Net-zero community-wide GHG emissions by 2050

Industrial Process Technical Advisory Group

July 17, 2014

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Agenda

- Resolution 20140410-024
- GHG Emission Sources
- Process, Deliverables & Schedule

Council Resolution

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- Council established goal: Net zero community wide greenhouse gas emissions by 2050
  - Prefers to achieve as soon as feasible
  - Emission reductions accomplished sooner are more important
- Review goals & objectives in 2007 Climate resolution
- Recommend:
  - Measurable interim targets starting with 2020, periodically to 2050
  - How and when annual progress reports will occur
  - How often to conduct comprehensive updates to the climate plan

Action Plans

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- Work with stakeholders to create action plans in the following sectors :
  - Electricity and Natural Gas
  - Transportation
  - Waste
  - Industrial Process

- Sector plans should include
  - GHG emissions resulting from existing plans
  - Short & long term actions
  - Secondary goals & measures for sector specific factors (VMT, renewables, etc.)
  - Feasibility & how other sectors could make up for shortfalls

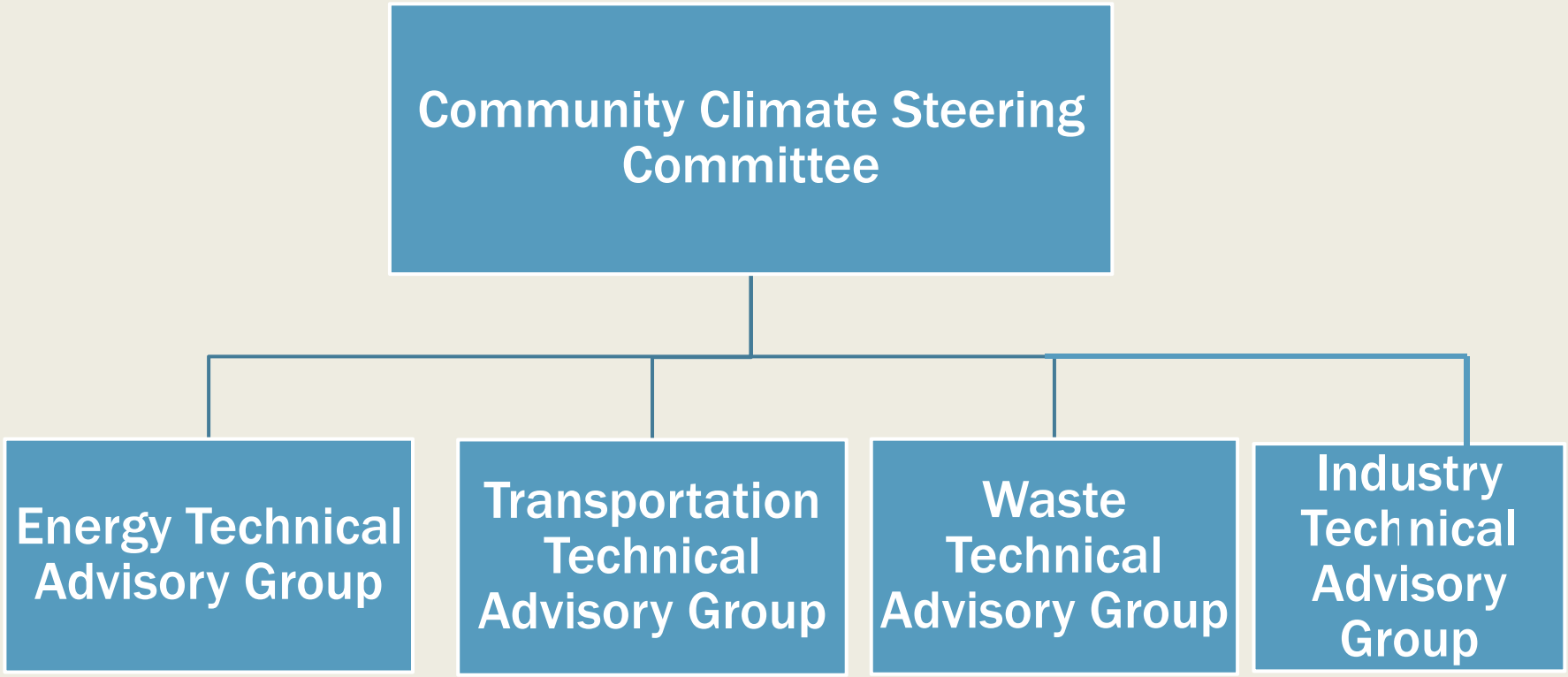
- Take into account
  - Population and business growth
  - Available and emerging technology
  - Potential costs and benefits
  - Climate preparedness and resilience
  - Barriers where the City does not exert direct control over community emissions

