

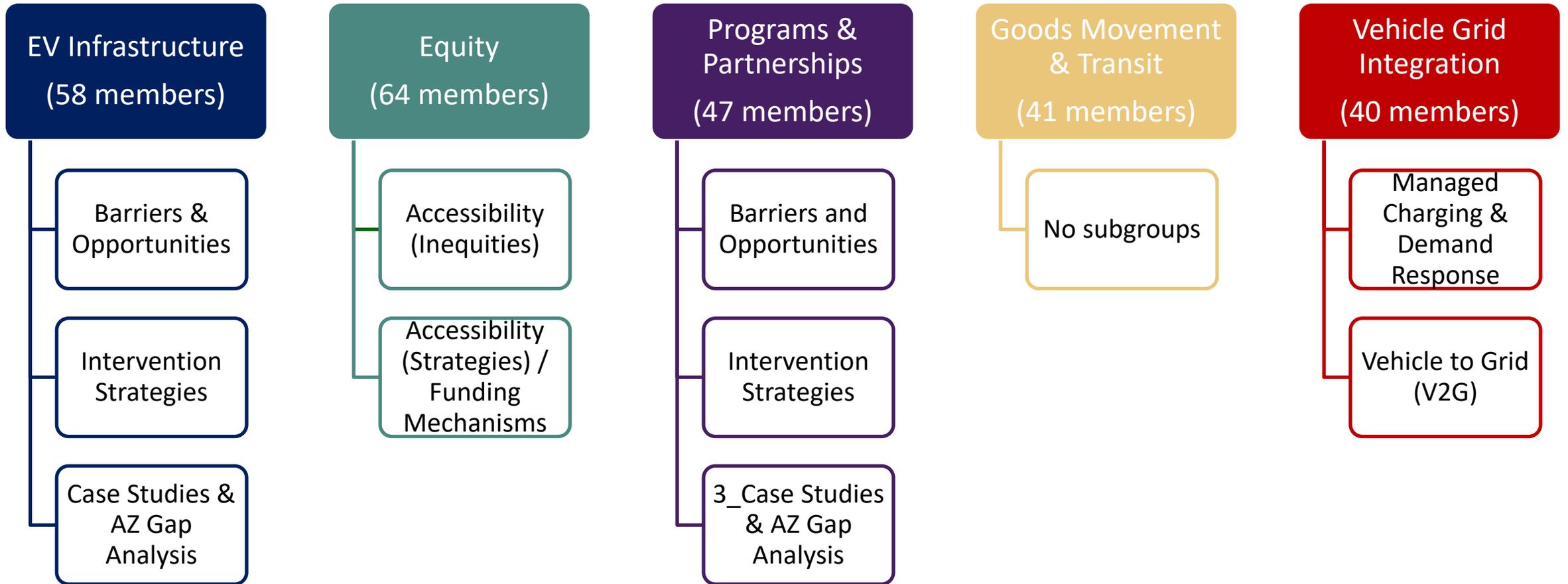
Workshop 2

STAKEHOLDER WORKING GROUP UPDATES

November 10, 2020

Statewide Transportation Electrification Plan, Phase II

B A C K G R O U N D



About **175** stakeholders have actively engaged in this process representing **local, state, and tribal entities, utilities, private firms, non-profits, energy coalitions, academic institutions, businesses, and other industry actors.**

EV INFRASTRUCTURE

Francesca Wahl

SUBGROUPS

Work Product 1: “Barriers & Opportunities”

- Subgroup Leads: Phil Jones and Caryn Potter
- Tentative Deadline: November 2

Work Product 2: “Intervention Strategies”

- Subgroup Leads: Justin Wilson and Erick Karlen
- Tentative Deadline: November 24

Work Product 3: “Case Studies & Arizona Gap Analysis”

- Subgroup Leads: Braden Kay and Grace Kelly
- Tentative Deadline: November 21

PRIMARY BARRIERS IDENTIFIED

Education and Outreach

- Examples include:
 - Lack of awareness of EV models, plugs and charging infrastructure
 - Utility role – budget for Marketing, Education and Outreach (how much and what?), web portals, ride and drives
 - Lack of differing educational awareness for the various use types

Costs of Charging Infrastructure

- Examples include: procurement costs, requirement and operational costs, and soft costs

BIPOC and Underserved communities

- Examples include: split incentives, access to capital, and access to used EV market etc.

Utility Programs, Application, and Investments

- Examples include: interconnection, rate design, and planning issues etc.

