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MISSION STATEMENT
To foster a PEV-friendly environment in the Piedmont Triad for consumers, businesses, and local leaders through collaborative, community based planning and implementation activities.

ACKNOWLEDGMENT
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The NC PEV Readiness Initiative: Plugging in from Mountains to Sea (M2S) planning project with funding provided by the U.S. Department of Energy’s Clean Cities Program through Centralina Council of Governments. Project collaborators include: Advanced Energy, Land-of-Sky Regional Council, NC Solar Center/NC State University, Piedmont Triad Regional Council, & Triangle J Council of Governments.
EXECUTIVE SUMMARY

As communities across the United States make the move toward electrified transportation, opportunities are emerging for Piedmont Triad business, government and community leaders to get involved, serve as champions, and benefit from this movement.

The mission of the Piedmont Triad PEV Planning Task Force is to foster a PEV-friendly environment in the Piedmont Triad for consumers, businesses, and local leaders through collaborative, community based planning and implementation activities.

The Piedmont Triad Task Force Steering Committee developed a membership recruitment plan and draft Community Position Paper, and organized meetings and communications with Taskforce members to identify goals and objectives, conducted a barriers analysis, and prioritized next steps in the development of this Community PEV Readiness Plan.

This plan addresses four key goals for the Piedmont Triad:

- Increasing awareness of the potential uses and benefits of PEVs
- Improving availability and accessibility of public charging stations
- Ensuring local policies and codes support PEV adoption
- Streamlining installation processes for charging stations
1. INTRODUCTION
Plug-In Electric Vehicles (PEVs) use electric power as their primary fuel source or as a way to improve their fuel economy. PEVs come in the form of plug-in hybrids or all electric vehicles. Drivers charge their PEVs through charging stations installed at their homes or place of work, in their communities, and while traveling. Maximum charge times can range from 30 minutes to several hours depending on battery type, battery capacity and power level of the charging station.

Every major vehicle manufacturer has announced plans to add a PEV to their product line, and several start-up companies have entered the auto industry with the express purpose of producing PEVs. The United States government believes the manufacture and support of PEVs represent key components of future American economic growth, international competitiveness, national security and environmental health. As a result, the U.S. has invested billions of dollars of federal funding to accelerate battery development, vehicle manufacturing and infrastructure planning and infrastructure deployment.

1.1 Purpose of the Piedmont Triad Community PEV Readiness Plan

Need for the Piedmont Triad Plan
PEVs represent a key component of the Piedmont Triad's future economic growth, competitiveness, energy security, and environmental health.

North Carolina and the Piedmont Triad are poised to experience significant growth in the adoption of PEVs. With North Carolina identified as a PEV manufacturing hotspot and growing availability of PEVs at dealerships across the state, now is a critical time to prepare our infrastructure and policies to take advantage of the building momentum of this sustainable transportation option.

PEVs are Coming to the Piedmont Triad... We Must Prepare
According to current projections from the Electric Power Research Institute (EPRI), the Piedmont Triad is expected to have more than 2,700 plug-in electric vehicles on its roads by 2015, and more than 145,000 by 2030 (Figure 1). Communities within the Piedmont Triad must be prepared for this new technology. As communities across the United States make the move toward electrified transportation, there are increasing opportunities for Piedmont Triad business, government and community leaders to engage in this movement.
The Piedmont Triad's PEV market also benefits from having:

- A well-educated citizenry, supported by multiple colleges and universities
- Local electric utilities and electric cooperatives which are highly engaged with the PEV industry
- Proactive municipal local governments that are supported by multiple local technical advisors
- Transportation industries committed to integrating electrification into their programs and fleets

**What will happen if we don’t plan?**

Prospective buyers of a PEV often express concern about the limited availability of vehicle charging stations combined with the limited range of most all-electric vehicles. While the number of charging stations has increased over the past year, with approximately 30 public stations in operation across the Piedmont Triad, it will take proactive planning to keep pace with the number of PEVs forecasted for this area. If we do not plan to optimize the type, location, and ease of installation for both public and residential charging stations, consumer frustrations may negatively impact the expected market penetration of these vehicles.

Air quality in the Triad has been improving over the past decade, with the region demonstrating maintenance of the federal regulatory standards. With 200,000 new residents expected in the region by 2020, the challenge of maintaining healthy air will grow. A comprehensive and inclusive plan will ease the transition for individuals to replace their internal combustion engine vehicles with a low or zero-emission PEV and ensure healthy air for Triad residents now and through future growth.
1.2 History of PEV Readiness in the Piedmont Triad

The Piedmont Triad community is a relative newcomer to PEV planning. Highlights of planning and support activities include:

- 2005 Triad Electric Vehicle Association formed
- 2010 1st Electric Vehicle charging station installed in the Triad
- 2011 Piedmont Triad Plugging In initiative launched, Task Force formed

1.3 NC PEV Readiness Initiative: Plugging In from Mountains to Sea

This publicly available, replicable community plan was created through the North Carolina PEV initiative “Plugging in from Mountains to Sea (M2S)”. The M2S project is one of 16 electric vehicle community readiness planning initiatives awarded by the U.S. DOE in an effort to increase awareness and actual consumer usage, as well as to help communities develop plans for the infrastructure needed to support the expected influx of PEVs. M2S includes multiple initiatives consisting of the development of a state-wide PEV readiness plan (through the NC PEV Taskforce) and four local PEV readiness plans for Asheville, Charlotte, the Piedmont Triad and the Triangle.

These readiness plans will serve as a guide to strengthen existing local and state initiatives to help North Carolina communities address their specific needs, including:

- Updating permitting processes;
- Revising codes;
- Training appropriate personnel;
- Assessing infrastructure needs;
- Promoting public awareness; and
- Evaluating and developing incentives.

Funding for the M2S project was provided by the U.S. Department of Energy’s CleanCities Program through the Centralina Council of Governments. Project collaborators included: Advanced Energy, Land-of-Sky Regional Council, NC Solar Center/NC State University, Piedmont Triad Regional Council, & Triangle J Council of Governments.
1.4 North Carolina PEV Taskforce

What Is It?
The North Carolina Plug-in Electric Vehicle (PEV) Taskforce was established in 2011 as an initiative of the North Carolina Department of Commerce and Advanced Energy to serve as a collaborative stakeholder led initiative to help accelerate the adoption of PEVs in NC. The Taskforce and its five (5) working groups researched and contributed to the individual sections of the state readiness plan.

Taskforce Mission Statement
“The NC Plug-In Electric Vehicle (PEV) Taskforce is focused on establishing North Carolina as the leader in electrified transportation and promoting PEV readiness throughout the state. A collaborative group of key stakeholders from private industry, academia, non-profit and local and state government, this Taskforce is working to ensure the rapid and seamless integration of PEVs into local communities and the marketplace.

The primary goals of the Taskforce are to increase the adoption of PEVs and support economic development opportunities through the exchange of innovative ideas and experience. The Taskforce will create a PEV roadmap, develop a network of PEV charging stations across the state, and align North Carolina’s electrified transportation goals with those on a national level.”

