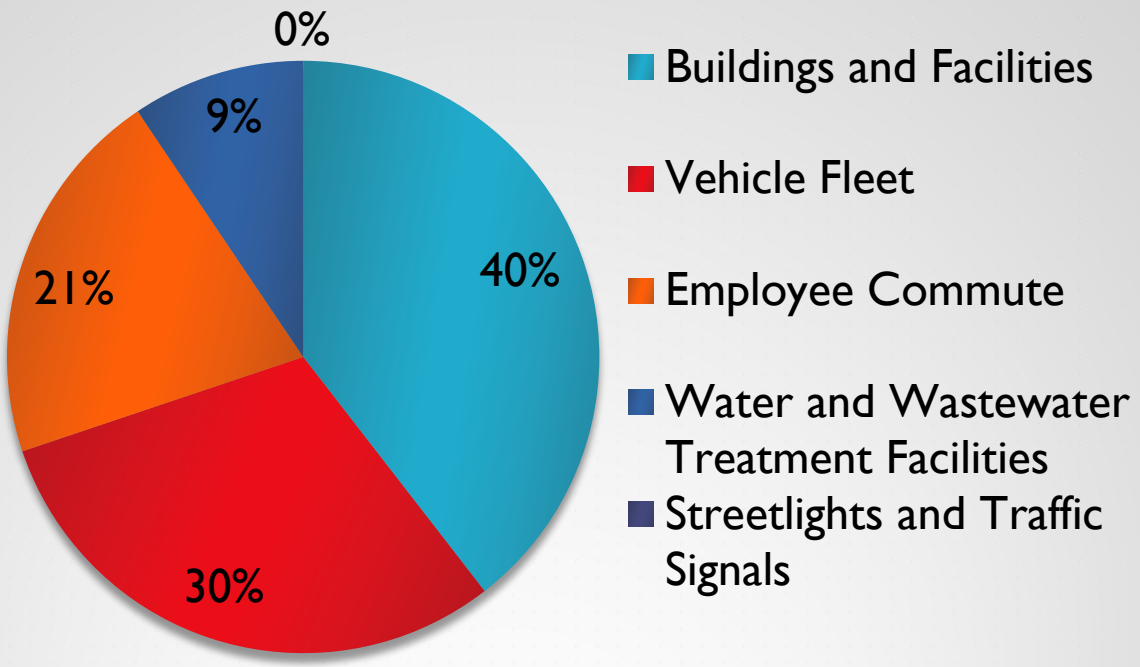
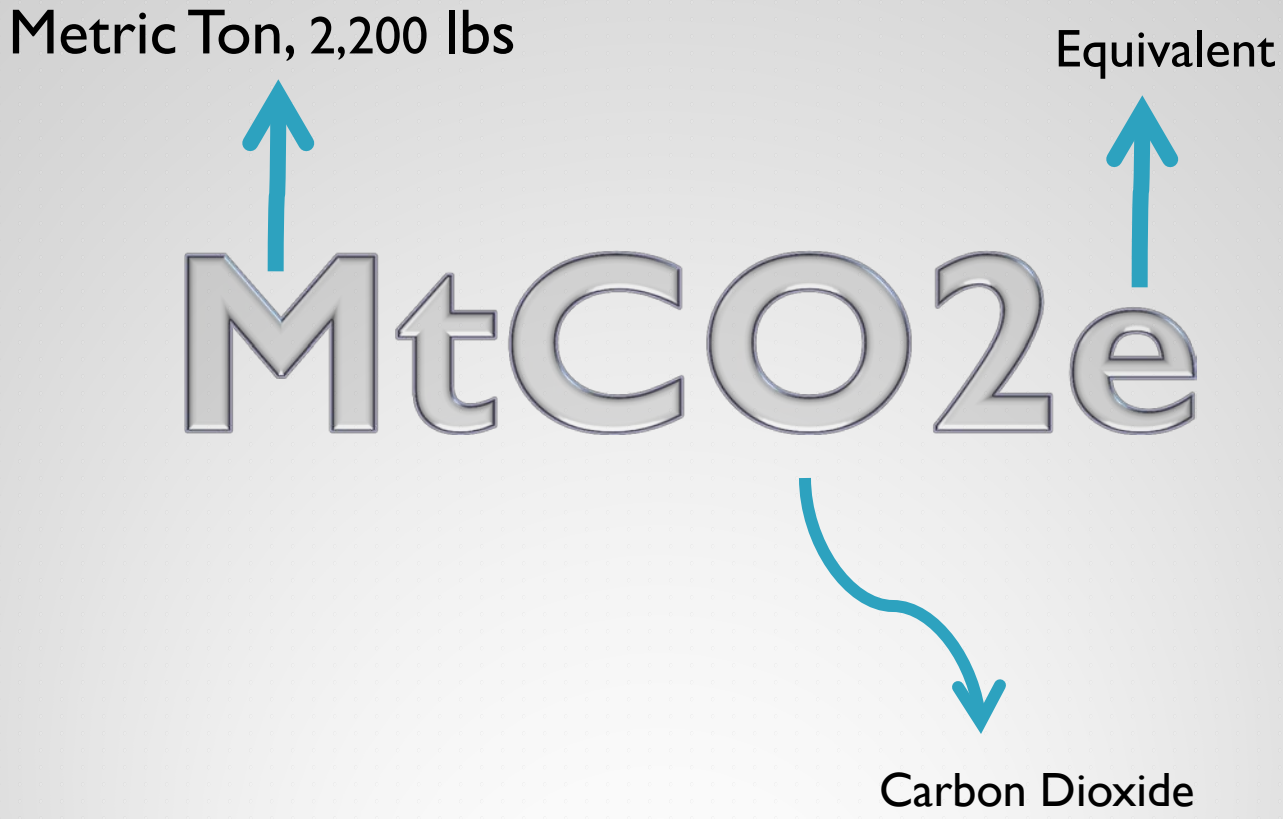
Missoula County Operations 2016 Greenhouse Gas Emissions Inventory