OPPORTUNITIES

- Develop a collaborative approach to developing these infrastructure programs with all the potential “Partners” (See Programs & Partnerships WG)
- Accelerated EV adoption and transportation electrification activities, if managed correctly, could lead to the following opportunities:
 - Avoid GHG emissions
 - Economic development opportunities
 - Downward pressure on rates over time
 - Utility investments in larger volumes to achieve volume discounts
 - EV Infrastructure in underserved communities paired with equitable transportation options
 - Grid technology advancements
 - Consumer awareness for savings and incorporating benefits in overall education and outreach
 - Engaging underserved communities

E Q U I T Y W O R K I N G G R O U P

D a n a e P r e s s l e r

EQUITY PERSPECTIVES

Objective: Determine how EV policies and programs can **grow access** to Transportation Electrification (TE) in **underserved communities**.

As used here, **access** may include, but is not limited to 1) ability to purchase or lease an electric vehicle (EV), 2) ability to utilize EV ride-sharing services, 3) electrifying modes of public transit, 4) availability of EV charging infrastructure, 5) job training and employment opportunities in industries associated with EVs and related infrastructure and 6) awareness of EV choices, benefits, and incentives.

As used here, **underserved communities** refer to populations with inadequate access to TE due to economic, social, cultural, or geographic circumstances. Underserved communities may include, but are not limited to 1) low-income households, 2) communities of color, 3) non-English speaking communities, 4) Tribal Nations, and 5) rural communities.

FINDINGS

Ensure an Equitable TE Process

- Center voices and experiences of underserved communities in development of TE plans, programs and policies
- Create structures to prioritize equity and track progress throughout development and implementation of TE Plan
- Build support for TE equity from key stakeholders
- Develop equitable funding mechanisms

Provide Underserved Communities Access to TE through EV Ownership

- Reduce upfront cost to purchase/lease an EV and reduce cost of battery replacement
- Increase availability of affordable EVs
- Equitably distribute charging stations with fair pricing models
- Raise awareness using right messages and right messengers

FINDINGS

Electrify Alternative Modes of Transportation and Target Services to Underserved Communities

- Public transit
- School buses
- Ride-sharing programs
- Micro-transit (e-bikes, scooters, etc.)
- Autonomous shuttle services

Provide Underserved Communities Access to TE Careers through Job Training and Education

- Provide training programs to support transition to TE jobs to avoid job losses in ICE repair services, etc.
- Create pipelines and training programs in prisons to provide access to green jobs
- Develop Career and Technical Education (CTE) programs in high schools and community colleges
- Allocate more funding for trade-focused R&D areas for high school and community colleges

PROGRAMS & PARTNERSHIPS
Caryn Potter & Amanda Reeve

SUBGROUPS

Work Product 1: “Barriers & Opportunities”

- Tentative Deadline: November 10

Work Product 2: “Intervention Strategies”

- Tentative Deadline: November 24

Work Product 3: “Case Studies & Arizona Gap Analysis”

