ARIZONA STATEWIDE TRANSPORTATION ELECTRIFICATION PLAN, PHASE II: WORKSHOP 1 REPORT

Energy + Environmental Economics (E3) and ILLUME Advising, LLC
On behalf of Arizona Public Service and Tucson Electric Power

August 26, 2020

This report provides a report of Workshop 1, including key points of stakeholder engagement during Workshop 1 and follow-up activities to support future stakeholder engagement immediately following Workshop 1.

WORKSHOP 1 SUMMARY

Facilitated by Energy + Environmental Economics (E3) and ILLUME Advising, LLC (the E3 Team) on behalf of Arizona Public Service (APS) and Tucson Electric Power (TEP), Workshop 1 brought together about 160 participants from across Arizona to discuss the development of a Statewide Transportation Electrification (TE) Plan through a virtual, online meeting space. Ben Shapiro, Consultant and Project Manager for E3, presented an overview of the Phase II Plan including the project scope, the specific methods and analyses that will inform the Phase II Plan, and an explanation of how the project will merge analytical results and stakeholder inputs to identify key TE barriers and related enabling actions. A copy of the E3 presentation slides can be found through the project microsite here, and a summary of E3's approach is included below.

Kimberly Jaeger Johnson, ILLUME Managing Consultant introduced the working group process before directing stakeholders to break out into individual Working Groups (facilitated by ILLUME and E3, with utility representatives present) to discuss expectations, define leadership roles, review activities, inputs, and crowdsourcing approaches, and provide space for stakeholders to discuss the scope of each working group, and redefine as necessary. Five concurrent working group breakout sessions were held, one for each of the working groups: EV Infrastructure, Equity, Programs and Partnerships, Goods Movement and Transit, and Vehicle Grid Integration. A copy of the ILLUME presentation slides can be found through the project microsite here.

SUMMARY OF E3 ANALYTICAL FRAMEWORK

As part of a general project overview Ben Shapiro of E3 walked through several research tasks and the different analyses E3 is conducting to provide key TE context and support development of the Phase II Plan. This section briefly summarizes the different workstreams and analytical tasks.

TRANSPORTATION ELECTRIFICATION INDUSTRY UPDATE

Prior to Workshop 1, on July 29th, 2020, E3 affiliate Dr. Nancy Ryan provided a Transportation Electrification Industry Update covering market, technology, and policy trends in the sector (slides and recording available on the project microsite). This background information helps to set the stage for TE both in Arizona and more broadly, providing a common baseline level of knowledge and understanding for stakeholders at the beginning of this planning process. Information gathered for and presented during this update will be incorporated in the Phase II Plan to provide broader context on the sector, key trends, and important considerations that are likely to influence the trajectory of TE.

MARKET ASSESSMENT

E3 is conducting a market assessment to document and describe the transportation sector in Arizona. Led by E3 affiliate Lucy McKenzie[1], this assessment will provide an inventory and segmentation of different vehicle types in the state (e.g., personal light-duty vehicles, medium-duty delivery vans, transit buses, etc.), subject to data

[1] Lucy McKenzie led E3's work to develop the 2019 Transportation Electrification Strategic Plan for Salt River Project.

availability. Results and modeling from this market assessment will help to inform key areas of opportunity for electrification, providing valuable information for stakeholders as the group considers which TE initiatives and enabling actions to recommend for prioritization.

AIR QUALITY POTENTIAL & ANALYSIS

To assess the anticipated air quality impacts from transportation electrification E3 will be using the U.S. Environmental Protection Agency's Co-benefits Risk Assessment (COBRA) health impacts screening and mapping tool. E3 will estimate changes in emissions of different pollutants – such as particulate matter and oxides of nitrogen – using electricity supply data from APS and TEP as well as emissions data for conventional internal combustion engine vehicles. The net pollutant emissions changes will then be input to the COBRA tool to estimate changes in health outcomes and the associated financial impacts. This analysis will encompass the changing electricity resource mix which both APS and TEP anticipate – with decreasing use of fossil fuel power plants over time – as described in the utilities' latest Integrated Resource Plans. The air quality potential analysis will be conducted for the different vehicle segments and adoption scenarios explored through the Cost-Benefit Analysis.

COST-BENEFIT ANALYSIS

E3 is conducting a cost-benefit analysis (CBA) to assess the lifetime impacts of transportation electrification for Arizonans. Given that different costs and benefits accrue to different individuals and groups, E3 will leverage several perspectives commonly used in electric sector cost-benefit analyses, including the Participant Cost Test (PCT, assessing costs and benefits for Arizonans adopting EVs), the Ratepayer Impact Measure (RIM, assessing impacts on electricity rates), and the Total Resource Cost test (TRC, assessing the total costs of energy in the utility service territory).

The CBA will be conducted for five different vehicle segments across three adoption scenarios, focused on the lifetime costs and benefits of vehicles adopted over the study period of 2020-2040. The five vehicle segments are intended to cover many of the primary transportation modes in Arizona, and include personal light-duty vehicles, rideshare and/or taxi light-duty vehicles, medium-duty parcel delivery vans, transit buses, and school buses. The three adoption scenarios include a "base" case, the base case with the addition of a managed charging assumption, and a high adoption scenario (which also assumes managed charging). The "base" case is informed by recent EV adoption forecasting APS and TEP have conducted with assistance from a third-party consultant, while the high adoption scenario is based on the Arizona portion of a nationwide EV adoption goal developed by the Rocky Mountain Institute, intended to reflect the proportion of carbon emissions reductions required from the transportation sector in order to meet global climate targets.

Results from the CBA will highlight the opportunities and challenges presented by different vehicle segments, including both the financial costs and benefits and related physical impacts such as carbon and criteria emissions and the impact on peak electricity demand. The magnitude of these impacts under the three adoption scenarios will help to inform planning decisions and the TE goals adopted by the utilities and the stakeholder group through the Phase II Plan.

GAPS ANALYSIS & PROPOSED ACTIONS

Using the results of the analyses described above and input provided by stakeholders through the five Working Groups and the two remaining workshops, E3 will conduct a "Gaps Analysis" to identify priority areas which must be addressed in order to enable further TE in Arizona, including consideration of barriers specific to particular communities and populations which must be overcome in order to enable a TE sector that can benefit all Arizonans.

This analysis will categorize barriers by vehicle segment and will assess different potential initiatives to address these hurdles with the goal of prioritizing recommended actions for both the utilities and other TE stakeholders in the state. This Gaps Analysis will be an important area in which the diverse perspectives and expertise of the stakeholder group can help to create a plan of action that both effectively addresses distinct barriers to EV adoption and leverages the broad range of support for TE which can be provided through collaborative efforts.

TRANSPORTATION ELECTRIFICATION PLAN AND STATEWIDE GOAL

The culmination of the stakeholder workshops and working groups and E3's analytical findings will be the Phase II TE Plan, to be submitted to the Arizona Corporation Commission in December 2020. Building on the Phase I report completed in December 2019, this plan will establish a framework for TE development in Arizona. The Phase II Plan will provide important background context on market, technology, and policy trends in the TE sector and an assessment of the current transportation landscape in Arizona; discuss the air quality impacts which can be expected from electrified transportation options; highlight the costs and benefits of TE for different vehicle segments and adoption scenarios; and assess the primary barriers to TE for different vehicle segments and populations, as well as prioritizing recommended initiatives to address these hurdles. The Phase II Plan will include statewide and utility specific TE goals and metrics which will be informed by both the analytical work E3 is conducting and input from the stakeholders through the Working Group and workshop process.