RESULTS

- Missoula County operations emitted a total of **6,810 MtCO2e** in 2016




Metric Ton, 2,200 lbs
Equivalent
MtCO2e
Carbon Dioxide

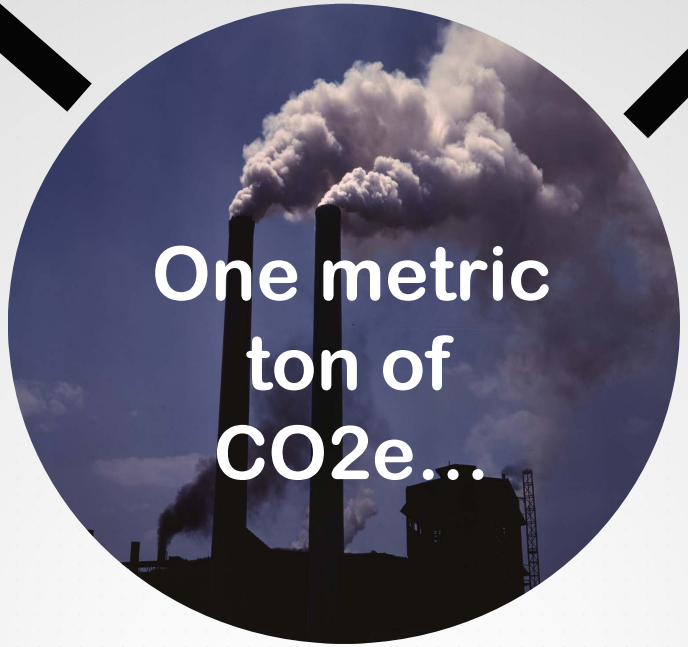
1 metric ton= 2,200 lbs

Missoula County emitted 14,982,000 lbs of CO_2e, the weight of ~3,745 cars

Monthly demand of average American household

Produce ~143lbs of poultry

Drive ~2,500 miles in medium-sized car



Produce ~48lbs of pork

Produce ~40lbs of beef

Emissions categorized into following scopes:

- **Scope 1:** All direct emissions from on-site fossil fuel combustion
- **Scope 2:** Indirect emissions from energy generated in one location but used in another
- **Scope 3:** Indirect emissions that occur outside the scope boundary as a result of activities within the boundary

Why do we categorize emissions into scopes?

