electrification programs that provide for site development outside of competitive federal funding through Mini-Grants that the Energy Office disburses for nonprofits and government entities. Hilton Head passed an ordinance in 2015 that requires businesses to install public Level 2 charging if they meet a certain number of parking spaces, reference: https://www.wtoc.com/story/28310466/hilton-head-island-requiring-builders-to-install-electric-car-charging-stations/

Examples from other states

- Virginia
- Florida
- Austin, TX

Is this a statewide or local initiative?

- This recommendation would seek to be a statewide initiative to encourage electrification programs consider LMI and MUD communities.

What is the target sector (light-duty/medium-duty/heavy-duty/all)?

- This recommendation will most likely target light-duty vehicles.

Summary of Assessment Criteria

Ability to implement:

- The ability to implement is medium as this will take time and funding to make a reality. Making sure non-affluent communities benefit will be important in equitable transportation initiatives. Leadership will be needed to add a "Right-to-Charge" in legislation.

Ensures equitable access for all:

- This recommendation seeks to ensure that equitable access and distribution of EV charging stations is conducted with funding sources, and not limited to single family occupancies.

Benefit to vulnerable or disinvested communities:

- This recommendation seeks to benefit vulnerable and disinvested communities by implementing guidance that the benefits of certain portions of funding (>40%) of programs go to communities where there is no investment, such as rural, MUD, and LMI communities. This recommendation also encourages the deployment of electrification within industrial areas that are usually co-located to LMI communities.

Promotes economic development and retention:

- This recommendation would encourage economic development through the contracting of charging companies and installers to place equipment.

Addresses public health and environmental considerations:

- While this recommendation does not specifically address public health and the environmental considerations, populations living within MUDs and near-high traffic, industrial areas experience higher burdens of pollution and could benefit from the use of EVs.

Education and awareness considerations:

- Education for MUD and LMI communities will need to be developed. Signage and marking in accordance with Plug in SC are encouraged.

Benefits to workforce development:

- This recommendation will encourage workforce development with skilled trades who install, operate, and maintain stations.

Provides additional co-benefits:

- Benefits Ratepayers
- Improves Accessibility
- Enhances Resilience Efforts
- Reduces GHG Emissions

Implementation Logistics

What needs to happen in the near / medium / long term?

- It is recommended that the State identify sources of funding to contribute to EV charging infrastructure. As this funding is disbursed, it should be ensured that funding is equitably distributed among communities and benefits all groups. A stipulation saying such, could be embedded in enabling legislation.
- SC should consider upgrading the building code regarding parking infrastructure to include EV charging, this can be done on a state level and local level.
- SC should consider amending SC Residential Landlord-Tenant Act Legislation to include a "Right-to-Charge" for renters and MUD owners. Code of Laws Section 27-40-10 https://www.scstatehouse.gov/code/t27c040.php

What is a reasonable start date? End date?

- It is encouraged that the State and Local entities consider upgrading building codes to allow for EV charging at commercial and residence areas.
- SC Legislation should ensure that state funded charging programs provide an equity lens based upon but not limited to prior investment, air quality, and income.
- SC Statehouse should consider amending the SC Residential Landlord-Tenant Act within two years.

Costs:

- Identification of funding sources
  - Current and upcoming federal funding encourages equity within grant dispersals.
  - Currently there is no funding for electric vehicles within South Carolina. SC would have to identify funding sources to enable programs.
  - SC Legislature can move forward legislation relating to "Right-to-Charge"
- How likely is this initiative to get funded (High/Medium/Low)?
  - This initiative has a medium level of likelihood, it will take cooperation by state/local governments, building groups, and community groups.
- What are the upfront costs (and who pays)?
  - There would not be costs for this recommendation, as it encourages programs that are developed to be viewed through an equity lens.
  - State taxpayers
  - Renter/MUD owners for upgrades
- What are the ongoing costs (and who pays)?
  - ?

- *What are the benefits to ratepayers?*
    - Downward pressure on rates due to increased utilization of EVs as well as benefits to transportation energy burden shifting to a lower cost/lower maintenance vehicle.
- *What are the additional resources needed (staff, etc.)?*
    - Resources such as mapping tools and staff for community engagement will make Charging programs more successful at utilization.

Key Actors & Action Required:

- *Lead advocating organization*
    - AIA? SC Housing? Charging providers? Community Groups?
- *Lead implementing organization*
    - SC Legislature
- *Other key players*
    - SC Energy Office
    - SC Department of Health and Environmental Control
    - SC Commerce
- *Current or upcoming policy action*
    - n/a
- *Current or upcoming utility action*
    - Duke Energy has been given PSC approval to conduct the Electrified Transportation Pilot across Carolina and Progress territory, this includes Level 2 rebates and DC Fast Charger programs
    - Santee Cooper has initiated a Level 2 rebate program and has signaled within their IRP that more programs are to be developed that include commercial fleets.
    - Have not seen MUD programs yet.
- *What are potential unintended consequences?*
    - Potential unintended consequences include funding areas that are not disinvested or heavily impacted by air quality
    - Poor community input that could lead to poor utilization
    - Risk of gentrification through landlords raising rents.
- *Ease of implementation (H/M/L) and explanation*
    - Medium ease of implementation, programs already exist to provide quantification to equity for charging grants.
    - May be harder for legislation on building codes and “Right-to-Charge”
- *Speed of implementation (H/M/L) and explanation*
    - Speed of implantation for this is low-medium - grant programs and proposal documents would have to be developed if the state devotes funding toward EV programs
    - Building code and “Right-to-Charge” legislation would have a higher speed of implementation.

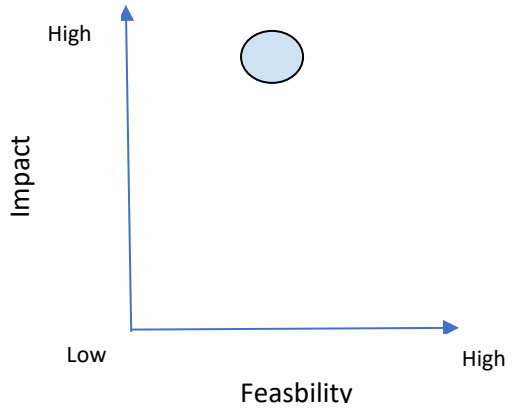
Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required? Define required action.*
  - Yes, legislative action will be required to budget funding for EV charging programs, ensure that equity is a program consideration, pass building code updates, and amend the SC Landlord Tenant Act
- *Is SC Public Service Commission action required? Define required action.*
  - No (?)
- *Is another external entity's action required? Define required action.*
  - SC Energy Office - develop grant programs with funding
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)?*
  - ?
- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?*
  - *ADA+*
  - *Voluntary Minimum Standards*
  - *E-bikes*
- *Does this recommendation need to occur prior to another's implementation? Which one(s)?*
  - ?

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 19

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Incentives and Financing

Recommendation Number and Title
Recommendation 19: Create incentives and financing mechanisms to reduce the upfront costs for consumers.

Recommendation Summary
There is a need to help consumers overcome the higher purchase price of new and used EVs compared to traditional ICE vehicles. This recommendation strives to create incentives and creative financing mechanisms to overcome these cost deltas. Examples include: • providing point-of-sale rebates and state tax credits, • implementing green bank and utility-based financing, and • providing utility rebates for residential charging stations. Incentives should focus on helping make EVs more affordable and be graduated by consumer incomes to ensure the incentives stimulate mass market EV adoption and support underserved market segments including low- to moderate-income households, Black, Indigenous, and People of Color (BIPOC) and rural communities. In this regard, any tax credits that are made available should be refundable so that low and moderate income consumers who don't pay sufficient taxes can still benefit.

Background
<u>Current Landscape</u> • In these early years of EV market development, there are numerous hurdles to getting consumers to consider and adopt EVs as their choice when buying a new or used vehicle. This particular recommendation deals with one of the most significant hurdles – the fact that because – while battery costs are rapidly decreasing – electric vehicles typically cost more upfront than internal-combustion engine (ICE) vehicles of comparable type. Given the benefits of EVs to consumers and society, and the fact that the lifetime costs of EV ownership are considerably less than ICE vehicles, it makes sense to find ways to lower the upfront costs of EV purchases, particularly for low income customers. While finding funding for such programs may be difficult, the need may also be short term. Most prognosticators believe that the premium cost of EVs over comparable ICE vehicles will disappear by around the middle of this decade. Thus, programs that are 3-6 years in length may be sufficient.

Additionally, incentives for new cars v. used cars has major equity implications. Even with price parity between BEV & ICE for new vehciles, it doesn't impact those who don't purchase new vehicles.

- Duke Energy Carolinas in the South Carolina service territory currently offers a $1,000 rebate for up to 400 customers in South Carolina who install home chargers. While this does not reduce the upfront cost of vehicles, it does reduce the overall cost of an initial purchase of EVs for those consumers who don't already own chargers. No South Carolina utility currently offers rebates or financing for EV purchases. South Carolina does not currently offer any tax credits for new or used EV purchases. There also are no Green Banks currently available in SC.