- Tentative Deadline: December 21

ACQUISITION FUNNEL

Residential Customers

- New Adopters/EV Interested
- Intermediate
- Advanced

Non-Residential Customers

- Small-Medium Business
- Commercial-Industrial Enterprises

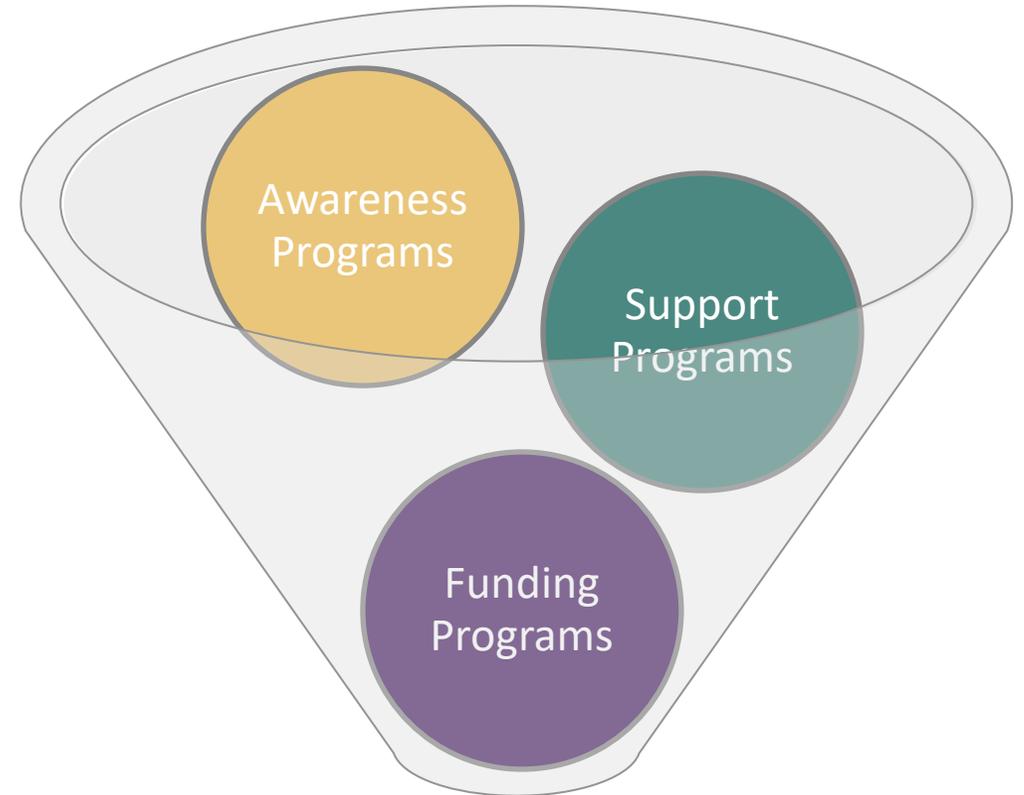
Government Agencies

- Cities, Counties, and Sovereign Nations
- Elected Officials and Policymakers
- Regulators

Electricity Providers

- Utilities

EVSPs, TNCs, and OEMs



Overall Program Funnel
Evaluation

BARRIERS & OPPORTUNITIES

High-Level Primary Barriers Identified

High-Level Opportunities Identified

AWARENESS

- General EV awareness is low
- Seasoned EV customers are at a different place in the funnel than non-seasoned EV customers
- Range anxiety: Fear of not being able to charge when needed most (*ex. charging during a roadtrip*)
- Limited to no experience to managing battery life for an electric vehicle and how it differs from the gas-powered, conventional vehicle driving experience

- Create an EV Roadmap
- Lead by example – fleet conversion and charger deployment
- Promote EV fleet vehicles when deployed on mass scale (*ex. Amazon delivery vans out in communities with promotion wraps touting benefits of it being an EV vehicle*)
- Conduct education campaigns specifically geared towards legislators

SUPPORT

- Limited vehicle diversity and models to choose from
- Inconsistent model availability from state to state
- Few pricing options to meet customer needs
- Dealership salespersons may have limited education on how to sell or discuss EVs with customers, or may be opposed to the idea of EVs

- Create cost comparison tools for EV options
- Encourage vehicle manufacturers to incentivize vehicles that are more expensive up front than other models
- Cross-promote charging stations, supportive EV dedicated rate design, and electric vehicle models
- Ensure regulatory lag doesn't hinder the growth of programs for all partner-types
- Support Right-To-Charge legislation
- Support EV-Ready building codes

BARRIERS & OPPORTUNITIES

High-Level Primary Barriers Identified

- Financial incentives/rebates for EVs and charging equipment are not high enough
- DC Faster Chargers have a high price point but low utilization rate in rural areas, making the incentive to install them lower
- Not enough diversified rate plans for to incentivize managed charging
- Limited EV charging access in Multi-Unit Dwellings (MUDs)
- Limited charging network impacts customer confidence
- No community organization-vetted plans for public charging infrastructure maps
- Lack of long-term planning to ensure customer connections to the electric grid for EVs are as efficient as possible
- Limited clarity regarding which business model works best for “third places” (workplace charging and public city locations)
- Lack of TE policies requiring compliance towards state and federal regulations
- Lack of long-term integrated distribution planning to ensure customer connections to electric grid for EVs is as efficient as possible

High-Level Opportunities Identified

FUNDING

- Arizona state government or utilities incentivize EV charging stations and related equipment, electrical service upgrades required for the installation, design and engineering services, construction, and installation (materials and labor), service, warranty, and O&M agreements as a way of getting closer to cost-parity
- Offer robust, tiered EV Charger incentives where funding levels are commensurate with specific scenarios
- Offer a "non-traditional offset" for larger companies to purchase EVs
- Support purchasing collaboratives
- Consider home charging capabilities for all customer types
- Determine the best locations for charging in alignment with neighborhood typology
- Test multiple models for third place charging through pilot programs