WORKSHOP 1 OUTCOMES

DIVERSE ATTENDEES

Stakeholders in Arizona came forward in Workshop 1 from across the state both geographically and by organizational sector. More than 120 stakeholders attended the workshop representing electric utilities, local and state government offices, the nonprofit sector, and the for-profit sector. Between 5 and 15 stakeholders attended working group breakout sessions. See APPENDIX A for a summary of attendees by organization.

STAKEHOLDER ENGAGEMENT FRAMEWORK

Given the high-level of engagement from Arizona's stakeholders, the E3 Team moved to develop a detailed stakeholder engagement framework as an outcome of Workshop 1. The framework includes structural content like the overall objective of the Phase II planning process and the overall objective of stakeholder working groups. It provides guiderails in the form of detailed working group objectives and research questions, and it outlines the tools the E3 Team developed to support a high-functioning, highly engaged stakeholder group. Refer to APPENDIX C. for the full framework document.

WORKING GROUP OBJECTIVES

Working group objectives provide structure and guidance for the working groups participating in the development of the Phase II Arizona Statewide Transportation Electrification (TE) Plan (Phase II TE Plan) being led by APS and TEP. To catalyze the working group discussions, we included a number of questions from various sources including some that came from the Southwest Energy Efficiency Project's (SWEEP's) Arizona Transportation Electrification Forum held in October 2019. Refer to SUB-APPENDIX A: Sub-Appendix A: Working Group Objectives for a detailed look at objectives and how each working group's discussion will tie into the Phase II TE plan.

STAKEHOLDER SURVEY FINDINGS

ILLUME administered a general interest survey for stakeholders prior to Workshop 1. ILLUME designed the short survey to capture initial stakeholder thoughts on TE in Arizona, to identify which and how many stakeholders may be interested in engaging in the planning process, and to identity which stakeholders were interested in joining and leading working groups. APPENDIX B. contains a table of open-ended responses that stakeholders provided to explain why they thought certain topics were important.

STAKEHOLDER THOUGHTS ON TRANSPORTATION ELECTRIFICATION

Stakeholders selected from a list of topics related to transportation electrification to indicate which of the topics they thought were key to consider in planning for Arizona. The table below shows the frequency and percentage of stakeholder responses for each of the key topics listed in the survey.

TABLE 1. WHAT ARE THE KEY TOPICS THE TRANSPORTATION ELECTRIFICATION PLAN SHOULD ADDRESS FOR ARIZONA?

KEY TOPICS THE PLAN SHOULD ADDRESS (MULTIPLE RESPONSE)	COUNT	PERCENT
Electric vehicle infrastructure	60	77%
Funding and incentives for electric vehicle service equipment (EVSE) and electric vehicles (EV)	50	64%
Equity considerations (underserved communities, income levels, urban vs rural, multi-unit housing)	40	51%
Environmental benefits (air quality/emissions reduction)	38	49%
Medium Duty, Heavy Duty, and Transit vehicle availability and/or fleet electrification	38	49%
Grid resilience/reliability	38	49%
Public education and outreach	35	45%
Public charging service providers (regulated vs competitive, pricing oversight)	34	44%
Local planning	31	40%
Highway funding and fuel tax	31	40%
Corridor planning	28	36%
Light Duty plug-in electric vehicle (PEV) availability	26	33%
Emerging technologies	24	31%
Other (please specify)	9	12%
Not sure	1	1%
TOTAL RESPONDENTS	78	100%

Other responses:

- Electric Vehicle Utility Rates -- all-volumetric TOU rate options for residential and commercial EV charging.
- Role of hydrogen production facilities in energy load management, clean energy production and fueling hubs
- Shared Vehicle Ownership & Autonomous EV RideShare
- Level 2 v. DC Charging

- Fleets
- Utility rate design for EV charging infrastructure
- Who pays
- SRP recommends coordination amongst governmental entities and industry when creating this plan. We also believe the following are the top priorities that we feel best fit into an utility plan: resilience/reliability; coordination; infrastructure & service investment recovery; equity.
- Light duty fleet electrification

WORKING GROUP INTEREST

Stakeholders that responded to the survey indicated the level of activity they intended contribute to the stakeholder engagement process as part of the development of the Statewide Transportation Electrification Plan, Phase II. The tables below show the frequency and percentage of stakeholder responses for each of the activities listed in the survey.

TABLE 2. WHICH ACTIVITIES WOULD YOU LIKE TO PARTICIPATE IN?

ACTIVITY INTEREST (MULTIPLE RESPONSE)	COUNT	PERCENT
Attend the Industry Update information session on July 29	50	63%
Remain informed on plan progress	50	63%
Provide written feedback and comments on presented materials and study findings	41	52%
Attend half-day workshops	39	49%
Other (please specify)	4	5%
TOTAL RESPONDENTS	79	100%

TABLE 3. WHICH BEST DESCRIBES YOUR LEVEL OF INTEREST IN ATTENDING HALF-DAY WORKSHOPS?

INTENDED WORKSHOP ENGAGEMENT LEVEL	COUNT	PERCENT
I want to be actively involved.	25	64%
I want to listen in.	10	26%
Other (please specify)	4	10%
TOTAL RESPONDENTS	39	100%

TABLE 4. WHICH WORKING GROUPS WOULD YOU LIKE TO JOIN?

WORKING GROUP MEMBERSHIP INTEREST (MULTIPLE RESPONSE)	COUNT	PERCENT
EV Infrastructure	29	85%
Programs and Partnerships	26	76%
Equity	20	59%
Vehicle Grid Integration	20	59%
Goods Movement and Transit	17	50%
TOTAL RESPONDENTS	34	100%

TABLE 5. WHICH WORKING GROUPS WOULD YOU LIKE TO LEAD?

WORKING GROUP LEADERSHIP INTEREST (MULTIPLE RESPONSE)	COUNT	PERCENT
EV Infrastructure	4	44%
Programs and Partnerships	4	44%
Goods Movement and Transit	3	33%
Vehicle Grid Integration	2	22%
Equity	1	11%
TOTAL RESPONDENTS	9	100%

NEWLY DEVELOPED TOOLS AND RESOURCES

The following table summarizes the working group tools that were developed and made available to stakeholders after Workshop 1. These tools will remain available throughout the duration of the project.

TABLE 6. STAKEHOLDER ENGAGEMENT TOOLS

TOOL	USES
Microsite	The microsite is an informational website that houses the formal output of the Phase II Plan and the stakeholder process. This will include: 1. Webinar and presentation recordings 2. Interim deliverables from the working groups and/or E3 if any 3. A list of upcoming meeting dates 4. A summary of the working groups including the focus areas, guiding research questions, and chair names / contact information 5. How-To demos for using SharePoint and Microsoft Teams
SharePoint	The SharePoint site will serve as a library for studies, inputs, and materials provided by the working group. It will also serve as a platform for storing working documents such as meeting minutes produced by the stakeholder groups.
Microsoft Teams	Microsoft Teams will be used as a Working Group communications platform, where each group will have their own group to self-organize communications, calendars, and deliverable dates. We will encourage the groups to keep content posted on SharePoint and provide links to that content (vs. storing content on Teams). Working groups will be able to utilize Teams' video conferencing technology for meetings.

In addition to these tools, we provide working group chairs with other materials including a draft meeting agenda and a draft slide deck with built-in background information to support working group facilitation.

APPENDIX CONTENTS

APPENDIX A. LIST OF WORKSHOP 1 ATTENDEES

The table below provides a summary of attendees by organization from Workshop 1.

