

DANE COUNTY AIR EMISSIONS INVENTORY

**University of Minnesota's
Center for Science, Technology, and Environmental Policy**

Presented by Todd Violante of the Dane County Planning and Development Department
to
Dane County's Environment, Agriculture, and Natural Resources (EANR) Committee

Wednesday, October 5, 2016

Introduction/Background

- 2011 Sustainable Communities Regional Planning Grant by HUD: \$2 million to the Capital Regional Sustainable Communities Initiative (Administered by CARPC)
- 2013 Recommendations of the Greenhouse Gas/Air Quality Work Group
- 2014 Budget Amendment for \$35,000
- Dane County contracted with University of Minnesota's Center for Science, Technology, and Environmental Policy (2014 to 2016)
- Report completed August 31, 2016

Overview of Inventories

- Dane County Air Emissions Inventory is actually THREE inventories:
 1. In-Boundary Emissions Inventory (IBEI) (Scope 1);
 2. Trans-Boundary Communitywide Infrastructure Use-Activity Footprint (CIF) (Scope 2 and some Scope 3); and
 3. Consumption-Based Emission Footprint (CBF) (Scope 3)
- Three different methodologies used to “footprint” energy use, greenhouse gas production, and air pollution emissions in Dane County as prescribed by ICLEI

Overview of Inventories

- The International Council for Local Environmental Initiatives (ICLEI): An international network of over 1,500 local governmental units working toward global sustainability
- ICLEI's GHG Protocol categorizes footprint methodologies in the following manner:
 1. Scope 1 = All direct/in-boundary GHG emissions (IBEI)
 2. Scope 2 = Indirect GHG emissions due to the consumption of electricity, heat, or steam (CIF); and
 3. Scope 3 = Other indirect GHG emissions that occur outside the boundary as a result of activities taking place within the boundary, such as purchased goods and services (CBF)

Air Emissions Tracked

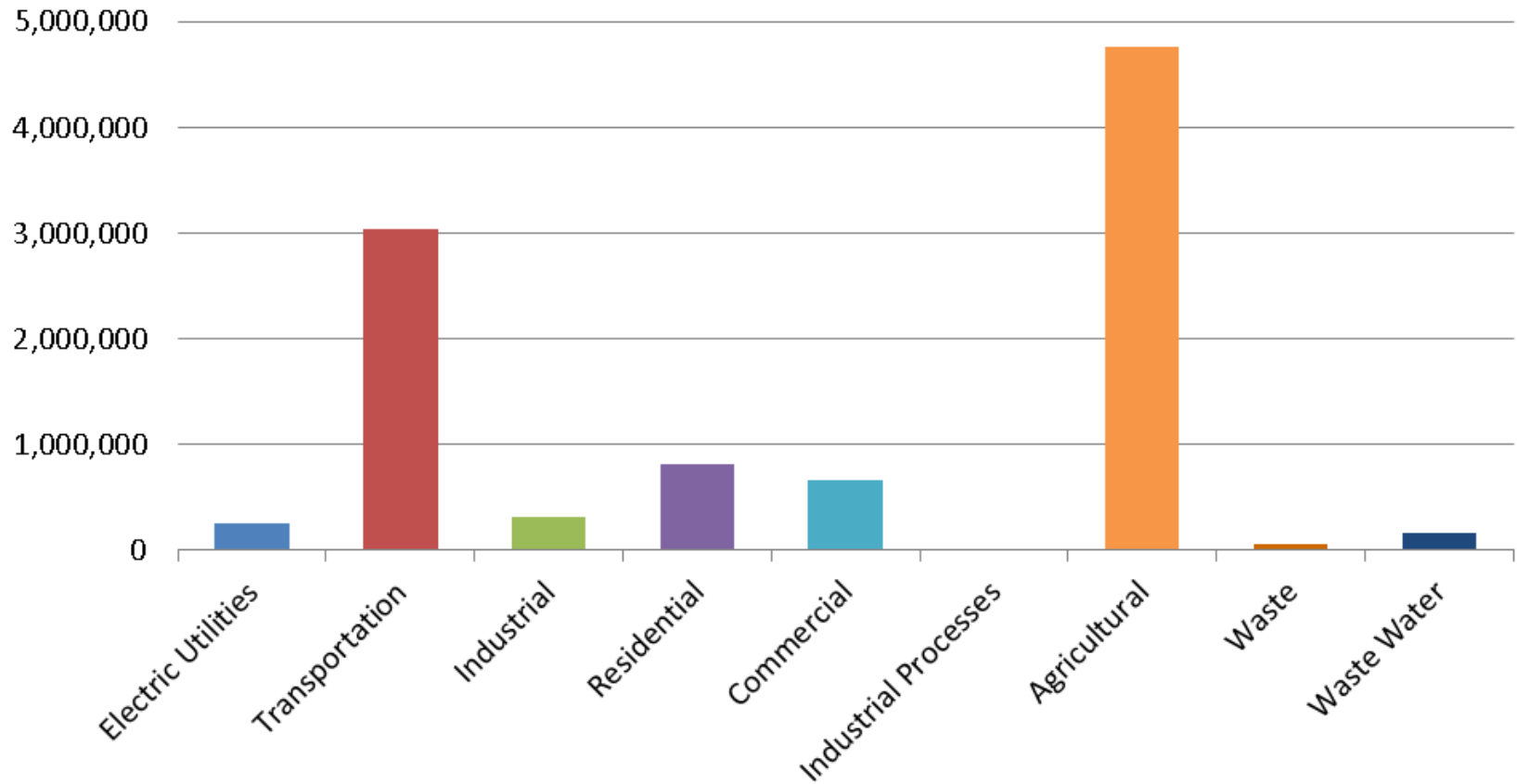
- Greenhouse Gases (GHGs) (Global/Climate Change):
 1. Carbon Dioxide;
 2. Methane;
 3. Chlorofluorocarbons (CFCs);
 4. Nitrous Oxide; and
 5. Others
- Criteria Air Pollutants (NAAQS)(Community/Health Impacts):
 1. Sulfur Oxides (SO_x);
 2. Oxides of Nitrogen (NO_x);
 3. Particulate Matter (PM); and
 4. Volatile Organic Compounds (VOCs)
- [EPA Greenhouse Gases/Climate Change Overview](#)

