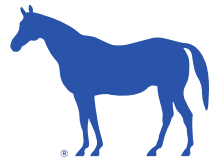


SUSTAINABILITY UPDATE

*Jada Walker Griggs, Sustainability Program Manager Senior
Environmental Quality & Public Works Committee*

June 18, 2024



LEXINGTON

Empower Lexington: A Plan for a Resilient Community

- Stakeholders developed original plan over a 3-year period (2009-2012) – facilitated by LFUCG; supported by Council in 2012
- Focus was on energy efficiency in 5 sectors:
 - *Residential*
 - *Industrial, Commercial, and Institutional*
 - *Land Use, Food, and Agriculture*
 - *Transportation*
 - *Waste*
- Plan was flexible / voluntary, with a goal to reduce energy use by at least 1% each year

Empower Lexington: 2023 Update

- Over 50 members participated in workgroups including core team (members from previous plan efforts)
- Engagement (public input) opportunities July-August 2023
- New sectors align with LEED for Cities Certification. Work to increase sustainability and climate resiliency.
- Sectors:
 - Natural Systems and Ecology
 - Transportation and Land Use
 - Water Efficiency
 - Energy and Greenhouse Gas Emissions
 - Materials and Resources
 - Quality of Life (Justice, Equity, Diversity, and Inclusion)

LEED* for Cities

- Lexington was selected as 1 of 13 cities to participate in the Leadership Cohort Program sponsored by the U.S. Green Building Council (USGBC) (Colorado Springs, CO; Des Moines, IA; Grand Junction, CO; Lantana, FL; Largo, FL; Lawrence, KS; North Miami, FL; Palm Coast, FL; Plano, TX; San Diego, CA; Scottsdale, AZ; South Bend, IN)
- USGBC is the global leader in green building. Vision is that buildings and communities will regenerate and sustain the health and vitality of all life.
- Program provides peer-to-peer networking opportunities, technical assistance, and access to educational resources; and covers fees for USGBC membership, registration, and certification review.

*LEED = Leadership in Energy and Environmental Design

Solarize Lexington Program



- Partnered with KY Solar Energy Society for a second year to provide a vetted process for residents
- Group-buying program designed to promote and encourage the use of solar
- Open only to Lexington-Fayette County residents, small businesses, non-profits, and places of worship
- Council approved \$1 Million for grants to low- to moderate-income homeowners (< 80% Area Median Income [AMI])
- Launched on March 12th; Enrollment ends Aug. 9th

Solarize Lexington Program

- 2023
 - 76 signed contracts (42 grant; 34 non-grants)
 - 42 grant-approved contracts signed
(average cost per home = \$21,545)
- 2024 (as of June 4th)
 - 82 interest forms submitted (40 grants; 42 non-grants)
 - 21 grant-approved contracts signed
(average cost per home = \$23,485)

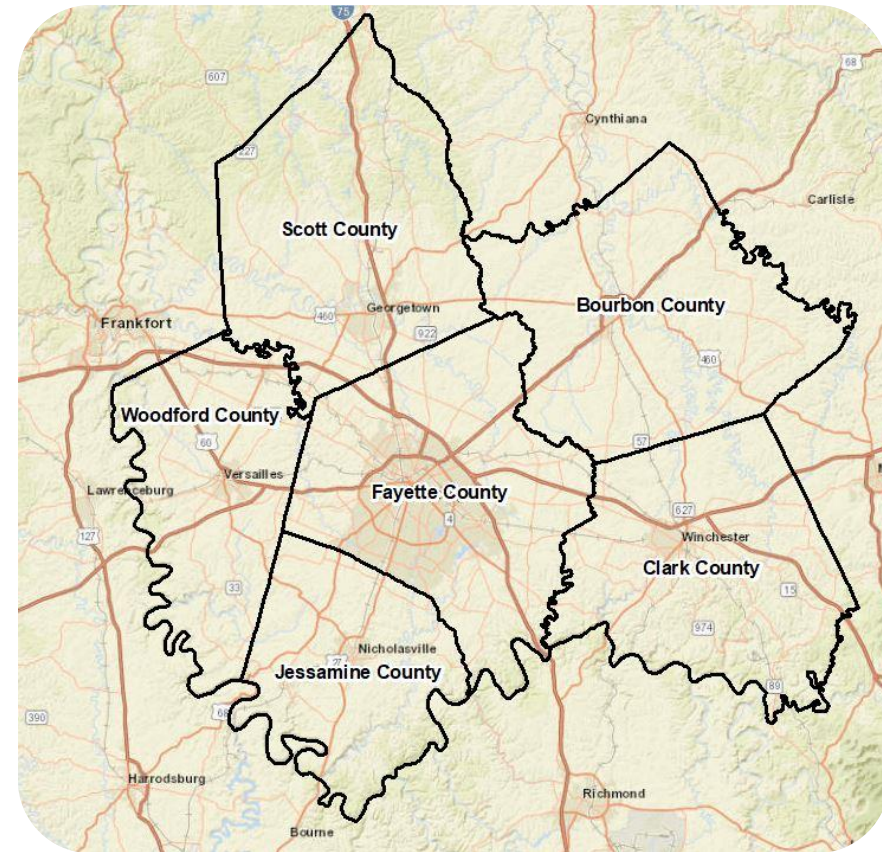
“I would like to thank you and everyone else involved with the Solarize Lexington Program. What a wonderful gift. The staff I worked with at your end were great. Everything they said would happen did and was very timely. The crew from Solar Energy were professional and very easy to work with. I am looking forward to getting my first electric bill.

This program makes me proud of our great city.”

- Solarize Lexington Grant Recipient

Climate Pollution Reduction Grant Program

- Lexington-Fayette County Metropolitan Statistical Area (MSA) received just under \$1 million dollars for a planning grant from U.S. Environmental Protection Agency to develop Priority and Comprehensive Climate Action Plans
- Planning for reducing GHG emissions and other harmful air pollution



Priority Climate Action Plan (PCAP)

- Requirements:
 - Simplified GHG Inventory for MSA
 - List of “Implementation Ready” Measures
 - Quantified GHG Reductions
 - Review of Authority to Implement
 - Low Income/Disadvantaged Communities Benefits Analysis
 - Stakeholder Engagement

Comprehensive Climate Action Plan (CCAP)

Requirements:

- Build on the simplified emissions inventory conducted for the PCAP to complete a comprehensive GHG Inventory for the CCAP
- Quantify Comprehensive GHG Reductions Targets by Sector
- Benefits Analysis
- Low Income/Disadvantaged Communities Benefits Analysis
- Stakeholder Engagement
- Review of Authority to Implement
- Intersection with other funding opportunities



Climate Pollution Reduction Implementation Grant

- Applications were due April 1, 2024
- Grants will provide funds for greenhouse gas (GHG) reduction measures that will significantly reduce cumulative GHG emissions by 2030 and beyond, and
- Will accelerate decarbonization across one or more major sectors responsible for GHG emissions.



Implementation Measures

- Tree Canopy
 - Increase tree canopy in our MSA
- Solarize Lexington Program
 - Extend the program to homeowners in other counties in our MSA
- Weatherization Program
 - Homeowners and renters with low- to moderate-income
- Lextran Electric Bus Charging Canopy Project
 - Provide cover/weather protection for electric fleet, charging infrastructure for each parking stall and generator backup for recharging during power outages
- Regional Electric Vehicle Charging Study
 - Identify demand for future public electric vehicle recharging stations

Program Highlights

In Two Years:

- Solarize Lexington 2023 and 2024 (\$1M grant for low- to moderate-income <80% AMI)
- Empower Lexington: A Plan for a Resilient Community (updated)
- 2021 Community-wide and LFUCG Municipal Greenhouse Gas Emissions Inventory
- LEED for Cities Certification
- Regional: Lexington-Fayette Co. Metropolitan Statistical Area Climate Pollution Reduction Planning Grant (Priority Climate Action Plan (PCAP) – completed and approved; Comprehensive Climate Action Plan (ongoing))
- Regional: Lexington-Fayette Co. MSA Implementation Grant (application submitted)
- Green Check Sustainability Business Program
- Pickleball Recycling
- Environmental Initiatives Specialist (hired Dec. 2023)

Questions?

