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# Valley Pathways Study:

## Building a Competitive, Clean Economy

Public Webinar: Study Preliminary Findings

February 29, 2024



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# Welcome

**Laura Duncan**

Senior Project Manager  
Tennessee Valley Authority



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# About Today's Meeting

A recording of this presentation will be available on the UT Baker School Website at:

<https://baker.utk.edu/valley-pathways-study/>

There will be an opportunity for questions at the end of the presentation using the Q&A function. We will also respond to the questions that were pre-submitted during registration.

Questions we don't have time for today will be answered in writing and posted online. Registrants will be notified when those responses are available.

# Agenda

- Welcome
- Project Overview
- Study Findings
- Next Steps
- Q&A

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# Project Overview

## Dr. Charles Boyd Sims

TVA Distinguished Professor of Energy & Environmental Policy  
Director of the Center for Energy Transportation, and Environmental Policy  
Howard J. Baker, Jr. School of Public Policy & Public Affairs  
University of Tennessee



# Study Partnership & Support



Mission is to address *critical energy and environmental challenges* by creating policy-relevant research and educational opportunities that integrate natural, physical, and social science.



Mission is to serve the people of the Tennessee Valley to make life better, with a focus on Energy, Environment, and Economic Development.



Significant, ongoing TVA experience working on major initiatives & engaging stakeholders

Guidehouse and VEIC are uniquely positioned to understand decarbonization pathways for the Valley and drive stakeholder alignment.



Experience conducting economy-wide decarbonization pathways modeling

- [Massachusetts 2050 Decarbonization Roadmap](#)
- [Duke Energy Carolinas Carbon Plan](#)

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# What is a Pathways Study?

A Pathways Study uses scenario-based analysis to compare several possible visions of the future to help determine the timing, scale, and effects of achieving greenhouse gas targets.

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**What paths are most feasible for the Valley to get to net zero by 2050?**



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**What impacts will these paths have on the Valley as a whole?**



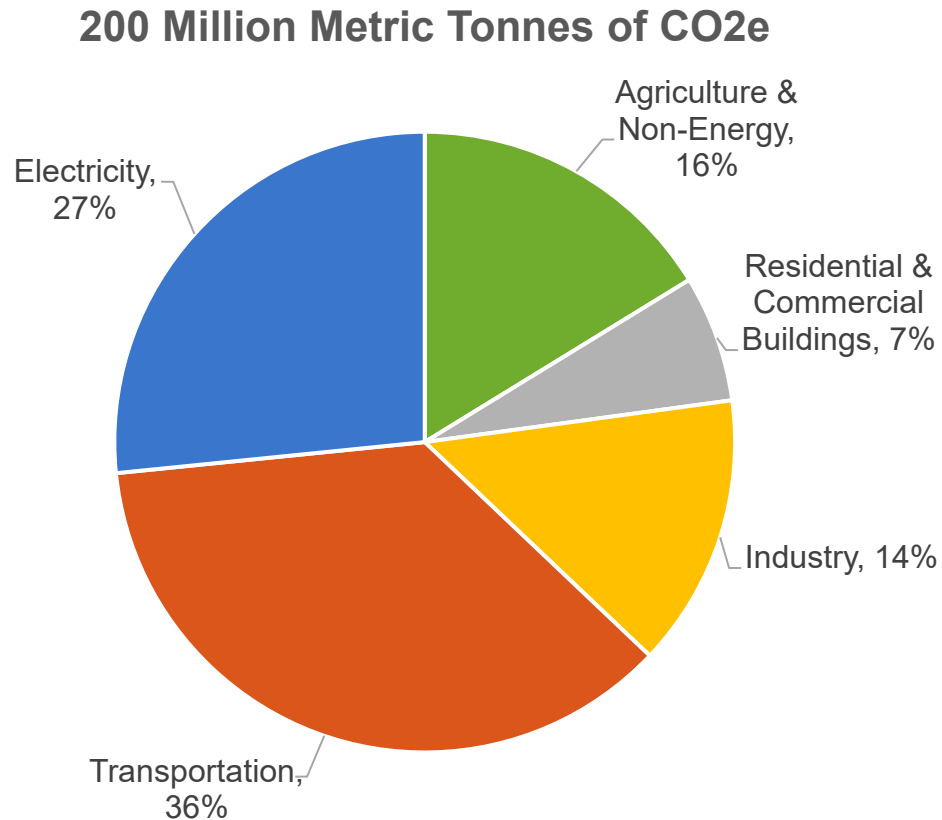
# Economy-Wide Study, Economy-Wide Stakeholders