- To get a better idea of where emissions come from, and how easy or difficult it would be to set reduction targets for different scopes. It would be easier, for example, to reduce emissions from scope 1 than it would be from scope 3.

Scope 1:

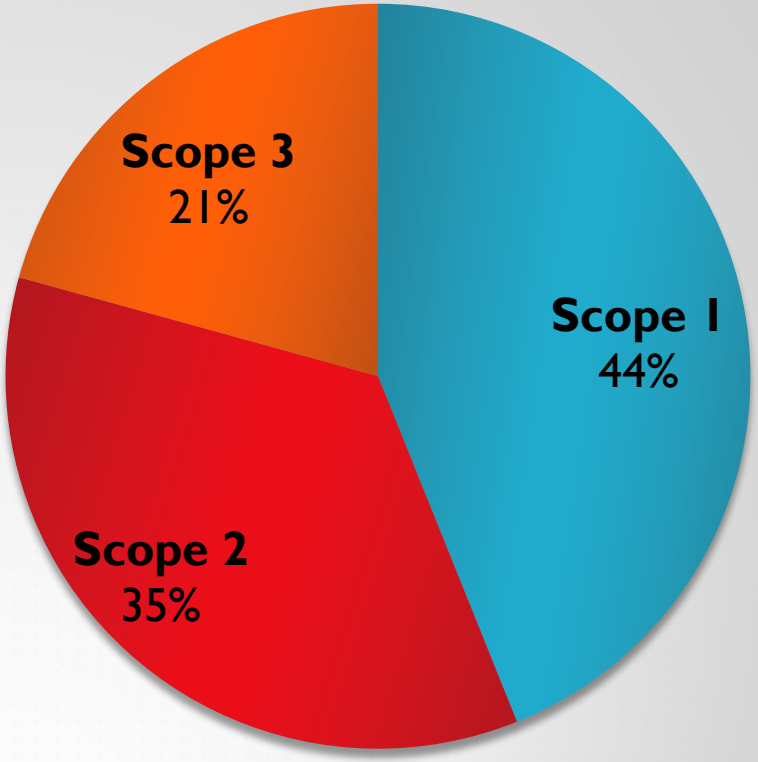
- Use of petroleum-based fuel in vehicle fleets (69%)
- Use of natural gas or propane for heating facilities (23%)
- Fugitive emissions from water and wastewater treatment facilities (8%)