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www.lexingtonky.gov/sustainability



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TETRA TECH



LEXINGTON

Lexington's 2021 Community-wide & Municipal Greenhouse Gas Inventories

Abby Terry, PE, LEED Green Assoc.

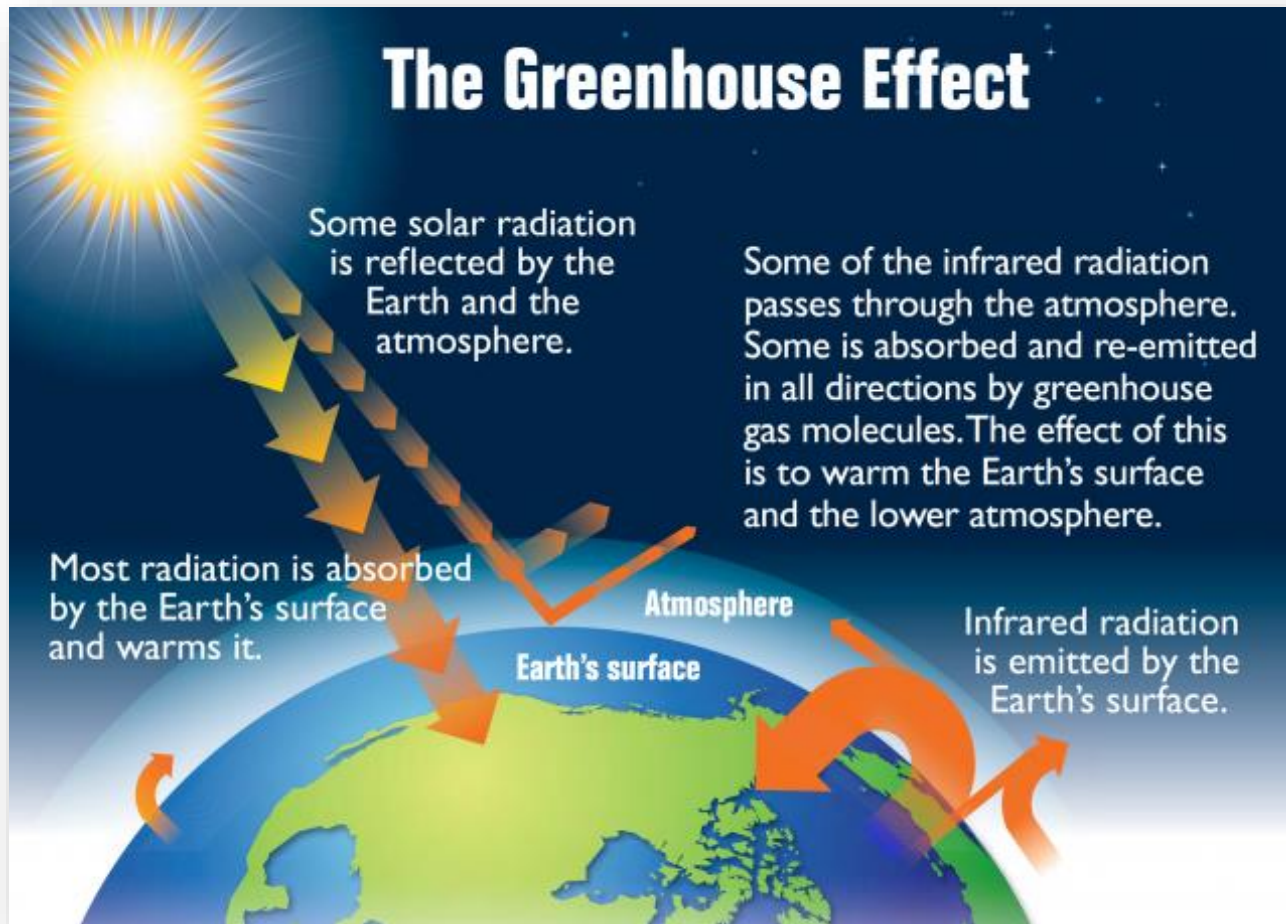
June 18, 2024

2021 Greenhouse Gas Inventory

- LFUCG contracted Tetra Tech to compile a greenhouse gas (GHG) emissions inventory for calendar year 2021 in conjunction with the Empower Lexington update
- Inventory includes total community-wide GHG emissions & LFUCG municipal operations' GHG emissions
- Goal is to re-calculate GHG emissions every 2 years going forward



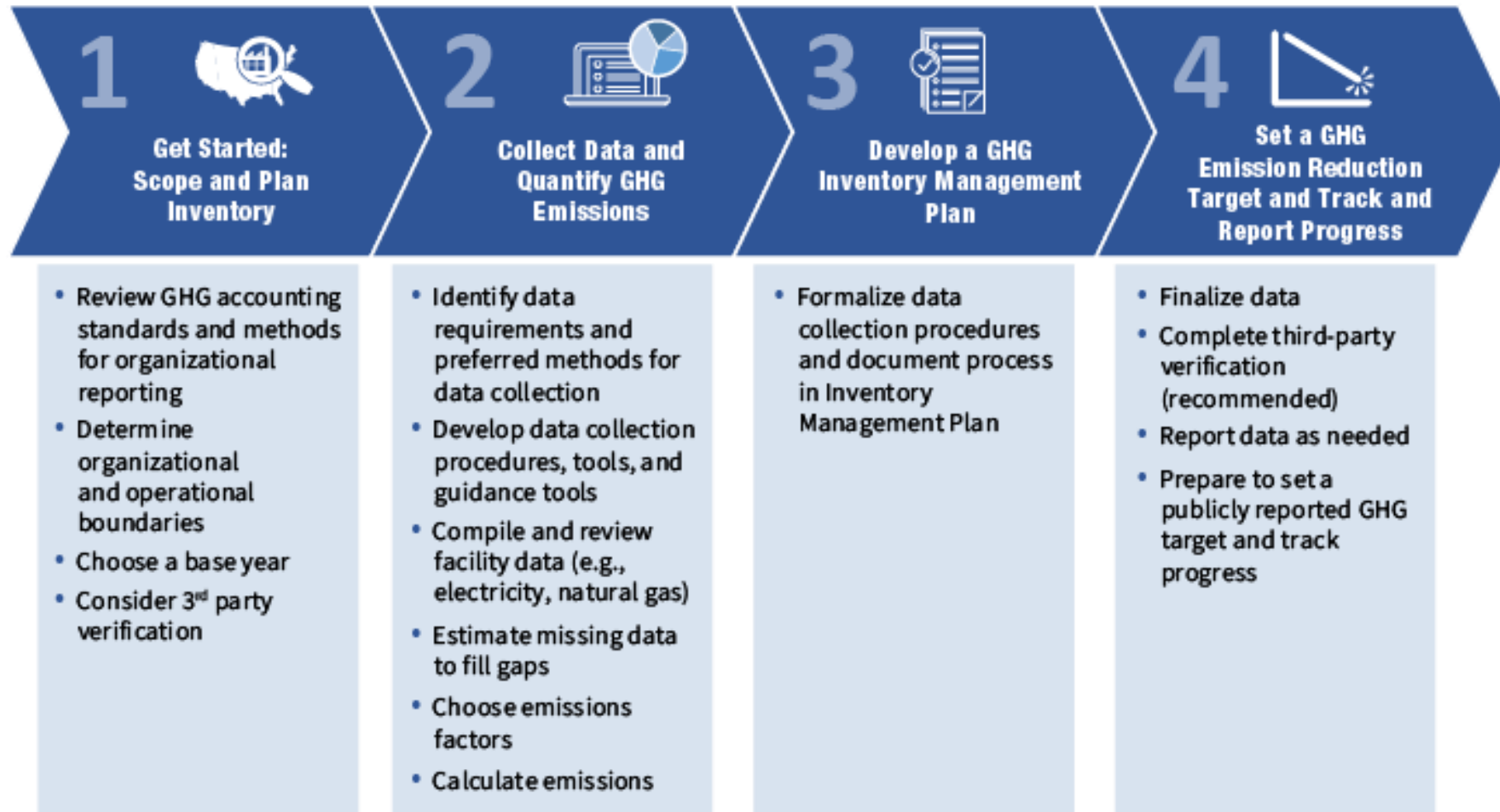
What's a greenhouse gas?