IBEI GHG Emissions by Sector - Dane County, 2013

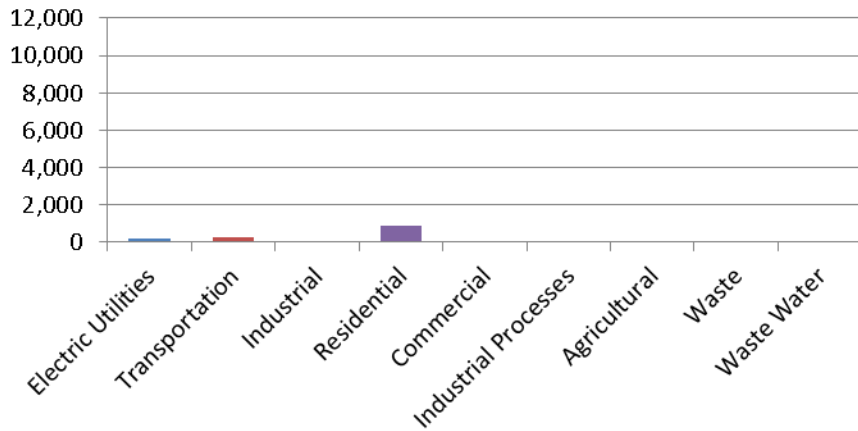
Total: 10.0 million mt CO₂e

19.7 mt-CO₂e/capita

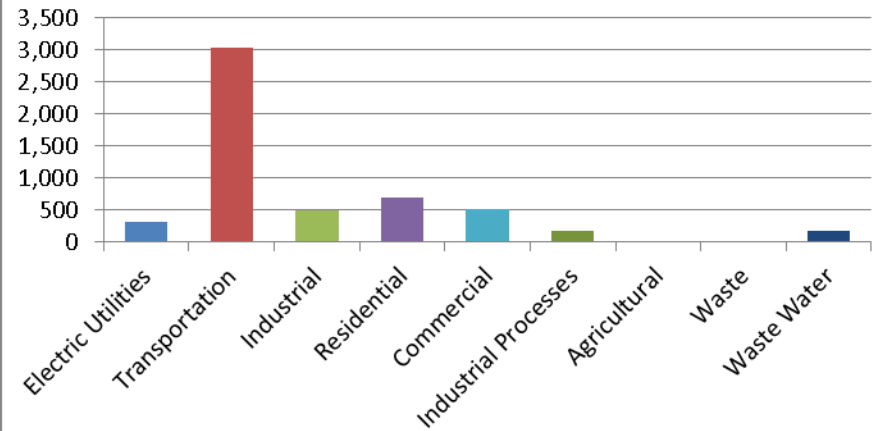
234.1 mt-CO₂e/Million \$ GDP



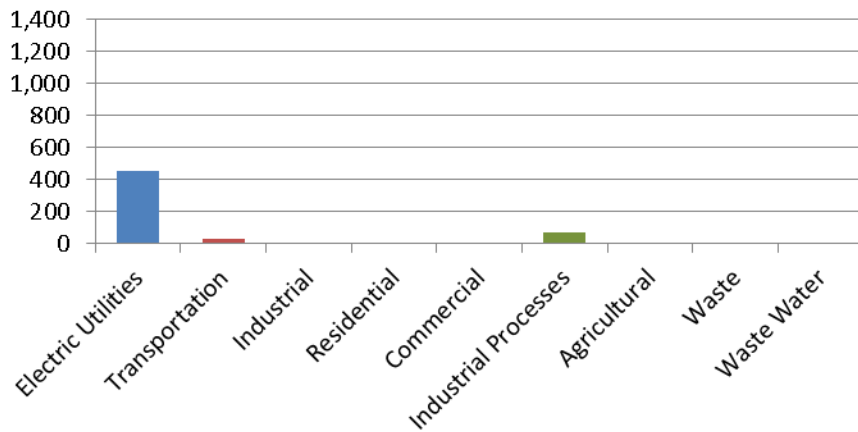
IBEI PM Emissions by Sector - Dane County, 2013
(Total = 1446.7 mt PM)



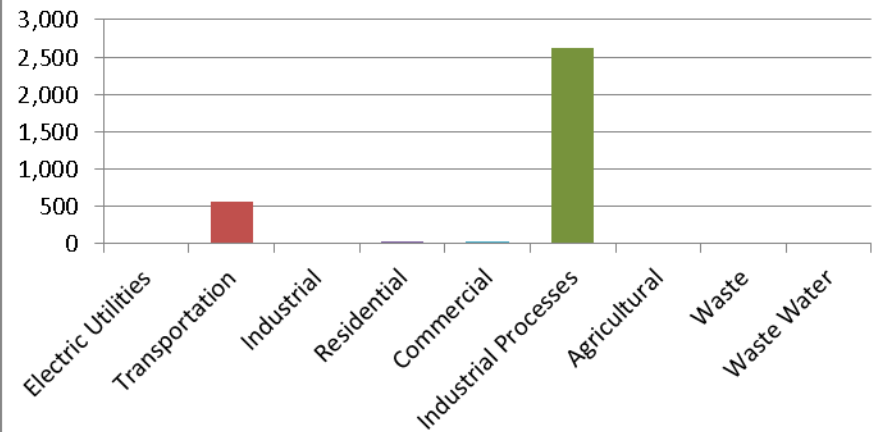
IBEI NOx Emissions by Sector - Dane County, 2013
(Total = 5445.3 mt NOx)