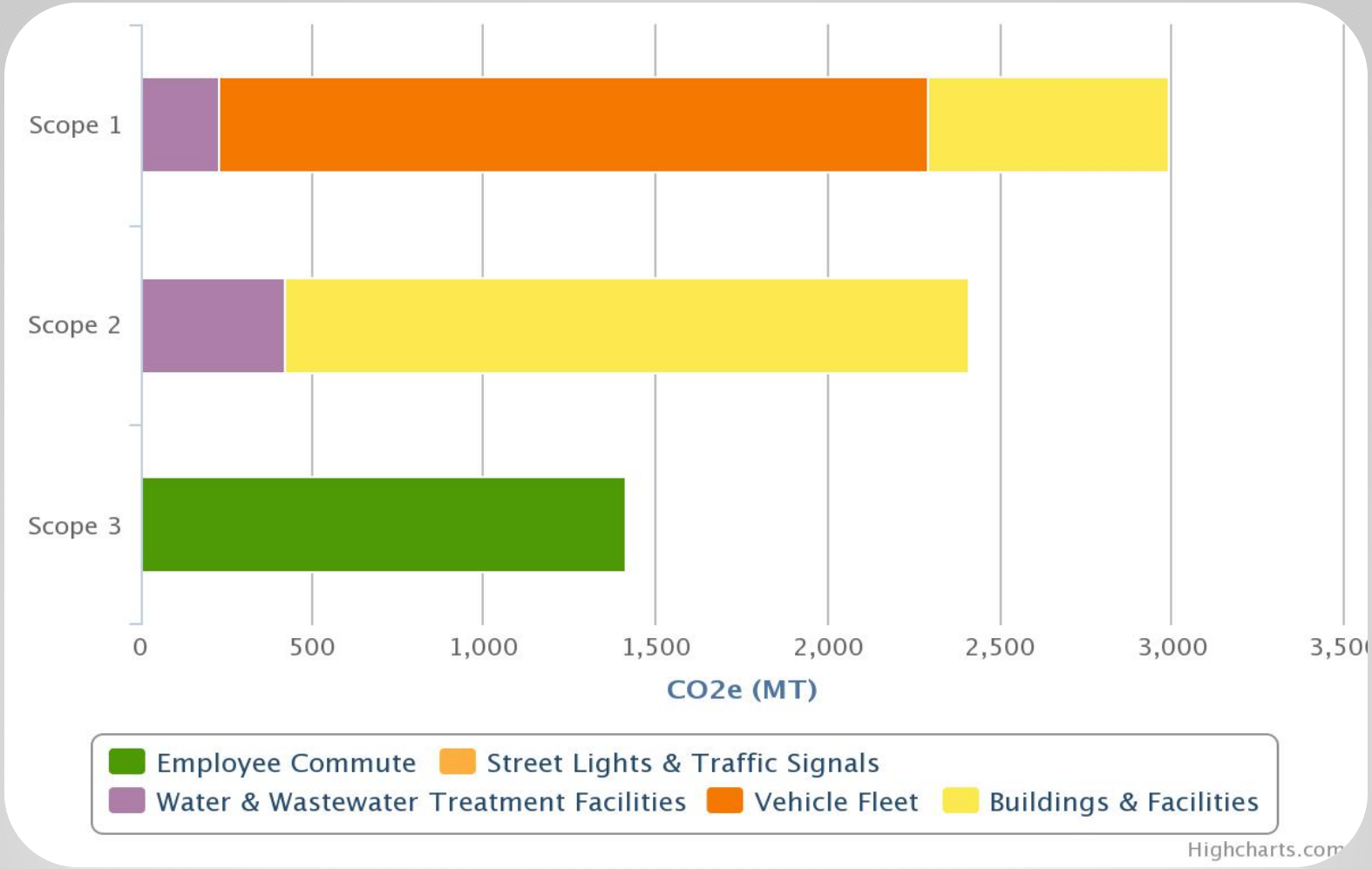
Scope 2:

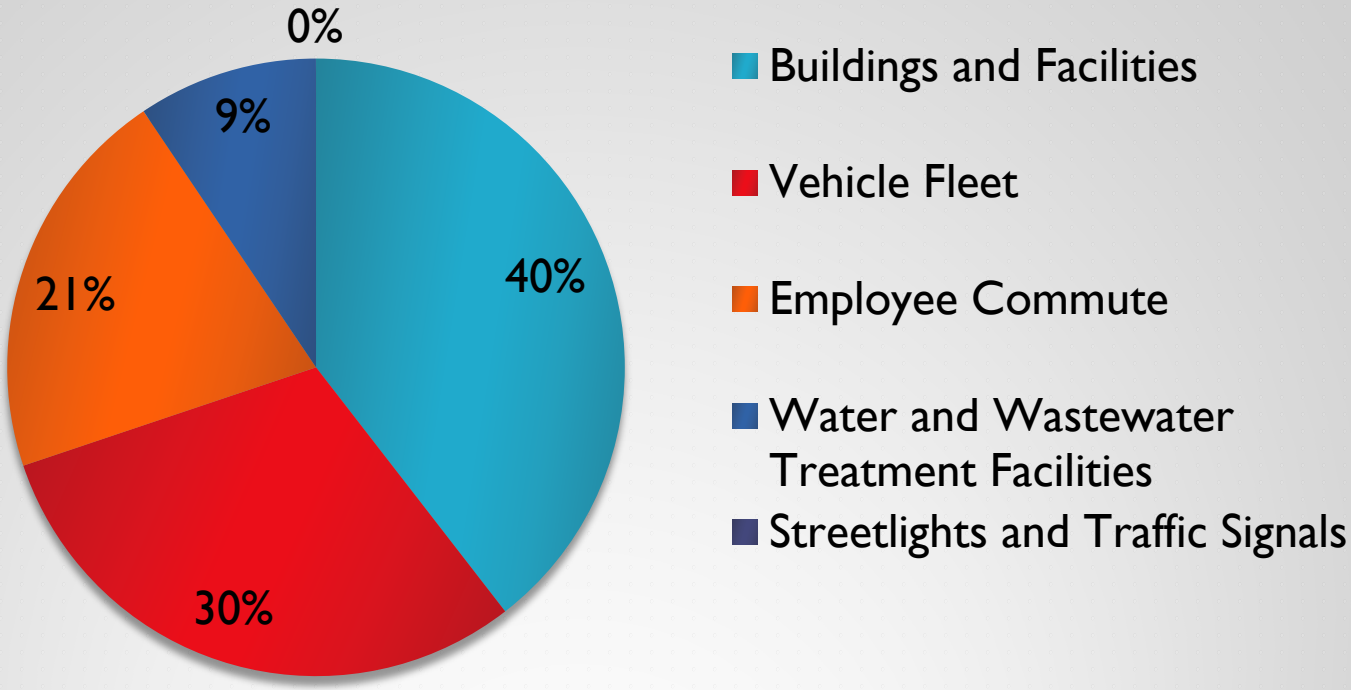
- Electricity use in buildings (83%)
- Electricity use in WWTP (17%)
- Electricity use from streetlights (<1%)

Scope 3:

- Employee commute (100%)