- Direct GHGs from Kyoto Protocol:
 - Carbon Dioxide (CO₂)
 - Methane (CH₄)
 - Nitrous Oxide (N₂O)
 - Nitrogen Trifluoride (NF₃)
 - Sulfur Hexafluoride (SF₆)
 - Hydrofluorocarbons (HFCs)
 - Perfluorocarbons (PFCs)



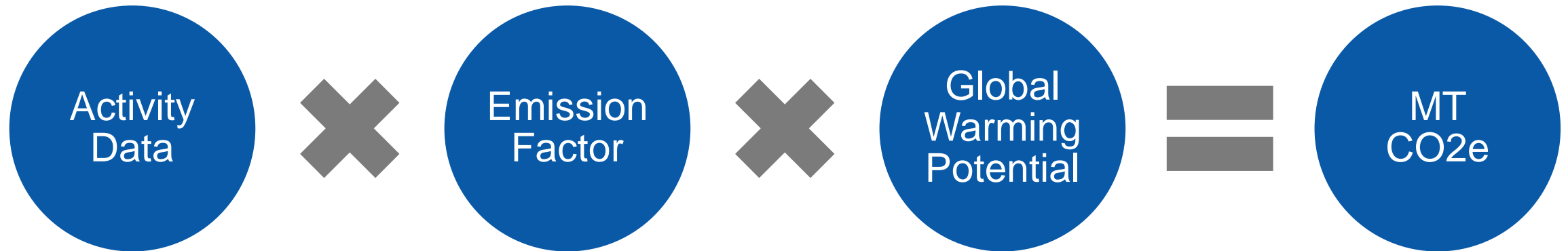
What's a greenhouse gas inventory?



Definitions

- **Global Warming Potential (GWP)** - A measure that allows for the comparison of the warming effect of various GHGs over a specific time period relative to carbon dioxide (where the GWP of CO₂ = 1)
- **Metric Tonnes of Carbon Dioxide Equivalents (MT CO₂e)** - A standardized unit that allows for the aggregation of emissions of different GHGs into a single number
- **Scopes** - Different categories used to classify and report GHG emissions that facilitate comprehensive accounting
- **Sectors and Sub-Sectors** - Classifications of activities / sources of emissions
- **Sources** - Individual activities generating GHG emissions

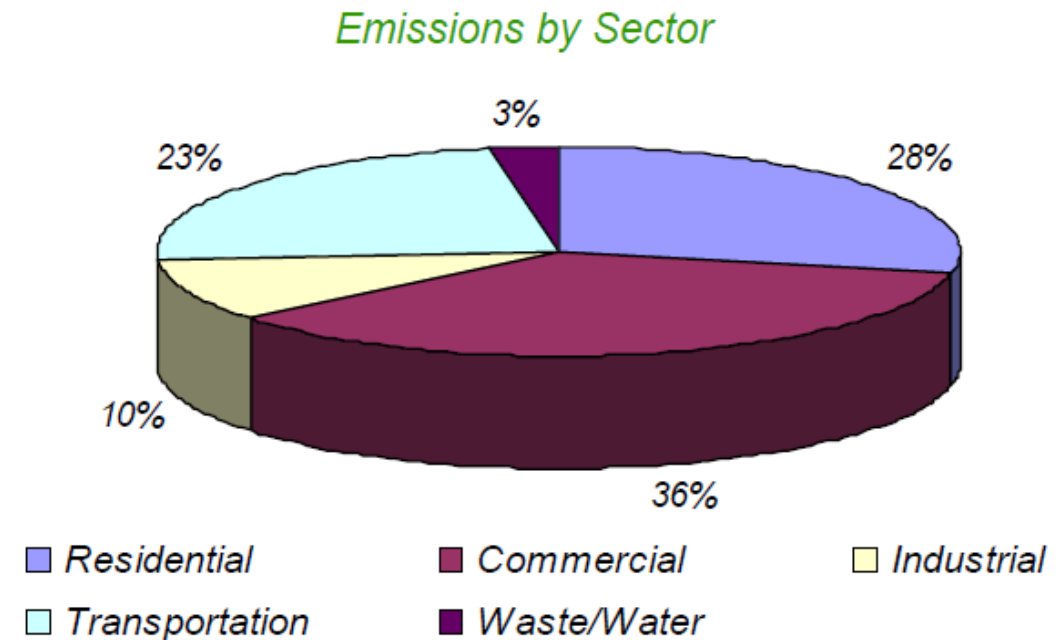
How are emissions calculated?





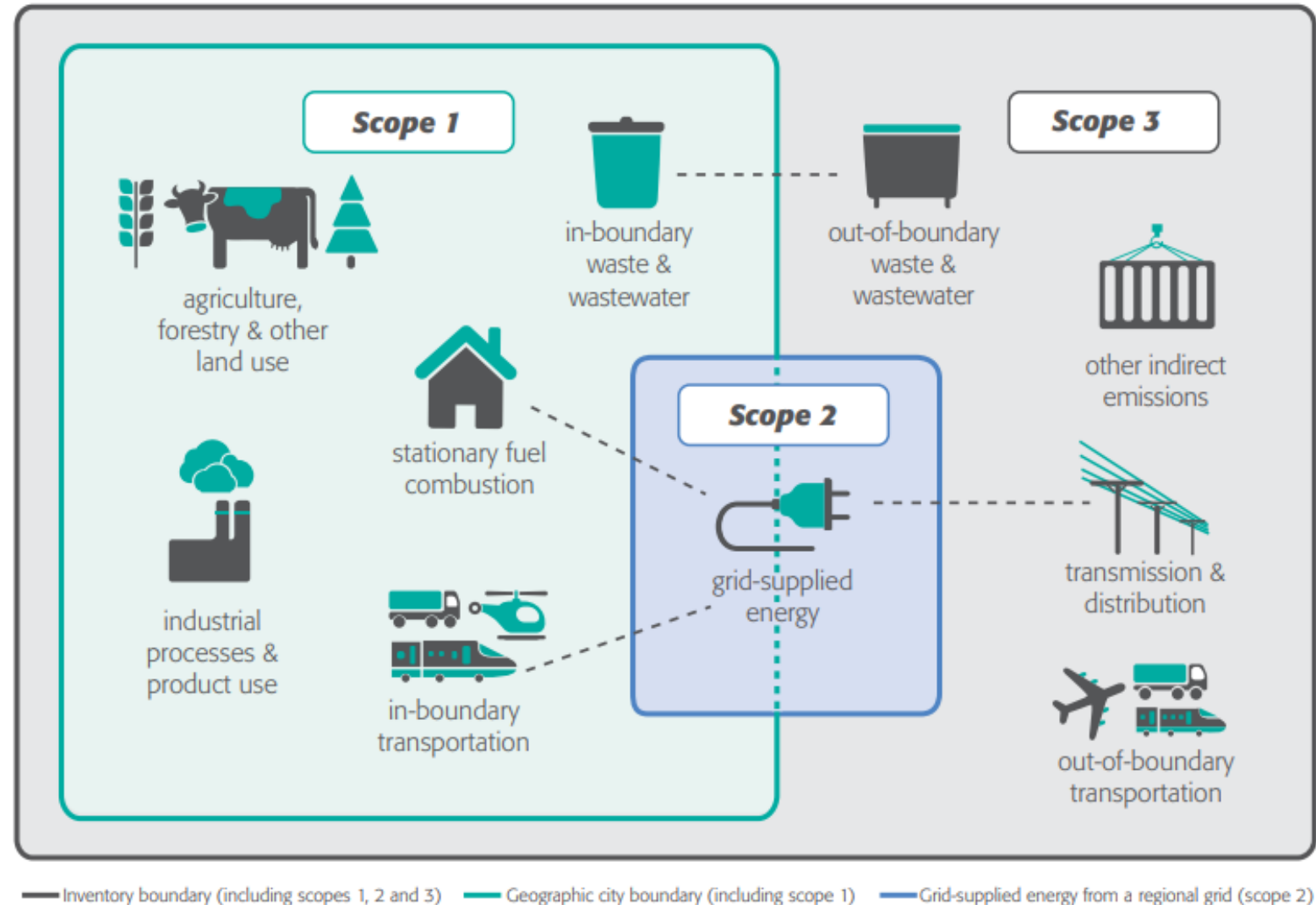
2007 Greenhouse Gas Inventory

- First inventory completed for Calendar Year 2007 using Clean Air and Climate Protection (CACCP) software
- Included Scope 1 and Scope 2 Emissions
- 6,777,136 MT CO₂e
- 23.4 MT CO₂e per capita
- Municipal emissions totaled approximately 2% of inventory