TABLE 7. ATTENDING ORGANIZATIONS

ORGANIZATION
Alliance for Automotive Innovation
Alliance for Transportation Electrification (ATE)
American Lung Association
Arizona Center for Law in the Public Interest
Arizona Commerce Authority
Arizona Corporation Commission (staff)
Arizona Department of Administration (ADOA) Electrification Coalition
Arizona Department of Environmental Quality
Arizona House of Representatives
Arizona Public Service
Arizona Residential Utility Consumer Office
Arizona State Senate
Arizona State University
Ceres
ChargePoint
City of Avondale
City of Glendale
City of Phoenix
City of Scottsdale
City of Sedona
City of Surprise
City of Tempe
City of Tempe - Fleet Services
City of Tucson
Coconino County
Cruise
E3
Electrification Coalition
ENERGY MANAGEMENT
Flagstaff Chamber
Fortis
General Motors
Greenlots
HDR
ILLUME
Intel
International Research Center
John Martinson Consulting

ORGANIZATION
Knight-Swift Transportation
Lake Havasu Area Chamber of Commerce
Local First Arizona Foundation
Lucid Motors
Maricopa Association of Governments
Maricopa County Air Quality
Maricopa County Equipment Services
Maricopa County Facilities Management Department
MetroPlan
Mother Nature
Move Tucson
NAIPTA
Nikola Corporation
Owner
Phoenix Elec Auto Assoc 501C3 non profit
Phoenix Revitalization Corporation
Phoenix Revitalization Corporation
Phoenix-Mesa Gateway Airport
Pima Association of Governments (PAG)
Pima County
Pima County Department of Environmental Quality
Pima County Fleet Services
Pinal County Sheriff Office (PCSO)
Pinnacle West
Pinyon Environmental
PIRG
Plug In America
Policy Development Group
Salt River Project
Snell & Wilmer / AMC & Arizona Chamber
Southwest Energy Efficiency Project
State of Arizona
Subcontractor to E3
Sun Engineering
Sun Tran
SunZia Transmission LLC
Tesla
The Kroger Co / Fry's Grocery
The Nature Conservancy
Toyota Motor North America
Trico Electric Cooperative, Inc.
Tucson Airport
Tucson Department of Transportation & Mobility
Tucson Electric Power

ORGANIZATION
Tucson Electric Vehicle Association (TEVA)
U-Haul International, Inc.
UniSource Energy Services
US National Park Service
Valley Metro
Valley of the Sun Clean Cities Coalition
Verdek
Western Resource Advocates

1. This list does not include attendees that did not register or that joined by phone.

APPENDIX B. OPEN-ENDED RESPONSES FROM THE STAKEHOLDER SURVEY

The following table shows the open-ended responses from stakeholders that completed the stakeholder survey. In addition to the open-ended responses, the table shows which key topics respondents selected as those that are most important to consider during the Phase II planning process.

LEGEND OF KEY TOPICS SELECTED

A. Local planning
B. Corridor planning
C. Equity considerations
D. Public education and outreach
E. Environmental benefits
F. Light Duty plug-in electric vehicle (PEV) availability
G. Medium Duty, Heavy Duty, Transit vehicle availability and/or fleet electrification
H. Public charging service providers
I. Funding and incentives for EVSE and electric vehicles
J. EV Highway funding and fuel tax
K. Grid resilience/ reliability
L. Emerging technologies
M. Electric vehicle infrastructure
N. Other (please specify)
O. Not sure

TABLE 8. OPEN-ENDED SURVEY RESPONSES

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
* SRP believes the overall statewide plan needs to be comprehensive and highly integrated. * The plan can provide a central point of visibility, best practices and resources for local and state policymakers. * Regarding public education, we recommend the effort focus on technical information and data (reporting on the state of the EV marketplace in Arizona, attributes of EVs and the potential role in the grid, transportation, and air quality improvements) * SRP also feels that achieving outcomes in the transportation electrification space requires coordination between multiple governmental entities, utilities and other industry stakeholders.	* This TE effort helps SRP and others in the industry, achieve future sustainability goals around TE and EVs. * SRP has demonstrated our commitment to sustainability, including a corporate goal to enable 5, EVs by 235, along with 9% managed charging. The proposed TE plan would complement SRP's ongoing efforts and future initiatives supporting statewide transportation electrification and electric vehicle adoption. * As a stakeholder in the process, SRP believes this effort can be coordinated with SRP's comprehensive plans around TE and Grid Modernization. * SRP feels that TE should be considered as an economic development opportunity and provides air quality goals for major population centers. * Lastly, TE provides mobility and the ability to have automation that will allow all citizens access to transportation and other services.	x	x	x	x	x	x	x		x		x	x	x	x	SRP recommends coordination amongst governmental entities and industry when creating this plan. We also believe the following are the top priorities that we feel best fit into an utility plan: resilience/reliability; coordination; infrastructure & service investment recovery; equity.
A more informed community will maximize the benefits of the technology.		x		x	x				x	x				x		
Access to charging infrastructure, especially for multifamily and workplace, is an important current obstacle to increasing EV adoption.	Quit wasting money on fossil gas infrastructure that doesn't solve climate. Electric is a much more effective solution.			x		x		x		x				x		
All of these topics have a direct impact on AZ meeting its transportation electrification goals and actually setting targets for EV deployment and infrastructure development. The plan can be broad but should also focus on direct areas the utilities can coordinate on and what the ACC can review	Building out the necessary infrastructure to support EV deployment in AZ is important, however, it should not get bogged down in too many details and rather focus on the big picture of scaling TE. It's important to keep areas like electricity rates, streamlining interconnection timelines and ensuring utilities have the right resources to support TE is important.			x		x	x			x				x	x	Utility rate design for EV charging infrastructure
Although the TCO of EV's is lower than ICE, we need to ensure that the portion of our population that is in the federal poverty level (around 25% for Arizona) does not subsidize an EV infrastructure that they will not be able to utilize. As mentioned in the webinar, purchase price drives the ability of low-income customers in the market for transportation, not TCO.	The impact of high amperage charging will have a major impact on the grid and must be addressed.			x		x								x		

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Other Text
Arizona is behind many States in this effort - unless someone is already involved at the policy/planning level or in the industry. We have to educate and then make EVs and infrastructure much more available and visible. I included everything on the list therefore since no high-level decisions are yet evident. The one item I excluded was emerging technologies - that is a bit further down the road and can be incorporated at a later date since there will not be massive changes until there is a larger market in the U.S. I did include DC v. Level 2 charging as an issue as i am concerned about the length of charging time in hot Arizona and for the less environmentally committed, but also of the cost and limitations of DC charging. I'd hate to see the State invest in extensive Level 2 charging only to determine that we should have included much more DC charging for the State.	Climate change and the efficiency of electric transportation are critical; however, for better or worse, we are in a State that may not quickly jump on the bandwagon. A large implementation effort so that infrastructure is quickly available to assist with adoption would east the effort but is restricted by available monies - particularly due to the Covid situation and the resources it requires. Another factor of great concern is effect on the grid and further increasing the monopoly power of the electric utilities. Are we considering effects of grid outages on transportation for example?	x	x	x	x	x	x	x	x	x	x	x		x	x		Level 2 v. DC Charging
Being a public Transit Agency, we are always looking to the future and sustainable transportation with less impact to the environment	Worried about range and battery longevity in Arizona's harsh Climate	x						x		x		x	x	x			
Building an electric transportation system will be costly and we are in the middle of a pandemic, with unknown impact on the economy. 35 million and counting have lost their jobs in the US. People have died from being unable to afford existing utility rates. The cost and who pays should be a primary consideration in the proposed changes.	If the private sector is developing aspects there should be no need for public subsidies.														x		who pays
Considering the entire ecosystem from the general public just getting from place to place to trucking and logistics and then also the grid reliability and infrastructure to be able to handle heavy use, spikes etc.								x		x	x	x					