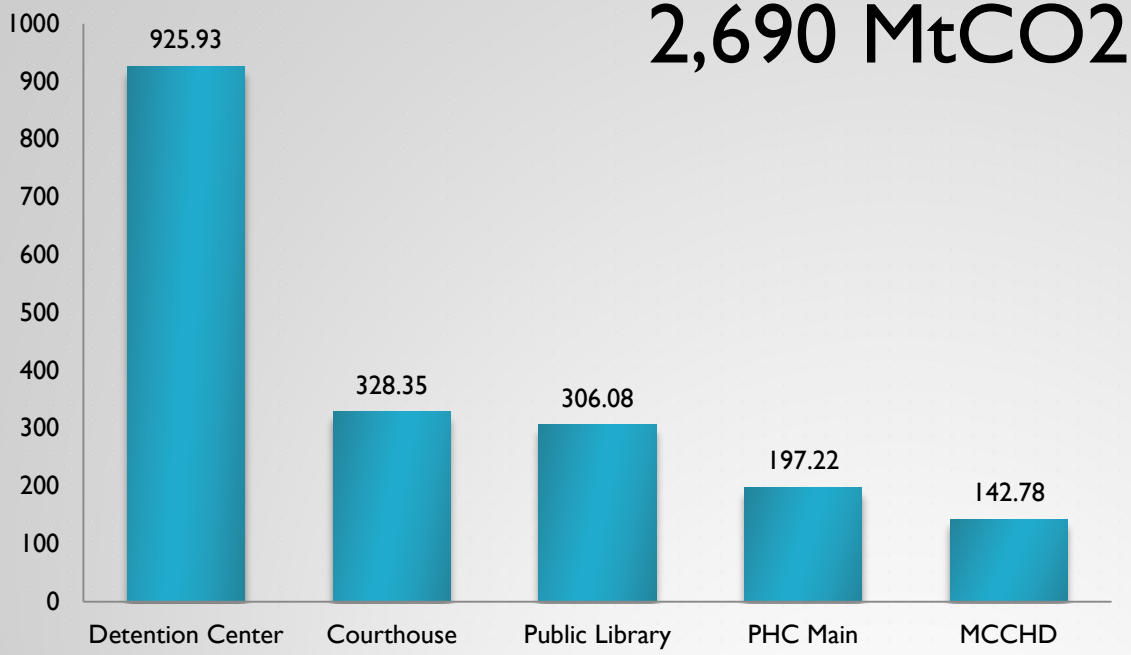


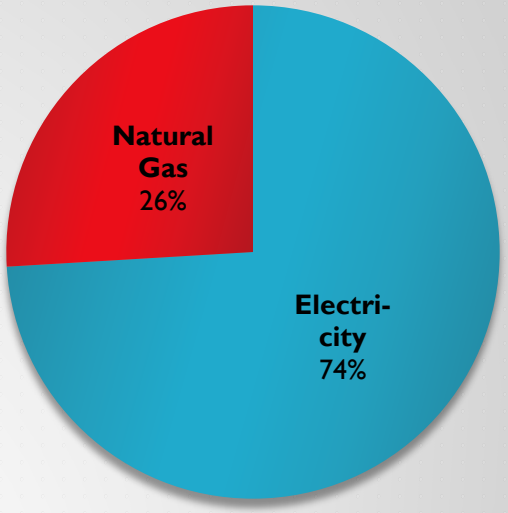

Scope 1
Scope 2
Scope 3
0
500
1,000
1,500
2,000
2,500
3,000
CO2e (MT)
Employee Commute
Street Lights & Traffic Signals
Water & Wastewater Treatment Facilities
Vehicle Fleet
Buildings & Facilities
Highcharts.com


0%
9%
40%
21%
30%
Buildings and Facilities
Vehicle Fleet
Employee Commute
Water and Wastewater Treatment Facilities
Streetlights and Traffic Signals