How does the State Roadmap work with the Piedmont Triad Community Readiness Plan?
The NC PEV Taskforce received funding through a U.S. Department of Energy Grant for PEV Readiness Planning called “Plugging In from Mountains to Sea”. This grant allowed the taskforce to create a statewide PEV Roadmap (readiness plan) for North Carolina, and to inform plans for the Triangle, Charlotte, Asheville, and the Piedmont Triad communities.

1.5 How the Piedmont Triad PEV Readiness Plan is to be Used

This plan is designed to serve as a foundation for additional planning efforts and a roadmap for implementation activities by both public and private stakeholders.

1.6 Organization of this Plan

The Piedmont Triad community plan incorporates elements as suggested by the U.S. Department of Energy for PEV planning.
Sections of the Plan

The Community PEV Readiness Planning process involved engaging community stakeholders to explore six different work areas associated with preparing for plug-in electric vehicle adoption:

- Vehicles
- Vehicle Charging Infrastructure
- Incentives
- Economic Development
- Policy, Codes and Standards
- Education and Outreach

Select PEV stakeholders in the Piedmont Triad served as a steering committee to guide and coordinate the progress. The steering committee met monthly and received additional assistance and feedback from area experts as needed.

1.7 Defining the Plan’s Boundaries

The planning boundary for Piedmont Triad electric vehicle readiness includes the jurisdictions comprising the 12 county Piedmont Triad region. Priority areas for PEV planning were selected based on principal travel corridors (Interstate, US and NC Routes), areas of urban development (population and employment centers), and long range transportation plans (future transportation improvements).

The Burlington-Graham, Greensboro, High Point and Winston-Salem Urban Area Metropolitan Planning Organizations (MPOs) located within the Piedmont Triad region were consulted in developing the boundary and focus area map, as were the Piedmont Triad and Northwest Piedmont Rural Planning Organizations (RPOs) and the Piedmont Authority for Regional Transportation (PART).
1.8 Goals of the Piedmont Triad Community PEV Readiness Plan

Developed with stakeholder input, the goals of this plan are to:

- **Goal 1**: Increase consumer and fleet awareness of the potential uses and benefits of PEVs
- **Goal 2**: Improve availability and accessibility of public charging infrastructure in the Triad
- **Goal 3**: Ensure local policies and codes support PEV adoption
- **Goal 4**: Streamline the installation process for charging infrastructure
2. STAKEHOLDERS AND WORK AREAS

As PEVs continue to become more widely available to consumers and charging stations appear in greater numbers statewide, the opportunity to generate PEV-related economic development increases. In order to fully take advantage of these opportunities, the Piedmont Triad must be a leader in PEV readiness in the state and nation. This vision requires coordination between a wide range of stakeholders to become reality.

2.1 Steering Committee and Stakeholder Involvement

Steering Committee
A Steering Committee was formed to establish the framework for this year-long planning effort, identify key stakeholders, and develop outreach strategies to ensure broad participation. The Steering Committee was comprised of representatives from:

- Piedmont Triad Regional Council
- North Carolina Solar Center’s Clean Transportation Program (NC State University)
- Advanced Energy
- Duke Energy

Stakeholder Task Force
The Steering Committee identified categories of stakeholders whose engagement would be important to the plan. Representatives from each of the following categories were invited to participate in the task force:

- Public & Private Fleets
- Local and Regional Government
- Transportation Planning
- Economic Development
- Vehicle and Charging Station Sales / Manufacturers
- Utilities
- Civic Groups
- Colleges and Universities
- Environmental Organizations
- Businesses with EV Interests

Some stakeholders were unable to participate in meetings but provided feedback in other ways, such as participating in surveys, responding to requests for information and providing feedback on documents.
2.2 Work Areas

PEV Community Readiness planning focused on six key work areas:

- Vehicles
- Vehicle Charging Infrastructure
- Education and Outreach
- Policy, Codes and Standards
- Incentives
- Economic Development

Each work area was considered by the taskforce during the planning process.

2.3 Substantial Partnerships with relevant stakeholders

In order to ensure all relevant stakeholders were identified and provided an opportunity to participate in the Piedmont Triad Community PEV Taskforce, steering committee members developed a contact list with relevant stakeholders in each categories of desired representation, focusing on those with direct interest in the six work areas. In total, 128 stakeholders were identified and invited to participate.

Steering Committee members conducted regular meetings, planned taskforce work sessions, and coordinated activities between meetings.

Stakeholders were brought together for an introduction to PEVs and the six work areas, and to collaborate in a facilitated discussion focused on identifying and removing barriers to PEV adoption. Between meetings, stakeholders were asked to rank their interest in the six work areas, prioritize targeted planning activities relating to the work areas, and propose electric vehicle charging station locations in the Piedmont Triad region. Stakeholders reconvened to complete and refine components of the draft community readiness plan.
2.4 Public Engagement

The general public was provided the opportunity to participate in taskforce meetings, respond to surveys and contribute to the Triad Plugging In project blog. A project website included background information, meeting summaries, surveys and maps. Notice of the planning efforts was featured in newsletters and shared using social media tools like Twitter and Facebook.

Feedback Surveys

More than 400 community stakeholders were asked to respond to a survey and the project blog to better understand perceptions and priorities relating to PEV planning activities in the Piedmont Triad area. 82 responses were received. Respondents were asked to rate how important PEV related activities were in supporting implementation of plug-in electric vehicles in the Triad. Responses were categorized and ranked by combining the Important and Very Important responses, to focus in on the priority planning activities to consider in the community PEV planning process. Survey responses are summarized below.

Figure 3. Survey Responses, Importance of PEV Planning Activities in the Piedmont Triad

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very Important</th>
<th>Important</th>
<th>Very Important + Important</th>
<th>Neutral</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing consumer and fleet awareness of suitable uses and potential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>benefits of PEVs [Education/Outreach]</td>
<td>76%</td>
<td>21%</td>
<td>96%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Simplify process for installing personal charging stations [Policies,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codes and Standards]</td>
<td>63%</td>
<td>29%</td>
<td>93%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Improve availability/accessibility of public charging stations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Vehicle Charging Infrastructure]</td>
<td>72%</td>
<td>18%</td>
<td>90%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Ensure that state and local policies and codes support PEV adoption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Policies, Codes and Standards]</td>
<td>72%</td>
<td>18%</td>
<td>90%</td>
<td>9%</td>
<td>1%</td>
</tr>
<tr>
<td>Ensure understanding of charging station permitting and inspection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>requirements [Policies, Codes and Standards; Education/Outreach]</td>
<td>49%</td>
<td>41%</td>
<td>90%</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Provide economic incentives for PEV purchasing [Incentives]</td>
<td>54%</td>
<td>23%</td>
<td>77%</td>
<td>22%</td>
<td>1%</td>
</tr>
<tr>
<td>Increase funding support for charging infrastructure [Incentives]</td>
<td>40%</td>
<td>33%</td>
<td>73%</td>
<td>22%</td>
<td>5%</td>
</tr>
</tbody>
</table>
3. VEHICLES

3.1 Introduction to Plug-in Electric Vehicles (PEVs) Work Area

PEVs continue to gain in popularity, with new models produced by many by vehicle manufacturers. With such tremendous growth in the number of advanced vehicle choices available to consumers, it has become increasingly more challenging for buyers to remain informed on the growing number of available technologies and options.

