



# BREATHE

Reducing Emissions For A Resilient Region

ADVISORY COMMITTEE | JANUARY 29, 2024





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Reducing Emissions For A Resilient Region

## CITY OF KNOXVILLE

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# Today's Meeting

## AGENDA

- PCAP GHG Inventory
  - Methodology
  - Preliminary data
  - Projections
- PCAP Priority Measures
  - MSA outreach & findings
  - Proposed measures
- Next Steps

## HOUSEKEEPING

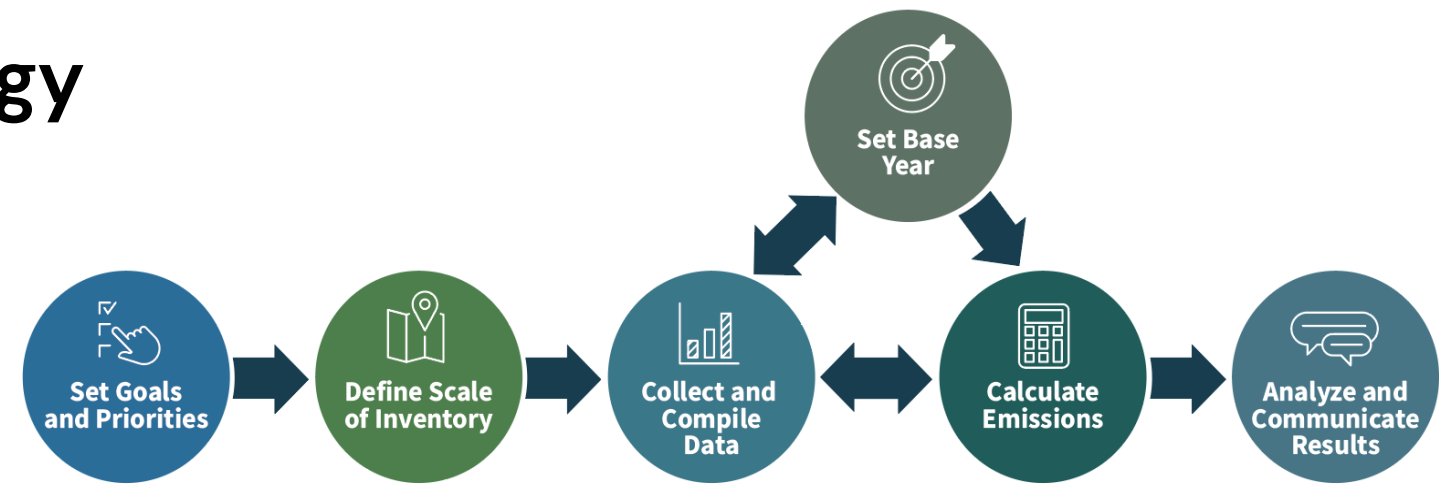
- Recording may be posted
- Mute
- Q&A at end