BUILDINGS AND FACILITIES

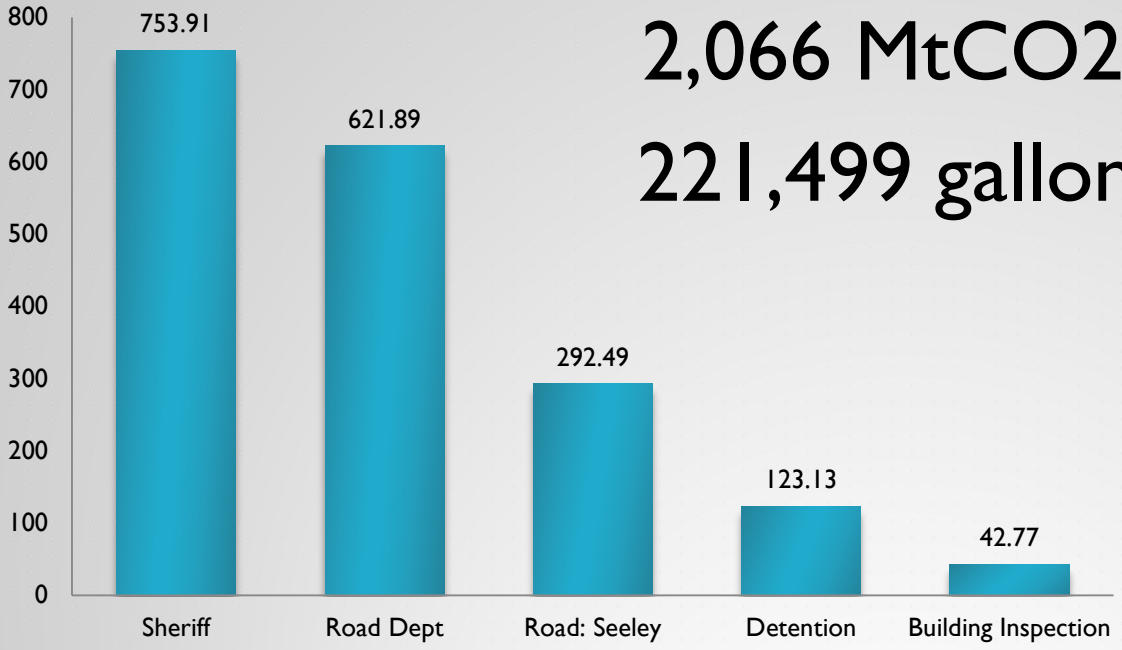
2,690 MtCO2e





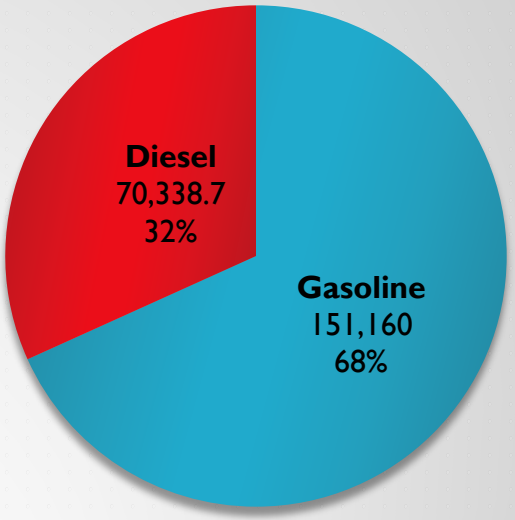
Top 5/ 56 buildings and facilities

VEHICLE FLEET



2,066 MtCO2e

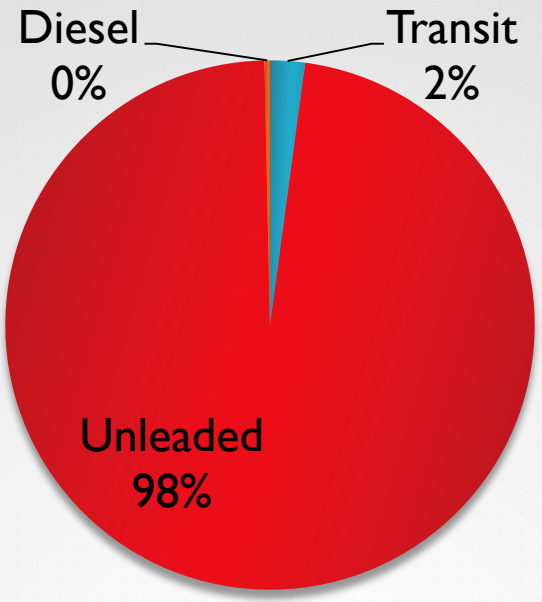