3.2 Piedmont Triad Background in PEVs

Personal Ownership
According to the North Carolina Department of Motor Vehicles, more than 150 plug-in electric vehicles are currently owned and operated within the Piedmont Triad region, with more electric vehicles available with each new model year at numerous dealerships across the region.

Corporate and Municipal Fleet Ownership
Several local governments and private fleets in the Piedmont Triad area have invested in plug-in electric vehicles, with more considering shifting portions of existing fleets as vehicle availability improves. Examples include the City of Winston-Salem, Volvo Truck and the University of North Carolina, Greensboro.

Utility Pilot Program
Duke Energy’s Charge|Carolinas pilot provided qualified participants in its service area with Level 2 charging stations. Duke Energy is remotely accessing information to better understand collective charging habits and the impact on the power grid. When the pilot ends, participants will be allowed to keep the charging station for a small fee.

In the Piedmont Triad, 18 households are participating in the pilot program.

3.3 Piedmont Triad Plug-In Electric Vehicle Planning

Goals
According to current projections from the Electric Power Research Institute (EPRI), the Piedmont Triad is expected to have more than 2,700 plug-in electric vehicles on its roads by 2015, and more than 145,000 by 2030. The primary goal related to vehicle planning is to support the growth of PEVs in operation within the Piedmont Triad area.
Barriers
The Stakeholder Taskforce identified two key barriers to increasing the number of PEVs in operation within the Piedmont Triad, including:

- Lack of public awareness of the features and benefits PEVs
- High cost of PEVs and Charging Infrastructure

Solutions
The Stakeholder Taskforce identified a number of potential strategies to address the identified barriers to increasing the number of PEVs in operation within the Piedmont Triad, which are detailed in the figures below.

Figure 4. Strategies to Improve Public Awareness of PEVs in the Piedmont Triad*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Required Resources</th>
<th>Responsible Party*</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarify myths vs. facts for... Dealerships General public</td>
<td>Outreach materials</td>
<td>Advanced Energy</td>
<td>Immediately</td>
</tr>
<tr>
<td>Develop and Implement Curriculum for Community College/High School</td>
<td>Curriculum</td>
<td>Duke Energy Advanced Energy Community Colleges Public School Districts</td>
<td>Immediately</td>
</tr>
<tr>
<td>Schedule and/or promote PEV test drive events</td>
<td>Manufacturers &amp; dealerships to provide test drive vehicles</td>
<td>PTRC NC Solar Center NC Green Power NC EV Groups Duke Energy</td>
<td>Immediately</td>
</tr>
<tr>
<td>Clarify information on domestic energy sources/impacts/costs</td>
<td>Existing studies</td>
<td>Duke Energy AE/ PTRC/SC</td>
<td>Immediately</td>
</tr>
<tr>
<td>Compile information on tax credits, return on investment calculator</td>
<td>Research and compilation of information</td>
<td>Advanced Energy PTRC NC Solar Center</td>
<td>3-6 months</td>
</tr>
<tr>
<td>Understand individual driving habits How far do we drive? Where?</td>
<td>On-line driving log tool Analysis/summary</td>
<td>Advanced Energy PTRC NC Solar Center</td>
<td>6 months – 1 year</td>
</tr>
<tr>
<td>Compile benefits of PEV infrastructure for local governments</td>
<td>Outreach materials</td>
<td>Advanced Energy PTRC NC Solar Center</td>
<td>6 months – 1 year</td>
</tr>
</tbody>
</table>

*As proposed by the Taskforce stakeholders
Figure 5. Strategies to Reduce costs of PEV implementation in the Piedmont Triad*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Required Resources</th>
<th>Responsible Party*</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase demand</td>
<td>Test drive events</td>
<td>Manufacturers, local dealerships</td>
<td>Immediately</td>
</tr>
<tr>
<td>Support continuous introduction of new vehicle and charging technologies</td>
<td>Funding and incentives for public agency adoption, infrastructure grants Example policies, local plans</td>
<td>Local governments, MPOs/RPOs</td>
<td>Immediately</td>
</tr>
<tr>
<td>Ensure power supply infrastructure is adequate to support planned charging station locations</td>
<td>Establishment of a regional coordination team</td>
<td>Utility representatives, local government staff</td>
<td>Immediately</td>
</tr>
</tbody>
</table>

* As proposed by the Taskforce stakeholders
4. INFRASTRUCTURE

4.1 Introduction to Infrastructure

While research shows that PEV owners will do the vast majority of their vehicle charging at home, the availability of public charging stations has a significant effect on reducing the potential for range anxiety – a driver’s concern that they might run out of battery charge before they reach their destination.

A community’s decision to install public charging stations is a strong indicator of community support for PEVs. The presence of workplace charging for employees, customers and fleet applications can positively impact adoption. In all cases, selecting the proper features, locations, communications and ownership for stations is critical to successful implementation.

The primary focus of the infrastructure area was to identify priority areas for publicly available charging infrastructure in the community. Stakeholders identified the characteristics of priority locations, which were then mapped for the Piedmont Triad region.

4.2 Piedmont Triad Background in Infrastructure

*Community Infrastructure*

At the time of this plan’s completion, 20 public charging stations in 15 locations had been installed in the Piedmont Triad region, with additional stations in various stages of site planning and installation. Existing locations were identified by stakeholders and verified through existing EVSE network resources and databases, and mapped (Figure 6). A corresponding table detailing station locations and characteristics for the Piedmont Triad is provided in the Appendix.

4.3 Piedmont Triad Infrastructure Planning

*Goals*

The primary goal related to infrastructure is to improve the availability of public charging infrastructure in the Piedmont Triad region.

*Barriers*

The Stakeholder Taskforce identified implementation costs and the lack of incentives to public and private entities as the primary barriers to increasing the availability of public charging infrastructure in the Piedmont Triad.
Solutions
The Stakeholder Taskforce determined that the best strategy to address the infrastructure barriers was to identify priority locations to pursue for installation of charging stations. This approach focuses limited resources on the development of infrastructure in locations with good community visibility and the greatest likelihood of demand for charging. Barriers related to costs and incentives are considered elsewhere in the plan.

Following an introduction to electric vehicle charging station siting considerations, the Stakeholder Taskforce responded to a survey identifying priority locations for future charging stations in the Piedmont Triad, including feedback on what makes the proposed site a priority and what potential challenges may exist in those locations. A summary of these responses are included in Figure 7 below.
### Figure 7. Priority Locations for Future Charging Infrastructure in the Piedmont Triad