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Education and outreach is something that needs to be coordinated across all the utilities and can be replicated across the utilities to have consistent messaging. The availability of EVSE and the funding for certain market segments is also critical to understand, coordinated with the topic of highway corridors and local planning.	Building codes for new residential and commercial construction to include wiring and conduits for EVSE is also important, as well as a goal for EV deployment. Whether that is 1M EVs by 23 or more aggressive should be jointly discussed and signed on to by the Governor. The highway funding issue and EV registration fees should be discussed at some point, but that is a much larger conversation and shouldn't take the focus away from ALL the other policy needed to support EVs. Also, legislation / policies preventing gas cars from blocking the EVSE should be addressed.	x	x		x					x				x			
EV charging infrastructure drives EV adoption.	Utility rates can be a major barrier to the financially sustainable operation of EV charging infrastructure -- EV specific rates or rates that take into consideration the unique aspects of public, high-power DC fast charging infrastructure can be beneficial to increasing EV charging infrastructure deployment in a utility territory.							x		x				x	x		Electric Vehicle Utility Rates -- all-volumetric TOU rate options for residential and commercial EV charging.
For over ten years, I have not been able to afford to own transportation. My sister purchased an electric scooter for me...I love it so much; I intend to never purchase a gas-powered vehicle. I intend to become an evangelist, and hopefully a dealer selling electric vehicles.	It appears to be less expensive, and I expect people who have low incomes may be able to easier afford electric vehicles.	x	x	x	x		x		x	x				x			
Greenhouse gases need to be cut down drastically. If the country is at a high level of NOx emissions already ZEVs should be affordable to everyone. Larger freight vehicles especially since they travel across country every day.	Mostly, ZEVs should be more affordable to the middle-class working individual/families who want to do more to lower GHG.			x		x		x									
Highly complex situation - many interactions in any policy, technology, adoption plans/issues.	Allow the market to drive demand and deployment. Incentives should be focused on incentivizing new entrepreneurial approaches and new innovation.	x		x	x		x	x	x	x	x	x	x	x			
I am a rural Arizona chamber executive and those are topics of concern for our business members.	There is very little availability in our community unless it's private. If our state plans to move us in this direction, more thought needs to be given to rural communities.	x		x	x		x		x	x	x	x					

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Other Text
I chose all of the topics as important to be included in the AZ TE plan since AZ is lagging when it comes to TE, including in EV adoption as well as EVSE deployment. TE is important from a societal and environmental point of view, and is also the future of the transportation industry. AZ needs a comprehensive and ambitious plan to become a leader in TE.	TE should not focus on electrification only as it's usually considered. AZ should consider a ZEV mandate in the same manner as CA as well as other states in order to be "technology neutral". FCVs can provide a complementary technology, especially for long-haul trucking, AZ residents without access to residential or workplace charging, and fleets with centralized depots. The objective should be zero emissions at the tailpipe, along with clean electricity and hydrogen production.	x	x	x	x	x	x	x	x	x	x	x	x	x			
I don't think these are important topics. New and current vehicles fueled by gasoline and diesel fuel are very efficient and clean. Electric vehicles have short range and the life cycle of electric batteries are much more toxic than current gas and diesel vehicles. Batteries are very toxic and the mining for cobalt is a very toxic endeavor.	Who is going to pay for it? How will the electric vehicle pay for the use of roads. They should not get a free ride.		x					x				x	x				
I don't want the electric company, as a distribution monopoly, getting an unfair advantage.	We need affordable electricity. if I don't have an electric car, I do not want to subsidize someone else's Tesla charging.								x								
I think looking at equity and infrastructure development if important.					x			x				x					

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Other Text
In my opinion all the topics selected are important because consumers, whether individuals or companies, need to know the impact of owning an EV. Education is very important since people may not be aware of everything that EVs have to offer, the environmental benefits will be of the utmost importance but I believe people are more concerned about the battery life and the affordability of an EV. Education must include information about the types of cars, and about owning or accessing charging stations. Consumers also need education on the pros and the cons, availability and accessibility of charging stations, costs for public charging and charging options, and available infrastructure and technologies as well as the emerging new ones. Additionally, utility companies should make sure their grid is reliable since increasing EV usage will result in an increased demand for electricity. Traveling in an EV is also a concern due to the battery life and the accessibility of charging stations on the roads, for that reason corridor planning and safety is important. Lastly, the availability of larger EV vehicles for fleet will make a difference. That is because if consumers, including government agencies, are able to switch their transit, medium-duty and heavy-duty vehicles to EV, not only will they save on fuel cost, but they will make a great impact in the environment. These types of commercial vehicles are big users of fossil fuels compared to a personal car.	EVs are trending and are here to stay and because of that transportation electrification would be a great step forward into the future for our state. We need to always keep on moving with the times to stay relevant in this changing world.	x		x	x		x	x	x	x	x	x	x				

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
In order to increase EV adoption, rebates and incentives should be made available for purchase of EVs and installation of EVSEs. In addition, aggressive state mandates for zero emission vehicles adoption is critical to decreasing GHG emissions. Thank you!	AZ has an EVSE gap and programs should be implemented to bridge the gap. More dealership collaboration to make more EV models accessible to AZ consumers.	x	x	x	x	x	x	x		x	x			x			
It is important for our community to keep abreast of the changes in the transportation industry.	How are diverse suppliers going to participate in the industry?	x		x	x	x			x	x	x	x		x			
It is important to build the infrastructure while offering incentives and procedures for underserved communities to participate.		x	x	x	x		x		x	x							
It is important to look at the overall picture to properly plan for the future: The impact to the fuel tax and highway maintenance as more vehicles on the road use less or no fuel at all. The grid reliability and maintenance thereof to accommodate an increasingly greater load. Just as gas stations line the highways, there will be a need to ensure charging stations are available along the various corridors. The environmental impact overall is just as important to discuss and the potential to use the emission offsets to the benefit of the local area, especially a nonattainment area; but it is also important to consider the environmental impacts from cradle to grave in regard to the life cycle of the electric vehicles. As a whole, the short and long-term perspective of electric vehicle infrastructure and sustainability thereof will be the big picture that will need to be discussed as part of all the smaller discussions.			x	x	x	x					x	x		x			
It's important that people in underserved communities are able to access affordable EVs and infrastructure	We need an extensive network of DC fast charging stations and rebates for low/moderate income EV purchases.	x	x	x			x	x	x	x		x		x			

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Just seemed to rise above the others. Certainly, don't want public funded electric stations. Let the private sector provide it as needed. Seems we're a ways off from everyone driving electric vehicles. Commercial trucking may be a different story.	I don't want state and local governments paying for it.		x			x					x	x		x			
Main area to decrease emissions, need to make it right, need to make it fast						x				x		x		x	x		Fleets
Need to ensure that underrepresented communities do not bear the brunt of the implementation and or contribute via fees and excise taxes and get no benefit in return.	While this will benefit the electric utilities the most, there has to be some equity or benefit or a held harmless clause that does not have a disproportionate impact on communities that will not be able to use that infrastructure.	x	x	x												
Provides insight into Arizona's EV Policies and Market drivers.	ZEV MOU consideration, Gov fleet transition policies and goals, MD/HD incentives and Utility Infrastructure Programs.			x			x	x		x				x		
Resilience				x								x	x	x		
Some of the most critical topics to get as many EVs on the road as fast as possible.	Finding ways to incorporate excess electricity from renewable sources is also high priority	x		x	x		x	x		x				x		
Such a multidimensional challenge often times requires the combination of several factors to achieve results. On the one hand we have the market, on the other the technology opportunities and both are necessary to work jointly to address the needs of the people.	Great opportunity for deploying large scale solar systems that could help power charging stations across the state. Linking emission reduction to taking advantage of solar resources represents a win win approach for Arizona.			x	x	x		x	x			x	x	x		
The industry, in a capitalist society, will take care of bringing these vehicles to market and allow for them to be competitive with current forms of transportation. On the other hand, these vehicles do not pay for their fair share of road maintenance in the State of Arizona. Only conventional vehicles pay into HURF; therefore, cities and counties will not be able to maintain roads with an ever-increasing presence of electric vehicles that do not pay taxes.	The legislature needs to get in front of this so that our cities and counties can afford to maintain the infrastructure needs of these new forms of transportation. Incentives to bring more of these on line will only take even more money away from maintaining the infrastructure. Let's face it, without well maintained infrastructure, it doesn't matter how many electric cars there are, they won't be able to go anywhere.								x		x	x		x		