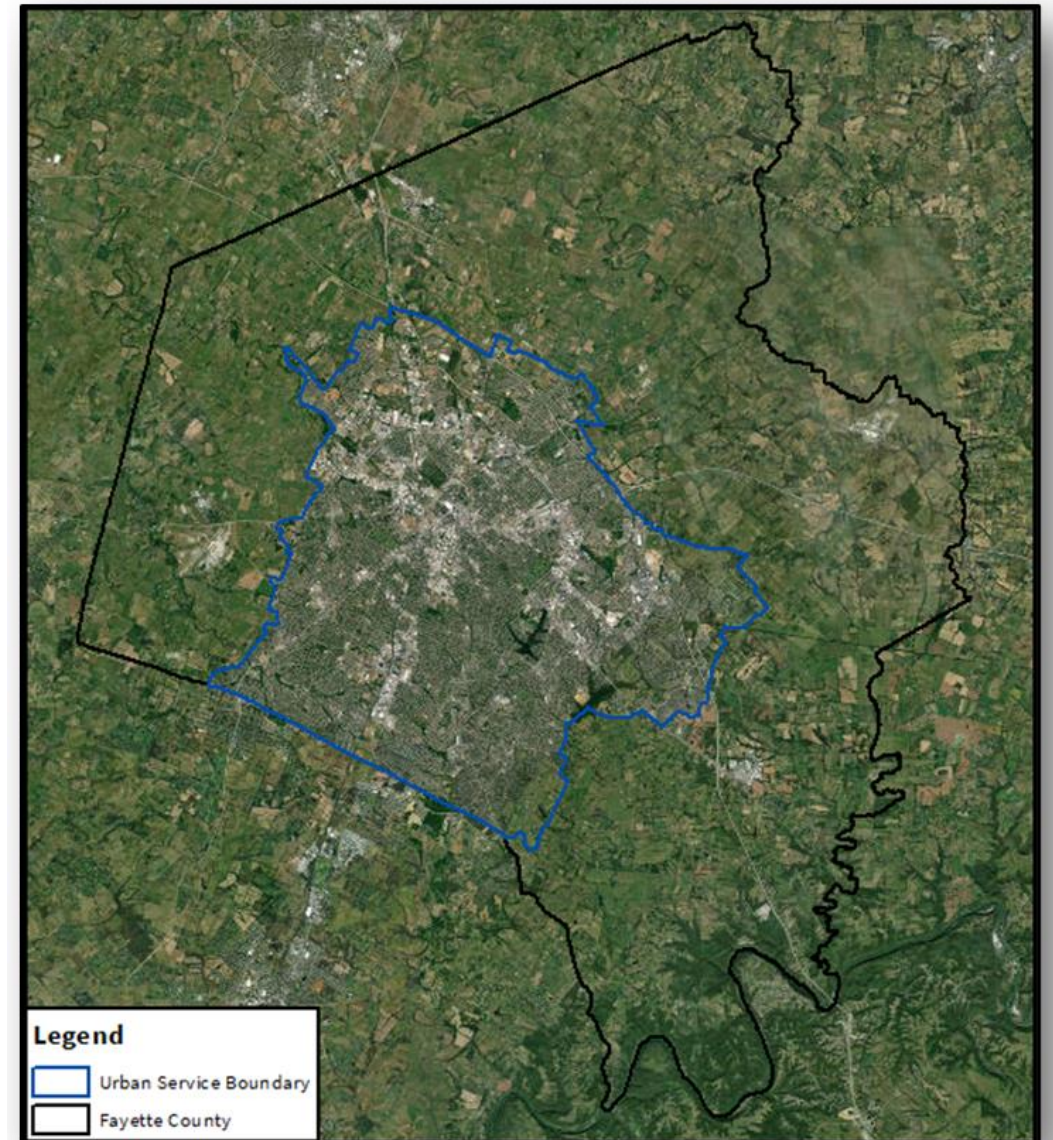
Methodology

- Sectors
 - Stationary Energy
 - Transportation
 - Waste
 - Industrial Processes & Product Use (IPPU)
 - Agriculture, Forestry, and Other Land Use (AFOLU)
- Scopes
 - Scope 1
 - Scope 2
 - Scope 3

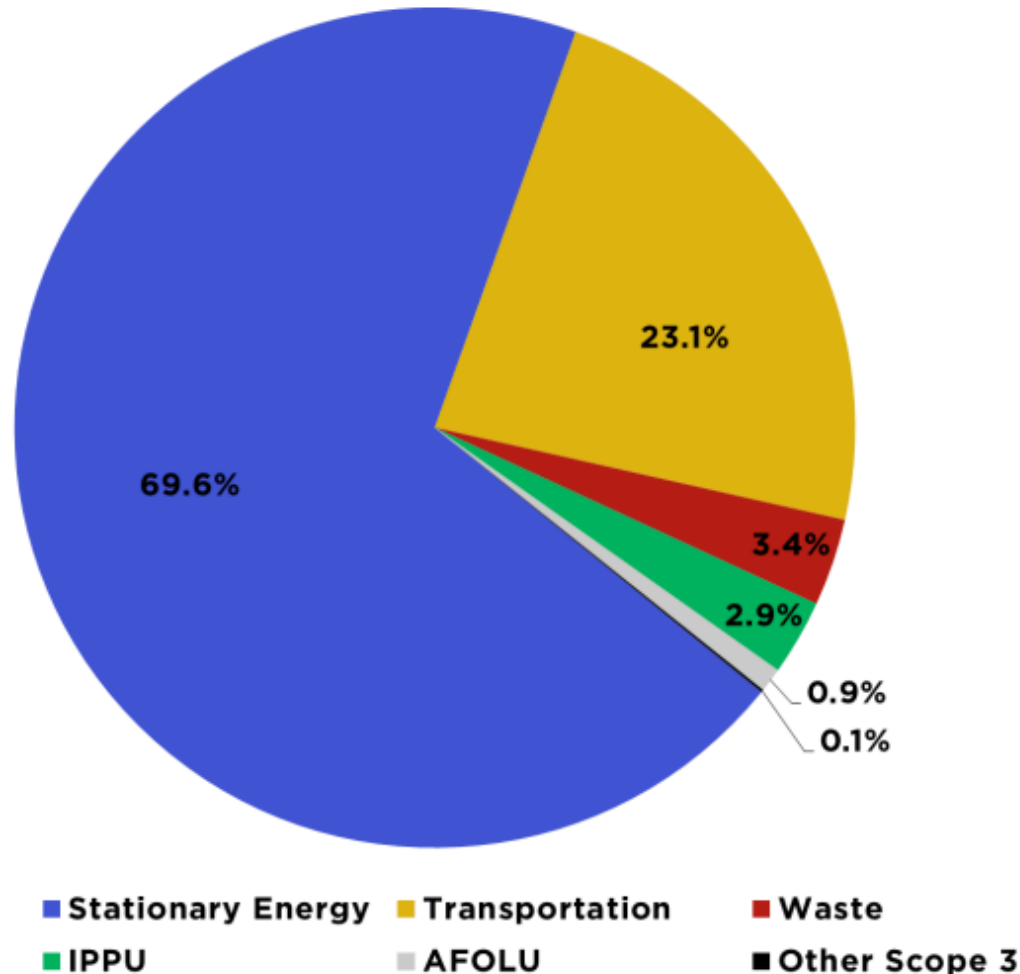









Defining the Inventory Boundary

- Calendar Year 2021
- Fayette County border used for community-wide inventory
- Activities and sources attributed to LFUCG operations were included as a subset to the community-wide inventory