<table>
<thead>
<tr>
<th>Location</th>
<th>Advantages</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hotels &amp; Resorts</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Proximity Hotel, Printworks Bistro | Appeal to likely EV owners  
O. Henry Hotel, Green Valley Grill  
Grandover Resort, Greensboro | Cooperation from land/property owners |
| **Shopping Centers**      |                                                                                               |                                                                             |
| Friendly Shopping Center, Greensboro  
Parkway Plaza, Winston-Salem  
Oak Summit Plaza, Winston-Salem'  
Hanes Mall, Winston-Salem  
Palladium, High Point | Good place to spend time while charging, heavy traffic volume,  
Compatible clientele  
Access to through and local traffic  
Movie theaters | Building public aware of the site  
Cooperation from land/property owners |
| **Colleges & Universities** |                                                                                               |                                                                             |
| UNC Greensboro  
Winston-Salem State University  
NC A&T State University, Greensboro  
Guilford Technical Community College  
Jamestown, Greensboro and High Point Campuses  
Elon University, Elon  
Guilford College, Greensboro  
Wake Forest University, Winston-Salem | Large campus communities, employees already discussing purchasing EVs | State property issues  
Public resistance to paying for public parking |
| **Parks & Community Facilities** |                                                                                               |                                                                             |
| Center City Park, Greensboro  
Sci-Works, Winston-Salem  
State Parks | Already a destination for meeting/working/recreating | Building public aware of the site |
| **Businesses**             |                                                                                               |                                                                             |
| Autotrends / Scooter Nerds, Greensboro | Close to baseball stadium, restaurants, parking garages | Building public aware of the site |
| **Transportation Hubs**    |                                                                                               |                                                                             |
| Train Stations in Burlington, Greensboro, High Point and Lexington (2014)  
Park and Ride lots | Extends commuter range  
Opportunity to integrate into Lexington site plan before construction | Difficulty with installation and access to power supply |
| **Hospitals & Medical Centers** |                                                                                               |                                                                             |
| Forsyth Medical Center  
High Point Regional  
Wake Forest Baptist  
Cone Hospitals | Likelihood of early adopters  
Visits often longer in duration | Difficulty with installation and access to power supply |
| **Employment Centers**     |                                                                                               |                                                                             |
| Hanes Corporation, Winston-Salem  
BB&T, Winston-Salem  
Lincoln Financial, Greensboro | Potential corporate partners for implementation | Cooperation from land/property owners |
<p>| <strong>Destinations</strong>           |                                                                                               |                                                                             |
| | Visits are longer in duration | Managing charging use |</p>
<table>
<thead>
<tr>
<th>Location</th>
<th>Advantages</th>
<th>Challenges</th>
</tr>
</thead>
</table>
| NC Zoo, Asheboro  
Old Salem, Winston-Salem  
Piedmont Triad Farmers Market, Greensboro  
High Point Furniture Market, High Point | Available power supply  
Lighting and site improvements | |
| Uptowns, Downtowns & Central Business Districts | Lots of shared parking  
Visits can be longer in duration  
Likelihood of public parking facilities | Building public awareness of the site  
Managing charger use  
Site improvements  
Cooperation from land/property owners |
| Sports Venues  
New Bridge Bank Stadium, Greensboro  
BB&T Ballpark, Winston-Salem | Visits often longer in duration | Managing charging use  
Cooperation from land/property owners |
| Truck Stops, Rest stops & Interstate Exit Restaurants | Addresses interstate range anxiety | Managing charging use  
Will stays be long enough to get a sufficient charge? |
| Apartment Complexes | Density of potential home-based users  
Incentive for rental-market PEV owners | Managing charging for multiple vehicles and users  
Cooperation from property managers/owners |

The Stakeholder Taskforce also identified broad categories of locations where charging infrastructure would be desirable. These locations were identified across the Piedmont Triad and mapped, as shown in Figure 8. These categories include:

- Public Parks
- Corporate Parks
- Government Facilities
- Shopping Centers
- Airports
- Medical Centers
- Public Rest Areas
- Regional Attractions
- Libraries
- Downtowns
- Farmer's Markets
- Performing Arts Centers
Figure 8. Priority Locations for Future Charging Infrastructure in the Piedmont Triad, By Category
5. POLICIES, CODES AND STANDARDS

5.1 Introduction to Policies, Codes and Standards Work Area

The policies, codes and standards related to municipal planning and inspection, electrical contracting, electric utilities and local businesses impact a community’s ability to successful adopt PEVs. The Policy, Codes and Standards work area addresses two overarching goals:

- To identify or eliminate processes or requirements that may unintentionally inhibit the adoption of PEVs or the installation of PEV charging infrastructure.
- To define or create policies, codes or ordinances that foster adoption of PEVs and installation of PEV charging infrastructure.

Jurisdictions within the 12-county Piedmont-Triad community have locally adopted land development ordinances that impact PEVs as a transportation option. Ordinances influence the complexity of the permitting process and may impose restrictions or requirements which may be prohibitive. The State of North Carolina has jurisdiction over most code modifications and interpretations, with building, electrical and accessibility codes approved and adopted by the NC Building Code Council of the NC Department of Insurance.

Streamlined permitting that provides clear guidance for public and private charging station installations makes adoption easier for consumers and simplifies the provision of PEV infrastructure for public and private providers alike. While current volumes of PEV purchases in any single jurisdiction allow plan reviewers and inspectors to identify problems without significant delay, the development of clear processes will help to prevent delays as volume increases.

5.2 Background in Piedmont Triad Policies, Codes and Standards

Existing Community Policies, Codes and Standards

According to the most recent inventory of fleet characteristics in the Piedmont Triad, a small but growing number of jurisdictions within the Piedmont Triad have written policies which support the addition of electric vehicles into their existing vehicle fleets. Other jurisdictions use informal policy guidance regarding fleet purchases, but indicate a willingness to consider electric vehicles where the specific travel demands can be met through an electric vehicle.

Workplace fleets which include electric vehicles are increasing in number across the Piedmont Triad, particularly in the public sector. Davidson County Community College has added a Chevy Volt to their fleet, the North Carolina School of the Arts in Winston-Salem has indicated plans to add electric vehicles to their fleet, and University of North Carolina-Greensboro has indicated plans to convert an existing fleet truck to all-electric.
Fleets large and small are implementing electric vehicles for a variety of reasons, including reduction of operating expenses and demonstration of a corporate commitment to the environment.

Figure 9. Charging Infrastructure, Volvo Trucks North America, credit: Skip Yeakel, Volvo Trucks

Existing Resources
Advanced Energy has developed guidance for installation of charging stations and community planning. These resources are available to aid local jurisdictions in the development of policies, reviewing existing codes, and establishing standards.

- Charging Station Installation Handbook
- Community Planning Guide

5.3 Piedmont Triad Policies, Codes and Standards Planning

Goals
The goals of the policies, codes and standards work area for the Piedmont Triad are to engage local planning and code enforcement officials in PEV focused activities, identify local ordinances and policies which might hinder PEV adoption and share best practices for local ordinances, policies and standards which streamline the installation process and incentivize the provision of publicly accessible charging infrastructure.

Barriers
Two primary barriers were identified by the Stakeholder Taskforce related to policies, codes and standards:

- Need for a regional inventory that synthesizes the policies, codes and standards in place across jurisdictions in the Piedmont Triad and gauges their potential impact on PEV implementation.
- Evolving rules, particularly related to enforcement of American with Disabilities Act provisions for accessibility at public charging stations.
**Solutions**

The Stakeholder Taskforce identified and prioritized potential strategies to address the barriers related to policies, codes and standards in the Piedmont Triad, which are detailed in Figure 10 below.