- Several utilities in other states offer rebates for EV purchases, although they are currently limited to new vehicles. Utilities offering rebates include:

Program	Rebate
Groton Utilities and Norton Utilities, CT	$2,000 for EV purchase, $1,000 EV lease $600 for approved Level 2 charger
New Hampshire Electric Coop	$300 for Level 2 or larger charger
Several Vermont Municipal and Cooperative Utilities	Up to $1,800 depending on utility
Duquesne Light	$60 one-time bill credit
PECO Energy	$50
Orlando Utilities Commission	$50 gift card for a test drive, $200 for purchase or lease
MidAmerican Energy	$500
Oklahoma Electric Cooperative	Up to $200
San Isabel Electric Association	$500 for EV purchase, Up to $5,000 for chargers depending on type
Salt River Project	$50 bill credit
Nevada Energy	Up to $500 for Level 2 EV charger
Numerous California investor-owned and public utilities	$1,000 - $7,000
Clark Public Utilities	Up to $2,000 (new and used, income level considerations)

- In other states, the state government itself offers rebates or tax credits for EV purchases (these are in addition to available federal tax credits). SC used to have a tax credit for plug in hybrid electric vehicles that expired in 2014. More info for each state. These states include:
    - Arkansas (rebate,income-based)
    - California (rebate, from CARB)

- Colorado (tax credit)
- Connecticut (rebate, based on battery size) - $5,000
- Maine (rebate, larger for low income)
- Maryland (tax credit, based on battery size)
- Massachusetts (rebate, maximum EV purchase price))
- New Jersey (tax exemption)
- New York (rebate, based on range and price)
- Pennsylvania (rebate, limited in number to 250, also medium- and heavy-duty rebates)
- Texas (2 rebate programs, limited in number and qualifications)
- Utah (rebate, heavy-duty vehicles only)
- Washington, (tax exemption)

- In addition, many states and utilities offer rebates and/or tax credits for EVSE installations which also help defray the initial costs of going electric.

- Green Bank financing for EVs is available through Green Banks established in several states, including Connecticut, New York, Florida, California, Rhode Island and Maryland.

- While there are many utilities offering on-bill financing of energy efficiency or demand response measures, no utilities appear to offer on-bill financing of EVs. Gulf Power in Florida had such a program at one time.

- Of the programs discussed above, tax credits or the establishment of a green bank would be state wide initiatives. Utility programs would of course only be available within each individual utility service area.

- The target market for the incentive, financing mechanisms, and tax credits discussed here is primarily the light-duty market for individual consumers, although as noted, some programs target medium- or heavy-duty vehicles including school and transit buses.

Summary of Assessment Criteria

- *Ability to implement:* All the proposed programs can be implemented with actions by the state, utilities, and/or the Public Utility Commission.
- *Ensures equitable access for all:* Equitable access will require careful program design, including consideration of income limits, vehicle price, refunds of tax credits to LMI consumers not paying taxes, and other measures. Each of these incentives is designed to lower barriers to purchase of new or used electric vehicles, they each will help ensure equitable access to the benefits of EVs.
- *Benefit to vulnerable or disinvested communities:* Vulnerable communities comprise those least able to pay the premium currently inherent in EV purchases, so they would benefit the most. To the extent credits or rebates are limited, they should be

prioritized for such communities or a targeted percentage should go to such communities.

- *Promotes economic development and retention:* Increased sales of EVs in the state incentivized by these programs will promote economic development and business retention in the state.
- *Addresses public health and environmental considerations:* Yes. Again, resulting increased sales in EVs and the resulting use of gasoline will have public health and environmental benefits.
- *Education and awareness considerations:* Attention will need to be paid to ensure that consumers are aware of any programs established to help with the purchase of EVs.
- *Benefits to workforce development:* Workforce development will be needed in any case to train workers to maintain EVs and charging stations. To the extent up-front incentives increase EV market penetration, more workforce development will be needed.

Implementation Logistics

Timeline:

- *What needs to happen in the near / medium / long term?:* For tax credits or state rebates, legislative action is needed in the near-term. For utility programs, utilities must design and file programs for PSC approval in the near-term. The Green Bank is probably a medium- or long-term action and will require action by private individuals wanting to start such a Bank. The SC Energy Office is in the process of developing a Green Bank Market Assessment to include electric vehicle considerations.
- *What is a reasonable start date? End date?* Reasonable start date is next legislative session. End date in about 5 years as EVs become cost-competitive.

Costs:

- *Identification of funding sources;* State treasury, utility rates, or green bank.
- *How likely is this initiative to get funded (High/Medium/Low)?* Tax credits or state rebates – low. Utility Programs – high. Green Bank – medium.
- *What are the upfront costs (and who pays)?* Taxpayer and/or ratepayer, private investors
- *What are the ongoing costs (and who pays)?* No ongoing costs
- *What are the benefits to ratepayers?* Downward pressure on rates as more EVs are out there to charge during off-peak period
- *What are the additional resources needed (staff, etc.)?* State revenue department may need additional staff to administer state programs

Key Actors & Action Required:

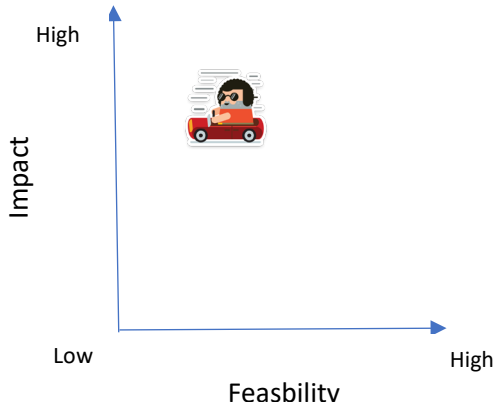
- *Key Actors:* Organizations engaging in this recommendation will include the advocating organizations, SC Department of Revenue, utilities, and private investors

- *What are potential unintended consequences?* May develop programs for which there are no or few vehicle purchase options. May be unpopular as many see EVs as vehicles for the rich.
- *Ease of implementation (H/M/L) and explanation:* Medium
- *Speed of implementation (H/M/L) and explanation:* Medium

Prerequisites and complementary recommendations

- *Is legislative action required?* Yes – for state tax credits and/or rebates
- *Is SC Public Service Commission action required?* Yes – they will need to approve utility programs for which rate recovery is sought.
- *Is another external entity's action required?* Only for the Green Bank idea for which some entity will need to establish.
- *Does another working group's recommendation need to occur prior to implementation?* No, although infrastructure build-out will need to occur in concert with market penetration of EVs that will be incentivized through these programs.
- Does another working group's recommendation need to occur in conjunction with this recommendation? Yes – infrastructure.
- *Does this recommendation need to occur prior to another's implementation? Which one(s)?:* No

Implementation/Feasbility Comparison matrix



Recommendation 20

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
Incentives and Financing

Recommendation Number and Title
Recommendation 20: Encourage electrification of private and public light, medium and heavy-duty fleets

Recommendation Summary

There is a need to help public and private fleet operators overcome the higher purchase price of light, medium and heavy-duty EVs compared to traditional ICE vehicles. This recommendation strives to create incentives and creative financing mechanisms to overcome these cost deltas. Examples include for public entity fleets:

- leveraging available federal funding (including federal excise tax waiver), accessing purchasing collaboratives, establishing attractive leasing options, providing utility incentives for local government, state government, K-12 school and transit bus procurement, implementing green bank and utility-based financing, implementing innovative utility rate design, and offering utility rebates for public entity fleet charging stations;

and additionally, for private fleets:

- providing state-funded grants, point-of-sale rebates, and state tax credits.

Develop a chart that shows the differences in public and private fleets. This chart should show the financing considerations that might be proposed.

Include incentives for EV charging equipment.

There will need to be a multi-prong approach.

- Differenrces between pub and priv fleets.
- The incentive to support the maker and charger.
- The utility role – inventivizing meta infra. Preparing the grid for rapidly increasing medium and heavy duty load.

Questions to answer:

- Where do you start? With which segments?
- How do you deploy over time? How to prioritize?

The recommendation will also strive to identify incentives for in-state light, medium, and heavy-duty EV manufacturers to maximize transportation electrification economic development and workforce benefits. This could be housed within SC Logistics (SC Competes) as they work with OEMs, suppliers, aerospace & logistics (trucking, 3PlLsc, etc…) companies throughout SC.

Background

The current landscape in SC does not lend itself to the electrification of fleets. There are no incentives, and no real push for companies to want to do this. The target Sector should be all, specifically short haul drayage for the time being. There was recently an EDA grant awarded through SCPA to A&R Logistics & Benore Logistics for fleet electrification, but a relatively small amount at $1.3M

DERA is a good start on the federal level and worked for Benore. There needs to be more support from the state level. Currently, the initial investment to convert a commercial fleet is too high and there is no business case to do so.

Regarding other states, California is always a good state to showcase, however, we are going to want to address/compare SC to states such as FL, GA, TN, and OH.

We should also look at the Federal excise tax and how it impacts South Carolina.

Summary of Assessment Criteria

Eduacation considerations: Technical schools are starting to focus on this trade (Trident Tech is already looking at programs)

Ability to Implement: Depending on incentives, the ability to implement would be fairly easy.

Health considerations: Strong consideration of public health & environmental considerations STRONG helps with meeting auto manufacturers sustainability goals that they WILL pass on to their suppliers and vendors.

The high initial investment is currently the biggest challenge for anybody that wants to implement an electric fleet. A future program needs to support the initial investment early on so their companies or organizations can quickly overcome this financial investment and recoup the expense. The higher cost and increase in the annual spend for EV fleets will help the manufacturers to increase output and reduce cost as they scale up.