## Preliminary GHG Inventory

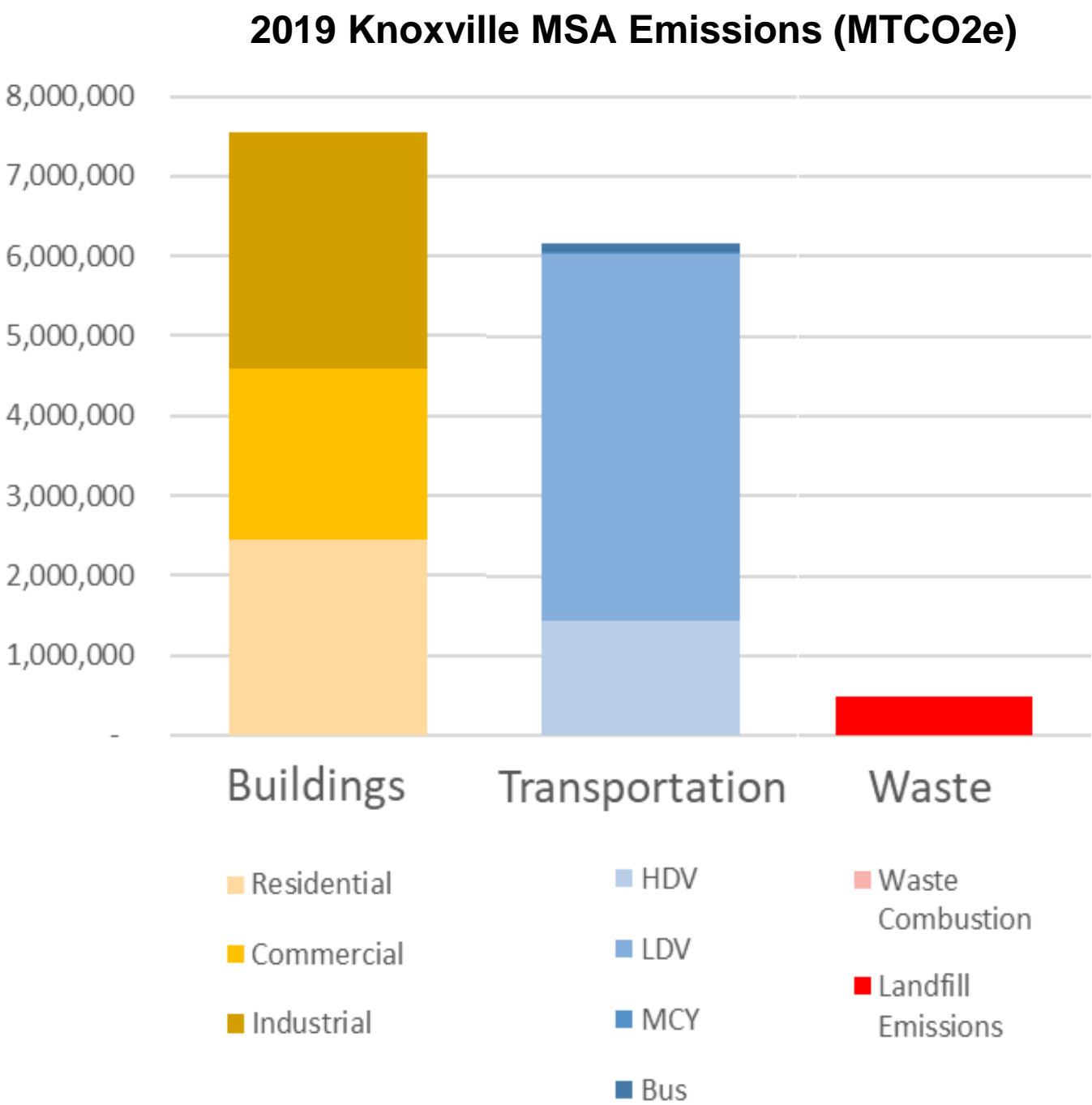
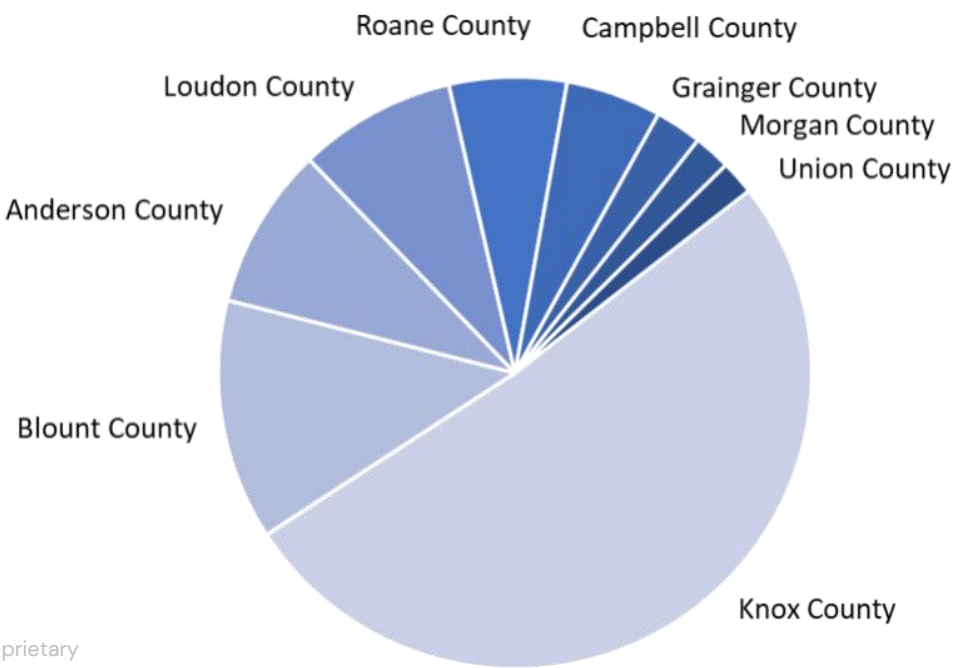
# GHG Inventory: Scope and Methodology

- **Scope:** Buildings, Transportation, and Waste
  - CCAP will expand to include other sectors (e.g., Agriculture)
  - CCAP will include more refined, bottom-up comprehensive emission estimates
- **Purpose:** used to develop projections and estimate GHG reductions from measures
- **Inventory Year:** 2019 (consistent with the state)
- **Global Warming Potential (GWP):** IPCC Fifth Assessment Report (recommended by EPA)
- **Population Data:** U.S. Census and projected data from the TN State Data Center
- **Methodology**
  - **Buildings:** Scaled state-level default emissions from EPA's State Inventory Tool (SIT) to the county by population
  - **Transportation:** EPA's MOVES4, which has on-road vehicle projection data for population, VMT, energy consumptions, and tailpipe GHG emissions by vehicle type and fuel type
  - **Waste:** Compiled EPA's Landfill Methane Outreach Program (LMOP) data
    - Annual MSW generated for each landfill only available in 2021; proxying 2021 annual MSW data for 2019
    - LMOP provides annual and cumulative MSW tons; total capacity of the landfill; and whether it has a landfill gas capture system in place
    - Waste Combustion Emissions: EPA GHGRP Facility-Level Information on Greenhouse Gases Tool (FLIGHT) – N/A for Knoxville MSA