- ❖ Ford Motor Company
- ❖ City of Knoxville
- ❖ Oak Ridge National Laboratory
- ❖ Southeast Energy Efficiency Alliance
- ❖ WestRock
- ❖ BrightRidge
- ❖ Tennessee State University
- ❖ University of Tennessee Chattanooga
- ❖ The Nature Conservancy
- ❖ Redstone Arsenal
- ❖ Tennessee Farm Bureau Federation
- ❖ Tennessee Interfaith Power and Light
- ❖ Tennessee Advanced Energy Business Council
- ❖ Tennessee Department of Economic Development
- ❖ Nashville Electric Service
- ❖ City of Chattanooga
- ❖ Tennessee Valley Public Power Association
- ❖ Middle Tennessee Natural Gas Utility District
- ❖ City of Florence Electricity
- ❖ UT Center for Transportation Research
- ❖ Tennessee Valley Industrial Committee
- ❖ Tennessee Department of Environment and Conservation
- ❖ Commonwealth of Kentucky Energy and Environment Cabinet
- ❖ Memphis and Shelby County Division of Planning and Development





# GHG Baseline for the Valley



## Key Insights

- 200 MMTCO<sub>2</sub>e is ~3% of US GHG emissions – the Tennessee Valley is home to about 10 million people, or about 3% of US population.
- Transportation is, by far, the largest source of greenhouse gas emissions in the Valley.
- Emissions from Buildings and Industry look small, but these sectors demand nearly 100% of the electricity that is generated for the Valley.
- Agriculture, waste, and other non-combustion emissions are a significant source of emissions in the Valley.

Tennessee Valley 2019 Greenhouse Gas Emissions (estimated). Commissioned by TVA and UTK Baker Center. Prepared by Guidehouse and VEIC. Draft, Nov. 2023.

# Foundations of a Clean, Competitive Economy

## Critical Actions

The pathways modeling conducted in this study highlight several critical actions and transitions that will be core building blocks for a Net Zero economy.

### Electric Vehicles



Electrifying light-duty vehicles is the single largest GHG reduction opportunity in the valley.

### Efficient Homes



High-efficiency heat pumps can abate GHGs, reduce utility bills, and relieve stress on the grid.

### Low-Carbon Fuels



Research and investments into low-carbon fuels can unlock deep reductions for aviation, trucks, and industry.

### 2050-Ready Communities



Integrated planning can drive sustainable growth and enable low-carbon transportation.

### Education & Innovation



Support every facet of a Net Zero economy, from workforce training to R&D for carbon capture.