Implementation Logistics

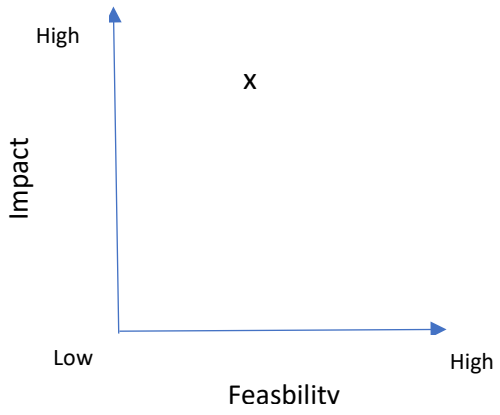
In the short-term focus on incentives from the state level. Without this, it will be very difficult for fleet companies to go electric.

If we want to make a difference on the east coast, we need to start a program quickly. Funds should be easy to access without a long application process. A simple tax credit for these EV investments would be beneficial.

Current upfront costs for a class 8 EVs are 3-4 times the price of a diesel unit. If a charger including installation is included that can easily reach $80k. Funds are needed to support the vehicle as well as charging infrastructure.

One challenge that will need to be addressed is not just the cost of the charger, but the electrical infrastructure to support. Often fast chargers draw more electricity than the user's electric distribution gear can handle, also the case with the utility. This can also impact the utility bill, driving up costs in the form of "demand charges". Because of this, it will be good to work with utilities to offer incentives around utility grid upgrades and reduced on-bill demand charges.

Prerequisites and complementary recommendations
With any state incentive, legislative action will be required. This will need to work in cooperation with other working groups – education, training, infrastructure (charging capabilities) More specifically, coordination with the infrastructure working group will be needed as they will be engaged with utilities to help solve the grid constraints problem referenced above.

Implementation/Benefit Comparison matrix
Using the information provided above, place the recommendation on this matrix: 

Recommendation 21

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Incentives and Financing

Recommendation Number and Title
Recommendation 21: Ensure passenger EV availability throughout South Carolina

Recommendation Summary

There is a need to ensure that SC consumers and fleet operators have full and unfettered access to new and used light-duty passenger EVs as state- and nation-wide demand increases. This recommendation strives to reduce obstacles currently limiting EV availability in SC. Examples include:

- Enabling EV manufacturers to sell and service products direct to consumers,
- Implementing low-carbon fuel standards,
- Developing state manufacturer and dealer incentives to prioritize EV availability in South Carolina,
- Supporting auto dealers' transition to selling and servicing EVs, and
- Implementing incentives for used car purchases on the secondary market.

Background

- *Challenges addressed*
  - As of July 2020, only 47 of XX EV models were available for sale in SC. In part, this is due to automakers prioritizing model availability in the 13+ states that have zero-emission vehicle or low carbon fuel standards. These states represent over 40% of the new car market and leverage regulation and/or incentivize market forces to make their states more attractive to automakers producing limited numbers of EVs.
  - EV manufacturers such as Tesla cannot sell and service vehicles to consumers forcing South Carolinians to venture out of state to purchase and service. The same will be true for Rivian, Lucid, Arrival, and other pure-EV companies. This puts consumers at a disadvantage, impacts state sales tax revenue, and undermines the state's EV manufacturer and supply chain company recruitment.
  - Auto dealers' traditional business model is disrupted by EVs that have a fraction of the number of parts and systems likely to result in far less service center revenue. Additionally, auto dealers are having to bear the cost of sales staff and technician EV training and charging and diagnostic infrastructure installation.

- *Current status in South Carolina*
    - No effort to address EV availability is underway
- *Examples from other states*
    - TN and FL allow EV manufacturers to operate dealerships/service centers to sell and service vehicles to consumers, NC and GA allow Tesla to in limited numbers (2 in GA, 6 in NC)
    - FL was a zero-emission vehicle standard state but has since rescinded. NC is considering as is FL once again.
    - No states in the Southeast have initiated a dealership transition support program.
- *Is this a statewide or local initiative?*
    - Statewide
- *What is the target sector (light-duty/medium-duty/heavy-duty/all)?*
    - Light-duty passenger EVs

Summary of Assessment Criteria

- *Ability to implement:*
    - Low-carbon fuel standard is fuel agnostic, incentivizing all alternative fuels, and therefore has a larger tent of stakeholders/supporters, whereas ZEV Standards focus on EVs. Typically, within executive branch statutory authority until any funds need to be appropriated.
    - Manufacturer direct sales and service is typically opposed by auto dealers, though if coupled with financial support to transition dealerships to sell EVs, and limited in scope, there may be an opportunity to negotiate. Legislative action is required.
- *Ensures equitable access for all:*
    - Without policies that ensure widespread EV availability, efforts to enable equitable access may be undermined.
- *Benefit to vulnerable or disinvested communities:*
    - Indirectly by providing availability.
- *Promotes economic development and retention:*
    - If SC adopted policies like these that open and broaden the marketplace, the state will be better positioned to attract EV-related investments and jobs. SC currently ranks #4 in the region for EV manufacturing investment ($775M) and employment (585). It will be increasingly challenging for the state to outcompete #1 TN, #2 GA, and #3 AL without accelerating EV consumer and fleet sales.
    - A lot of money leaks out of the SC economy importing expensive gas and diesel. If all the cars, trucks, and buses were electric today, South Carolinians would spend less on transportation fuel and retain more transportation fuel dollars. That would add up to an extra $5.8 billion circulating through the state's economy annually.
- *Addresses public health and environmental considerations:*

- Every EV on the road displaces tailpipe emissions that contribute to poor air quality and climate change. With SC becoming a leader in solar generation, EVs get cleaner every day as more in-state-generated renewable energy is brought online.

- *Education and awareness considerations:*
  - Outreach to governor's office, legislators and staff, auto dealers
- *Benefits to workforce development:*
  - Consumer access to EVs will help drive up sales that in turn supports EV manufacturer and supply chain company investment and job growth in the sector
- *Provides additional co-benefits:*
  - Enabling greater EV availability, creating a more favorable market, and supporting auto dealer transition, will lead to more EVs on SC's roads that in turn will deliver public health and climate change benefits.

Implementation Logistics

Timeline:

- New financial incentives will require appropriating monies by the state legislature.
  - Prefiling of legislation starts on 11/15/2021
  - The 2022 legislative session starts on 1/11/2022 and ends on 5/12/2022
- To make base incentives available to consumers in 2022, discussions need to start ASAP with legislative leaders and with the Governor's office
- Realistically, a longer timeframe should be considered to ensure incentives achieve results and meet the needs of consumers (in other words, we shouldn't simply "throw money" at the problem).

Cost Considerations:

- **Who** receives the incentive?
  - OEMs (e.g., corporate income tax refunds/credits)
  - Dealers (e.g., "wholesale" incentives)
  - Consumers (e.g., "retail" incentives)
  - Utilities
  - Other or combination
- **What form** should the incentives take?
  - Cash at the time of sale
  - Cash rebate at registration
  - Tax credit (refundable or nonrefundable?)
  - Other
- **How** will the incentives be funded
  - Simple appropriation of monies
  - New tax or other new revenue stream

- **How long** will incentives need to be in place
    - Needs a sunset: should fund only early adoption of new and used vehicle purchasers (not be a permanent entitlement program)
- **What is the Exposure** to the State (i.e., once the incentive structure is determined, what is the expected sales volume)
    - **Is it a good investment?** (i.e., will the forecasted sales volume after incentives be substantially larger than non-incentivized volume).
    - **This will determine the feasibility of having the incentives funded**

Key Actors & Action Required:

- Identify key stakeholders
    - In-state OEMs
    - Alliance of Automotive Innovation
    - Dealers (South Carolina Automobile Dealers Association)
        - Bring a different business case to dealers – transition to another working group?
        - Design state programs to ensure dealers have accessibility to offer charging.
    - Environmental NGOs
    - Trade/Business Associations whose members are impacted (e.g., SCMA, SC Competes, SC Logistics)
- Identify key policy makers
    - State agencies (e.g., Revenue, Commerce)
    - Legislative leaders

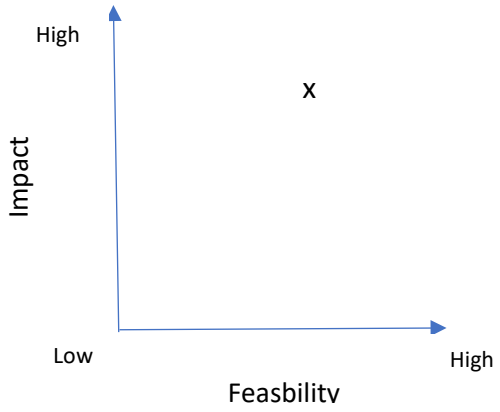
Prerequisites and complementary recommendations

- Depending on the scope, amount, and structure of the incentives, legislative action will be required. In addition, the Department of Revenue may need to promulgate tax rules.
    - House and Senate sponsors must be identified
    - The Governor's office must support the proposed action
- The SC Public Service Commission may have action.

Need to determine how the incentives will be funded and what the incremental expected sales volume will be – in other words, is it money well spent

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 22

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Incentives and Financing

Recommendation Number and Title
Recommendation 22: Engage utilities to accelerate transportation electrification.