GMT PERSPECTIVES

Transit Fleets - We had good Statewide Transit Participation with input from several providers, including Mountain Line (NAIPTA), Valley Metro, Sun Tran

Regional Planning Associations – We received input from organizations, like PAG/RTA

Consultants & Advocates - We had good participation which brought perspective beyond Arizona

Public Fleets – Participation in the process, similar concerns as transit fleets although different operational needs

Private Fleets - No direct participation, although team members have had conversations about concerns, including with the Arizona Trucking Association

PRIMARY BARRIERS IDENTIFIED

Vehicles

- Costs (Capital vs Life Cycle)
- Performance vs Fleet needs
- Climate and Automation Impacts
- First Generation Technology (BEB and FCEV)

Electrical Vehicle Service Equipment

- Charging Needs (speed vs Costs)
- Location (Depot vs On route)
- Electric Capacity – on the grid and at the facility
- Rate Structures

Emerging Technology

- Understanding and Experience
- Vehicle and EVSE adoption

STRATEGIES & RECOMMENDATIONS

Fleet Management Plans – Fleet needs, vehicle performance, electrical needs & availability, costs

Cooperative Purchasing - For Vehicles and EVSE

Coordination and Partnerships - Stakeholders and Electric providers to determine needs, locations, and timing

Incentives - To mitigate risks to adoption; Grant and Financing programs, rate structures

Policy - To incentivize and promote EV adoption

Knowledge Sharing - Forums, working groups, pilot studies

VEHICLE GRID INTEGRATION

Varun Thakkar

KEY QUESTIONS TO CONSIDER

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?