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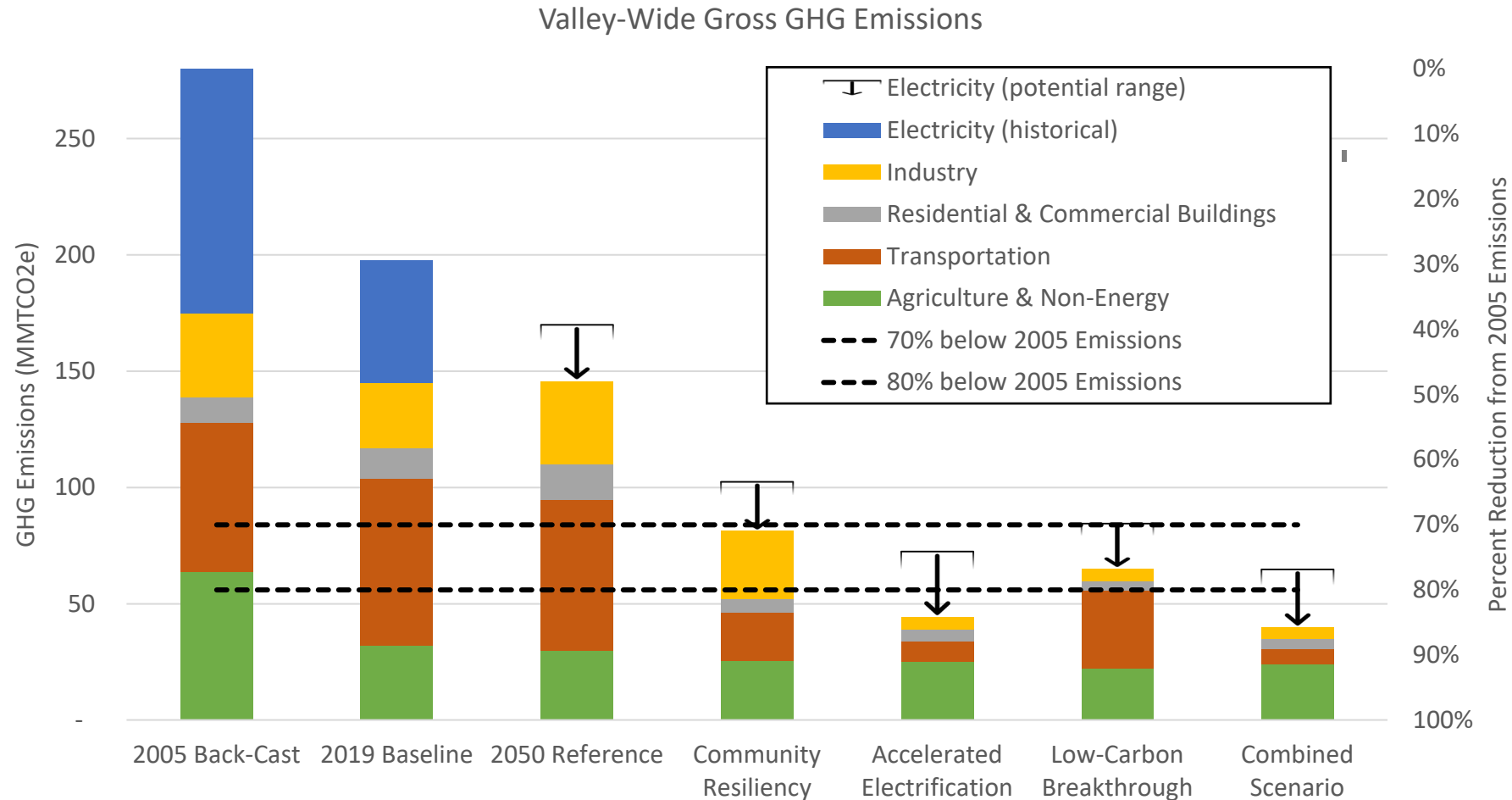
# Study Findings