Recommendation Summary

There is a critical need to engage electric utilities as catalysts in the transition of light, medium and heavy-duty internal combustion engine (ICE) vehicles to their electric-powered counterparts. This recommendation strives to leverage the utilities' assets and capabilities to accelerate EV adoption and EV infrastructure such that this proliferation is mutually beneficial to utility customers and to society through reduced carbon emissions from ICEs. Examples of ways that may help accomplish this include:

- Rebates for EV purchases,
- Rebates for EV charging infrastructure (level 2 chargers and 150 kW fast chargers) for residential, public, workplace and fleet locations,
- Establishing make-ready incentive programs,
- Designing and implementing attractive rates for EV charging during off-peak times, (infrastructure working group rate design study recommendation)
- Investing in the electrification of their own fleets, and
- Investing in vehicle-to-grid technologies to help maintain grid performance and resiliency as more types of distributed energy resources are attached to the grid.

Background

Currently, there is extremely little policy on the main issue facing EV adoption, range anxiety. Range anxiety is due to the lack of EV charging infrastructure (level 2 and above). S.C.'s legislature did issue Bill S 0304 which prompted activities to study the obstacles that widespread EV adoption has in front of it.

The roles that utilities will play in EV adoption are evolving. Duke Energy Carolinas and Duke Energy Progress South Carolina are installing, owning and operating 60 DC fast chargers which are 100 kilowatts (kW) and above in their service territories in the Upstate and the Pee Dee regions of S.C. These provide a foundational level of infrastructure and are intended to facilitate EV market growth. Other utilities, public power, and member-owned cooperatives (power providers) in S.C. offer rebates for level 2 charging stations being installed in

residences with the agreement that the utilities can monitor the charging data for educational purposes.

The list above contains individual power providers' efforts geared toward personal EVs. Taking these efforts and collaborating with other EV stakeholders to broaden these into a comprehensive strategy for building a robust EV charging infrastructure across S.C. would be an intuitive next step. Stakeholders other than power providers include EV manufacturers, fueling complexes, plus other private companies that are looking to become "charging hosts" or to operate in the EV space in some capacity but have their own hurdles that must be overcome in order for them to invest in EV charging infrastructure.

The obstacles that charging hosts are having with their business cases being feasible for EV charging stations are large, upfront capital costs which means long payback timeframes plus the likelihood of incurring fully loaded demand charges via power providers' rates during the time period when the EV charger capacity factors are very low and will remain so until the non-residential charging infrastructure issues are addressed. Georgia has approved rate-based make-ready programs to help cover the cost of new lines and transformers to get everything behind the meter ready to support EV chargers. Florida has approved special EV electricity tariffs that greatly reduce demand charges for EV charging hosts until the capacity factors for the charging stations approach a sustainable percentage.

Power provider concerns include grid resilience, grid modernization, sufficient, efficient generation reserve margins, and maintaining rate equitability among customer classes. EV charging may require power providers to upgrade their power delivery system, transformers and lines, and can impact their capacity reserve requirements. This remains to be seen because innovative ways to mitigate these issues need to be explored. Incentivizing innovative technologies such as customer-owned batteries, microgrids, and vehicle-to-grid initiatives are some ways that could possibly help with this. Comprehensive industry studies need to be conducted to determine the feasibility of these alternatives.

Equitable utility incentives are also part of the discussion. To get to the end goal – people and fleets owning EVs – we cannot only focus just on getting chargers on the landscape. Utilities need to be aware of other players / incentives / programs in the ecosystem. We need to set up programs to ensure that they lead to more EVs on the road.

Incentive from the utility can help ensure charging infrastructure is widely and equitably available. The utility may not want to be in this role long-term as their main role is providing safe, reliable power.

This needs to be a collaborative effort among stakeholders to figure this out.

Summary of Assessment Criteria

This recommendation seeks to spur conversations among power providers and non-power provider stakeholders to understand what each stakeholder can bring to the table to use in

establishing a state-wide, non-residential EV charging infrastructure. This group would be a working group that would evaluate all resources and seek to find feasible synergies considering those resources to study, develop, and implement collaborative solutions to EV proliferation at all vehicle duty levels.

Implementation Logistics

Timeline:

- Near-term: Identify power providers, fueling depot owners, car manufacturers, and other entities that have resources to offer towards pursuit of the recommendation. Poll these entities to determine if they have interests in having a seat at the table to pool resources to explore innovative ways to deploy EV charging infrastructure throughout S.C.
- Medium-term: Conduct discussions among stakeholders to share business cases and the direct capital/resources that stakeholders have to offer toward this endeavor; develop innovative ideas to leverage these resources; design pilot projects to test the feasibility of ideas.
- Long-term: Forge agreements with willing stakeholders to pursue projects that prove to be feasible pilot projects.
- Reasonable start date: January 2022
- Reasonable end date: Three years past actual start date

Resource and Costs:

- Potential resources and funding sources
    - Power Providers
    - Government (Federal Infrastructure Bill or other funding sources)
    - Private entities
- How likely is this initiative to get funded (High/Medium/Low)?
    - High
- What are the benefits to utility customers and other stakeholders' customers? Desired outcome is the efficient use of resources among entities that yields a robust, reliable EV charging network throughout S.C. where higher demand impacts on the electrical grid have been mitigated and the EV charging customer can consistently initiate a charge.

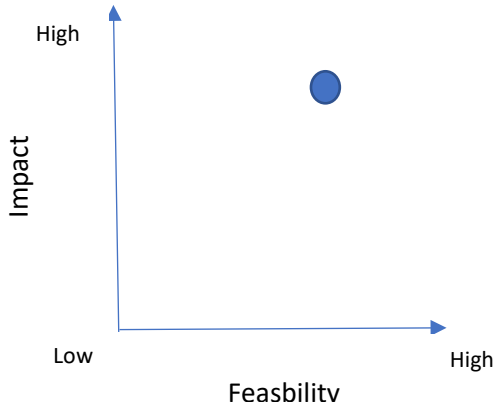
Prerequisites and complementary recommendations

- *Does another working group's recommendation need to occur in conjunction with this recommendation?* Infrastructure WG rate design study and any recommendations referencing direct utility investment
- *General parameters to be considered:*
    - Utility rate studies
    - Proposed number of EV chargers to be installed
    - Proposed number of EV vehicles to be sold over given time periods
    - Number of EV miles driven
    - Total energy (kWh) used to "fill up" EVs

- Number of charging sessions completed
- Number of charging session abandoned due to a connectivity issue

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 23

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
Public Entities Working Group

Recommendation Number and Title
Recommendation #1: Develop Needs Assessment and Educational Campaign

Recommendation Summary
This recommendation has 2 components: (1) Develop a needs assessment/survey of public entities throughout the state a. Purpose of assessment would be to determine the fleet needs and challenges. b. Public entity-specific groups targeted would include public agencies, cities, and counties regarding their fleet needs and challenges. Include different use cases and fleet types, e.g., motorpool, police, transit, refuse, etc. c. Also identify a SC public entity that already has telematics to be a case study/pilot to further identify needs and challenges. (2) Develop & implement an educational campaign a. Purpose of the educational campaign would be to provide information targeted to public agencies, cities, and counties that address the needs and challenges identified through the needs assessment. b. Public-entity specific groups targeted would be organizations such as the SC Municipal Association, the SC Association of Counties, the Governmental Fleet Management Association, the Association of SC Energy Managers, regional Councils of Government, and others.

Background
Three to four paragraph description of the current landscape. Please include: • *Challenges addressed* • Currently fleet managers in South Carolina do not have a comprehensive understanding of the financial and environmental benefits of electric vehicles due to misconceptions, lack of educational opportunities, and unanswered questions. • Furthermore, fleet managers work with department directors who put forth requests for vehicles. These department heads also face a lack of educational opportunities and exposure to electric vehicles to understand how EVs may fleet into their fleets.

- *Current status in South Carolina (does this already exist?)*
    - Palmetto Clean Fuels, an initiative of the South Carolina Energy Office and funded through the US Department of Energy's Vehicle Technologies Office, provides technical assistance and fleet coaching to fleets interested in alternative fuels. Palmetto Clean Fuels has developed fleet procurement and electric vehicle information to government agencies interested: http://energy.sc.gov/evsforstateagencies
    - Plug in SC is the state's standardized EV signage program that is administered through Palmetto Clean Fuels. It provides a standard approach to EV charging station station design and signage. However, this program does not provide specifics for fleets interested in deploying chargers.
    - In 2020, the SCEnergy Office in collaboration with State Fleet Management surveyed state and local agencies regarding interest on electric vehicles and placement on state procurement contracts. Many of the respondents noted they would be interested in electric vehicles being listed on state contract, in addition to charging infrastructure.
- *Examples from other states (if applicable)*
    - *https://dca.colorado.gov/state-fleet-management/alt-fuel-vehicles-greening*
    - *https://ncadmin.nc.gov/government/motor-fleet-vehicles/zero-emissions-vehicles*
    - *https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/programs-projects/programs-and-projects/sustainable-transportation-and-alternative-fuels/sustainable-transportation-and-alternative-fuels/transportation-electrification-in-tennessee.html*
    - *https://energy.utah.gov/wp-content/uploads/Utah-EV-Master-Plan.pdf*
    - *https://yellowhammernews.com/state-launches-drive-electric-alabama-program-promoting-use-of-electric-vehicles/*
    - *https://www.gsa.gov/cdnstatic/Which_Charging_Station_is_best_for_me_BPA_Decision_Tree.pdf*
- *Is this a statewide or local initiative?*
    - This initiative will be lead by statewide entities to benefit state agencies and local municipalities. Consideration should be given to different types of fleets that are interested in EVs, such as police, heavy-duty vehicles, take-home vehicles, etc. Furthermore, consideration to facility improvements for fleets should be noted – such as upgraded power, parking designs , and charging consideration for depots.
- *What is the target sector (light-duty/medium-duty/heavy-duty / all)?*
    - All – but focus will mainly be light to medium.