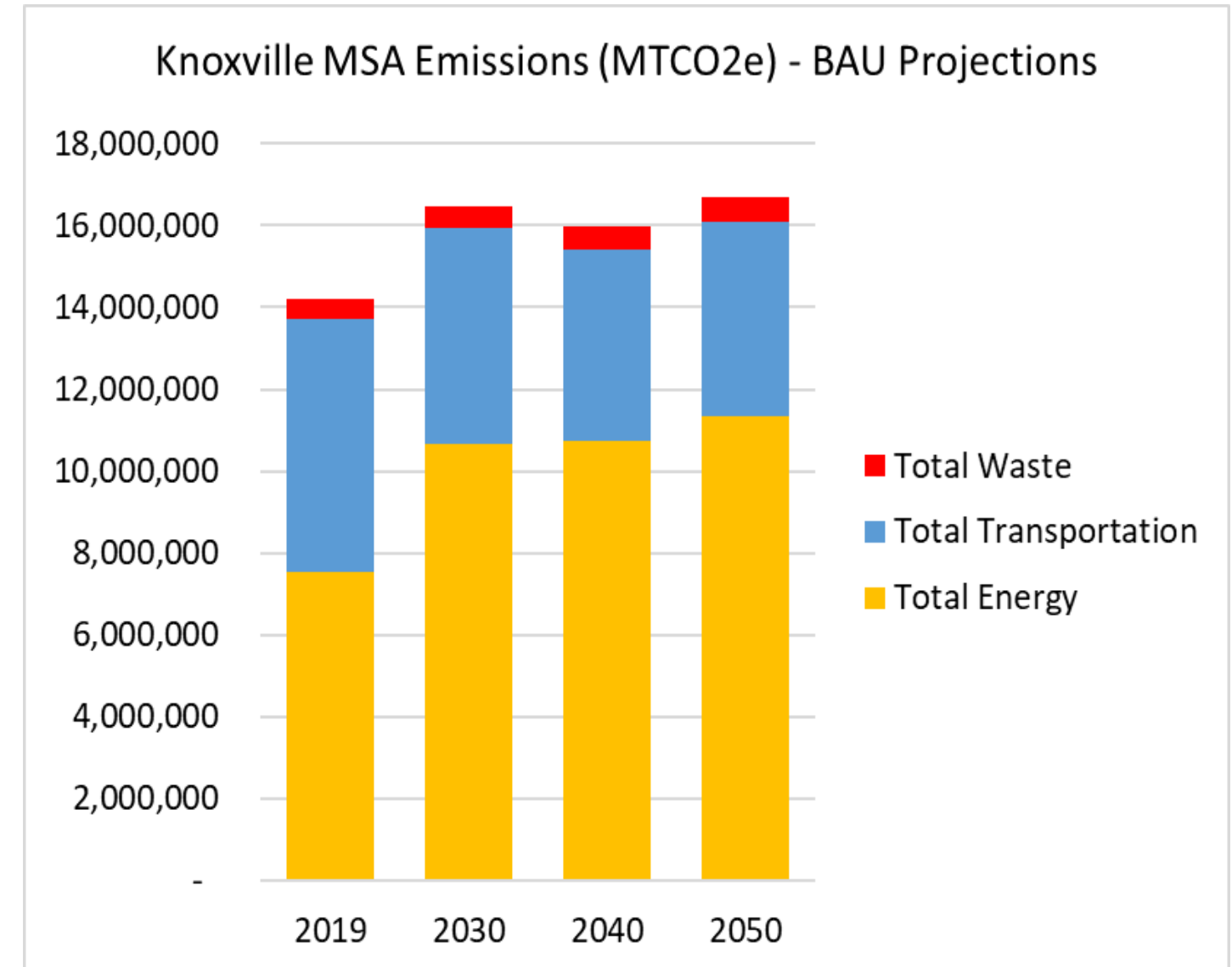
# GHG Inventory: Preliminary Results

County	Emissions (MTCO <sub>2</sub> e)
Knox County	7,290,632
Blount County	1,867,771
Anderson County	1,256,377
Loudon County	1,221,976
Roane County	909,352
Campbell County	741,403
Grainger County	360,817
Morgan County	285,076
Union County	263,086
<b>MSA</b>	<b>14,196,490</b>