**Figure 10. Strategies to Address Barriers in Local Policies, Codes & Standards**

<table>
<thead>
<tr>
<th>Priority Rating</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Document local ordinances and policies that create barriers to PEV adoption, noting what could be done to eliminate the barrier.</td>
</tr>
<tr>
<td>2</td>
<td>Document Ordinances and policies relating to new construction or major renovations that require a specific number of spaces be provided with conduit to serve the power and communication wiring needs of future PEV charging stations, or to require a specific number of spaces be provided with PEV charging stations.</td>
</tr>
<tr>
<td>3</td>
<td>Develop best practices for encroachment agreements related to installation of PEV charging stations on public and/or private property.</td>
</tr>
<tr>
<td>4</td>
<td>Document utility policies related to EVSE installation</td>
</tr>
<tr>
<td>5</td>
<td>Identify community Americans with Disabilities Act (ADA) officials and experts, connecting them with existing ADA references related to PEV charging stations.</td>
</tr>
<tr>
<td>6</td>
<td>Document the existing processes for obtaining a charging station permit and completing the inspection process, including federal permitting requirements applicable to installations, including NEPA; provide guidance and best practices to address federal permitting issues</td>
</tr>
<tr>
<td>7</td>
<td>Develop best practices for both way-finding signage and identification signage for PEV charging stations.</td>
</tr>
<tr>
<td>8</td>
<td>Document local employer policies with regard to provision of PEV charging stations for employees and/or customers, use of such stations, assessment of fees for use, etc.</td>
</tr>
<tr>
<td>9</td>
<td>Develop best practices for preferred/restricted PEV parking and related enforcement.</td>
</tr>
<tr>
<td>10</td>
<td>Document requirements related to battery disposal, including second life uses, manufacturer’s guidelines and legal framework</td>
</tr>
</tbody>
</table>

---

PIEDMONT TRIAD COMMUNITY PEV READINESS PLAN | 22
6. EDUCATION AND OUTREACH

6.1 Introduction to Education and Outreach Work Area

The Education and Outreach work area explores the development and dissemination of resources to enhance electric vehicle knowledge. Leveraging the work completed by the NC PEV Taskforce Education and Outreach Working Group, materials can be tailored to audiences based on specific needs and goals.

The Education and Outreach work area features four topics:

- Education
- Training
- Outreach
- Marketing

6.2 Piedmont Triad Background in Education and Outreach

Existing Community Education and Outreach Activities

Over the past year, several activities were undertaken in the Piedmont Triad to educate local officials and stakeholders about plug-in electric vehicles. These activities were supported with outreach materials developed and deployed specifically to engage stakeholders in the planning process.

Figure 11. Piedmont Triad Community Education and Outreach Events

<table>
<thead>
<tr>
<th>Activity or Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEV 101 Lunch and Learn, Greensboro</td>
<td>December 7, 2011</td>
</tr>
<tr>
<td>PEV 101 Lunch and Learn, Winston-Salem</td>
<td>December 8, 2011</td>
</tr>
<tr>
<td>Triad Taskforce Kick-off Meeting</td>
<td>March 13, 2012</td>
</tr>
<tr>
<td>Perceptions and Priorities survey</td>
<td>Spring, 2012</td>
</tr>
<tr>
<td>Triad Taskforce Work Session (barriers analysis/planning)</td>
<td>May 1, 2012</td>
</tr>
<tr>
<td>First Responders Training</td>
<td>May 30, 2012</td>
</tr>
<tr>
<td>Triad Mobile Care meeting (PEV Taskforce update)</td>
<td>June 5, 2012</td>
</tr>
<tr>
<td>Statewide PEV Taskforce meeting with ride-and-drive</td>
<td>June 19, 2012</td>
</tr>
<tr>
<td>Inspectors and Installers Training</td>
<td>June 26, 2012</td>
</tr>
<tr>
<td>Community Planning Workshop</td>
<td>July 11, 2012</td>
</tr>
<tr>
<td>PEV 101 Presentation, Winston-Salem (Triad Air Awareness)</td>
<td>October 4, 2012</td>
</tr>
</tbody>
</table>
Figure 12. Piedmont Triad Community Outreach and Education Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Position Paper</td>
<td>Work Session</td>
</tr>
<tr>
<td></td>
<td>Email</td>
</tr>
<tr>
<td></td>
<td>Blog</td>
</tr>
<tr>
<td>Priorities and Perceptions Survey Summary</td>
<td>Work Session</td>
</tr>
<tr>
<td></td>
<td>Blog</td>
</tr>
<tr>
<td>Piedmont Triad Web Articles</td>
<td>Email</td>
</tr>
<tr>
<td></td>
<td>Blog</td>
</tr>
<tr>
<td>Invitations to Meetings, Events and Trainings</td>
<td>Work Session</td>
</tr>
<tr>
<td></td>
<td>Email</td>
</tr>
<tr>
<td></td>
<td>Blog</td>
</tr>
<tr>
<td>Strategies for Overcoming Barriers summary</td>
<td>Work Session</td>
</tr>
<tr>
<td></td>
<td>Blog</td>
</tr>
</tbody>
</table>

Figure 13. Examples of Outreach Materials

6.3 Piedmont Triad Education and Outreach Planning

Goals

The Stakeholder Taskforce identified one key goal related to Education and Outreach:

- Increase consumer and fleet awareness of the potential uses and benefits of PEVs
Barriers
The Stakeholder Taskforce identified one key barrier to address through education and outreach:

➢ Lack of public awareness of the features and benefits PEVs

Solutions
A set of outreach activities for improving awareness of and readiness for electric vehicles were identified and prioritized by the Stakeholder Taskforce, which are detailed in the figure below.

Figure 13. Priority Outreach Activities

<table>
<thead>
<tr>
<th>Priority Ranking</th>
<th>Activity</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distill and distribute outreach materials on tax credits, incentives, return-on-investment calculators, and life-cycle cost calculator tools</td>
<td>Provide potential PEV customers with materials to support informed vehicle purchase decisions</td>
</tr>
<tr>
<td>2</td>
<td>Prepare “myths vs. facts” outreach materials</td>
<td>Dispel myths held by potential PEV customers</td>
</tr>
<tr>
<td>3</td>
<td>Prepare or adapt brochure or information packet on the benefits of public EVSE installation</td>
<td>Provide local government leaders with the justification to initiate public EVSE installation projects and fleet purchases or guide policy discussions</td>
</tr>
<tr>
<td>4</td>
<td>Distill and distribute PEV-related studies to community spokes-people</td>
<td>Clarify information on domestic energy sources, impacts, costs, etc.</td>
</tr>
<tr>
<td>5</td>
<td>Develop or promote driving log and scan gauge monitoring tool - smart phone application and/or - on-line application</td>
<td>Assist potential PEV customers in characterizing driving habits and determining if a PEV makes sense for them, including life cycle costs and purchase vs. lease options</td>
</tr>
<tr>
<td>6</td>
<td>Conduct and promote PEV ride and drive events, including short term rentals</td>
<td>Provide potential PEV customers with hands-on experiences to support informed vehicle purchase decisions</td>
</tr>
<tr>
<td>7</td>
<td>Collect and publicize owner testimonials and case studies from within the Piedmont Triad</td>
<td>Encourage confidence in potential PEV customers</td>
</tr>
<tr>
<td>8</td>
<td>Prepare or adapt information related to home charging equipment, including sizing, location selection &amp; costs Address issues related to multi-family and rental housing</td>
<td>Provide potential PEV customers with materials to support informed charging equipment purchase decisions</td>
</tr>
</tbody>
</table>
7. INCENTIVES AND ECONOMIC DEVELOPMENT

7.1 Introduction to Incentives for Plug-in Electric Vehicles (PEVs)

**Incentives**

Incentives can provide critical support to make PEVs a reasonable consumer choice. The Incentives work area covers efforts to define and evaluate various benefits that could be provided to encourage individuals and fleets to become PEV owners or drivers. Planning activities relating to Incentives include assessing existing incentives and develop plans to communicate the anticipated benefits of these incentives for PEV owners and industry.