Summary of Assessment Criteria
Two to three sentence discussion of each of the criteria used to assess the recommendation (if known):

- *Ability to Implement (Political):*
    - This recommendation should be accomplished without political barriers. Public entity leadership – especially fleet managers -- would have to be open and would need to help prioritize getting informed and educated about EVs. The availability of EVs on state contract will help to encourage this process.
- *Ensures equitable access for all:*
    - Many of the charging stations and EVs within state fleet and local agencies would be behind the fence charging. However, allowing communities to charge when fleets are not using them would benefit communities and expand access.
- *Promotes economic development and retention:*
    - By promoting EVs and EV infrastructure, state and local entities can promote economic development through equipment purchases, investments into grid reliability, and infrastructure placements that all involve manufacturing and construction jobs. Furthermore, SC entities can deploy chargers to revitalize and attract citizens to areas of retail, entertainment, and eateries – just to name a few.
    - Offering workplace charging can help attract and retain employees who drive EVs or are thinking of purchasing an EV. Providing workplace charging can also show that employers are proactive in seeking opportunities to enhance the employee experience at the workplace.
    - *https://www.boston.gov/sites/default/files/file/2020/03/1527-03%20-%20Workplace%20Charging.pdf*
- *Addresses public health and environmental considerations*
    - Even a small percentage of vehicles shifted within state and local government fleets to electric could make a sizable difference in petroleum usage and fuel expenditures that are sent out of state. Furthermore, employees that utilize these vehicles are generally exposed to tailpipe emissions while doing work and having vehicles idle. For example, firefighters who are usually exposed to large-displacement diesel engines while at the firehouse and on-scene are regularly exposed to these negative health impacts. Even small-scale idle reduction (APUs) units can provide a difference: https://www.firerescue1.com/fire-products/vehicle-equipment/exhaust-removal-systems/articles/dangerous-diesel-managing-health-risks-related-to-diesel-exhaust-emissions-at-the-station-LVq8YvsEyrsOxDdB/
- *Education and awareness considerations:*
    - The SC Energy Office has released electric vehicle procurement and training materials located here: http://energy.sc.gov/evsforstateagencies
    - Palmetto Clean Fuels and the SC Energy Office can provide technical assistance and trainings as requested, and can connect to a broad array of EV information and tools via the Clean Cities network.
    - OEMs provide training to fleets already, but this can be expanded as interest grows.

        - Education about charging behaviors and habits is needed. Of particular importance is training on managed charging for fleets.
- *Benefits workforce development:*
    - Fleet transition plans made in conjunction with local trade and educational agencies will benefit workforce development. Many schools have apprenticeship and trade mentorship programs with fleets; in combination with electric vehicle and hybrid trade programs, this will benefit SC workforce market by providing technicians for a growing industry.
- *Provides additional co-benefits:*
    - *Maintenance costs:* EVs typically require less maintenance than conventional vehicles because:
        - The battery, motor, and associated electronics require little to no regular maintenance
        - There are fewer fluids, such as engine oil, that require regular maintenance
        - Brake wear is significantly reduced due to regenerative braking
        - There are far fewer moving parts relative to a conventional gasoline engine.
    - *https://afdc.energy.gov/vehicles/electric_maintenance.html*

Implementation Logistics

Please provide detail on the anticipated timeline and cost of the recommendation, including:
Timeline:

- *What needs to happen in the near / medium / long term?*
    - Fleet managers and the SC Energy Office could partner to develop a South Carolina focused education campaign for fleet managers. Preparing for this transition will take time and proper planning and now is the time to do it. Staff resources and capacity will have to be contributed and partnering with state, city, and county associations will be crucial to reaching diverse audiences.
- *What is a reasonable start date? End date?*
    - These efforts could begin in fall 2022 and continue until need is no longer there.

Costs:

- *Identification of funding sources (if known)*
    - State Energy Program funds
    - Clean Cities funding
    - Additional federal funding (IIJA)
    - State allocations for staff
- *How likely is this initiative to get funded (High/Medium/Low)?*
    - Medium/high – this is a need identified by many state and local agencies
- *What are the benefits to ratepayers?*

- Vehicle-to-grid (V2G) or vehicle-to-building (V2B) – buses. https://www.nrel.gov/docs/fy17osti/69017.pdf
- *https://www.mass.gov/files/documents/2018/04/30/Mass%20DOER%20EV%20school%20bus%20pilot%20final%20report .pdf*
- VEIC conducted a number of analyses to assess the potential costs and benefits of vehicle-to-building (V2B) program. Although the V2B component of this study was not implemented, they examined electricity usage data at individual schools to estimate their current demand charges and the extent to which a V2B system could reduce those costs. They estimated that the bus batteries would need to have between 10- 12% of the stored capacity available to power the school building. Building demand varies monthly, and we estimate that schools could potentially earn between $80 - $450/month by reducing their buildings' demand by 3-19 kW/month, earning approximately $1,700 - $2,000+ over the course of two years. This study includes potential financial savings for one school building within the participating school districts.

- *What are the additional resources needed (staff, etc.)?*
  - *Staff, funding for projects and outreach development*

Key Actors & Action Required:

- *Lead advocating organization*
  - State Energy Office
- *Lead implementing organization*
  - Palmetto Clean Fuels, fleet managers, State Fleet Management, others
- *Other key players*
  - Department of Administration
- *What are potential unintended consequences?*
  - Improper planning and installation could led to overburdernsome installation/equipment costs
- *Ease of implementation (H/M/L) and explanation*
  - *H – building blocks already in place*
- *Speed of implementation (H/M/L) and explanation*
  - *M – need to hire staff and/or devote focus to this.*

Prerequisites and complementary recommendations

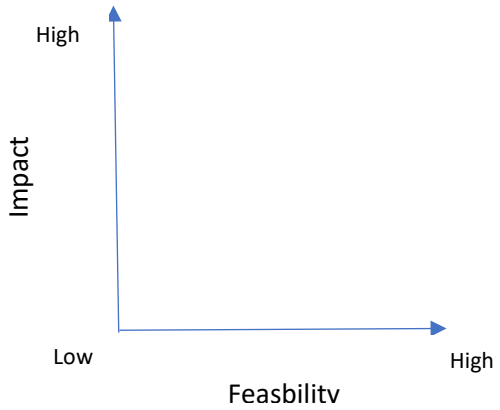
Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required? Define required action* ***NO***
- *is SC Public Service Commission action required? Define required action* ***NO***
- *Is another external entity's action required? Define required action* ***NO***
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)?* ***NO***
- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?* ***NO***

- *Does this recommendation need to occur prior to another's implementation? Which one(s)? **NO***

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 24

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Public Entities Working Group

Recommendation Number and Title
Recommendation #2: Develop planning and zoning mechanisms

Recommendation Summary
• Develop and provide guidance to local governments on best practices and model ordinances/code changes needed to support EV infrastructure deployment • Integrate EV infrastructure deployment with existing/ongoing comprehensive plans • Include multi-unit/multi-family dwellings in planning and zoning mechanisms   • Ensure that issues of equity are incorporated into code changes/zoning • Identify necessary roles at local and state level

Background

Three to four paragraph description of the current landscape. Please include:

- *Challenges addressed*
- *Current status in South Carolina (does this already exist?)*
- *Examples from other states (if applicable)*
- *Is this a statewide or local initiative?*
- *What is the target sector (light-duty/medium-duty/heavy-duty / all)?*

Most zoning and development codes and comprehensive plans in South Carolina do not contemplate electric vehicles or charging infrastructure. In many cases, these policy documents were enacted decades ago and have not been updated to reflect the evolution in the transportation industry and alternative fuel technologies. As a consequence, many communities still rely on parking standards that were originally formulated thirty or even forty years ago. Even today, as new homes, apartment buildings, parking garages, and shopping centers are constructed in our state, most are built without consideration of EV infrastructure.

The lack of minimum EV infrastructure standards has several consequences that impede the deployment of EV chargers and increased EV ownership. First is the simple result of not requiring such infrastructure as an ordinary and customary condition of development: if not included in the development code, most developers will not install either the electrical infrastructure or physical chargers in their projects, thereby reinforcing the status quo. Second, the lack of EV infrastructure in private development creates an expectation for public

entities and local governments to compensate for this shortage. This may include installing EV infrastructure on limited and unevenly distributed public land or providing financial incentives for developers to retroactively install EV infrastructure. The final concern presented here is that occupants of multifamily buildings are overwhelmingly disadvantaged when it comes to EV ownership opportunities due to the lack of charging access. This particularly impacts low-income residents and effectively precludes them from electric vehicle ownership.

This working group believes that providing guidance to local governments for integration of EV infrastructure is an important step to prepare South Carolina for electrification. Such recommendations should be developed in collaboration with commercial and residential developers, planning and zoning officials, transportation representatives, utilities, and other stakeholders. The guidance should incorporate best practices from other states, be equitable in its recommendations, and take into account the capacity and resources of local jurisdictions across the state to implement the new policies.