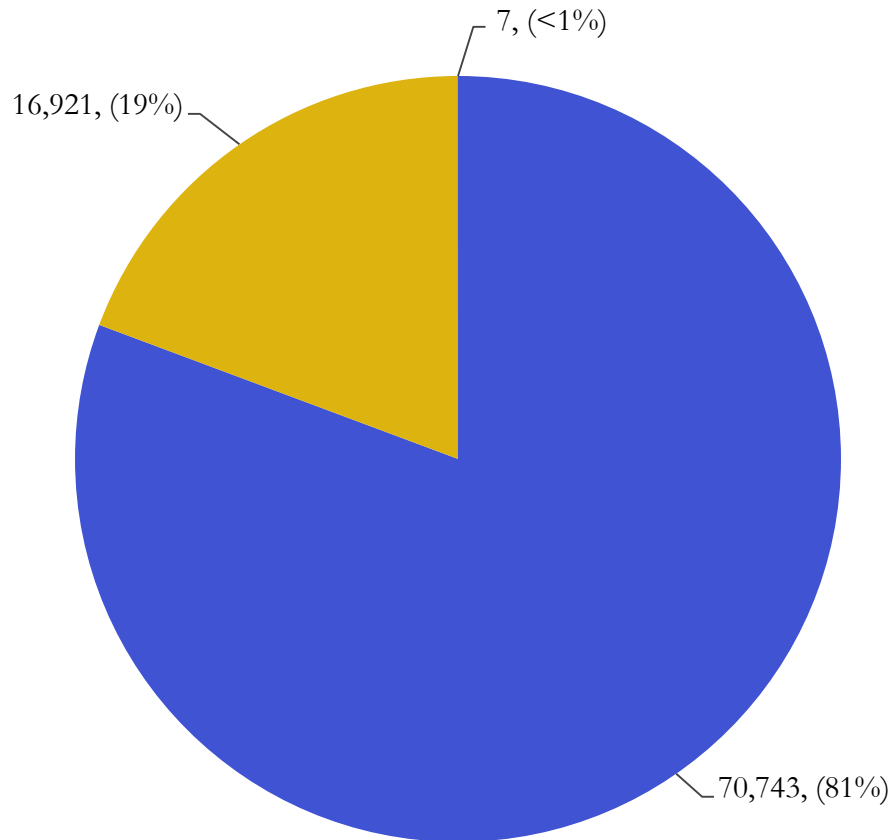
2021 Greenhouse Gas Inventory: Community-wide







| tCO ₂ e | BASIC+ | Scope 1 | Scope 2 | Scope 3 |
|---|--------|-----------|-----------|---------|
|  Stationary Energy | | 744,112 | 3,164,120 | 142,385 |
|  Transportation | | 1,190,161 | | 152,976 |
|  Waste | | 79,028 | | 116,396 |
|  IPPU | | 169,691 | | |
|  AFOLU | | 54,207 | | |
|  Other Scope 3 | | | | 5,809 |
|  TOTAL | | 5,818,885 | | |

18.1 MT CO₂e per capita

2021 Greenhouse Gas Inventory: Municipal Operations



■ Stationary Energy ■ Transportation ■ Waste

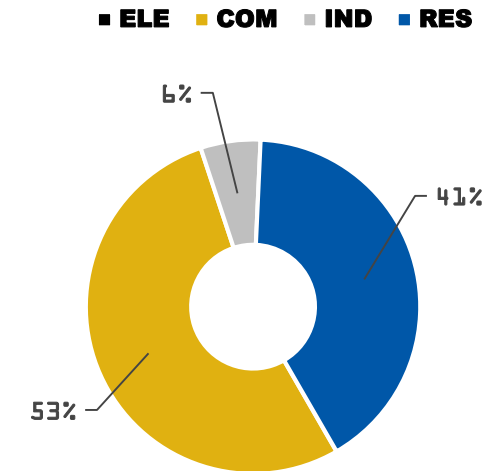
| tCO ₂ e | BASIC | Scope 1 | Scope 2 | Scope 3 |
|--|--------------------------|---------------|---------------|--------------|
|  | Stationary Energy | 5,583 | 62,226 | 2,933 |
|  | Transportation | 16,921 | | |
|  | Waste | | | 7 |
|  | TOTAL | 87,671 | | |



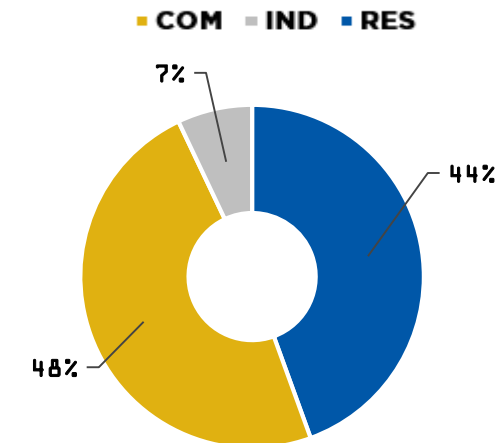
Stationary Energy Highlights

- **69.6% of inventory total**
- Sources include:
 - Electricity usage
 - Electricity distribution losses
 - Natural gas usage
 - Natural gas fugitive emissions
 - Permitted community sources
 - Blue Grass Airport ground equipment fuel usage
 - Off-road vehicles
 - Coal hauling fugitive emissions
 - Hazardous materials pipelines fugitive emissions
- Commercial sub-sector responsible for largest percentage of natural gas and electricity usage
- KY had fourth highest percentage of coal in resource mix in 2021

2021 Community-wide Natural Gas Usage by Sub-Sector

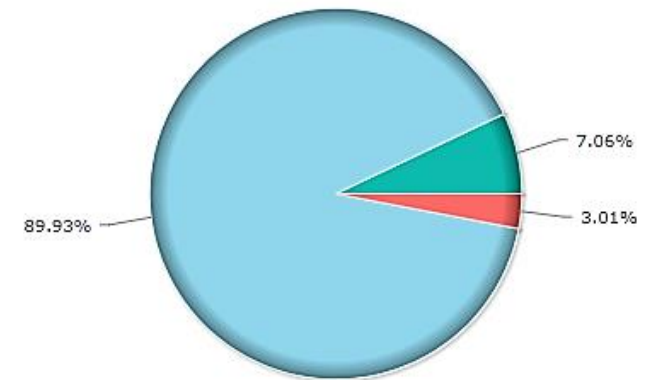
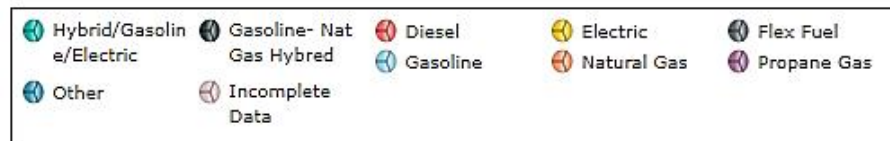
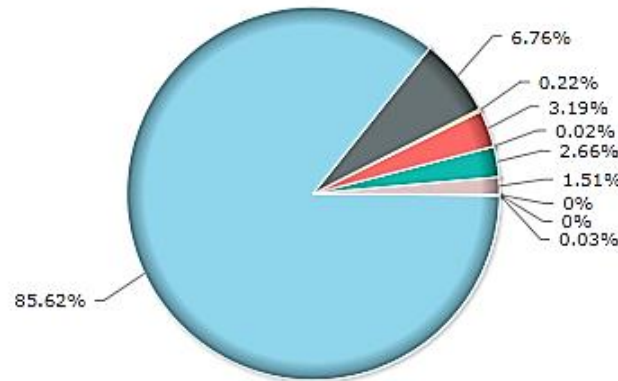
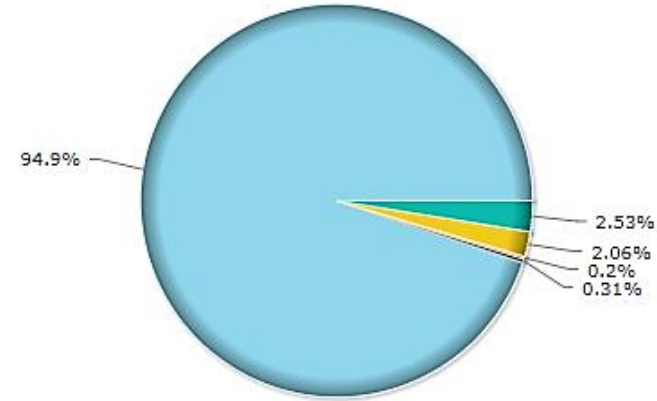