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
The infrastructure must benefit everyone regardless of income or social status.	What is the ROI, is it needed or do we have a solution looking for a problem. What is the future technology which will provide the most benefit to the public.			x	x				x		x	x				
The proliferation of EV's both locally and regionally is vital to the success of adoption of EVs. Having large agencies such as transit need to lead by example. Charging infrastructure is critical for EV owners to have the confidence to travel around the state.	Need more charging	x	x	x		x		x	x		x		x	x		
The push towards electrification of on road vehicles is being driven by market demand and therefore I feel the biggest deterrent to electrification and adoption of green technologies is based on accessibility and infrastructure. Without these, wide scale adoption will be delayed by years if not decades.	Currently the biggest complaint or negative feedback I have received regarding our fleet of vehicles and in discussions with other stake holders are range anxiety, infrastructure, and cost of vehicles. Once cost to invest in EVs meets or is lower than traditional ICE vehicles, I feel adoption of EVs will rise dramatically. Infrastructure is also a large roadblock, not only are there not enough publicly available charging stations in the state, the time to build in the infrastructure appears to be a roadblock.	x	x	x		x		x			x	x		x		
The transit agency I work for has adopted a policy directive to transition to battery electric buses. Fleet electrification is my focus, I think electrification needs to be planned holistically.	We are not on the bleeding edge of this technology; we have the benefit of learning from other states and utility companies. I hope we don't see this effort as recreating the wheel.			x			x	x	x	x				x		
There are significant challenges for implementing EVs, however these three are important because we must figure out a way to 1) have EVs pay their fair share for using our roads and highways, 2) have electric rate that are based on a competitive market and not being subsidized by other users, 3) understand that it took 1+ years to put the infrastructure in place for gas and diesel vehicles.	I think we have to be honest a realistic that EVs are not zero emission vehicles as many try and proclaim. Additionally, we must be honest about the environmental impacts the batteries create and what we are going to do about disposal at the end of their life-cycle. In short, we need to have a complete conversation.								x		x			x		
These are crucial to enable rapid adoption of HDEVs										x		x		x		
These seem to be foundational issues as well as areas of opportunity.		x	x	x	x	x	x	x	x	x	x	x	x	x	x	Shared Vehicle Ownership & Autonomous EV RideShare

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
They all can help reduce our addition to oil and NG, they all help reduce the brown cloud in Arizona. It can help our local power utilities.	We are behind the USA in changing to electrification. Our state still makes tons of pollution and imports all our Oil and gas. City buses and school buses all needed to be converted.	x	x		x	x	x	x	x	x	x	x		x			
They are all necessary elements of a successful TE plan, as well as trying to reflect the various interests of the key stakeholders in the EV ecosystem. If these factors are not addressed adequately, the TE Plan, and its recommendations, won't get a positive reception at the Commission and other state agencies.	I have a lot of thoughts! But as Kathy said, I will save them for the working group discussions.				x	x	x	x		x				x			
They are necessary to prepare the grid and to ensure that disadvantaged communities are nor left behind.	How do we get disadvantaged business to participate on these projects?			x					x					x			
They will all be critical in wide scale adoption of EVs, which we need to mitigate climate change.				x		x	x	x	x	x	x	x	x	x			
This is new to our territory so these issues I would like a bit more info on. I already understand so much, but I need more info.	They come to me as discussions begin. Educating customers is huge. They can't make the investment if they don't use the vehicles that much. Customers will need to understand this.	x			x	x				x	x			x			
To establish and understand expectations and appropriate resources to deploy EV technology in local government fleets.	It should be a priority for fiscal and environmental reasons.	x					x			x	x			x			
Transportation electrification is a critical pathway to achieving clean air standards and reducing public health impacts on residents, and especially lower-income communities, communities of color, people with asthma and other respiratory illnesses and others more vulnerable to the impacts of unhealthy air. The transportation sector must transition away from fossil fuels and combustion technologies across the light-, medium- and heavy-duty sectors as quickly as possible to reduce health impacts, health disparities and climate change.	Targeted investment in infrastructure, consumer and commercial incentives are should be a priority for post-COVID recovery.			x	x	x	x	x		x				x			

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
We need to ensure that the cost and availability of the vehicles and infrastructure are in place to encourage buyers. The cost and reliability of electricity needs to be consistent.									x	x			x			
We should focus on things we can control locally, acknowledge and work to influence things beyond our direct control and keenly watch emerging trends so we can adapt our strategies	Fleets with central hubs are ideal candidates for implementation, particularly if their fleets can be reasonably converted with current technologies. I think keys to that conversion are systems for Delivery trucks and transit vehicles. The next key milestone will be the mass marketed electric pickup, but that will require a commitment to distributed public charging stations. Consumer adoption will require the even further expansion of public charging facilities.		x		x			x	x	x	x			x		
We want to improve the climate		x		x		x					x	x		x		
We, as local government, need grants, incentives, and partnerships to be able to not only fund but plan more effectively at either starting or expanding EV's in our fleets.	Ready to engage now.	x							x	x						

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Other Text
While much thought has been given to increasing access to electric vehicle charging infrastructure for personal vehicle ownership, electrification of centrally managed light-duty vehicle fleets has not received similar attention. The centrally managed fleets model has the ability to increase public access to an easy, affordable, and cleaner transportation option. This is particularly true for those who do not own an EV, are unable to purchase one, or may otherwise not have the ability to charge - addressing well-documented barriers to EV adoption. Managed EV fleets also present unique central management and control benefits. Fleet managers will have oversight over operations, including when EVs drive, charge, and deploy. This provides a greater ability to capture unique synergies between grid and rider demand. EVs deployed in this model could align with statewide electrification goals, delivering decarbonization impacts that decentralized fleets may not be able to achieve. These fleets could even effectively serve as virtual power plants, responding to real-time signals from utilities, offering demand generation, and even creating modular microgrids during emergencies and public-safety power shutoffs. Given the centralized nature of both vehicle operations and charging decisions, incentivizing privately owned and managed charging infrastructure for use in shared EV fleets can support increased public access to green miles through higher charger utilization rates. For example, average public fast charger utilization rates in California are currently projected to be between 25-3%. In contrast, centrally-managed EV fleets will be incentivized to maximize utilization rates to reduce expenses. If these fleets achieve utilization rates of 5-6%, public funding invested in EV fleet fast chargers could provide twice as many green miles to the public.	Although likely outside the scope of these workshops, electricity rates for EVs play an important role in adoption. To ensure widespread transportation electrification in Arizona, it is crucial that EV owners, whether individuals or managed fleets, have access to EV-specific rates, in both the residential and commercial sectors. These rates should be designed to provide cost savings for EV owners relative to fossil fuels as well as encourage charging behaviors that benefit the grid. These dual goals can be accomplished through the establishment of EV rates that vary based on time of use and seasonality.			x				x						x			Light duty fleet electrification
Widespread beneficial electrification is key to reducing emissions and driving down electricity rates for all utility customers.	I'm excited to learn more about APS/TEP's concrete plans to move forward electric vehicle infrastructure.			x			x	x	x			x		x			

Why are these topics important, in your opinion?	What other thoughts do you have about transportation electrification in Arizona?	Key Topics Selected														Other Text
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
	Do not believe third party charging providers should be under regulatory jurisdiction - let the market allow competition...Oversight can be provided by a different agency...		x		x	x		x		x	x	x	x	x	x		Role of hydrogen production facilities in energy load management, clean energy production and fueling hubs
	I hope it's embraced	x	x			x							x	x			

APPENDIX C. STAKEHOLDER ENGAGEMENT FRAMEWORK & WORKING GROUP OBJECTIVES

AZ TRANSPORTATION ELECTRIFICATION PLAN, PHASE II - STAKEHOLDER ENGAGEMENT FRAMEWORK

PREPARED FOR: APS and TEP
PREPARED BY: E3, ILLUME
DATE: August 25, 2020

This memo documents the framework for stakeholder engagement for Phase II of the Statewide Transportation Electrification Plan. The framework includes working group objectives, terms of engagement, and a calendar of events.