Stakeholder Process

Resolution listed:

- Public Input Sessions
- Reviewed by Relevant Boards and Commissions
- Consideration of results of 2014 Generation Plan Task Force
- Formation of Technical Advisory Groups to work with city staff to develop action plans

Organization



TAG Purpose: Create and distill the strategies, actions, and sub-measures for each sector

In 35 years, WHAT might be POSSIBLE?

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- This is an opportunity to be:
  - Visionary about the long term while also
  - A pragmatic leader in the short term
- Transformation is enhanced or hindered by:
  - Technology Availability (evolutionary, transformational, new)
  - Cost (capital, operating, timing)
  - Human behavior (learning, accepting, modifying, changing)
- It's 2050, what does Industry in Austin look like with a 95% reduction in GHG emissions?

Council resolution and the big picture

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1. **Framework – May - September 2014**
   a) Interim targets
   b) Framework for meeting targets (actions)
   c) Progress update to City Council

2. **Final Plan – October 2014 - March 2015**
   a) Focused actions and reduction calculations
   b) Combine emission reductions and climate resiliency into one comprehensive plan document
   c) Presented for Community review and council adoption

Resolution 20140410-024

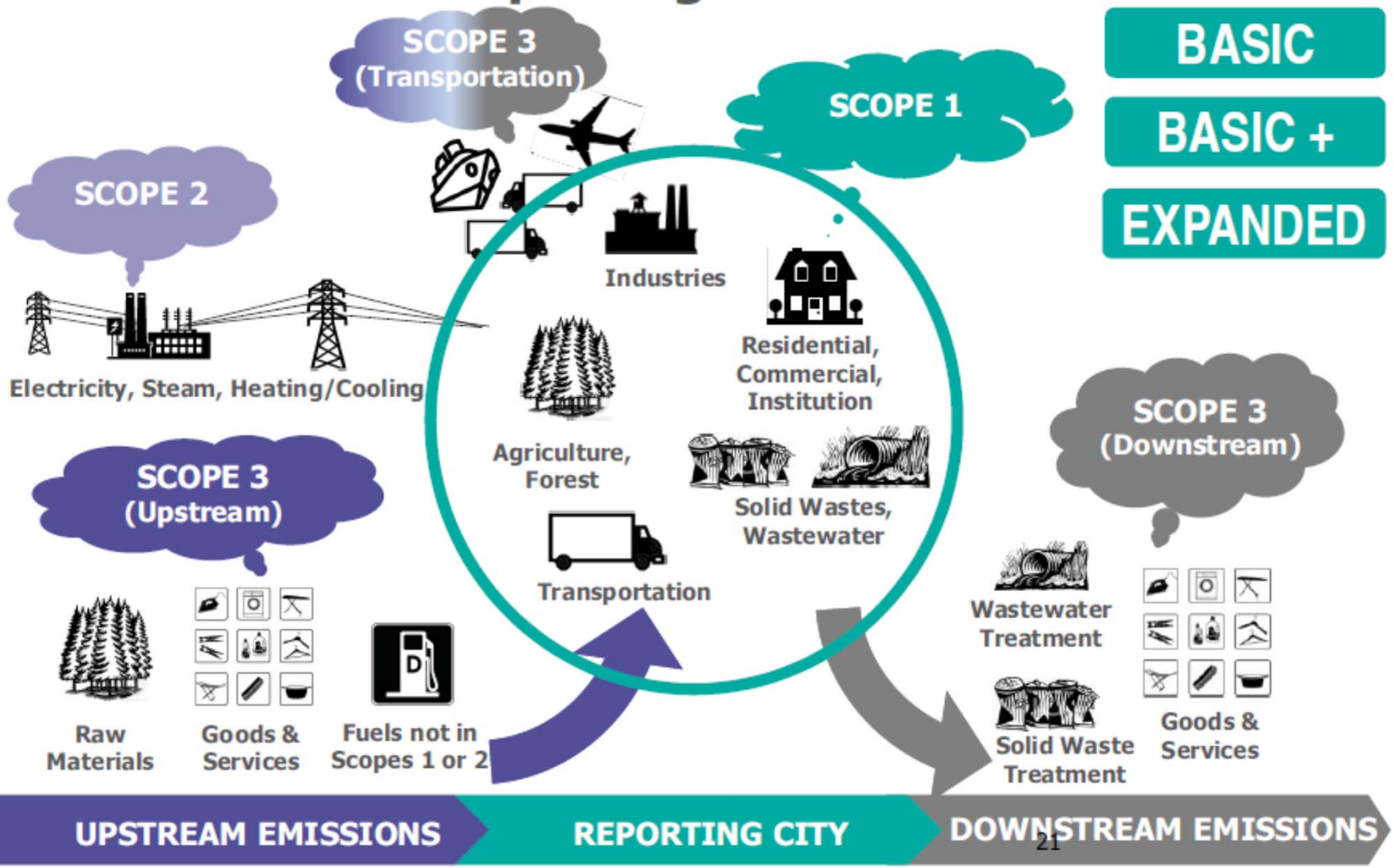
3. Implementation Plan
   a) Specific actions
   b) Costs and schedules
   c) Data tracking