**Benjamin Miller**

Director  
Guidehouse

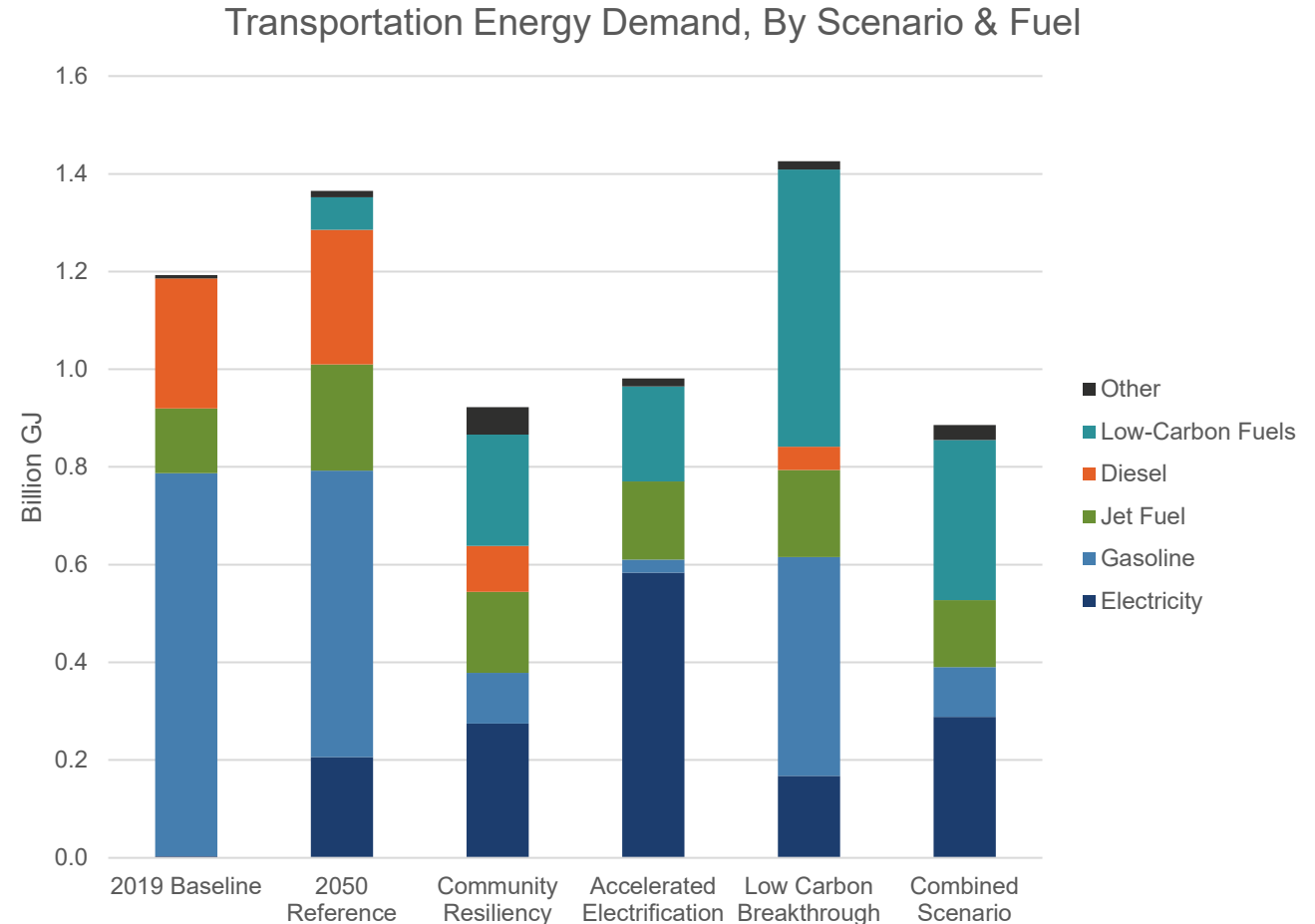


# High-Level Model Results



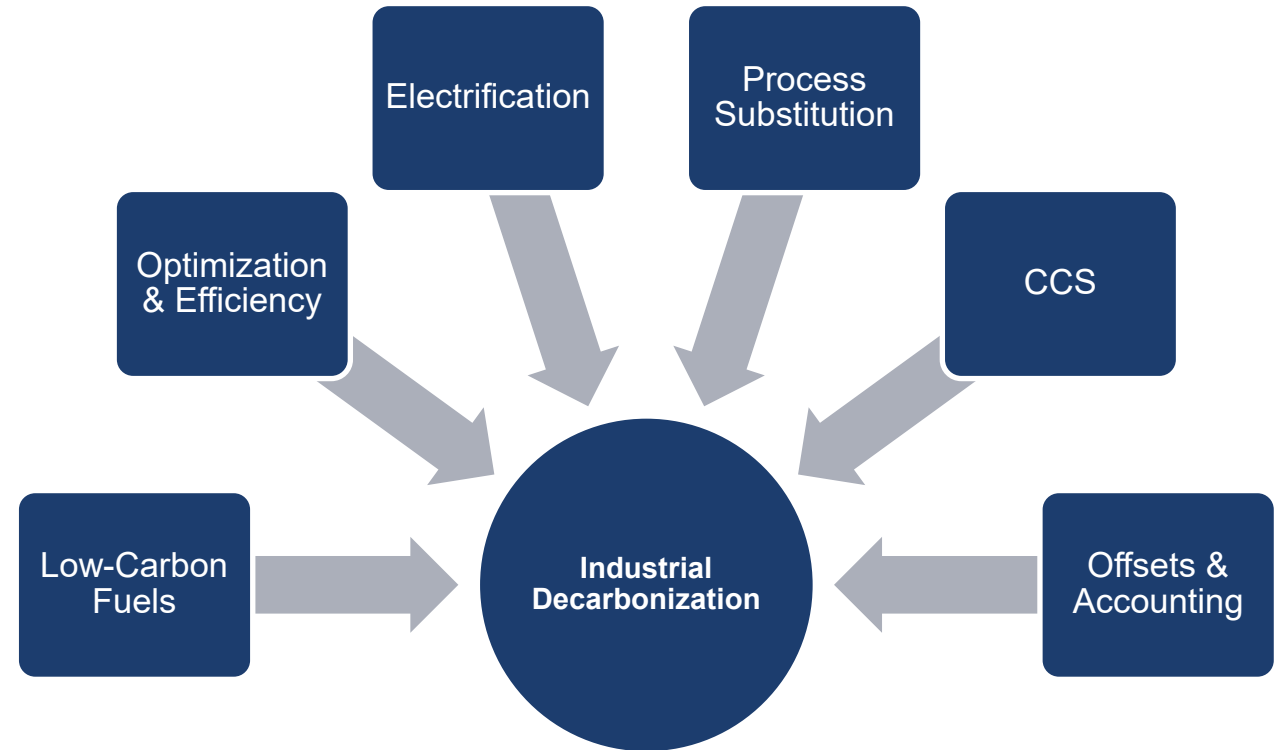
# Transportation Sector Decarbonization

- Transportation emissions are largest source of emissions in baseline – and largest opportunity for reductions.
- Passenger vehicles represent majority of transportation emissions – about 25% of Valley-wide emissions.
- Electrification offers the largest emissions reductions opportunity, although reducing VMT can help to limit grid impacts.
- Low-carbon fuels will be important for non-passenger vehicle modes.