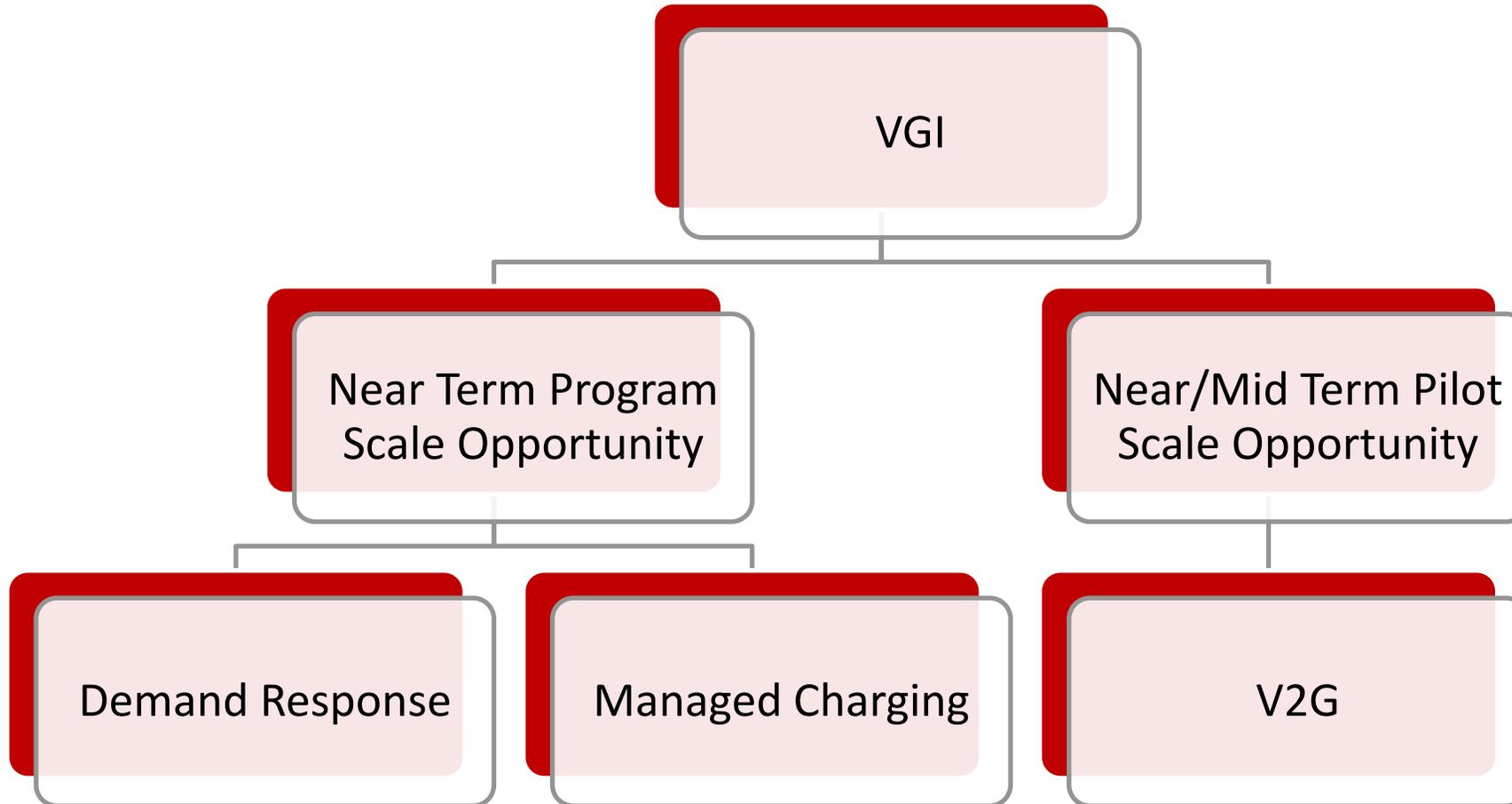
Managed Charging

- 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 increased 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?

OPPORTUNITY HIERARCHY



PRINCIPLES FOR MANAGING EV CHARGING TIMES AND DEMAND RESPONSE

Stacked Approach for Infrastructure and Program Design

- Load sharing design for maximizing building's electrical equipment and distribution system transformers, as well as maximizing grid and ratepayer benefits when charging EV's efficiently
- Designing DR/Managed Charging programs to do the following:
 - Absorb daytime solar production and avoid curtailment
 - Mitigate artificial peaks created in response to TOU rates
 - Having EV charging work in concert with other DER and load shifting devices

OPPORTUNITIES FOR MANAGING EV CHARGING TIMES AND DEMAND RESPONSE

Smart/Responsive Rate Design Guiding Principles

- Rate design that aligns evolving load and production profiles:
 - Pricing signals that incentivize customers to charge EV's at efficient times of the day, while providing signals to continue reducing demand spikes and energy consumption
 - As power generation continues to decarbonize, it is critical to evolve rate structure to align with grid and customer needs
 - Capturing the scale of opportunity in residential vs commercial rate design
 - Without advance customer education and awareness, rate design alone will not drive managed charging, and will cost ratepayer's more money

FUTURE V2G PROGRAMS

Upfront Barriers

- Today hardware costs, technology, maturity, and compatibility are a barrier to market transformation
- Platform evolution

Early Pilot Opportunities

- Residential Solar Customer – Onsite Consumption and Peak Shaving
- School Bus – Grid Management Around Set Operating Hours
- Workplace – Solar absorption that allows for exporting energy for EV charging for optimal times

All three of these opportunities have longer dwelling times and shorter routes.

Q&A

N E X T S T E P S

CALENDAR OF EVENTS

| Event | Date | Objectives |
|------------------------|----------------------------------|---|
| Working Group Meetings | November - Mid-December | <ul style="list-style-type: none">Working groups finalize their feedback products and/or deliverables |
| Plan Development | November - January | <ul style="list-style-type: none">E3 will draft the Gaps Analysis & Recommended Actions sections of the report, incorporating Working Group input from deliverables |
| Workshop 3 | Mid- to Late-January (Tentative) | <ul style="list-style-type: none">E3 presents draft TE plan including the Gaps Analysis & Recommendations Actions sections |
| Plan Finalization | February (Tentative) | <ul style="list-style-type: none">E3 finalizes the Phase II Plan, incorporating input from working groups on Gaps Analysis & Recommend Actions sections |

A P P E N D I X

E Q U I T Y W O R K I N G G R O U P

BARRIER: Voices of underserved and underrepresented communities may be missing from this stakeholder process

OPPORTUNITIES:

- Continue to identify stakeholders and craft inclusive approaches to empower communities to have a voice in developing TE plans, programs and policies.
- Analyze demographic data across the state to help inform where gaps are (the company HDR has useful GIS data).
- Listen to the needs of BIPOC communities first. Focus groups and surveys may be useful tools, but conversations need to happen with community-based organizations, faith-based organizations, and local trusted community leaders and representatives.
- Partner with community-based organizations to build trust and ensure TE materials and messages are culturally sensitive, relevant and available in key languages.
- Including community voices in policy development can help avoid unintended consequences such as gentrification.