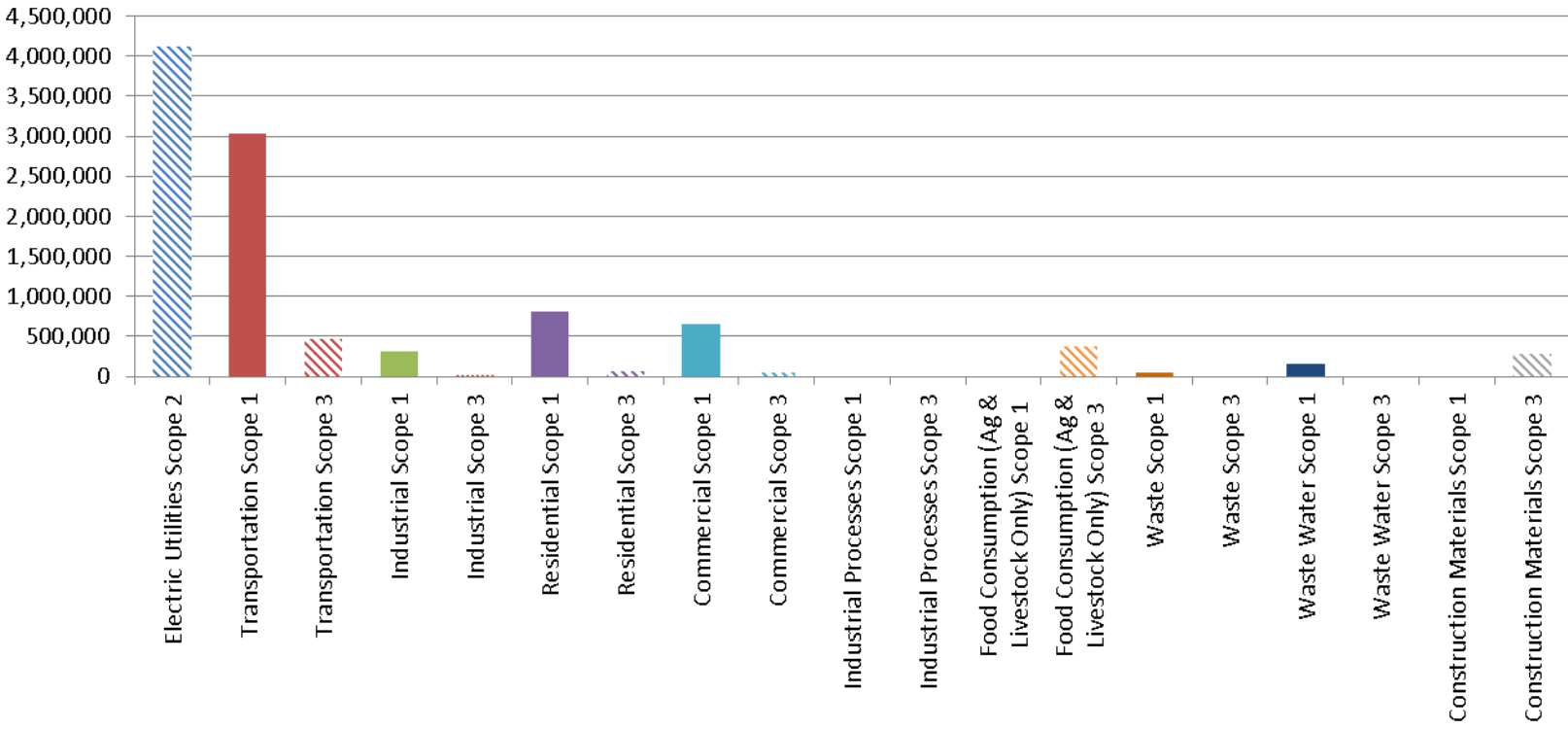
IBEI SOx Emissions by Sector - Dane County, 2013
(Total = 566.9 mt SOx)



IBEI VOC Emissions by Sector - Dane County, 2013
(Total = 3279.7 mt VOC)



Community-Wide Infrastructure Use-Activity Based Footprint, CO₂e Emissions by Sector & Scope - Dane County, 2013
(Total = 10.4 million mt CO₂e)
20.4 mt-CO₂e/capita
242.4 mt-CO₂e/Million \$ GDP



Primary Conclusions

- Within Dane County's boundaries (IBEI), transportation and agriculture are the two sectors that dominate GHG emissions.
 - However, only transportation is a significant contributor to criteria air pollutants, particularly NOx.
- Industry is the major contributor of VOCs (IBEI).
- Electric utilities contribute 81 percent of Scope 1 SOx emissions (IBEI) and most Scope 2 PM (CIF) and the largest share of NOx(CIF).
- “Transportation and electricity sector interventions seem to be where Dane County can make the most impacts on criteria air pollutant reductions.” (Scope 1/IBEI)
- The contributions to GHGs from transportation and electricity generation become much more pronounced in the Communitywide Infrastructure Use-Activity Footprint (CIF).

So what do we do about it?

There are already numerous sustainability efforts taking place in Dane County, which include, but certainly are not limited to the following, all of which have the effect of reducing GHGs and improving air quality for public health:

- 2013 County Executive Climate Action Council
- 2016 Dane County [Government] Sustainable Operations Plan
- Dane County landfill (Electricity Generation and CNG from Methane and Carbon Dioxide Capture)
 - Dane County Highway Garage CNG filling station
- Dane County has the largest municipally owned solar installations in the state (Highway Garage, Medical Examiner, Airport) and geothermal technology installed at Badger Prairie Health Care Center
- Manure digesters prompted by Dane County and area partners
- Additional exceptional activities of the cities of Fitchburg, Madison, Middleton, Monona, and others

Next Steps

- 2016 Budget Amendment \$35,000 to develop a countywide climate action plan
 1. Component 1: Dane County Government Climate Action Initiative
 - a. Contract with UW-La Follette School of Public Affairs to update Dane County's 2011 Greenhouse Gas Emissions Report with more current information AND develop recommendations for tracking fuel consumption of Dane County fleet vehicles
 2. Component 2: Develop a Countywide Climate Action Plan via the Climate Action Council
 - a. Dane County Executive 2017 Budget Includes an Office of Energy and Climate Change
- Incorporate Dane County and other local community sustainability successes into the Countywide Climate Action Plan as examples to build upon and proliferate

Questions?