**Economic Development**

According to the NCSEA Industry Census, North Carolina had an estimated 14,800 full time equivalent employees in the clean energy sector in 2011, a growth of 18% from 2010. PEV-related industries are included in this number, but remain small compared to other sectors. Clean energy firms already exist in 87 counties across the state, providing North Carolina with a unique opportunity to become a national leader by driving economic development, inspiring new businesses, and creating green jobs through the introduction and integration of PEVs and their accompanying infrastructure.

The Economic Development work area includes research on, and the development of, initiatives focused on expanding the Piedmont Triad green economy in the field of PEVs and insuring that PEVs are branded as a means for economic development and job creation within the Piedmont Triad. Building relationships with key economic development stakeholders can help to identify and capitalize on opportunities as they become available.

7.2 Piedmont Triad Background in Incentives and Economic Development

**Incentives for PEVs**

Local incentives can come from a range of public and private entities, including:

- Local Businesses & Employers
- Utility Providers
- Lenders & Financial Institutions
- Local Government
- Vehicle Dealerships

Federal tax credits of up to $7,500 are currently available for vehicles like the Nissan Leaf and Chevy Volt, based on battery capacity. These credits are transferable for entities without a tax liability, like local governments. In North Carolina, qualifying PEVs are exempt from the vehicle emissions inspection program. The state employee credit union offers a 0.5% discount on the standard interest rate to finance the purchase of a ‘green vehicle’, including PEVs. PEVs across North Carolina are permitted to utilize High Occupancy Vehicle (HOV) lanes where they exist.
Local Economic Development Opportunities

The Piedmont Triad has already begun to see the economic benefits of the PEV industry. GE Energy Industrial Solutions, which began manufacturing operations in Mebane in 1972, has begun manufacturing EV charging stations. With a staff of 275 people, this provides an opportunity for collaboration with local community colleges to provide the advanced manufacturing training curriculum that would be a further incentive for other EV manufacturers to consider the Piedmont Triad for new manufacturing facilities.

7.3 Piedmont Triad Incentives and Economic Development Work Area

Goals

The primary goals related to incentives and economic development are:

- Support the development of new incentives
- Encourage innovation in vehicle and charging technologies in the Piedmont Triad region

Barriers

The Stakeholder Taskforce identified lack of incentives as a primary barrier to increasing PEV adoption.

Solutions

The Stakeholder Taskforce identified some key strategies to address the barriers to PEV incentives and economic development within the Piedmont Triad, which are detailed in the figure below.

Figure 14. Strategies to Address Barriers to PEV Incentives and Economic Development

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Required Resources</th>
<th>Responsible Party</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compile information on incentives and tax credits, vehicle cost comparison calculator</td>
<td>Research and compilation of information</td>
<td>Advanced Energy PTRC NC Solar Center</td>
<td>Immediately</td>
</tr>
<tr>
<td>Support continuous introduction of new vehicle and charging technologies</td>
<td>Funding and incentives for infrastructure development and installation grants Example policies, local plans</td>
<td>Local governments, MPOs/RPOs</td>
<td>Immediately</td>
</tr>
<tr>
<td>Develop local incentives, including:</td>
<td>Research and compilation of best practices</td>
<td>Advanced Energy PTRC NC Solar Center</td>
<td>3-6 months</td>
</tr>
<tr>
<td>- Try before buying with business fleets that include PEVs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Reduced permitting fees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ticketing policies to encourage turn-over at public charging infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rebates, particularly in electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. ELECTRIC UTILITIES

8.1 Introduction to Electric Utilities

The Piedmont Triad is served by a range of public, non-profit and private utility providers. Each of these utilities is engaging in various plug-in electric vehicle readiness activities to help better prepare their operations and the electric rate payers for the adoption of plug-in electric vehicles.

Providers

Private

➤ Duke Energy Carolinas

Duke Energy Carolinas owns nuclear, coal-fired, natural gas and hydroelectric generation facilities. That diverse fuel mix provides approximately 19,500 megawatts of owned electric capacity to approximately 2.4 million customers in a 24,000-square-mile service area of North Carolina and South Carolina.

Duke Energy is the largest electric power holding company in the United States with more than $100 billion in total assets. Its regulated utility operations serve approximately 7.1 million electric customers located in six states in the Southeast and Midwest. Its commercial power and international business segments own and operate diverse power generation assets in North America and Latin America, including a growing portfolio of renewable energy assets in the United States.


Electric Cooperatives

The North Carolina Electric Membership Corporation consists of the state’s 26 electric cooperatives which provide energy and related services in 93 of North Carolina’s 100 counties. Each of the cooperatives are member-owned, not-for-profit and overseen by a board of directors elected by the membership. In the Piedmont Triad, these include:

➤ Pee Dee Electric (Montgomery)
➤ Randolph Electric Membership Corporation (Randolph, Alamance, Montgomery)
➤ Energy United (Davidson, Davie, Forsyth, Guilford, Montgomery, Randolph, Rockingham, Stokes, Yadkin)
➤ Surry Yadkin Membership Corporation (Forsyth, Surry, Stokes, Yadkin)
➤ Piedmont Electric Membership Corporation (Alamance, Caswell)
➤ Central Electric (Randolph)
ElectriCities

NC Public power is a municipally-owned and operated electric service comprised of more than 70 communities in North Carolina collectively known as NC Public Power. In the Piedmont Triad, participating communities include:

- Lexington
- High Point

The Piedmont Triad’s network of electric utility providers all have some ongoing initiatives to prepare for the adoption of electric vehicles, focusing on the impacts of electric vehicle adoption to the grid and helping the customers learn about best practices for vehicle usage.
9. RECOMMENDATIONS

9.1 Plan Awareness

A key step of implementing this plan is to insure that stakeholders, local governments and the public are aware of the plan and its recommendations. Endorsement of this plan will be requested from the Piedmont Triad Regional Council Board of Delegates, and endorsement by member governments across the Piedmont Triad planning area will be encouraged. The plan will be made available in digital format on the PTRC website and the Triad Plugging In blog, and in print format.

9.2 Monitoring the Implementation of the Plan

The Piedmont Triad Regional Council will monitor implementation of the plan, and work with local stakeholders to support implementation of the plan's recommendations.

9.3 Amending the Plan

The Piedmont Triad Regional Council will be responsible for reviewing the plan from time to time and initiating amendments as needed, and will encourage the periodic review of the plan by local stakeholders.

9.4 Updating the Plan

The Piedmont Triad Regional Council will be responsible for responding to requests from stakeholders to update the plan as needed.