BARRIER: Lack of structures in place to ensure equity is prioritized, and progress is tracked as TE Plan is implemented could result in further disparities

OPPORTUNITIES:

- Set up reporting structures to research and assess TE equity issues, identify and track key indicators.
- Set rules to ensure that high percentage of investment in EV upgrades (30-40%) directly benefit low-income communities and track progress.
- Establish Equity Advisory Council or similar body

BARRIER: Insufficient support from key stakeholders to consider and advance equity throughout TE planning and implementation process could exacerbate existing inequities

OPPORTUNITIES:

- Center equity into all aspects of TE planning process, do not relegate it to one section of the plan.

BARRIER: High upfront cost to purchase/lease EVs puts them out of reach for many households

OPPORTUNITIES:

- Vouchers, rebates, tax credits and sales exemptions to offset costs and improve financing options.
- Targeting vouchers exclusively to low-income drivers increases equity and cost-effectiveness of the voucher by directing funds to those who need it most.
- Trade-ins for ICE vehicles will also help transition to TE.

BARRIER: Unequal access to charging, especially for households renting apartments or multifamily units without dedicated garage, carport, or parking space with electrical outlet

OPPORTUNITIES:

- Provide free public charging in low-income communities.
- Utility companies could adopt set of rules governing equitable investment in charging infrastructure.
- Cities and towns should adopt ordinances and standards requiring installation of EV charging stations, with a focus on providing free/low-cost charging for multifamily residences and workplace charging.
- Provide EBT-type cards for fast charging for low-income individuals.

BARRIER: High cost of battery replacement in used EVs

OPPORTUNITIES:

- Insurance and/or warranties provided by auto manufacturer.
- Utilities could subsidize batteries in exchange for managed charging. Program could be targeted to low-income households and reduce cost of purchasing an EV.

BARRIER: Limited availability of EVs

OPPORTUNITIES:

- Encourage auto dealers specialized in selling EVs to locate near low- and moderate-income communities and provide equitable financing options (monitor for predatory lending).

BARRIER: Insufficient information on EVs (AZ residents and auto dealers)

OPPORTUNITIES:

- Listen to the needs of disadvantaged/underinvested communities and create programs and informational campaigns on TE that resonates with the community and uses relevant mediums and messengers.
- Provide training and education for auto dealers on EV benefits and incentives, especially for low-income consumers.

BARRIER: Very limited access to TE for households without access/desire to own a personal vehicle and who rely on public transit, ride-sharing, or other means of transportation.

OPPORTUNITIES:

- Subsidize or provide public electric transportation targeted to raise transportation equity.
- Incentivize/require public buses to be electric.
- Incentivize/require school districts to transition to electric buses.
- Incentivize/require EV adoption for ride-sharing.
- Develop public ride-sharing programs targeting service to low-income communities.
- Cities and towns to adopt policies that support road access for electric microtransit (bicycles, scooters, etc.)

BARRIER: EV charging on Tribal Nations may suffer from lack of basic infrastructure

OPPORTUNITIES:

- Explore opportunity for fleet electrification for Tribal governments.

BARRIER: Expensive infrastructure may dissuade owners of multifamily housing units from installing EV chargers

OPPORTUNITIES:

- Promote availability of manufacturer agnostic charging stations.
- Utilities could offset some of the costs to developers.
- Cities and towns could require EV-Ready or EV-Capable parking spaces in new developments (it is significantly cheaper to build infrastructure at time of development than retrofitting existing construction).

BARRIER: Insufficient planning for existing workers could lead to job losses for individuals in ICE repair services, etc.

OPPORTUNITIES:

- Create training programs to support transition.

BARRIER: Limited training for high school career and technical education in TE could lead to lack of skilled labor market

OPPORTUNITIES:

- Develop Career and Technical Education (CTE) programs in high schools and community colleges, especially those serving primarily low-income and underserved communities.
- Allocate more funding in trade-focused and research and development areas for high school and community college programs.

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OPPORTUNITIES:

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BARRIER: Limited training for high school career and technical education in TE could lead to lack of skilled labor market; same issue with ex-felons other disenfranchised groups

OPPORTUNITIES:

- Develop Career and Technical Education (CTE) programs in high schools and community colleges, especially those serving primarily low-income and underserved communities.
- Allocate more funding in trade-focused and research and development areas for high school and community college programs.
- Create pipelines and training programs in prisons and provide access to green jobs.