OVERALL PROJECT OBJECTIVE

Electric vehicle (EV) technology has progressed dramatically in recent years and is beginning to create changes to our conventional transportation system. Transportation electrification (TE) can provide significant benefits to EV purchasers and utility customers generally, improves air quality, and aids in the growth of the Arizona economy. To unlock this value, Arizona's electric utilities along with regulatory agencies, policymakers, automakers, third-party charging service providers, and other stakeholders must work together to support EV adoption while also integrating this new load into the existing electricity system.

Arizona's Statewide Transportation Electrification Plan is intended to provide a roadmap for TE in our state, focused on realizing the associated air quality and economic development benefits for all residents along with understanding the impact of EV charging on the grid. In 2020, Arizona utilities – Arizona Public Service (APS), Tucson Electric Power (TEP) – and other stakeholders will discuss proposed TE programs and initiatives with the ultimate goal of drafting a plan to expand TE in Arizona.

OVERALL GOALS FOR STAKEHOLDER WORKING GROUPS

The overall goal of the stakeholder working groups is to elicit key points of feedback for consideration in the Phase II planning process from stakeholders. The stakeholders' feedback will be used to give context to the research, understand and identify barriers, and plan ways to overcome barriers. The working groups' findings and recommendations will inform the gaps and recommendations in the Phase II TE plan and shared with the broader stakeholder group at the upcoming workshops. Specifically, the stakeholders' recommendations and proposed actions will help to inform:

- The "Gaps Analysis" E3 is conducting to identify barriers to TE and initiatives to overcome them.
- The coordinated actions required by utility and non-utility partners to support TE.
- Additional analysis by E3, if feasible.

Participating in the working groups is the most direct way to provide input to the plan. It is important to APS and TEP that stakeholders' voices are heard and reflected in the final deliverable to ensure that Arizona can support a robust TE sector.

INDIVIDUAL WORKING GROUP OBJECTIVES

Working group objectives provide structure and guidance for the working groups participating in the development of the Phase II Arizona Statewide Transportation Electrification (TE) Plan (Phase II TE Plan) being led by APS and TEP.

We have outlined objectives to focus each working group's discussion and tie into the Phase II TE plan. For each working group, we will provide:

1. A facilitator (for the chair kickoff meeting and formal working group meetings)
2. Reference reports
3. Subject matter experts to answer questions and recommend additional resources

To catalyze the working group discussions, we included a number of questions from various sources including some that came from the Southwest Energy Efficiency Project's (SWEEP's) Arizona Transportation Electrification Forum held in October 2019. We welcome working group members to develop additional questions as the stakeholder process continues.

Please refer to SUB-APPENDIX A. Working Group Objectives for details on objectives and guiding questions for each group.

EXPECTATIONS OF WORKING GROUP CHAIRS

To lead stakeholder working groups through the Phase II planning process, we ask working group chairs to fulfill the following responsibilities:

Convene your working group at least two times to address the objectives set forth in this document;

- Meetings should take place in between full-group Workshops.
- The number of times your working group meets should be contingent upon the level of engagement of your working group members.

Assign roles within your working group sessions to ensure:

- Minutes are taken and stored on SharePoint.
- Action items are documented and summarized at the close of the meeting, stored on SharePoint, and circulated to the working group.
- Follow-up meetings are scheduled in accordance with most working group members' schedules.

Create a safe meeting space to allow for:

- All voices to be heard, encouraging multiple viewpoints to be discussed.
- Working group members to state their views clearly, ask questions when things are unclear, and allow development of collective feedback.

Refer to Terms of Engagement for guidelines on how to encourage constructive engagement. Please share these guidelines with your working group members. Group facilitators may also help in ensuring balanced input from working group members.

Empower your working group members to collaborate throughout the process by:

- Identifying opportunities for your working group members to collaborate such as forming 2-3 person teams to tackle a guiding research question.
- Another activity you deem critical for moving the group forward.

Ensure resources are provided through the appropriate channels. Working groups have access to tools designed to facilitate collaboration:

- SharePoint: a place to archive meeting notes and save group-specific inputs.
- Microsoft Teams: a place to communicate online and to schedule meetings.

When it is unclear which tool is appropriate or how features of these tools work, reach out to Goldie Christensen at goldie@illumeadvising.com

Elevate any concerns you have with the working group to Kimberly Jaeger Johnson at kimberly@illumeadvising.com. We are committed to ensuring that you have the support you need to resolve any issues that may arise.

TERMS OF ENGAGEMENT

We ask that stakeholders adhere to a set of ground rules designed to encourage constructive engagement:

Be clear. State your views using clear language and with the intent of sharing information. Share all information you have that is relevant to discussion topics.

Be curious. When something is unclear to you, it may be unclear to others. Ask genuine questions to understand the information others share and be curious about the differences in others' views.

Be aware. Engage in discussion mindfully such that you hold space for others' contributions as much as your own.

SUPPORT FOR WORKING GROUPS

The stakeholder development process within the Statewide Transportation Electrification Plan – Phase II is driven by the utilities with support from E3 and ILLUME Advising. The table below outlines the roles and responsibilities of these respective organizations, as well as whom to contact, and under what circumstances.

TABLE 9. SUPPORTING ROLES AND RESPONSIBILITIES

ORGANIZATION	ROLES AND RESPONSIBILITIES
APS AND TEP	• Provide Plan Development: guidance, direction, establish objectives towards the implementation of the TE process. • Utility representatives attend all Workshops and will attend all Working Group Meetings to assist stakeholders as questions arise with regard to utility offerings, current programs, and regulatory-related questions. Utility representatives will not drive stakeholder discussions. • Utility representatives will assist in answering questions that come through the Microsoft Teams environment. • Questions typically answered by this group: "What type of incentive programs are currently available to EV customers in TEP's territory?"
Energy + Environmental Economics (E3)	• Provide Research and Evaluation: As the lead driver on the TE Plan E3's role is to provide stakeholders with research findings in the areas of: Market Assessment, Air Quality Potential & Analysis, Cost-Benefit Analysis, Gaps Analysis and Proposed Actions. • E3 representatives attend all Workshops and several of the initial Working Group Meetings (Kickoff and First Working Group meetings for EV Infrastructure, Goods Movement and Transit, and Vehicle Grid Integration) to provide technical assistance in the above-mentioned areas. E3 will attend additional working group meetings to offer technical support on an as-needed basis. • E3 representatives are available to field technical assistance questions that arise within individual working groups within the Microsoft Teams environment. Responses will be returned within 3 working business days. • Questions typically answered by this group: "What type of inputs have other states used as they create cost-benefit analyses?" "Where can I find out how many charging stations are currently installed in Coconino County?"
ILLUME Advising	• Responsible for facilitation of Working Groups, communication tools/environment, stakeholder customer service. ILLUME is responsible for facilitating, hosting, and logistics around stakeholder meetings and the creation of an online environment for stakeholder communication, feedback, and reporting. • ILLUME representatives attend all Workshops formal Working Group Meetings) to assist working group leadership in keeping conversations within the scope/objectives, and to step in as appropriate to model ways to elicit feedback from participants. ILLUME is also responsible for troubleshooting technical issues around the Microsoft Teams and SharePoint environment. The ILLUME team is responsible for onboarding new stakeholders and providing customer service to stakeholders. • ILLUME representatives monitor the Microsoft Teams environment for stakeholder comments, questions, and to ensure scheduling of meetings. Responses to questions will be returned within 3 working business days. • Questions typically answered by this group: "How do I create a working group meeting and where do I include the zoom link?" "I have a colleague that wants to join the group. How can we onboard this person?" "Where do I upload our meeting notes?"