# GHG Inventory: Business-As-Usual (BAU) Projections

- **Buildings:** Used EIA's Annual Energy Outlook (AEO) regional growth rates of projected energy consumption to project emissions
- **Transportation:** Run MOVES4 with default settings to create a BAU projection for population, VMT, energy and emissions from on-road vehicles.
  - Note MOVES includes fuel efficiency improvements for ICEVs.
  - Use AEO grid emissions factor projection to calculate emissions from the electricity consumption (from EV charging)
- **Waste:** MSW tons buried (and associated emissions) grow by the average population growth for the MSA region.
- **Methodology for Measure Quantification**  
*(forthcoming)*

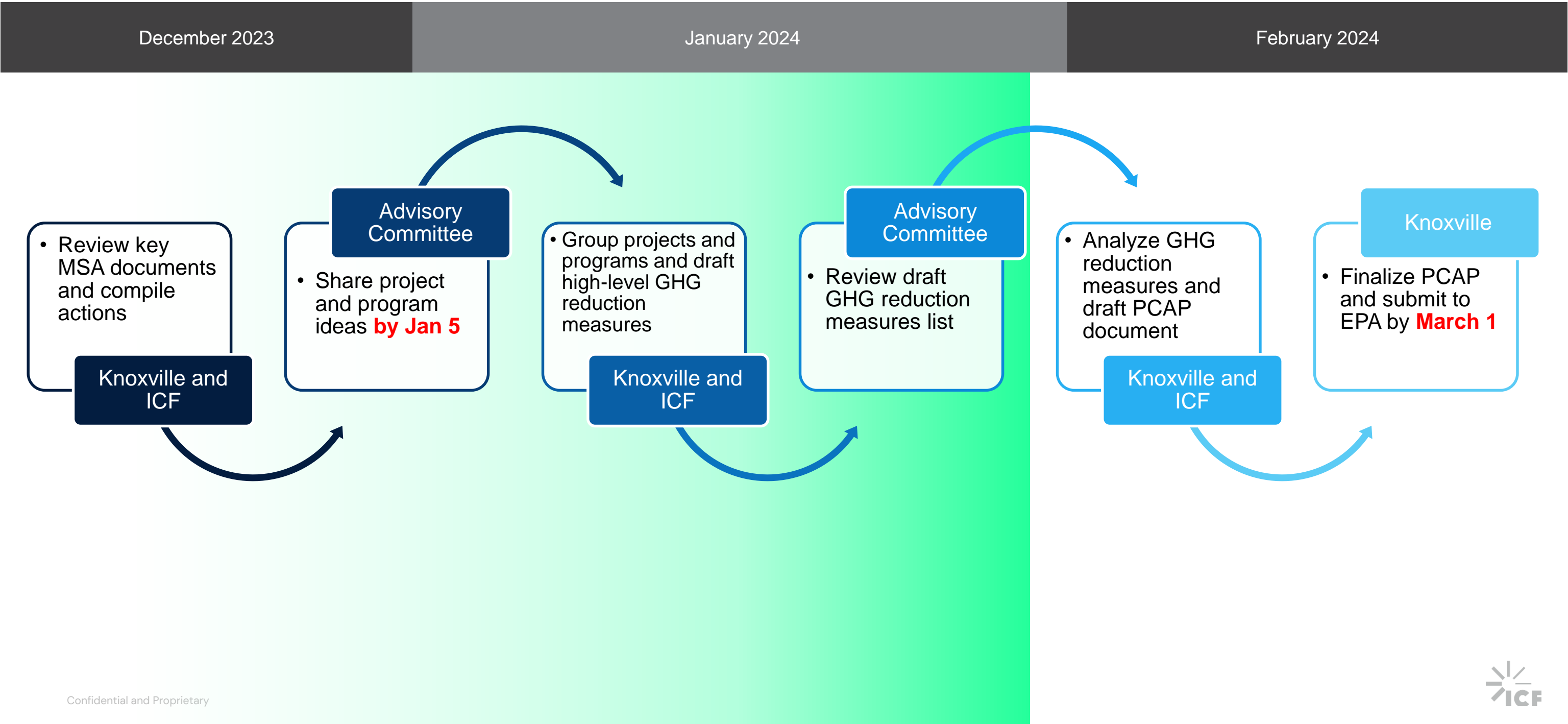




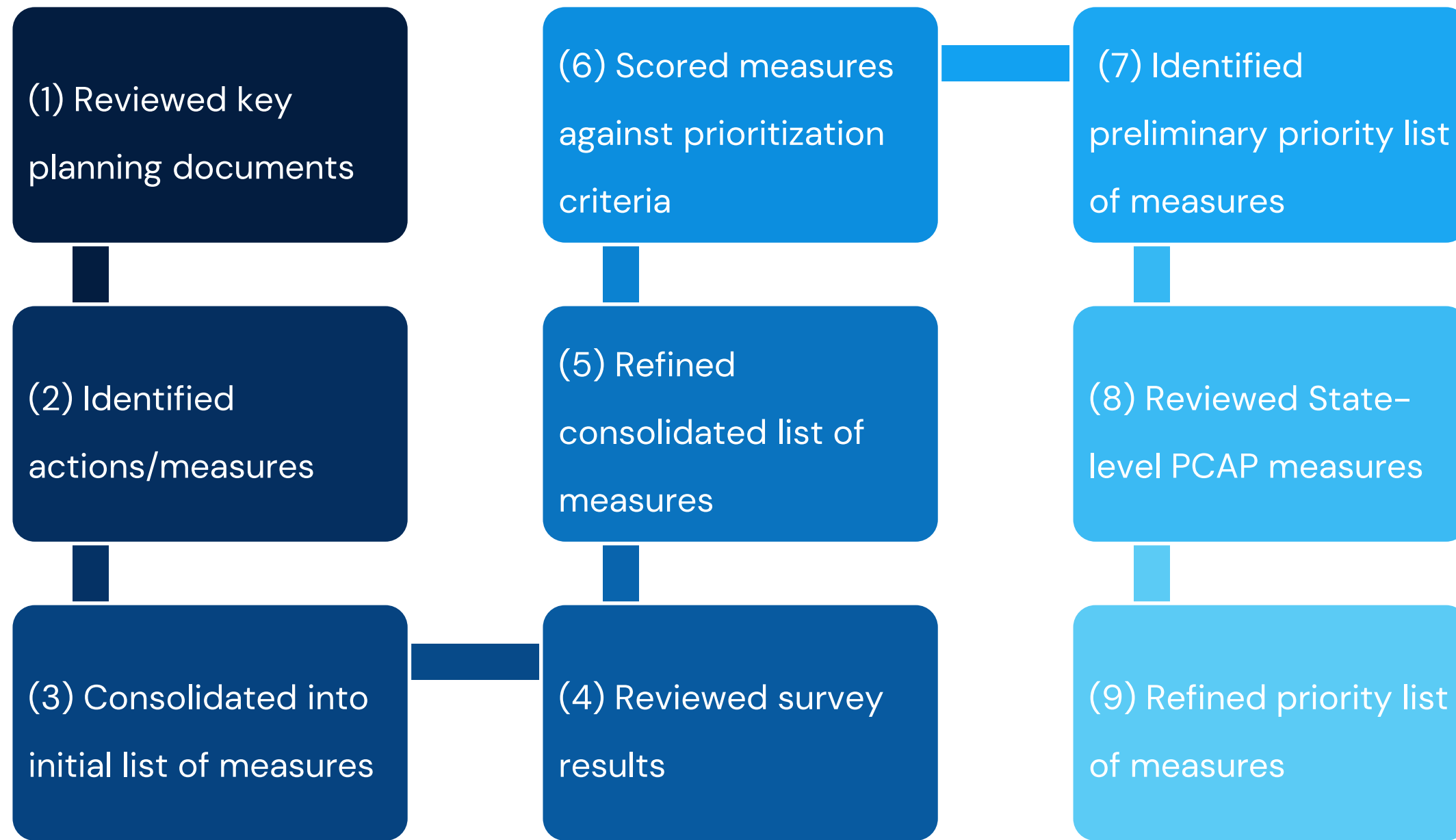
## PCAP Measures



# Process Recap: Selecting PCAP GHG Reduction Measures



# Measure Development and Prioritization – Process Overview



# Measure Development and Prioritization

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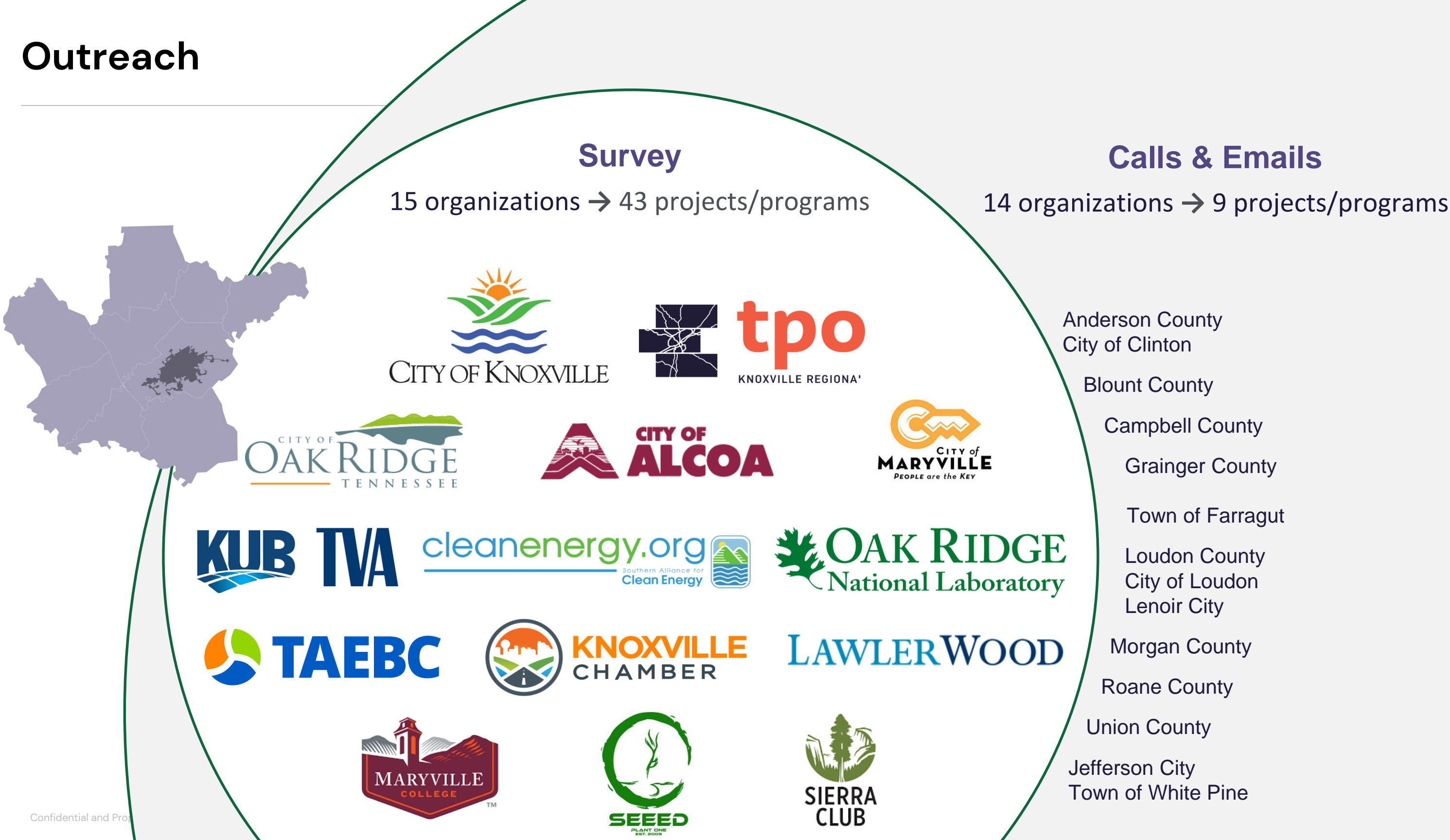