9.5 Funding

Implementation funding will come from a variety of sources – federal and state programs, local funding allocations and non-profit foundations. Appendix 2 describes a range of these potential funding sources in more detail.
9.6 Action Plan

There are several key activities identified by the Stakeholder Taskforce that, if undertaken, will help to foster a PEV-friendly environment in the Piedmont Triad for consumers, businesses, and local leaders and address the four key goals of the plan.

**Goal 1: Increase awareness of the potential uses and benefits of PEVs**

Distill and distribute outreach materials on tax credits, incentives, vehicle cost comparisons and total life-cycle vehicle costs.

**Goal 2: Improve availability and accessibility of public charging stations**

Collaborate with stakeholders, local government and business interests to pursue the installation of public charging stations in priority locations across the Piedmont Triad.

**Goal 3: Ensure local policies and codes support PEV adoption**

Inventory and document local ordinances and policies that create barriers to PEV adoption and identify best practices and model language that could be implemented to eliminate barriers.

**Goal 4: Streamline installation processes for charging stations**

Inventory and document best practices to streamline installation process, including site review, electrical permitting, encroachment requirements, environmental permitting, ADA compliance and signage.
### APPENDIX 1. PUBLIC CHARGING STATION LOCATIONS

#### A.1 Public charging stations

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>City</th>
<th>ZIP</th>
<th>Type of Access</th>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asheboro Nissan</td>
<td>1635 E Dixie Drive</td>
<td>Asheboro</td>
<td>27203</td>
<td>Public Dealership hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCDOT - Alamance County</td>
<td>I-85 S</td>
<td>Burlington</td>
<td>27215</td>
<td>Public 24 hours, daily</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>NCDOT - Alamance County</td>
<td>I-85 N</td>
<td>Burlington</td>
<td>27215</td>
<td>Public 24 hours, daily</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Carolina Nissan</td>
<td>1329 Huffman Mill Rd</td>
<td>Burlington</td>
<td>27215</td>
<td>Public 8:30 am – 8:30 pm; 2 stations for shop use only</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Dick Shirley Chevrolet</td>
<td>2616 Alamance Road</td>
<td>Burlington</td>
<td>27215</td>
<td>Public For shop use only</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Alamance Regional Medical Center</td>
<td>1240 Huffman Mill Road</td>
<td>Burlington</td>
<td>27251</td>
<td>For shop use only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glen Raven</td>
<td>1831 North Park Ave</td>
<td>Glen Raven</td>
<td>27217</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PART Park and Ride Lot</td>
<td>820 S Main St</td>
<td>Graham</td>
<td>27253</td>
<td>Public 24 hours, daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crown Nissan</td>
<td>3900 W Wendover Ave</td>
<td>Greensboro</td>
<td>27407</td>
<td>Public 9:00 am – 9:00 pm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Vann York’s High Point Nissan</td>
<td>1810 S Main St</td>
<td>High Point</td>
<td>27260</td>
<td>Public Dealership hours</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Shoppes at Childress Vineyards</td>
<td>517 Vineyards Crossing</td>
<td>Lexington</td>
<td>27295</td>
<td>Public 24 hours, daily</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>General Electric</td>
<td></td>
<td>Mebane</td>
<td></td>
<td>Public, company hours</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Simmons Nissan</td>
<td>1994 Rockford St</td>
<td>Mount Airy</td>
<td>27030</td>
<td>Public Dealership hours</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Reidsville Nissan</td>
<td>1123 Freeway Dr</td>
<td>Reidsville</td>
<td>27320</td>
<td>Public</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Modern Nissan/Chevy</td>
<td>5795 University Parkway</td>
<td>Winston-Salem</td>
<td>27105</td>
<td>Public 24 hours, daily</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Flow Chevrolet</td>
<td>1400 S Stratford Rd</td>
<td>Winston-Salem</td>
<td>27103</td>
<td>Public Dealership hours</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL:** 4 20
APPENDIX 2. PARTICIPATING ORGANIZATIONS

The principal investigators wish to acknowledge the contributions of our stakeholder groups, including:

- Piedmont Authority for Regional Transportation
- Winston-Salem State University
- Center for Design Innovation
- Davidson County
- Elon University
- Forsyth County
- City of High Point
- Norcross York Energy
- Petty’s Garage
- Triad Air Awareness
- Triad Electric Vehicle Association
- University of North Carolina, Greensboro
- Vann York’s High Point Nissan
- Wake Forest University
- City of Winston-Salem

...and numerous individual PEV owners
APPENDIX 3. DESCRIPTION OF FUNDING OPPORTUNITIES

**Clean Fuels Advanced Vehicle Technologies** aims to reduce transportation-related emissions in 24 counties that are in non-conformity or maintenance status for air quality through the targeted use of CMAQ funds. In the Piedmont Triad, this includes Davidson, Davie, Forsyth and Guilford counties. Projects that reduce emissions through the use of alternative fuels and advanced vehicle technologies can be considered for funding assistance, provided that the proposed project reduces emissions in a target county. Applications for funding may be submitted according to the grant cycle through the NC Solar Center.

**Congestion Mitigation and Air Quality Improvement Program (CMAQ) Funds** are federal funds allocated by NCDOT to qualifying Metropolitan and Rural Planning Organizations for use on projects that reduce transportation related emissions in counties which have been designated as non-conformity or maintenance areas for air quality. In the Piedmont Triad, these include the Greensboro, High Point and Winston-Salem Urbanized Area MPOs and the Northwest Piedmont RPO. Applications for funding may be submitted according to the grant cycle through the appropriate MPO or RPO.

**Federal Plug-In Electric Vehicle Tax Credits** are available for the purchase of a new PEV that meets the battery capacity and vehicle weight requirements. Credits range from $2,500 - $7,500. Credits will phase out once a specific number of electric vehicles have been purchased.

**Golden LEAF Foundation** promotes the social welfare of North Carolina’s citizens by providing economic impact assistance to economically distressed or tobacco-dependent regions of North Carolina. The Foundation awards grants to 501(c)(3) nonprofits and governmental entities in three focus areas: agriculture, job creation and retention, and workforce preparedness—particularly in alternative energy. Applications may be submitted according to the grant cycle to the Foundation.