Summary of Assessment Criteria

Two to three sentence discussion of each of the criteria used to assess the recommendation (if known):

- *Ability to Implement (Political):* Developing guidance to incorporate EV infrastructure into local zoning and development codes seems feasible and low-risk, especially if promulgated as advisory recommendations rather than a requirement. A phased framework could also be developed with increasing standards over time as EVs become more prevalent. Different tiers of regulations/guidance could gain traction according to the capacity and political environment in each jurisdiction.
- *Ensures equitable access for all:* Zoning regulations are intended to be uniform in their application and enforced equally. Policies that integrate EV infrastructure into various residential developments (e.g. single-family, multi-family, etc.) will help ensure equitable access for all.
- *Benefit to vulnerable or disinvested communities:* This recommendation has the potential to increase access to EV chargers throughout the community, especially in multifamily housing developments. Seniors and low- and moderate-income households often reside in such settings, along with occupants of market-rate units. Providing adequate charging infrastructure in these settings will help all residents of multifamily housing communities benefit from EVs. An additional consideration may be to explore requiring EV infrastructure as a condition of receiving Housing Tax Credits (LIHTC) from the South Carolina State Housing Finance and Development Authority.
- *Promotes economic development and retention:* A robust EV infrastructure network is essential for South Carolina to adapt to the rapid evolution in personal and commercial transportation. Important economic sectors such as logistics, advanced manufacturing, and tourism will increasingly rely on EVs and the systems that support

electrification. Charging infrastructure must be readily available, especially in parking and delivery areas, and it is essential that public entities—especially local governments, which have wide latitude to regulate land development—play their respective roles in supporting electrification.

- *Addresses public health and environmental considerations*: The history of urban planning zoning is integrally tied to public health. Addressing EV infrastructure through local zoning codes will provide processes for orderly deployment of the physical infrastructure, improve mobility throughout communities, and promote technology that improves air quality.
- *Education and awareness considerations:* This recommendation is essentially an education and awareness campaign. Model ordinances and sample policies will be developed and made available to communities, which must then determine the appropriate implementation framework that works best for their particular community.
- *Benefits workforce development:* This recommendation deals less with job creation opportunities through electric vehicle production or workforce training programs to service EV fleets. Instead, new standards for EV infrastructure installations will help businesses and public entities prepare for a major shift in commuter and commercial transportation by enabling workers and companies to transport people, goods, and services through an accessible and widely available EV infrastructure network. In addition, workers who drive EVs will seek out workplaces that support this growing technology.
- *Provides additional co-benefits:* Incorporating EV infrastructure standards into zoning ordinances will help improve accessibility and grow the EV network statewide. In addition, such policies support local and regional efforts around resiliency and climate change adaptation.

Implementation Logistics

Please provide detail on the anticipated timeline and cost of the recommendation, including:
Timeline:

- *What needs to happen in the near / medium / long term?*
  - Near – identify entity responsible for coordinating effort and determine if this can be completed internally or if outside assistance is required.
  - Medium – responsible entity researches best practices and engages with stakeholders to draft model ordinances and policies
  - Long-term – publish and distribute model ordinances to communities across the state and provide ongoing education and technical assistance for adoption and implementation at the local level.
- *What is a reasonable start date? End date?*
  - Start Q1 Fiscal Year 2023

- End Q4 Fiscal Year 2023

Costs:

- *Identification of funding sources (if known)*
  - Progress may be achieved with little/no cost by engaging existing professional networks and associations (e.g. American Planning Association, Urban Sustainability Director's Network). If an outside consultant is engaged, this may require additional resources.
- *How likely is this initiative to get funded (High/Medium/Low)?*
- *What are the upfront costs (and who pays)?*
- *What are the ongoing costs (and who pays)?*
  - One of the objectives of this ordinance is to include more EV infrastructure through private development. As a result, this cost would shift to private developers, or public entities that construct new projects.
- *What are the benefits to ratepayers?*
- *What are the additional resources needed (staff, etc.)?*

Key Actors & Action Required:

- *Lead advocating organization*
  - *SC Energy Office, or could approach another organization about taking a leading role*
- *Lead implementing organization*
- *Other key players*
  - Planning and Zoning Officials
  - Local Elected Officials
  - Development community (single-family, multifamily, commercial)
- *Current or upcoming utility action*
  - If issues around rate structures can be addressed, it may reduce future issues as EV infrastructure becomes more widely available and the technology integrated with daily transportation needs.
- *What are potential unintended consequences?*
  - Additional startup costs for small businesses and minority/women-owned businesses. Some of these could be alleviated through public-private partnerships, grants, or reimbursement programs.
- *Ease of implementation (H/M/L) and explanation*
- *Speed of implementation (H/M/L) and explanation*

Prerequisites and complementary recommendations

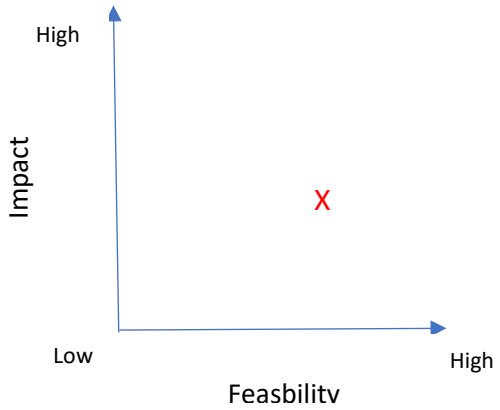
Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required? Define required action* ***NO***
- *is SC Public Service Commission action required? Define required action* ***NO***
- *Is another external entity's action required? Define required action* ***NO***
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)?* ***NO***

- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?* ***NO***
- *Does this recommendation need to occur prior to another's implementation? Which one(s)?* ***NO***

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 25

SC Electric Vehicle Stakeholder Initiative
Working Group Recommendation Template

Working Group(s)
Public Entities Working Group

Recommendation Number and Title
Recommendation #3: Provide Decision-Support Tools and Resources

Recommendation Summary

- Provide public entities with tools that enable comparison of EVs to conventional fuel vehicles
  - Utilize fleet assessment tools, such as those provided through AFLEET or Electrification Coalition's tool
  - Identify total cost of ownership/financial implications of EVs over conventional fuel vehicles
  - Identify additional factors, including environmental impacts and maintenance
- Link tools with funding opportunities available
  - Identify existing funding opportunities to offset costs of EVs over internal combustion engines
  - Direct state entities to take advantage of existing and available federal resources for alternative fuel vehicle and infrastructure deployment, to reduce extra burden for local revenue generation
- Utilize telematics for case studies to inform
  - Identify a public entity that already has telematics to be a case study/pilot

Background

Three to four paragraph description of the current landscape. Please include:

- *Challenges addressed*
  Fleets working to electrify are challenged to proceed with this effort in a way that has minimal impact on day-to day-operations and is cost effective. Fleets must be able to identify best locations to install EVSE and upgrade electrical capacity. This will be the primary barrier to 1) beginning to implement electric vehicles in the fleet and 2) expanding fleet electrification efforts.
- *Current status in South Carolina (does this already exist?)*
  Several cities in SC are electrifying their municipal fleets and transit fleets. Those municipalities could be polled based on their level of knowledge and actions related to fleet electrification.
- *Examples from other states (if applicable)*

Examples from other states in the region are available, such as the City of Charlotte, NC. The Electrification Coalition has many examples and case studies detailing best practices and methods to overcome barriers here: https://www.electrificationcoalition.org/resource_cat/case-studies/

- *Is this a statewide or local initiative?*
  This effort could be both statewide and local. By adding EVs and EVSE to state purchasing contracts, the state could serve as a resource on electrification for fleets, as the process will be similar to that of local municipalities. The state could also develop a clearinghouse of resources for local governments to use when working through the fleet electrification process. The state could investigate opportunities to further support both its own and local municipal fleet electrification.
- *What is the target sector (light-duty/medium-duty/heavy-duty/all)?*
  All sectors and vehicle classes could be targeted as there are currently practical electric vehicle options in all classes. However, the strategy for light duty electrification will differ from medium-, heavy-duty, and transit electrification because it will be done in a "business-as-usual" approach. This means, light-duty electric vehicles could replace internal combustion engine (ICE) vehicles as ICE vehicles are phased out. More information on how this strategy can be implemented is highlighted in the Charlotte, NC case study published by the Electrification Coalition.