2021 Community-wide Electricity Usage by Sub-Sector



Transportation Highlights

- **23.1% of inventory total**
- Sources include:
 - On-road transportation
 - Off-road transportation
 - Rail
 - Aviation
- ~90% of vehicles registered in Fayette County are non-commercial

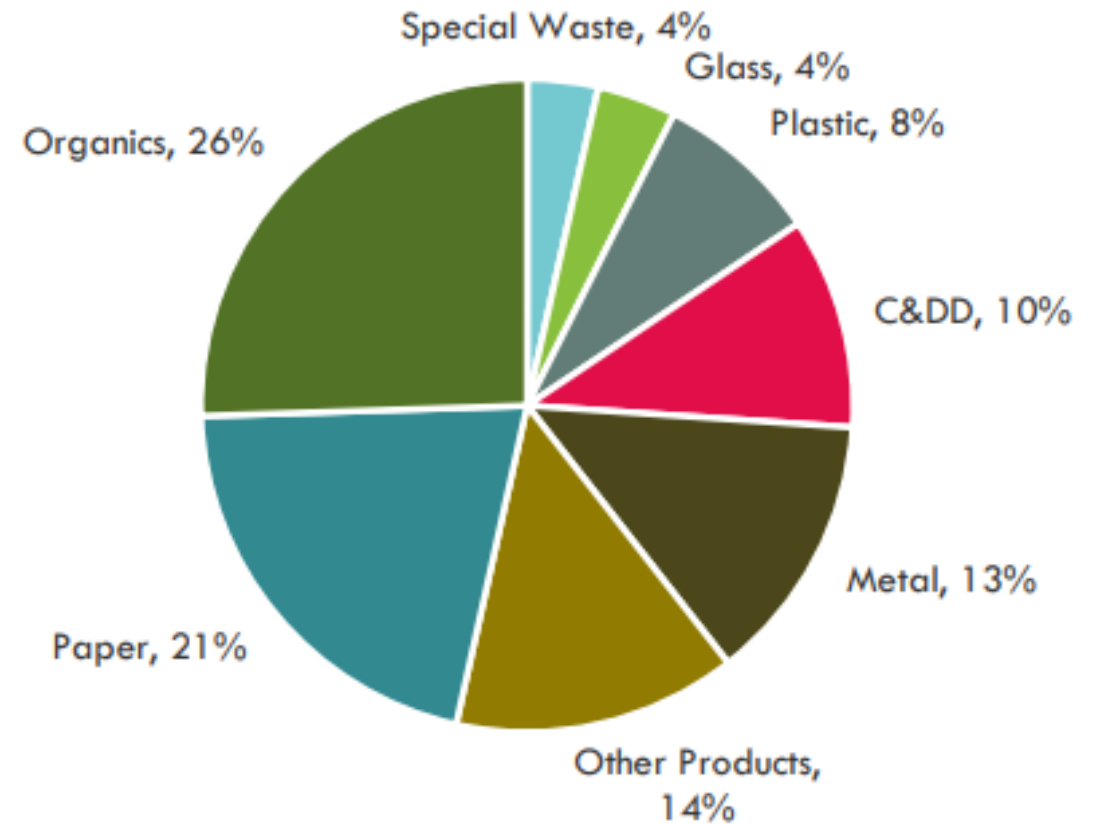




Waste Highlights

- **3.4% of inventory total**
- Sources include:
 - Solid waste
 - Compost
 - Wastewater
- No active MSW landfills in Fayette County, all MSW hauled outside of county
- 0.91 tonnes of waste generated per person
- ~10% diversion rate
- Waste diverted:
 - Yard waste
 - Recycling
 - E-waste
 - Tires
 - Paper shred
 - Yard signs
 - Large appliances

2022 Waste Characterization Study Results





Industrial Products & Product Use (IPPU) Highlights

| Industry | Significant Processes | Applicable for Fayette County |
|---|--|-------------------------------|
| Mineral Industry | Production of cement, lime, and glass | N |
| Chemical Industry | Production of ammonia, nitric acid, adipic acid, caprolactam, glyoxal, glyoxylic acid, carbide, carbide, titanium dioxide, and soda ash | N |
| Metal Industry | Production of iron steel and metallurgical coke, ferroalloy, aluminum, magnesium, lead, and zinc | N |
| Non-energy Products from Fuels and Solvent Use | Consumption of lubricants, paraffin waxes, bitumen, road oil, and other petroleum diluents, white spirit, kerosene, and some aromatics | Y |
| Electronics Industry | Manufacture of semiconductors, thin-film-transistor flat panel displays, and photovoltaic manufacturing | N |
| Substitution of Fluorinated Substances for Ozone Depleting Substances | Use of refrigeration and air conditioning, fire suppression and explosion protection, aerosols, solvent cleaning, foam blowing, sterilization of equipment, tobacco expansion applications, solvents in the manufacture of adhesives, coatings, and inks | Y |

- **2.9% of inventory total**
- Sources include:
 - Asphalt production
 - Substitution of ozone depleting substances

Agriculture, Forestry, & Other Land Use (AFOLU) Highlights

- **0.9% of inventory total**
- Sources include:
 - Enteric fermentation
 - Manure management
 - Biomass burning
 - Fertilizer application
 - Tree canopy
- Urban tree canopy provided ~42,339 MT CO₂e in carbon sequestration