The **NC State Energy Office** oversees several programs related to energy savings and energy efficiency for North Carolina governments, universities and private businesses. The State Energy administers energy-related federal funds, provides technical assistance for energy related initiatives and oversees efforts to grow North Carolina’s green economy.
## APPENDIX 4. READINESS MATRIX

<table>
<thead>
<tr>
<th>PEV Planning Elements</th>
<th>Piedmont Triad Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial Score</td>
</tr>
<tr>
<td>1. Documentation demonstrating a substantial partnership with relevant stakeholders, which may include:</td>
<td>.5</td>
</tr>
<tr>
<td>a. State and local governments;</td>
<td>.5</td>
</tr>
<tr>
<td>b. all relevant generators and distributors of electricity and utility regulatory authorities;</td>
<td>.5</td>
</tr>
<tr>
<td>c. as appropriate, owners and operators of regional electric power distribution and transmission facilities;</td>
<td>0</td>
</tr>
<tr>
<td>d. departments of public works and transportation;</td>
<td>.5</td>
</tr>
<tr>
<td>e. owners and operators of property that will be essential to the deployment of a sufficient level of publicly available charging infrastructure (including privately owned parking lots or structures and commercial entities with public access locations);</td>
<td>0</td>
</tr>
<tr>
<td>f. plug-in electric drive vehicle manufacturers or retailers;</td>
<td>0</td>
</tr>
<tr>
<td>g. third-party providers (such as vendors, installers, etc.) of charging infrastructure or services;</td>
<td>0</td>
</tr>
<tr>
<td>h. fleet(s) that will participate in the program;</td>
<td>.5</td>
</tr>
<tr>
<td>i. Clean Cities Coalitions</td>
<td>.5</td>
</tr>
<tr>
<td>2. A clear description of the role and responsibilities of each stakeholder; and a plan for continuing the engagement and participation of the stakeholders, as appropriate, throughout the implementation of the plan. This includes engagement of major fleet operators to encourage electrification of fleets such as taxis, municipal operations and delivery vehicles.</td>
<td>0</td>
</tr>
<tr>
<td>3. Analysis of barriers to the implementation of plug-in electric vehicles and infrastructure in your proposed area and a discussion of steps to reduce or eliminate the identified barriers.</td>
<td>0</td>
</tr>
<tr>
<td>PEV Planning Elements</td>
<td>Piedmont Triad Region</td>
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<tr>
<td></td>
<td>Initial Score</td>
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<tr>
<td>4. Current plans for plug-in electric drive vehicle deployment in the area/region covered by the plan including:</td>
<td></td>
</tr>
<tr>
<td>a. the number of plug-in electric drive vehicles anticipated to be plug-in electric drive privately owned personal vehicles; a justification should be provided for these estimates</td>
<td>0</td>
</tr>
<tr>
<td>b. the number of plug-in electric drive vehicles anticipated to be privately owned fleet or public fleet vehicles; a justification should be provided for these estimates</td>
<td>0</td>
</tr>
<tr>
<td>c. An analysis of usage patterns of vehicles</td>
<td>0</td>
</tr>
<tr>
<td>5. A plan for deploying residential, workplace, private, and publicly available charging infrastructure, including:</td>
<td></td>
</tr>
<tr>
<td>a. primary and secondary potential charging locations:</td>
<td></td>
</tr>
<tr>
<td>i. an estimate of the number of consumers who will have access to private residential charging infrastructure in single-family or multifamily residences;</td>
<td>0</td>
</tr>
<tr>
<td>ii. an estimate of the number of consumers who will have access to workplace charging infrastructure;</td>
<td>0</td>
</tr>
<tr>
<td>b. a plan for ensuring that the charging infrastructure or plug-in electric drive vehicle be able to send and receive the information needed to interact with the grid and be compatible with smart grid technologies to the extent feasible</td>
<td>0</td>
</tr>
<tr>
<td>c. a plan that identifies and addresses the unique challenges of installing infrastructure at multifamily residential buildings;</td>
<td>0</td>
</tr>
<tr>
<td>d. an estimate of the number and location of publicly and privately owned charging stations that will be publicly or commercially available;</td>
<td>0</td>
</tr>
<tr>
<td>e. an estimate of the number and location of charging infrastructure that will be privately funded or located on private property;</td>
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<tr>
<td>f. an estimate of the potential costs associated with EVSE deployment and potential sources of funding.</td>
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<tr>
<td>PEV Planning Elements</td>
<td>Piedmont Triad Region</td>
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<td></td>
<td>Initial Score</td>
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<tr>
<td>6. Descriptions of updated building codes (or a plan to update building codes before or during the grant period) to include charging infrastructure or dedicated circuits for charging infrastructure, as appropriate, in new construction and major renovations; EVSE must be commercially available</td>
<td>0</td>
</tr>
<tr>
<td>7. Descriptions of updated construction permitting or inspection processes (or a plan to update construction permitting or inspection processes) to allow for expedited installation of charging infrastructure for purchasers of plug-in electric drive vehicles, including a permitting process that allows a vehicle purchaser to have charging infrastructure installed rapidly (24 - 48 hours is a suggested target goal for private residential applications or permit by notification);</td>
<td>0</td>
</tr>
<tr>
<td>8. Descriptions of updated zoning, parking rules, or other local ordinances as are necessary to facilitate the installation of publicly available charging infrastructure and to allow for access to publicly available charging infrastructure, as appropriate. Also attention should be given to compliance American with Disabilities Act if applicable;</td>
<td>0</td>
</tr>
<tr>
<td>9. A plan for effective marketing, outreach, training, and education relating to plug-in electric drive vehicles, charging services, and infrastructure; the plans should include specialized training and education necessary to ensure that vehicles and related electric charging equipment is installed, maintained, and operated in a safe and proper manner. This could include training for electric charging point users, first responders, public safety officers, inspectors, installers, and construction permitting officials in areas where electric charging is being introduced, among other target audiences.</td>
<td>0</td>
</tr>
<tr>
<td>10. An assessment and plan to communicate available or anticipated benefits or incentives for plug-in vehicle owners; and identify and establish other potential needed or desired benefits or incentives. These may include:</td>
<td>0</td>
</tr>
<tr>
<td>a. rebates of part of the purchase price of the vehicle;</td>
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<tr>
<td>b. state and federal tax incentives/credits;</td>
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<tr>
<td>PEV Planning Elements</td>
<td>Piedmont Triad Region</td>
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<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
<td>Initial Score</td>
</tr>
<tr>
<td>c. reductions in sales taxes or registration fees;</td>
<td>0</td>
</tr>
<tr>
<td>d. rebates or reductions in the costs of permitting, purchasing, or installing home</td>
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</tr>
<tr>
<td>plug-in electric drive vehicle charging infrastructure;</td>
<td></td>
</tr>
<tr>
<td>e. rebates or reductions in State or local toll road access charges;</td>
<td>0</td>
</tr>
<tr>
<td>f. additional consumer benefits, such as preferred parking spaces or single-rider</td>
<td>0</td>
</tr>
<tr>
<td>access to high occupancy vehicle lanes for plug-in electric drive vehicles.</td>
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<tr>
<td>11. A description of utility, grid operator, or third-party charging service</td>
<td>0</td>
</tr>
<tr>
<td>provider, policies and plans for accommodating the deployment of plug-in electric</td>
<td></td>
</tr>
<tr>
<td>drive vehicles, including:</td>
<td></td>
</tr>
<tr>
<td>a. rate structures or provisions and billing protocols for the charging of plug-in</td>
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</tr>
<tr>
<td>electric drive vehicles;</td>
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</tr>
<tr>
<td>b. analysis of potential impacts to the grid;</td>
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<tr>
<td>c. plans to minimize the effects of charging on peak loads;</td>
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</tr>
<tr>
<td>d. A proposed plan for making widespread utility and grid upgrades</td>
<td>0</td>
</tr>
</tbody>
</table>

**Score for Planning Elements:** 0.5 1.5

**Scoring Key**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Started</td>
</tr>
<tr>
<td>1</td>
<td>Activities Begun</td>
</tr>
<tr>
<td>2</td>
<td>Significant Progress</td>
</tr>
<tr>
<td>3</td>
<td>Completed</td>
</tr>
</tbody>
</table>
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