Greenhouse gases

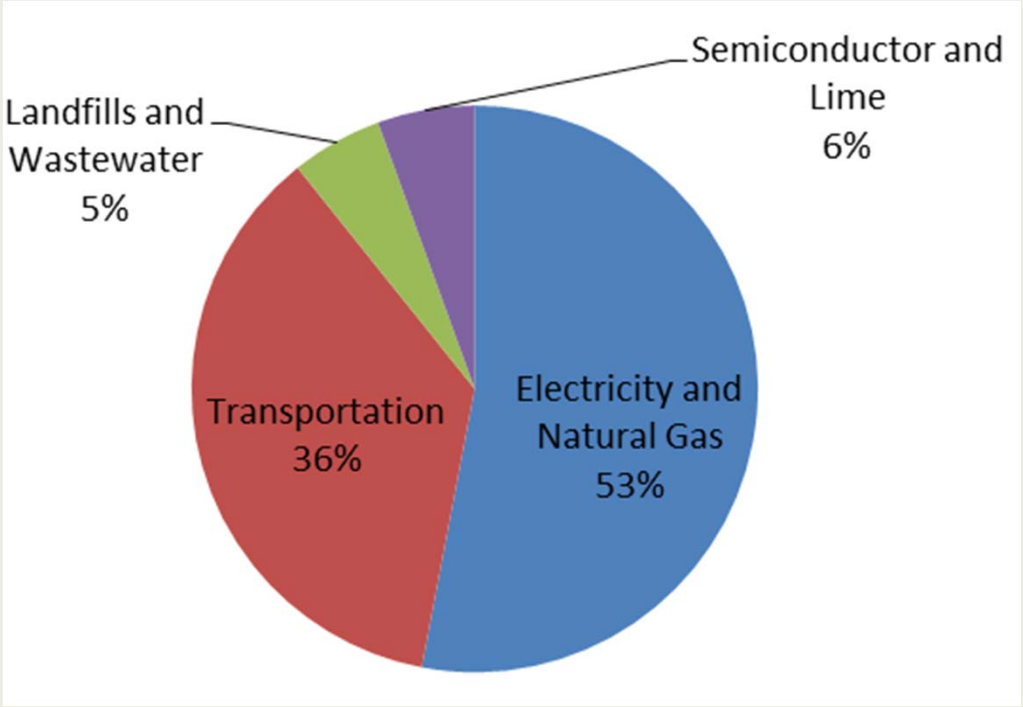
- Carbon Dioxide
  - Major Sources: Burning of vegetation and fossil fuels
  - 100 year global warming potential = 1
- Methane
  - Major Sources: Production of fossil fuels, agriculture, landfills
  - 100 year global warming potential = 25
- Nitrous Oxide
  - Major Sources: Agriculture, wastewater treatment, fossil fuel combustion
  - 100 year global warming potential = 298
- Fluorinated Gases
  - Major Sources: Semiconductors, electrical manufacturing, ozone depleting substance replacement
  - 100 year global warming potential = 1,000 – 15,000