22,500 Equine



10,000 Cattle
500 Dairy Cows



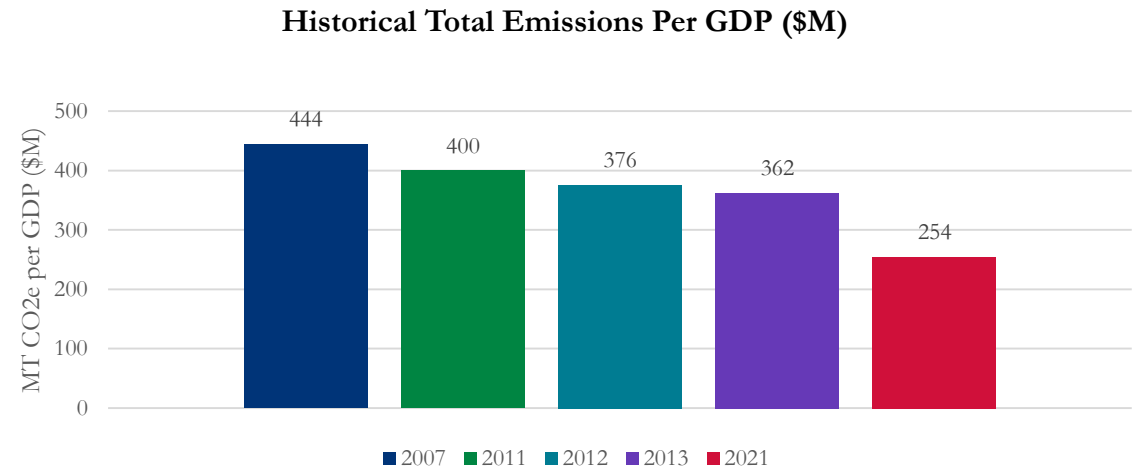
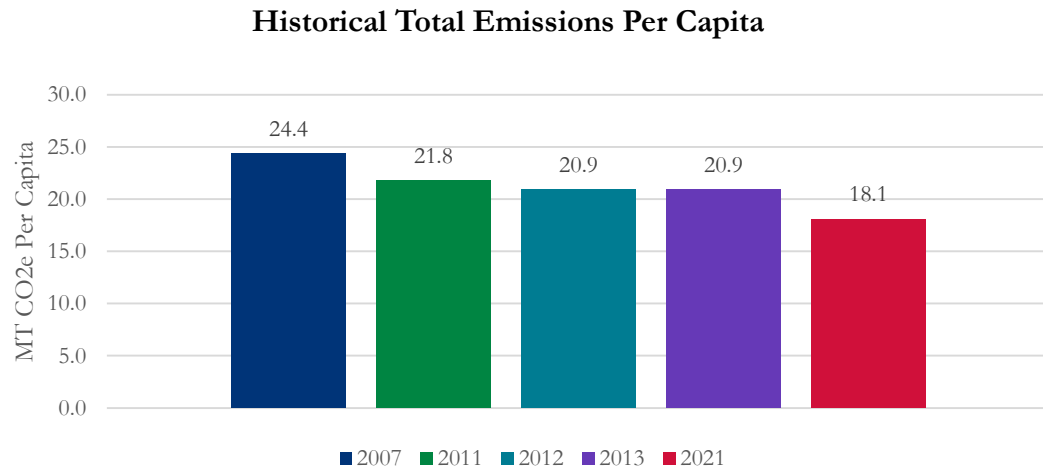
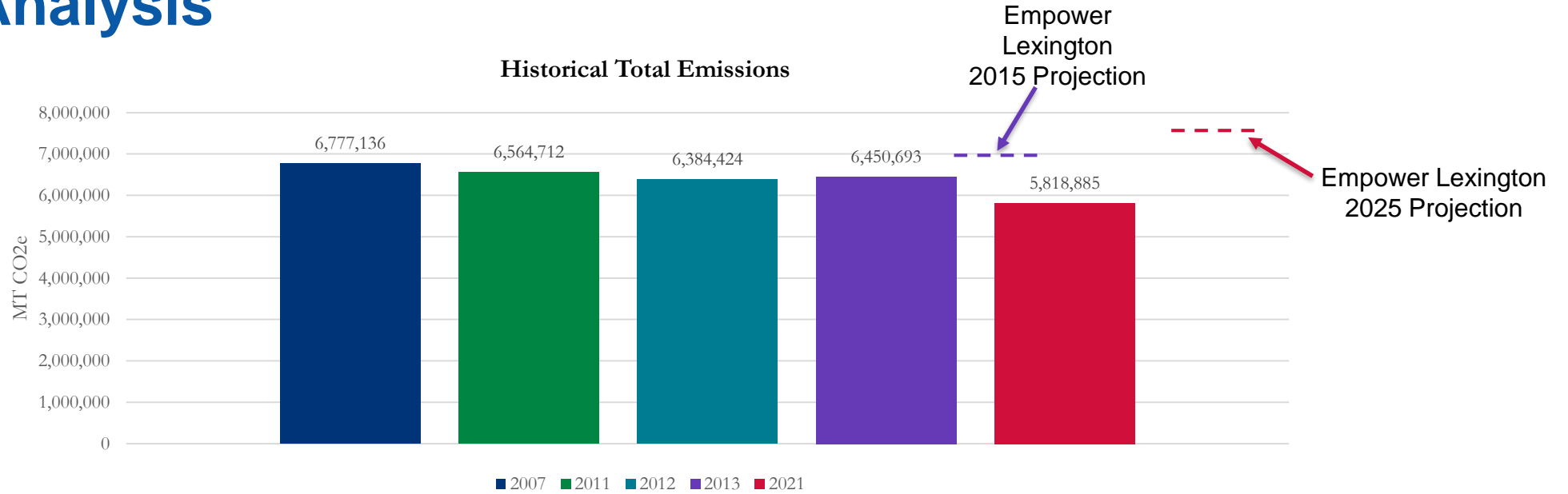
916 Sheep



