Valley Pathways Study: Building a Competitive, Clean Economy

Public Webinar: Study Preliminary Findings

February 29, 2024
Welcome

Laura Duncan
Senior Project Manager
Tennessee Valley Authority
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
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.

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

- Massachusetts 2050 Decarbonization Roadmap
- Duke Energy Carolinas Carbon Plan

Guidehouse

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

Experience conducting economy-wide decarbonization pathways modeling

TVA

The University of Tennessee
Knoxville

BAKER SCHOOL
OF PUBLIC POLICY & PUBLIC AFFAIRS

TVA

TENNESSEE VALLEY AUTHORITY
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.

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

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 MMTCO2e 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.
## 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.

<table>
<thead>
<tr>
<th>Electric Vehicles</th>
<th>Efficient Homes</th>
<th>Low-Carbon Fuels</th>
<th>2050-Ready Communities</th>
<th>Education &amp; Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Electric Vehicle" /></td>
<td><img src="image2.png" alt="High-Efficiency Heat Pump" /></td>
<td><img src="image3.png" alt="Low-Carbon Fuels" /></td>
<td><img src="image4.png" alt="Energy Storage" /></td>
<td><img src="image5.png" alt="Education" /></td>
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<tr>
<td>Electrifying light-duty vehicles is the single largest GHG reduction opportunity in the valley.</td>
<td>High-efficiency heat pumps can abate GHGs, reduce utility bills, and relieve stress on the grid.</td>
<td>Research and investments into low-carbon fuels can unlock deep reductions for aviation, trucks, and industry.</td>
<td>Integrated planning can drive sustainable growth and enable low-carbon transportation.</td>
<td>Support every facet of a Net Zero economy, from workforce training to R&amp;D for carbon capture.</td>
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Study Findings

Benjamin Miller
Director
Guidehouse
High-Level Model Results

Valley-Wide Gross GHG Emissions

- Electricity (potential range)
- Electricity (historical)
- Industry
- Residential & Commercial Buildings
- Transportation
- Agriculture & Non-Energy
- 70% below 2005 Emissions
- 80% below 2005 Emissions

GHG Emissions (MMTCO2e)

Percent Reduction from 2005 Emissions

- 2005 Back-Cast
- 2019 Baseline
- 2050 Reference
- Community Resiliency
- Accelerated Electrification
- Low-Carbon Breakthrough
- Combined Scenario
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 CO₂ 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.

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<tbody>
<tr>
<td>Challenge</td>
<td>Lack of charging infrastructure</td>
<td>Capital costs of new equipment</td>
<td>Production scale and cost</td>
<td>Resource constraints</td>
<td>Accessibility and pipeline.</td>
</tr>
<tr>
<td>Solution</td>
<td>More charging infrastructure</td>
<td>New incentives to shift household economics</td>
<td>R&amp;D, pilots for early movers.</td>
<td>Flexible funding and technical assistance</td>
<td>Engagement with key actors.</td>
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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

The Valley Pathways Study
Building a Competitive, Clean Economy

Preliminary Findings
February 2004

The Wilson Report
Building a Competitive, Clean Economy

Valley Pathways Initiative

A Competitive, Clean Economy

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The Wilson Report
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Valley Pathways Initiative
Virtual Meeting Logistics – Asking Questions:

1. Locate the Q&A icon at the top of your Teams Event Window.
2. Tap the Ask a question button at the bottom.
3. Enter your name and question then click the Send button on the bottom right.

No featured questions yet

Ask a question

Ask a moderator
Questions won't be visible to everyone until a moderator approves them

Please provide your name

Your name (optional)

Post as anonymous
Q&A
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/