# Buildings & Industry Decarbonization

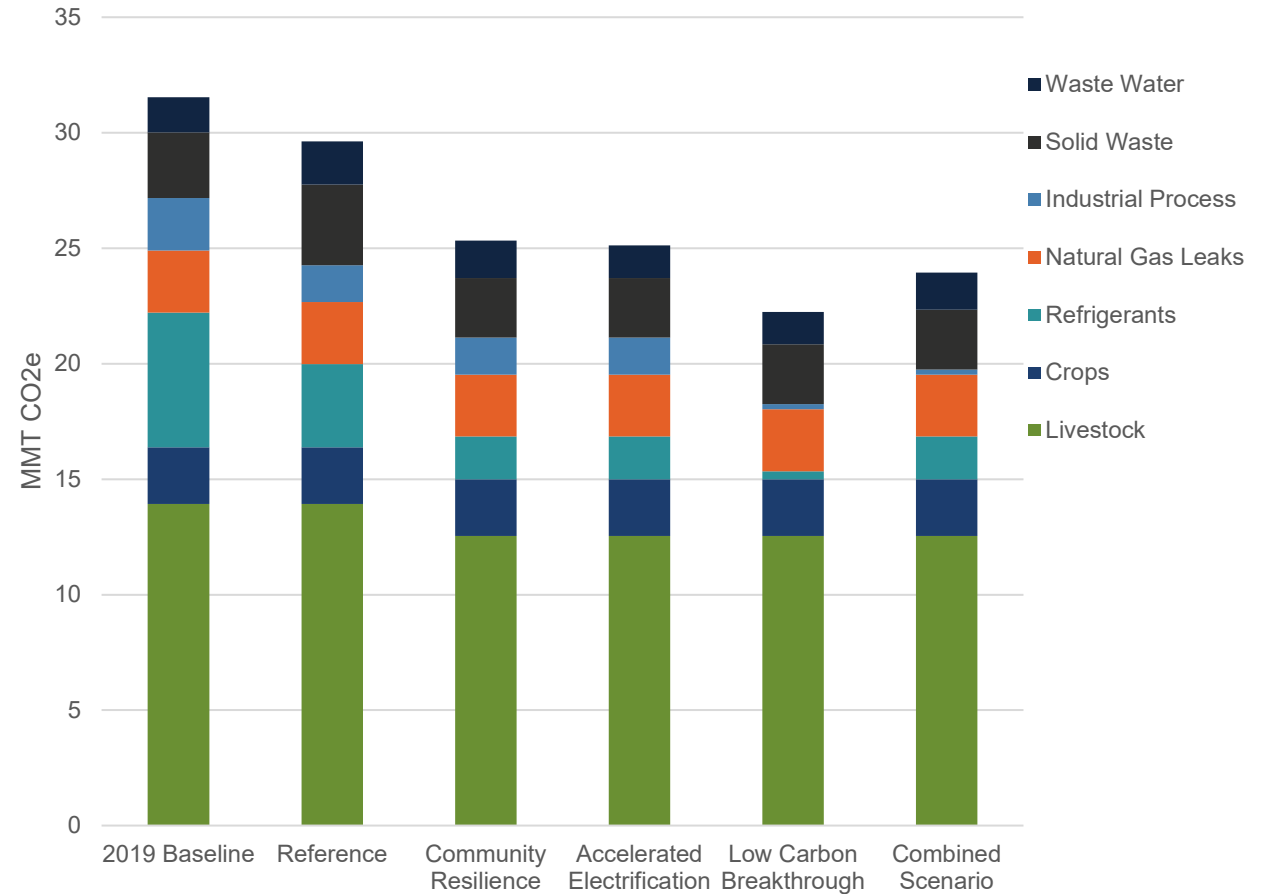
- Contrasting transportation, high electric HVAC penetration limits opportunity in residential and commercial buildings.
- “TVA-preferred” heat pumps can reduce electricity demands by >50%, save hundreds of dollars per month, and ease peak demand.
- A range of solutions will be needed for industrial decarbonization, from process innovation to low-carbon fuels.
- GHG accounting standards might be an important consideration.










# Non-Energy & Agriculture Emissions

- Non-energy sector is relatively small today, but the most difficult to decarbonize.
- Sector accounts for about 25% of 2005 emissions, but about 50% of 2050 emissions.
- Phase-out of HFCs drives majority of reductions.
- Process CO<sub>2</sub> is also addressable.
- Farming practices are already mostly no-till.
- Limited opportunities to reduce emissions from livestock (and human)... effluence.



# Barriers & Opportunities for Foundational Actions

Foundational activities face critical barriers but highlight key areas where concerted action or investment could unlock new progress.

Foundation	Electric Vehicles	Efficient Homes	Low-Carbon Fuels	2050-Ready Communities	Education & Innovation
					
Challenge	Lack of charging infrastructure	Capital costs of new equipment	Production scale and cost	Resource constraints	Accessibility and pipeline.
Solution	More charging infrastructure	New incentives to shift household economics	R&D, pilots for early movers.	Flexible funding and technical assistance	Engagement with key actors.