GREENHOUSE GAS PROTOCOL

Illustration of Reporting Framework



2010 Travis County GHG Inventory
15.2 Million metric tons CO2e



- **Energy**
  - Power plants in and outside of Travis county that meet our kWh used
  - Natural gas burned for heat
- **Transportation**
  - Trips that occur in Travis county
  - Data based on TTI VMT estimates and scaled to an annual basis
- **Landfills and Wastewater**
  - Wastewater treatment plants and 4 landfills
- **Semiconductor and Lime**
  - 1 lime plant and 4 semiconductor facilities

We follow the 2012 US Community GHG Protocol – ICLEI
This is a direct, source and data based methodology

Industrial Process

Source	2011	2012
Freescale EB site	62,897 mtCO2e	58,107 mtCO2e
Freescale OH site	53,809 mtCO2e	59,528 mtCO2e
Samsung Austin	406,859 mtCO2e	322,024 mtCO2e
Spansion	92,188 mtCO2e	93,050 mtCO2e
Austin White Lime	271,216 mtCO2e	301,907 mtCO2e
TOTAL	**886,969 mtCO2e**	**834,616 mtCO2e**

Source: EPA Facility Level Information on Greenhouse Gases Tool (FLIGHT)
http://ghgdata.epa.gov/ghgp/main.do

Breakdown of Emissions from EPA

- Semiconductor
  - Stationary Combustion – Natural Gas
  - Process Emissions
    - Nitrous Oxide
    - Sulfur Hexafluoride, Fomblin, Krytox, NF3, Perfluorocyclobutane, Octofluorocyclopentene, PFC-14, PFC-116, HFE-7200, HFE-7500, HT-110, HT-135, HT-170, HT-200, FC-40, HFC-23, HFC-41, PFC-218, FC-3283
- Lime
  - Stationary Combustion in Kilns - Coal & Natural Gas
  - Process Emissions
    - $CaCO_3$ + Heat → CaO + CO_2

TAG Final Deliverable

- Report Section for the Austin Community Climate Plan
  - Description of baseline emissions, growth trajectories, and reduction pathways to net zero
  - Strategies and actions, qualitatively assessed in terms of what will be done by whom, and how they could be achieved.
  - Write-ups and descriptions of costs, benefits, and why actions are included

Report

- Overarching Strategies, Indicators and Goals

- Actions divided into 3 groups
  - 2015-2018: Currently in plans and on the books
  - 2018-2025: New actions we could start in the near future
  - 2030 and Beyond: Visionary actions

- Actions screened:
  - Quantified potential for GHG reduction
  - How will it be affected now and in the future by:
    - Population and business growth
    - Available and emerging technology
    - Potential costs and benefits
    - Climate preparedness and resilience
    - Barriers where the City does not exert direct control over community emissions

Schedule

- July and August
  - Kickoff meeting, group organization and direction
  - 2050 Visioning and Strategy development
- September
  - Status report due to City Council
  - Strategy and Action refinement
- October
  - Qualitative and Quantitative analysis
  - Brief the Steering Committee
- November and December
  - Feedback from the Public
  - Drafting final plan
- January – March 2015
  - Boards and Commissions, Council, to finalization

Next Steps

- Set a recurring meeting date / time
- What should this TAG focus on?