96 Goats

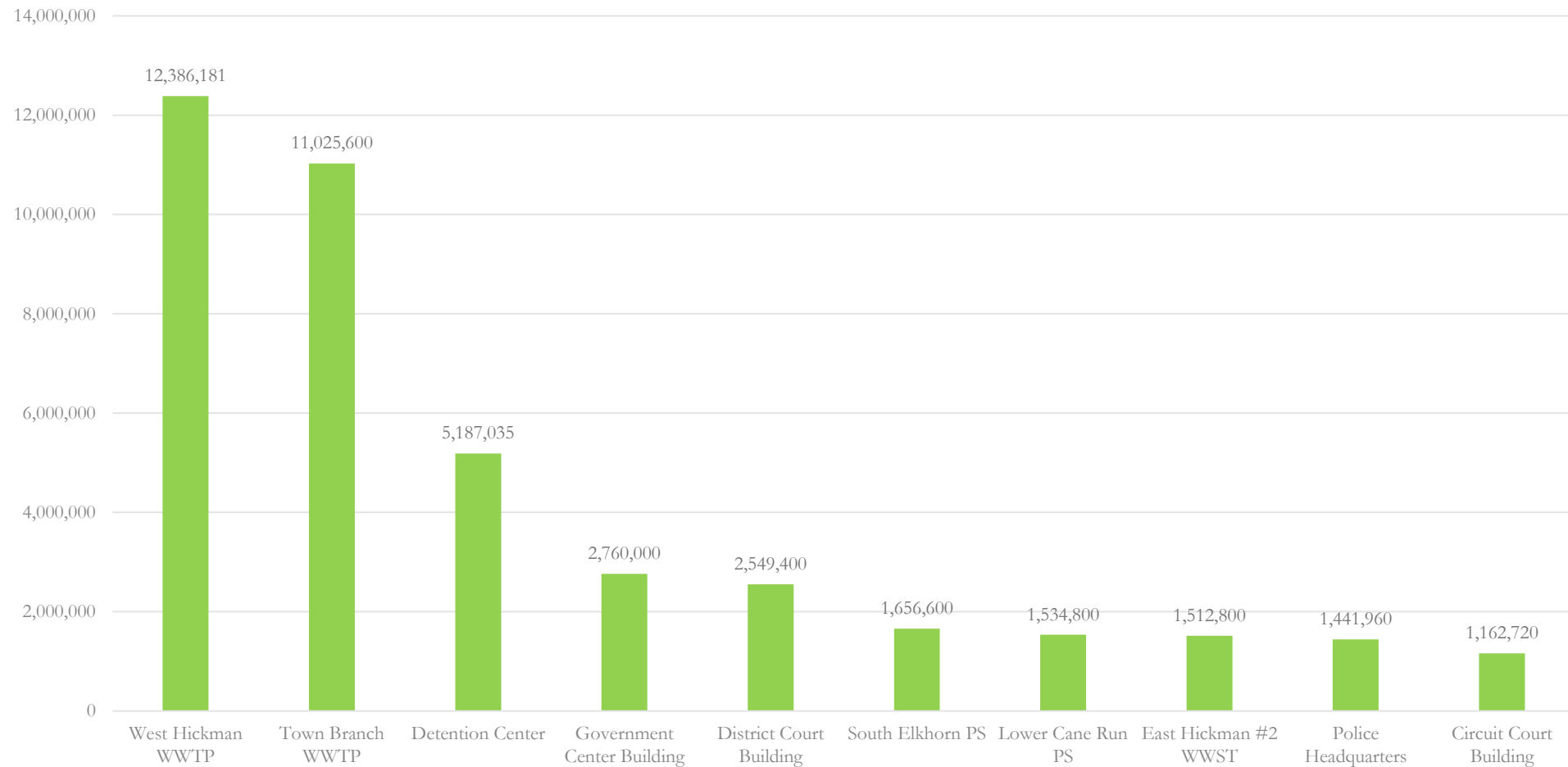


Trend Analysis

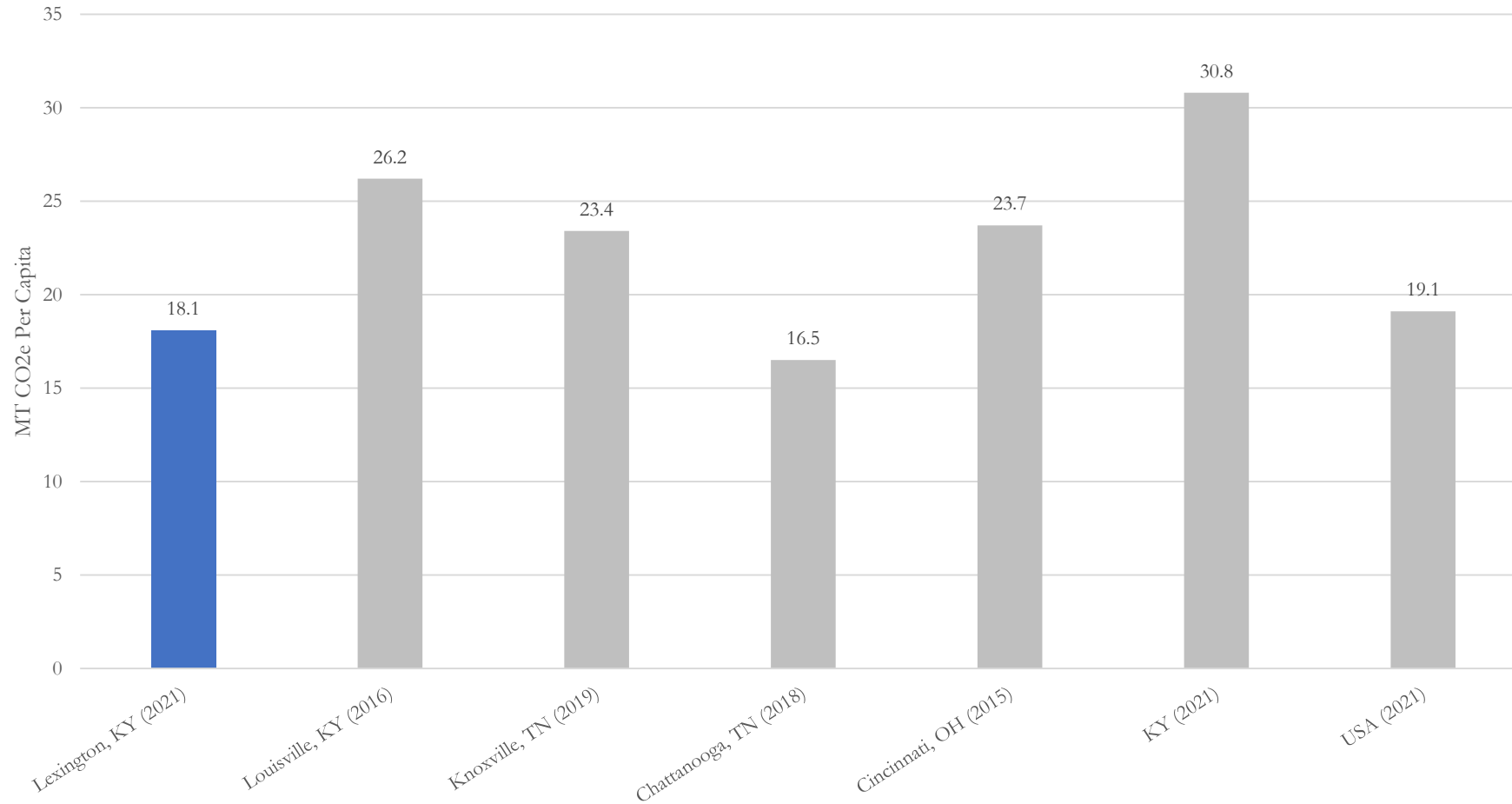


Trend Analysis (cont.)

Top 10 LFUCG Electricity Users in 2021

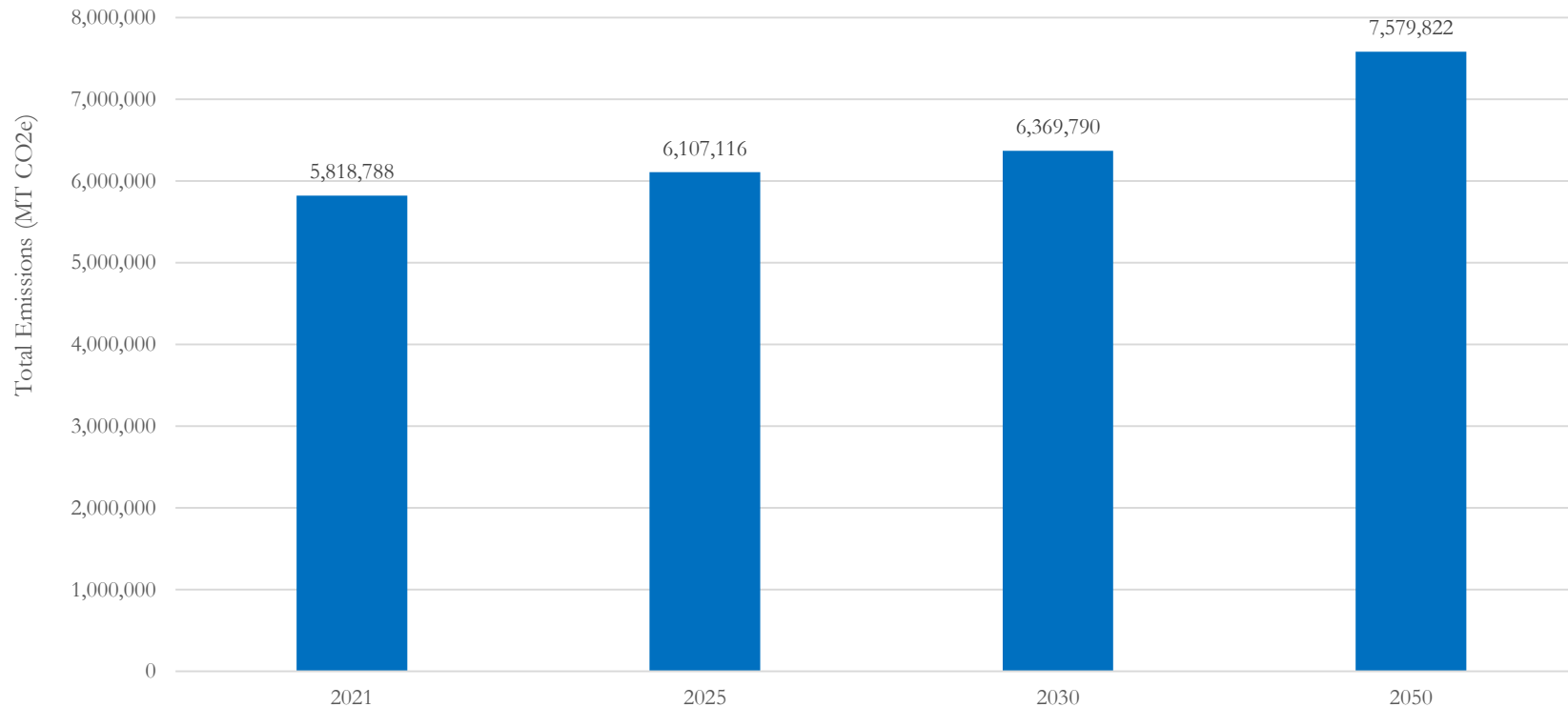


Peer Comparison



“Business as Usual” Emissions Forecast

- Population forecasts and occupation outlooks used to project emissions
- Assumes no major changes in operations or emission factors



30% increase by 2050

Questions?

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