## Key Documents Reviewed

- TDOT Carbon Reduction Strategy
- Knox TPO 2045 Mobility Plan
- Multi-Jurisdictional Local Hazard Mitigation Plan
- Knoxville Energy & Sustainability Work Plan
- Knoxville Vision Zero Action Plan
- Knoxville Green Fleet Policy
- Knoxville Downtown Circulation & Mobility Study
- Knoxville Sidewalk Study
- Knoxville Urban Tree Canopy Report
- Knoxville State of the Urban Forest Report
- Knoxville Urban Forest Management Plan



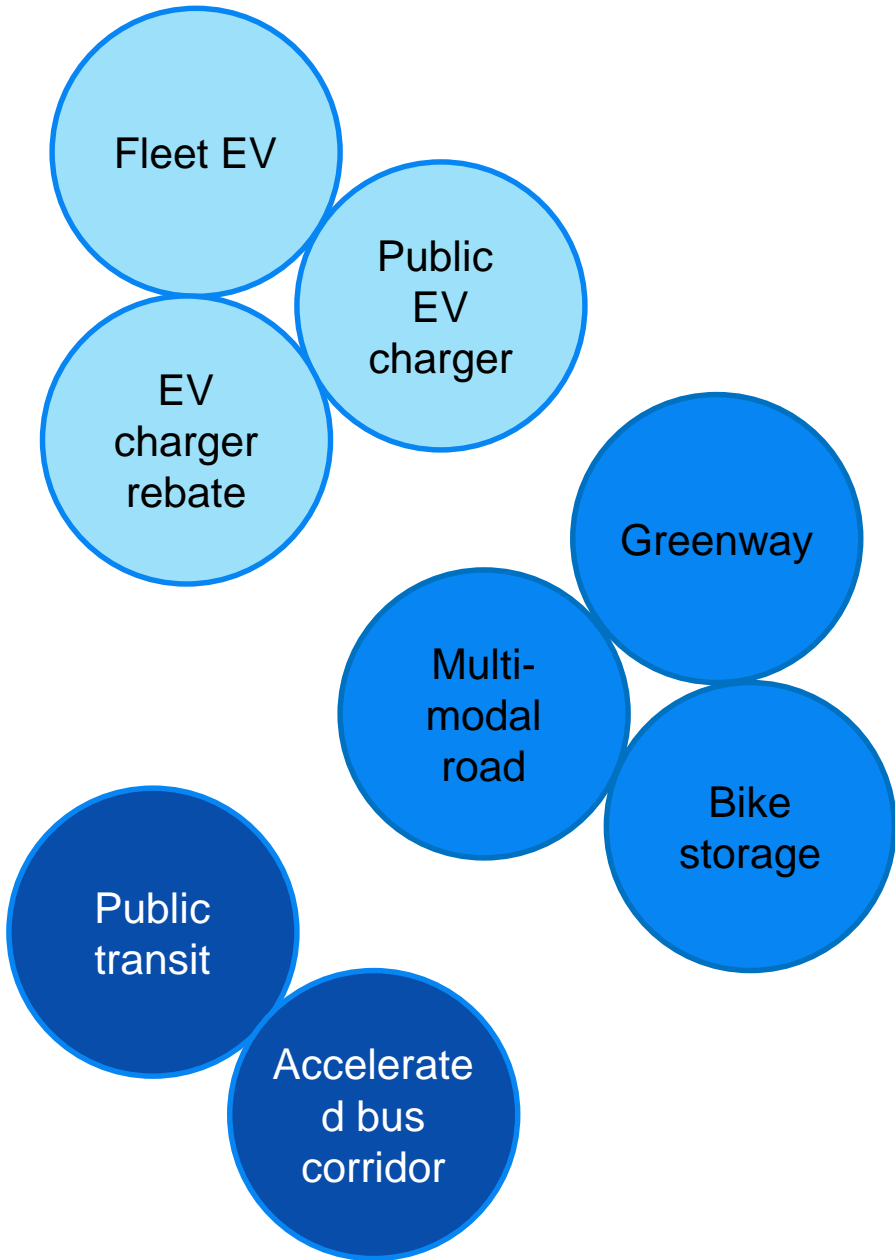
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# Outreach