Each working group is supported by a team of subject matter experts. The following individuals are designated representatives of APS, TEP, E3 and ILLUME:

EV INFRASTRUCTURE

- Plan context: Devon Rood, APS – devon.rood@aps.com; Judson Tillinghast, APS – Judson.tillinghast@aps.com
- Plan context: Art Fregoso, TEP – afregoso@tep.com
- Study insights: Ben Shapiro, E3 - ben.shapiro@ethree.com
- Group facilitation support: Anne Dougherty, ILLUME Advising - anne@illumeadvising.com
- Technical support: Goldie Christensen, ILLUME Advising - goldie@illumeadvising.com

EQUITY

- Plan context: Kathy Knoop, APS – Kathy.knoop@aps.com; Mike Denby, APS – Michael.denby@aps.com
- Plan context: Nicole Hopkins, TEP – Nicole.Hopkins@tep.com
- Group facilitation support: Victor Mercado, ILLUME Advising - victor@illumeadvising.com
- Technical support: Goldie Christensen, ILLUME Advising - goldie@illumeadvising.com

PROGRAMS AND PARTNERSHIPS

- Plan context: Brent Goodrich, APS – brent.goodrich@aps.com; Kerri Carnes, APS – kerri.carnes@aps.com
- Plan context: Camila Martins-Bekat TEP – cmartins-bekat@tep.com
- Group facilitation support: Kimberly Jaeger Johnson, ILLUME Advising - kimberly@illumeadvising.com
- Technical support: Goldie Christensen, ILLUME Advising - goldie@illumeadvising.com

GOODS MOVEMENT AND TRANSIT

- Plan context: David Peterson, APS – David.peterson@aps.com
- Plan context: Francisco Castro, TEP – Fcastro@tep.com
- Study insights: Ben Shapiro, E3 - ben.shapiro@ethree.com
- Group facilitation support: Amanda Maass, ILLUME Advising - amaass@illumeadvising.com
- Technical support: Goldie Christensen, ILLUME Advising - goldie@illumeadvising.com

VEHICLE GRID INTEGRATION (VGI)

- Plan context: Jay Delaney, APS – Jason.delaney@aps.com; Derek Seaman, APS – derek.seaman@aps.com
- Plan context: Ray Martinez, TEP – RMartinez1@tep.com
- Study insights: Eric Cutter, E3 - eric@ethree.com
- Group facilitation support: Anne Dougherty, ILLUME Advising - anne@illumeadvising.com
- Technical support: Goldie Christensen, ILLUME Advising - goldie@illumeadvising.com

STAKEHOLDER ENGAGEMENT TOOLS

The following table summarizes the working group tools that will remain available throughout the duration of the project.

TABLE 10. STAKEHOLDER ENGAGEMENT TOOLS

TOOL	USES
Microsite	The microsite is an informational website that houses the formal output of the Phase II Plan and the stakeholder process. This will include: 1. Webinar and presentation recordings 2. Interim deliverables from the working groups and/or E3 if any 3. A list of upcoming meeting dates 4. A summary of the working groups including the focus areas, guiding research questions, and chair names / contact information 5. How-To demos for using SharePoint and Microsoft Teams
SharePoint	The SharePoint site will serve as a library for studies, inputs, and materials provided by the working group. It will also serve as a platform for storing working documents such as meeting minutes produced by the stakeholder groups.
Microsoft Teams	Microsoft Teams will be used as a Working Group communications platform, where each group will have their own group to self-organize communications, calendars, and deliverable dates. We will encourage the groups to keep content posted on SharePoint and provide links to that content (vs. storing content on Teams). Working groups will be able to utilize Teams' video conferencing technology for meetings.

In addition to these tools, we will provide working group chairs with other materials including a draft meeting agenda and a draft slide deck with built-in background information to support.

CALENDAR OF EVENTS

TABLE 11. CALENDAR OF EVENTS & OBJECTIVES

EVENT	DATE	OBJECTIVES
Workshop 1	**Aug 11**	• Introduced the general approach to stakeholder engagement • Convened initial working groups • Identified working group chairs
WG Chair Kickoff	Week of Aug 31	• Orient chairs to the stakeholder engagement framework • Review objectives and guiding questions • Review resources and supports for chairs • Answer questions (e.g., overall process, expectations for chairs, use of working group input in Phase II TE Plan)
WG Meetings	Aug 31-Oct 2	• Schedule meetings using Microsoft Teams • Track attendance and meeting minutes • Discuss guiding questions • Prepare feedback for consideration in the Phase II plan • Prepare an update to share out with the whole group during Workshop 2, plan on a 10-minute update per Working Group
Workshop 2	**Oct 7 (tentative)**	• E3 presents initial study findings • Working groups share general updates on their activities including what's been done so far and what's planned next for the whole group during the workshop
WG Chair Check-ins	On-going	• Chairs meet with APS, TEP, E3, and ILLUME to provide general updates on how working groups are going including activities to date, anticipated next steps, and any areas where support is needed • APS, TEP, E3, and ILLUME provide support as needed
WG Meetings	Oct 7-Nov 6	• Schedule meetings using Microsoft Teams • Track attendance and meeting minutes • Discuss guiding questions • Prepare feedback for consideration in the Phase II plan • Prepare an update to share out outcomes of the group's work to date during Workshop 3
Workshop 3	**Nov 10 (tentative)**	• E3 presents draft "Gaps Analysis" results and potential TE-enabling actions • Working groups share outcomes of the group's work to date
WG Chair Debrief	Week of Nov 16 (tentative)	• Chairs meet with APS, TEP, E3, and ILLUME to debrief on their experiences in leading working groups

SUB-APPENDIX CONTENTS

A. Working Group Objectives

SUB-APPENDIX A: WORKING GROUP OBJECTIVES

Arizona Statewide Transportation Electrification Plan, Phase II

Working Group Guidance

Introduction

This document is intended to provide structure and guidance for the working groups participating in the development of the Phase II Arizona Statewide Transportation Electrification (TE) Plan (Phase II TE Plan) being led by Arizona Public Service (APS) and Tucson Electric Power (TEP).

For each working group, we have outlined objectives to focus the group's discussion and tie into the Phase II TE plan. Reference reports and subject matter experts will be available to the working group participants to answer questions or recommend additional resources and welcome working group members to introduce additional references.

To catalyze the working group discussions, we have included a number of questions from various sources including some that came from the Southwest Energy Efficiency Project's (SWEEP), Arizona Transportation Electrification Forum held in October 2019. We welcome working group members to develop additional questions as they may arise.