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# The Path Forward

**Danielle Wilmot**

Associate Director  
Guidehouse

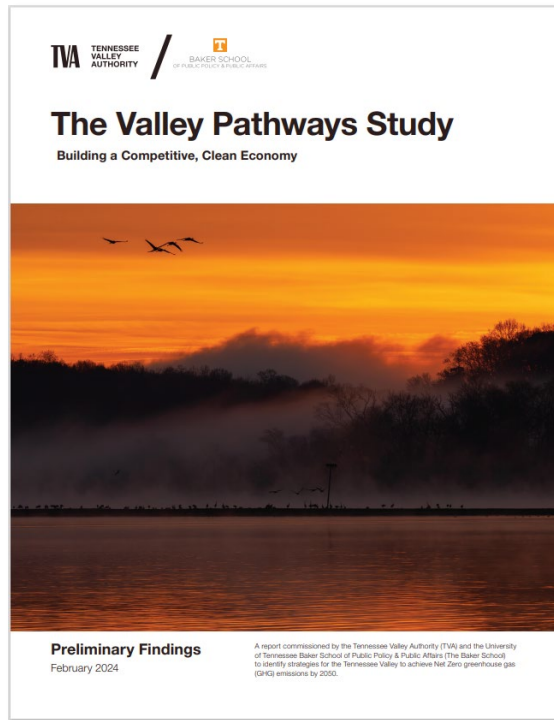


# Valley Pathways Initiative

Study

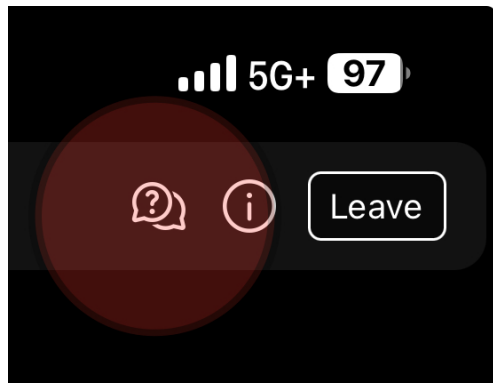
Actions

Results

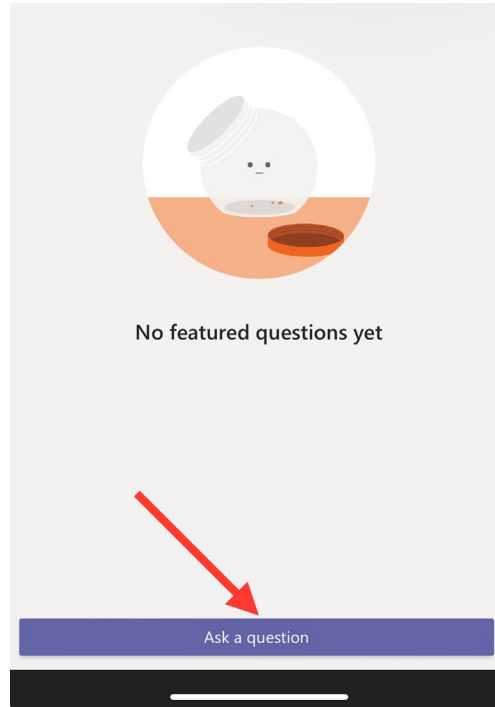


- Preliminary Findings Report
  - Public Webinar
  - Stakeholder Information Sharing & Feedback
  - Studies to address information gaps (challenges & solutions)
  - Opportunities to grow programs and initiatives
- A Competitive, Clean Economy

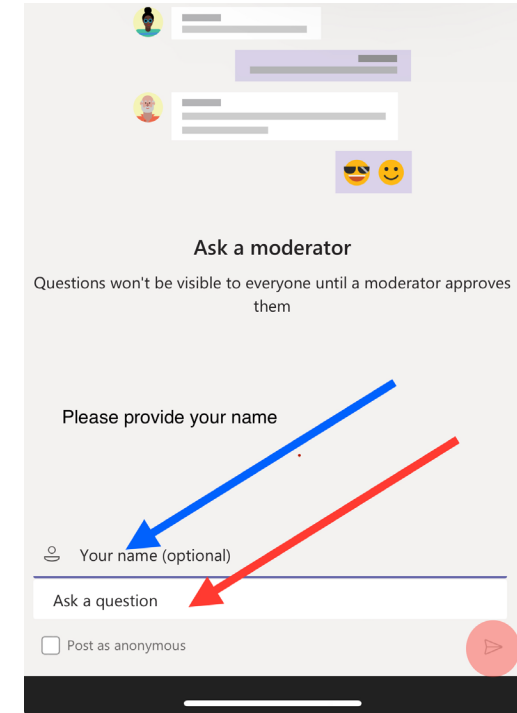
# Virtual Meeting Logistics – Asking Questions:



Locate the Q&A icon at the top of your Teams Event Window.



Tap the Ask a question button at the bottom.



Enter your name and question then click the Send button on the bottom right.

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# Q&A

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# Thank you!

Please stay in touch as the Valley Pathways Study continues to grow and evolve.

Sign up for the VPS mailing list and leave feedback on the study at

<https://baker.utk.edu/valley-pathways-study/>