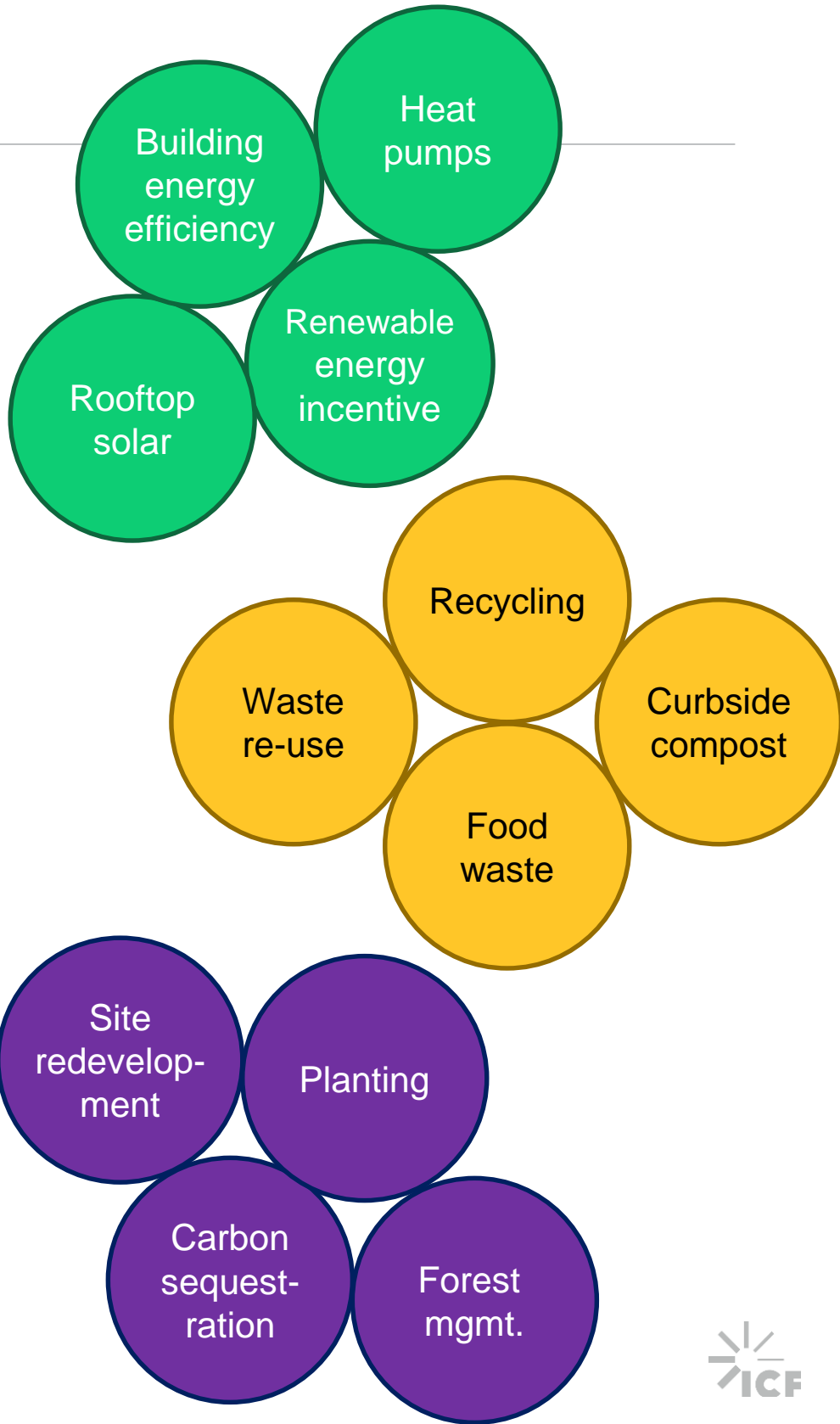


# Outreach



## 52 projects/programs from:

Anderson County  
Blount County  
City of Alcoa  
City of Knoxville  
City of Maryville  
City of Oak Ridge  
Keep Blount Beautiful  
Knoxville-Knox County CAC  
Knoxville Chamber  
Knoxville Utilities Board  
Oak Ridge National Lab  
Sierra Club  
TN Advanced Energy Business Council



# PCAP Measure Scoring Criteria

Factor	Definition	Scoring
Authority to implement	Is there a clear legislated or regulatory authority for this work?	0 (no) 1 (yes)
Lead Implementer	Is there a clear actor interested in moving this work forward, do they have experience with similar project types?	0 (no) 1 (yes w/o experience) 2 (yes w/ experience)
Impacts to LIDACs	To what extent could the measure benefit LIDACs relative to other measures?	1-3
GHG reduction potential	What is the estimated annual GHG reduction potential in 2050 (and 2030) compared to 2005?	1-5
Air pollution benefits	Will the measure result in an overall change in PM2.5, NOx, SO2, VOCs, air toxics?	-1 (no) 0 (undetermined) 1 (yes)

## Other Considerations

- Representative of projects identified in MSA survey responses
- Coverage by State-level PCAP measures

# Proposed PCAP Measures for Knoxville MSA

Sector	Potential Measure
Buildings	Amplify opportunities for and deployment of building energy efficiency upgrades.
Buildings	Study, develop, and implement strategies to electrify buildings.
Clean Electricity	Develop and invest in renewables.
Transportation	Expand electric vehicle infrastructure.
Transportation	Transition to electric and alternative fuel vehicles in public fleets and provide access to supporting charging or fueling infrastructure.
Transportation	Expand, improve, and encourage use of public transit.
Transportation	Boost active transportation and the use of alternative transportation systems.

# PCAP Measure Definitions

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## Buildings & Energy

### **P1: Amplify opportunities for and deployment of building energy efficiency upgrades**

- Applicable to residential, commercial, and municipal buildings.
- Applicable to existing buildings only.
- Includes weatherization programs.

### **P2: Study, develop, and implement strategies to electrify buildings**

- Applicable to residential, commercial, and municipal buildings.
- Applicable to existing buildings only.