How Working Group input will be used:

Working group findings and recommendations will be incorporated into the Phase II TE plan and shared with the broader stakeholder group at the upcoming workshops. Specifically, recommendations and proposed actions will help to inform:

- The "Gaps Analysis" E3 is conducting to identify barriers to TE and initiatives to overcome them.
- The coordinated actions required by utility and non-utility partners to support TE.
- Additional analysis by E3, if feasible.

It is important to APS and TEP that stakeholders' voices are heard and reflected in the final deliverable to ensure that Arizona can support a robust TE sector.

EV Infrastructure

Objectives and Ties to Phase II TE Plan

- Identify key barriers and opportunities to develop sufficient charging capabilities to support anticipated levels of EV adoption.
- Identify and prioritize, by lead stakeholder, the near-, medium- and long-term actions necessary to enable greater TE in Arizona sufficient to meet the outlined adoption goal.

Discussion Questions

- Charging Deployment
  - What are the barriers and best policies for enabling and expanding Level 2 EV Infrastructure to multi-unit dwellings, vehicle fleets and workplaces?
  - Given the forecast for EV chargers, what are the primary barriers to meeting this level of development of EV Infrastructure, including different types (Level 2, DCFC) and locations (home, workplace, public)?
  - What missed opportunities for EV charging station infrastructure exist across the state? What should be done to address these missed opportunities?
  - Which organizations and/or entities are best positioned to overcome these barriers?
  - Where do potentials for collaboration exist (e.g., local governments working with the utilities and electric vehicle service providers) to develop building codes and permitting processes that streamline installation of EV supply equipment (EVSE) without compromising safety considerations.
  - What are the challenges around interoperability and open charging protocols for both Level 2 and DCFC?

- Ownership of Infrastructure
  - How will/should different charging station ownership models play out in Arizona (i.e. utility versus third-party owned)?

- Building Codes and Policies
  - How can we overcome zoning codes issues that may hinder the development of EVSE in multi-family residences or commercialized zones?
  - What opportunities exist to adopt residential and commercial EV-ready building codes to spur EV adoption, and can performance-based incentives play a role?

Equity

Objectives and Ties to Phase II TE Plan

- Determine how EV policies and programs can grow access to Transportation Electrification in underserved communities.
- Identify key considerations and opportunities to ensure all Arizonans can share in the benefits offered by EVs and related technologies, especially those parts of the community which have historically been underserved or disadvantaged.
- Identify and prioritize, by lead stakeholder, the near-, medium- and long-term actions necessary to ensure equity in the development of programs and deployment of TE infrastructure in Arizona.

Discussion Questions

- Accessibility
  - Identify the primary ways in which the conventional transportation sector produces or exacerbates existing inequities between or within communities across the state.

- Discuss how increasing electrification of transportation modes and options in Arizona may perpetuate existing inequities; develop recommendations for how this can be avoided or mitigated.
- Investigate how equity in TE is being handled in other jurisdictions; report out on "best practices," as well as any pitfalls to avoid.
- Research the effectiveness of different incentive programs (e.g., upfront rebates, financing options, and discounted retail rates), awareness campaigns, or other programs that may focus on including underserved or disadvantaged communities in the transition to TE.
- Develop potential metrics for assessing whether existing or initial TE programs and offerings in Arizona are sufficiently addressing equity concerns.
- How can EVs and related technology be made accessible to these consumers in ways that address their mobility needs and energy and transportation budget?

+ Funding Mechanisms

  - How can tools like vouchers, rebates, and financing assistance programs be designed and implemented to bring down the costs of EV ownership for low-income consumers?

+ Education and Outreach
  - How can we promote EV awareness in underserved and hard-to-reach communities? What are the channels of communication for these populations? Who are the trusted messengers? How can we develop plans to educate and promote EVs as an option to these communities?
  - How can we educate auto dealers on EV benefits and incentives, and especially on available incentives for low-income consumers?

+ Employment Opportunities
  - How can Arizona's growing EV economy prioritize and target underserved community members for hiring and training?

+ Programs and Partnerships

Objectives and Ties to the Phase II TE Plan

+ Identify key opportunities and synergies for the development of programs and partnerships to support the broad adoption of EVs in Arizona.
+ Map the core competencies of different TE stakeholders to the barriers which need to be addressed; identify which players are best positioned to help overcome specific barriers, and where gaps remain.

Discussion Questions

+ Program and Policy Design
  - What best practices, program and incentive models exist in other states for partnerships between government entities, fleets, Transportation Network Companies (TNCs), nonprofits, and industry to expand EV education and outreach? Which of these practices/models are ripe for adoption and implementation in Arizona?

- What programs and incentives exist and/or are the most effective nationally for encouraging EV adoption? Which of these offerings are ripe for adoption and implementation in Arizona?
- What is the potential for pilot programs to test new program models and concepts? What should the process be for proposing and funding smaller-scale pilot programs outside of rate cases?
- What are the primary barriers to further adoption of EVs in different vehicle segments and from the perspective of different stakeholders, as well as potential actions for overcoming these barriers?

+ Goods Movement and Transit

Objectives and Ties to the Phase II TE Plan

- Describe and document the primary barriers or challenges to electrification of different medium duty and heavy duty (MD/HD) vehicles, focusing on distinctions between these vehicles and light-duty vehicles. Examples may include lack of sufficient charging infrastructure to power these larger vehicles, availability of EV models for the required use cases, and load management challenges due to the size of charging loads, among others.
- Identify and prioritize, by lead stakeholder, the near-, medium- and long-term actions necessary to enable MD/HD TE in Arizona.
- Discuss EV load impacts and related management or mitigation strategies to integrate electric MD/HD vehicles into the electricity system.
- Document the specific needs of fleet operators, transit agencies and other stakeholders.

Discussion Questions

- Charging Deployment
  - Considering the work under the Alternative Fuel Corridor Study, are there other locations that should be considered?[2]

- Partnerships
  - Identify the best practices around partnerships to catalyze electrification of transit systems and delivery van fleet electrification.
  - What are the barriers related to inland ports and ports of entry?

- Grid and Resource Planning Impacts
  - Given the potential impacts of MD/HD vehicles on the grid, what are the opportunities around managed charging and non-wire alternatives to assist in reducing those impacts?
  - What are the energy demand and load effects associated with the outlined adoption goals?

[2] https://azdot.gov/planning/transportation-planning/alternative-fuel-corridors

+ Vehicle Grid Integration (VGI)

○ Objectives and Ties to the Phase II TE Plan

- + Provide guidance on the priority VGI opportunities to be explored and developed in Arizona including managed charging, demand response, vehicle-to-home, and vehicle-to-building.
- + Develop recommendations for VGI programs and partnerships to prioritize, and the specific actions which the utilities and other TE stakeholders should take to realize these opportunities. Focus on near-term actions, while documenting medium- and long-term needs to develop a comprehensive approach to VGI planning and use cases.

○ Discussion Questions

- + Grid Resilience
  - ○ What is the current state of technology of vehicle-to-grid and associated residential and business applications?

- + Demand Response
  - ○ How can utility efficiency and demand response programs help reduce projected demand resulting from EV charging?

- + Managed Charging
  - ○ What are the resource planning impacts if EV charging occurs with or without control or coordination (i.e. managed versus unmanaged charging)?

- + Resource Planning
  - ○ What are the resource planning implications for various organizations of more than one million electric vehicles on Arizona's roads by 2030?
  - ○ What is the relationship between EV charging, renewable energy, and intermittent energy resources? How can we leverage EV deployment to alleviate the duck curve? Under what use cases could increase EV deployment exacerbate the duck curve? How can this information be used to inform other EV offerings?
  - ○ What are the best practices around managed charging and other VGI programs and pilots? Which ones are ripe to be implemented in Arizona?