Summary of Assessment Criteria

Two to three sentence discussion of each of the criteria used to assess the recommendation (if known):

- *Ability to Implement (Political):*
  Immense job creation opportunities (including large scale manufacturing) and economic benefits are available to cities/states through the transition to electrification.
  - Reference resources: Workforce development frameworks and programs CA (CPUC and CEC documents outline this)
  - https://www.pennfuture.org/Files/Admin/Green-Stimulus-FINAL.pdf
  - The National EV EMobility Equity Town Hall
  - https://www.utilitydive.com/news/maintenance-workforce-electric-trucks/581934/
  - Colorado agencies launch comprehensive clean trucking strategy
  - Center for Transportation and the Environment (CTE) report; : entire US transit fleet could transition to ZEVs by 2035 for $56B - $89B
  - https://netl.doe.gov/sites/default/files/2021-04/Initial%20Report%20on%20Energy%20Communities_Apr2021.pdf
  - https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-biden-administration-outlines-key-resources-to-invest-in-coal-and-power-plant-community-economic-revitalization/

- https://westgov.org/news/article/register-for-webinar-electric-vehicle-workforce-needs-and-opportunities
- https://www.bls.gov/green/electric_vehicles/#occupations

- *Ensures equitable access for all:*
  St Paul MN EVIE carshare program for LD equitable access. Charlotte, NC transit bus program is focused on reducing air pollution in areas that have historically suffered from poor air quality. Consider EVSE placement and EV ready building ordinances for MUDs.
- *Benefit to vulnerable or disinvested communities:*
  Air quality, consider development of a program to incent used EV sales in areas that have been historically underserved.
- *Promotes economic development and retention:*
  The state should consider the development of an EV/EVSE technician and installer / maintenance training program. Local community colleges and / or state colleges should be the focus of the development of these programs.
  Addresses public health and environmental considerations
- *Education and awareness considerations:*
  Stakeholder / community education and engagement efforts should be undertaken. Ensure high profile EV applications like police and fire units are tracked for data. Publish ongoing progress reports re. fleet electrification percentages and dollars saved/ emissions benefits of these applications.
- *Benefits workforce development:*
  Reference the above technician / electrical installer trainings to be developed through tech colleges. Work with unions to make these programs available and consider scholarships funded by philanthropic entities.
- *Provides additional co-benefits:*
  Fuel diversification, economic, resilience, climate, air quality, investment in the future of manufacturing, job creation, tech leadership. Develop policies that support AV in specific area(s) that allow for leniency and facilitate AV development.

Implementation Logistics

Please provide detail on the anticipated timeline and cost of the recommendation, including:
Timeline:

- *What needs to happen in the near / medium / long term?*
  Fleet analysis is needed in state and all municipal fleets. It is critical to understand what we are working with and how many units will be required and of course, the associated EVSE investment. The EC can provide this and will include recommendations for near, mid and long term and associated EVSE.
- *What is a reasonable start date? End date?*

The start date should be very soon. So all LD fleet will be electrified by 2030 and all MD/HD applications will be electrified by 2040. This goal setting is critical, especially at the state fleet level. Many states have been unable to announce goals like this and because of this, many states are falling behind the local city and county fleets. Set a goal early and stick to it, it should include reporting on progress annually.

Costs:

- *Identification of funding sources (if known)*
  EC and others are able to assist with strategy and analysis. For larger classes and transit applications, consider consultant assistance to evaluate depots. EC can assist with route identification and recommendations.
- *How likely is this initiative to get funded (High/Medium/Low)?*
  For LD vehicles, it is best to take a business-as-usual approach. Federal funding should be pursued for larger applications and Low-No funding is available for transit.
- *What are the upfront costs (and who pays)?*
  Analysis and planning strategy is available at no cost through the EC as well as through Clean Cities resources and tools. Policy assistance is also available at no cost.
- *What are the ongoing costs (and who pays)?*
  Ongoing costs are primarily based on EVSE maintenance and increasing electrical capacity. With LD, these costs should be taken into account when developing a business case for transition. Consider working with a 3rd party financing vendor to electrify school buses and transit/MD/HD. Costs can be offset with V2G and through grants available from the federal government.
- *What are the benefits to ratepayers?*
  Grid stabilization and off-peak energy purchases will be guaranteed to utilities.
- *What are the additional resources needed (staff, etc.)?*
  Technician training

Key Actors & Action Required:

- *Lead advocating organization*
  Leverage local and national non-profit groups to assist with this.
- *Lead implementing organization*
  Consider developing an RFP and leverage the assistance of the EC on strategy and implementation.
- *Other key players*
  Utilities, Community, Dealerships, Manufacturers, 3rd party organizations like Highland Electric
- *Current or upcoming policy action*
  Streamlining approval and permitting process for EVSE installation. Implement an "EV First" fleet procurement policy.
- *Current or upcoming utility action*
  Develop a process to provide electrical surveys of locations for fleet (state and local) domiciles.
- *What are potential unintended consequences?*

Charging during peak times can cost more than gasoline and diesel, implement charging strategy and software to manage charging. Technician training is imperative to ensure buy in and to provide educational access to existing techs. Absolutely imperative to include budget for EVSE maintenance, especially at fleet owned locations. Explore charging station vendors programs for public charging.

- *Ease of implementation (H/M/L) and explanation*
  This is totally dependent on the ability of the market but generally speaking LD is very straightforward. MD/HD require higher electrical capacity and have higher upfront costs. MD/HD requires more investment currently but is absolutely doable.
- *Speed of implementation (H/M/L) and explanation*
  This is dependant on factors like application, access to grant funding for MD/HD while LD will happen at the same speed as the fleet replacement plan.

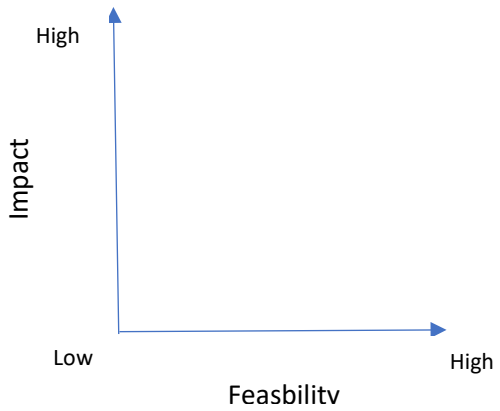
Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required? Define required action NO*
- *is SC Public Service Commission action required? Define required action NO*
- *Is another external entity's action required? Define required action NO*
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)? NO*
- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)? NO*
- *Does this recommendation need to occur prior to another's implementation? Which one(s)? NO*

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 26

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
Public Entities Working Group

Recommendation Number and Title
Recommendation #4: Identify and Evaluate Financial Mechanisms

Recommendation Summary

• Identify how cooperative purchase agreements can be utilized
  • Identify barriers faced in utilizing these arrangements
  • Provide guidance on how this has been done effectively for purchasing vehicles
• Explore GSA program for surplus vehicles for governmental entities
• Address the uncertainty regarding end-of-use values and auctioning
  • Explore how to offset the revenue derived from practice of auctioning off end-of-use vehicles
• Explore state funding and leasing options, beyond just school and transit buses

Background

Three to four paragraph description of the current landscape. Please include:
• *Challenges addressed*
  • Currently, there is a need to identify how cooperative agreements can be accessed by state. Also, there is a need to explore GSA Program for surplus vehicles for governmental entities. Finally, a significant challenge to address would be the uncertainty of end-of-use value for fleets, as local governments include auctioning off end-of-use vehicles in their business plans.
  • Current status in South Carolina (does this already exist?)
• *Examples from other states (if applicable)*
  • Need to access examples available from other states who have worked to identify how cooperative purchase agreements can be used to transition their fleets.
• *Is this a statewide or local initiative?*
  • This could start at the state level as it could help inform local government fleets who may have fewer resources. However, local government examples do exist and are readily available.
• *What is the target sector (light-duty/medium-duty/heavy-duty / all)?*
  • Priority sector would be light-medium duty fleets.

Summary of Assessment Criteria

Two to three sentence discussion of each of the criteria used to assess the recommendation (if known):

- *Ability to Implement (Political):*
  - Leasing is already viable and is being used for state fleets. There may be opportunities to move from a straight evaluation of capital costs to consideration of ongoing operations and management costs.
- *Ensures equitable access for all:*
  - In some cases, organizations can work out partnerships to pass on the federal tax credits to those entities that are leasing the vehicle. This can change the cost calculations and make options more available.
- *Promotes economic development and retention:*
  - Economic opportunities can arise from 3rd party leasing. Also ability to lease land to a 3rd party EV charging station vendor.

Implementation Logistics

Please provide detail on the anticipated timeline and cost of the recommendation, including:
Timeline:

- *What needs to happen in the near / medium / long term?*
  - Information sessions/webinars need to be held on these topics, using case studies from other states' and municipalities' fleets.
- *What is a reasonable start date? End date?*
  - Fall 2022 and beyond

Costs:

- *Identification of funding sources (if known)*
  - Numerous tools and resources are available at no cost through Clean Cities program as well as non-profit organizations.
  - Federal funding through IIJA could be available.
- *How likely is this initiative to get funded (High/Medium/Low)?*
  - Given focus on electrification of transportation, further exploration of this topic is highly likely
- *What are the upfront costs (and who pays)?*
- *What are the ongoing costs (and who pays)?*
- *What are the benefits to ratepayers?*
  - Ulitmately, benefits could arise from cost savings of transitioning to electric vehicles, due to total cost of ownership being lower.
- *What are the additional resources needed (staff, etc.)?*

Key Actors & Action Required:

- *Lead advocating & implementing organization:*
  - Fleet managers & public entity decision makers
- *Other key players*

- SC Energy Office, Palmetto Clean Fuels, non-profits, EV OEMs and 3rd party EV charging station providers

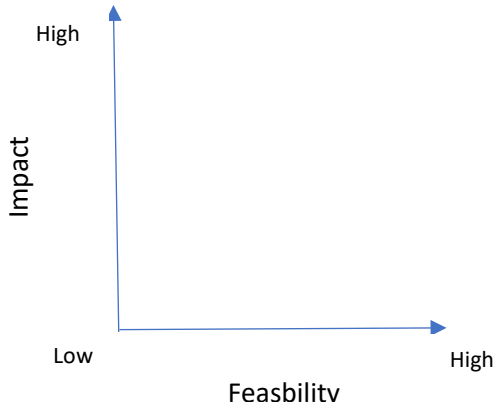
Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

- *Is legislative action required? Define required action* ***NO***
- *is SC Public Service Commission action required? Define required action* ***NO***
- *Is another external entity's action required? Define required action* ***NO***
- *Does another working group's recommendation need to occur prior to implementation? Which one(s)?* ***NO***
- *Does another working group's recommendation need to occur in conjunction with this recommendation? Which one(s)?* ***NO***
- *Does this recommendation need to occur prior to another's implementation? Which one(s)?* ***NO***

Implementation/Benefit Comparison matrix

Using the information provided above, place the recommendation on this matrix:



Recommendation 27

SC Electric Vehicle Stakeholder Initiative

Working Group Recommendation Template

Working Group(s)
Public Entities Working Group

Recommendation Number and Title
Recommendation #5: Continue engaging with utilities on options for public entities.