- Includes incentives to purchase heat pumps, stoves, and water heaters.

### **P3: Develop and invest in renewables**

- Includes solar, wind, and geothermal.
- Includes distributed solar and community-scale investments.



# PCAP Measure Definitions (continued)

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## Transportation

### **P4: Expand electric vehicle infrastructure**

- Covers deployment of new charging infrastructure for all-electric vehicles or plug-in hybrids.
- Achieved through policy development and investment programs.
- Includes installations at public sites and by residential customers.

### **P5: Transition to electric and alternative fuel vehicles in public fleets and provide access to supporting charging or fueling infrastructure**

- Applicable to light-duty, medium-duty, and heavy-duty vehicles.
- Includes zero-emission vehicles (ZEVs), alternative fueled vehicles, and hybrid electric vehicles.
- Achieved through comprehensive strategy development and implementation.

# PCAP Measure Definitions (continued)

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## Transportation

### **P6: Expand, improve, and encourage use of public transit**

- Achieved through the adoption of dedicated lanes, infrastructure improvements, zero-emission vehicles, and transit subsidies.
- Includes investments that enhance coverage, service quality, frequency, and/or speed.
- Includes Results in reduction of vehicle miles traveled (VMT) by single occupancy vehicles (SOVs).

### **P7: Boost active transportation and the use of alternative transportation systems**

- Includes programs that increase the number of trips taken by walking, biking, and ride-sharing.
- Achieved through enhanced bicycle and pedestrian facilities, incentives to reduce SOV use, vanpooling promotion programs, hybrid work programs, and parking management policies.
- Results in reduction of VMT by SOVs.



Next Steps

# Immediate Next Steps

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- ASAP: Stakeholders + ICF finalize PCAP measure definitions/scope
  - **Advisory Committee: provide feedback by Tuesday, January 30**
- Next 2 weeks: ICF quantifies GHG emission reductions for PCAP measures
- Next 2 weeks: ICF + Three<sup>3</sup> develop LIDAC engagement plan for CCAP
- Mid-February: ICF + Knoxville prepare/finalize PCAP report
- Late February: Knoxville submits PCAP by March 1





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