Recommendation Summary

• Provide guidance on how to negotiate rate structures with utilities
  ○ Investigate opportunities for municipalities to negotiate rate structures for their particular needs.
• Provide guidance on exploring managed charging with utilities
  ○ Include possibility of a managed charging pilot
• Explore vehicle-to-grid and vehicle-to-X opportunities
  ○ Implement pilots that deploy school buses to learn from bi-directional charging programs and determine benefits (revenue, resilience, others)

Background

Three to four paragraph description of the current landscape. Please include:
• *Challenges addressed*
  • Currently there is a need for understanding of what the costs, utility upgrades, rate structures, and EV charging equipment that will be incurred or utilized by fleets.
  • There are limited demand/time of use rates that exists by utilities, the ones that do, fleet managers may not understand.
  • Lack of collaboration between fleet managers and energy managers of facilities (silo'ing).
  • Lack of knowledge benefits of vehicle-to-grid (V2G) as well as financial benefits to the operators who sell electricity back to the grid, as well as benefits to emergency response and resilience.
  • Ability for agencies to switch into rate classes that benefit EV usage.
• *Current status in South Carolina (does this already exist?)*
  • Municipalities with utilities may be better able to pivot to the EV transition with rate structures that benefit the municipality.

- PCF and SCEO provide assistance to fleets to understand upgrades and rate structures – heavily rely on utilities for info from their side – important to to start process early as lead times for equipment can be a while
- Utilities can provide support to fleets but may not be entirely objective
- Need more examples of V2G to learn from.
- Things to learn from transit providers – they are the largest EV fleets deploying in SC – as well as biggest battery operators.

- *Examples from other states (if applicable)*
  - https://atlaspolicy.com/wp-content/uploads/2021/09/Electric-Vehicle-Reimbursement-Rate-for-Colorado-State-Employees.pdf
- *Is this a statewide or local initiative?*
  - Statewide initiative with local focus for municipalities and co-op territory
- *What is the target sector (light-duty/medium-duty/heavy-duty / all)?*
  - *All*

Summary of Assessment Criteria

Two to three sentence discussion of each of the criteria used to assess the recommendation (if known):

- *Ability to Implement (Political):*
  - n/a
- *Ensures equitable access for all:*
  - Many of the charging stations and EVs within state fleet and local agencies would be behind the fence charging, but allowing communities to charge when fleets are not using them would benefit communities and enhance access.
  - Infrastructure upgrades can benefit communities by reducing barriers to electrification
- *Benefit to vulnerable or disinvested communities:*
  - Can provide investment to disadvantaged areas – particularly utility upgrades.
  - Would be important to make sure workforces from these communities are employed doing the work in their communities.
- *Promotes economic development and retention:*
  - By promoting EVs and EV infrastructure, state and local entities can promote economic development through equipment purchases, investments into grid reliability, and infrastructure placements that all involve manufacturing and construction jobs – benefiting workforce. Furthermore, SC entities can deploy chargers to revitalize and attract citizens to areas of retail, entertainment, and eateries, to name a few.
  - Offering workplace charging can help attract and retain employees who drive EVs or are thinking of purchasing an EV. Providing workplace charging can also show that employers are proactive in seeking opportunities to enhance the employee experience at the workplace

    - *https://www.boston.gov/sites/default/files/file/2020/03/1527-03%20-%20Workplace%20Charging.pdf*
- *Addresses public health and environmental considerations*
    - While not directly from this recommendation:
    - Even a small percentage of vehicles shifted within state and local government fleets to electric could make a sizable difference in petroleum usage and fuel expense that are sent out of state. Furthermore, employees that utilize these vehicles are generally exposed to tailpipe emissions while doing work and having vehicles idle. Workers such as firefighters who are usually exposed to large-displacement diesel engines while at the firehouse and on-scene are exposed to significant air quality impacts. Even small-scale idle reduction (APUs) units can provide a difference: https://www.firerescue1.com/fire-products/vehicle-equipment/exhaust-removal-systems/articles/dangerous-diesel-managing-health-risks-related-to-diesel-exhaust-emissions-at-the-station-LVq8YvsEyrsOxDdB/

- *Education and awareness considerations:*
    - Education and awareness will be a major focus of this initiative. It should strive for collaboration between energy and fleet managers to better understand facility assets to reduce infrastructure installation and deployment costs.
    - Planning considerations include access to 3-phase power, making EV charging infrastructure placement better suited to a visitor center vs dirt lot.
    - Staff capacity will have to be built throughout the state and fleet offices to better understand rates and utility involvement.
    - Palmetto Clean Fuels and SC Energy Office can provide trainings and technical assistance through resources available through Clean Cities network, national labs, and other US Department of Energy sources.
- *Benefits workforce development:*
    - Fleet transition plans made in conjunction with local trade and educational agencies will benefit workforce development. Many schools have apprenticeship and trade mentorship programs with fleets and electrician programs; in combination with electric vehicle and hybrid trade programs, this will benefit SC workforce market by providing technicians for a growing industry.
- *Provides additional co-benefits:*
    - Better grid utilization and EV utilization will benefit the grid and put downward pressure on rates by better utilizing generation capacity during times of higher renewable energy generation or off peak.
    - *https://www.nrdc.org/experts/max-baumhefner/electric-vehicles-are-driving-rates-down*
    - *https://cleanfuelsohio.org/what-does-electric-vehicle-adoption-mean-for-grid-resiliency/*

- *https://img1.wsimg.com/blobby/go/2398067f-0bc3-41a7-84e3-4f90ff64c63d/downloads/ATE%20Rate%20Design%20Principles.pdf?ver=1626634532123*

- *Maintenance costs*
  - EVs typically require less maintenance than conventional vehicles because:
  - The battery, motor, and associated electronics require little to no regular maintenance
  - There are fewer fluids, such as engine oil, that require regular maintenance
  - Brake wear is significantly reduced due to regenerative braking
  - There are far fewer moving parts relative to a conventional gasoline engine.
  - *https://afdc.energy.gov/vehicles/electric_maintenance.html*

Implementation Logistics

Please provide detail on the anticipated timeline and cost of the recommendation, including:
Timeline:

- *What needs to happen in the near / medium / long term?*
  - Short: Fleet managers and other decision makers should make contact to co-ops, and IOUs to better facilitate information sharing to fleets and programs
  - Medium: Fleet managers and other decision makers should propose small, medium, and heavy deployment situations at various fleet depots within agencies to understand what type of upgrades and EV charging requirements would be needed as vehicles cycle out.
  - Long: Fleet managers and other decision makers should be involved in association programming to promote EV knowledge as well as prepare fleet and energy managers for the transition
  - Appropriate entities should be involved in PSC proceedings and testimony to advocate for state agencies and government.
  - Vehicle-to-grid (V2G) programs may be one-off type of program for now. Perhaps upcoming EPA Clean School Bus funding could provide an opportunity to fully understand the potential of V2G. https://stnonline.com/special-reports/expectations-temper-despite-feds-funding-zero-low-emissions-school-buses/
- *What is a reasonable start date? End date?*
  - Fall 2022

Costs:

- *Identification of funding sources (if known)*
  - State Energy Program funds
  - Clean Cities funding
  - *Federal funding through IIJA and IRA*
- *How likely is this initiative to get funded (High/Medium/Low)?*
  - *Medium – current activities can be augmented with more staff capacity*

- *What are the upfront costs (and who pays)?*
    - Taxpayers
    - Potentially rate payers
    - Staff, equipment, technical consulting?
- *What are the ongoing costs (and who pays)?*
    - Taxpayers
    - Potentially rate payers
    - Staff, equipment, technical consulting?
    - Electricity
- *What are the benefits to ratepayers?*
    - Revenue and grid reliability from V2G
    - Better generation utilization across the grid at growing numbes of ev
- *What are the additional resources needed (staff, etc.)?*
    - Staff, funding for projects and grant programming at a state level

Key Actors & Action Required:

- *Lead advocating organization*
    - State fleet managers, decision makers, SGFMA , MASC, other associations
- *Lead implementing organization*
    - SC Energy Office, Palmetto Clean Fuels
- *Other key players*
    - Utilities, co-ops, IOUs,
    - Contractors, installers,
- *Current or upcoming policy action*
    - Act 46
- *Current or upcoming utility action*
    - Duke and Dominion have programs in other states
- *What are potential unintended consequences?*
    - Stranded assets – if a fleet moves and invested lots of money to upgrade a structure

Prerequisites and complementary recommendations

Please explain the types of actions that need to occur prior to or during implementation. This can include:

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- *is SC Public Service Commission action required? Define required action* ***NO***
- *Is another external entity's action required? Define required action* ***NO***
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Implementation/Benefit Comparison matrix

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