221,499 gallons



Top 5/ 31 vehicle fleets

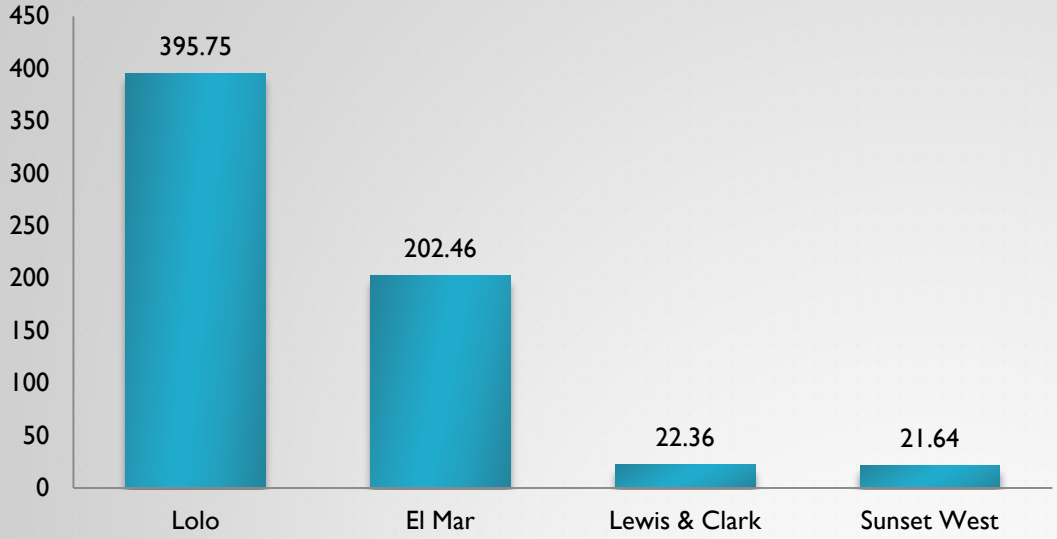
EMPLOYEE COMMUTE

1,411 MtCO2e



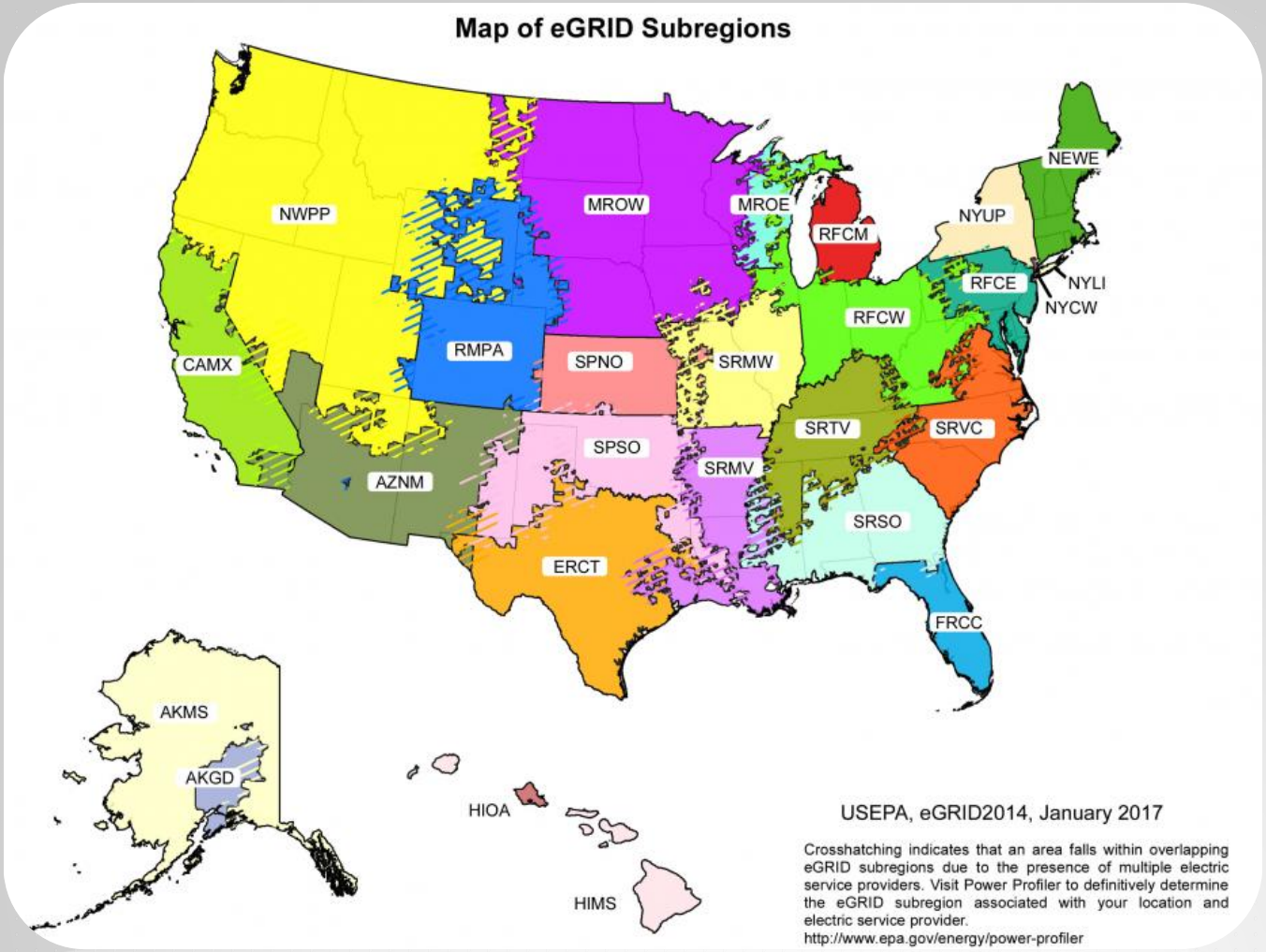
WATER & WASTEWATER TREATMENT FACILITIES

642 MtCO2e



Population Served

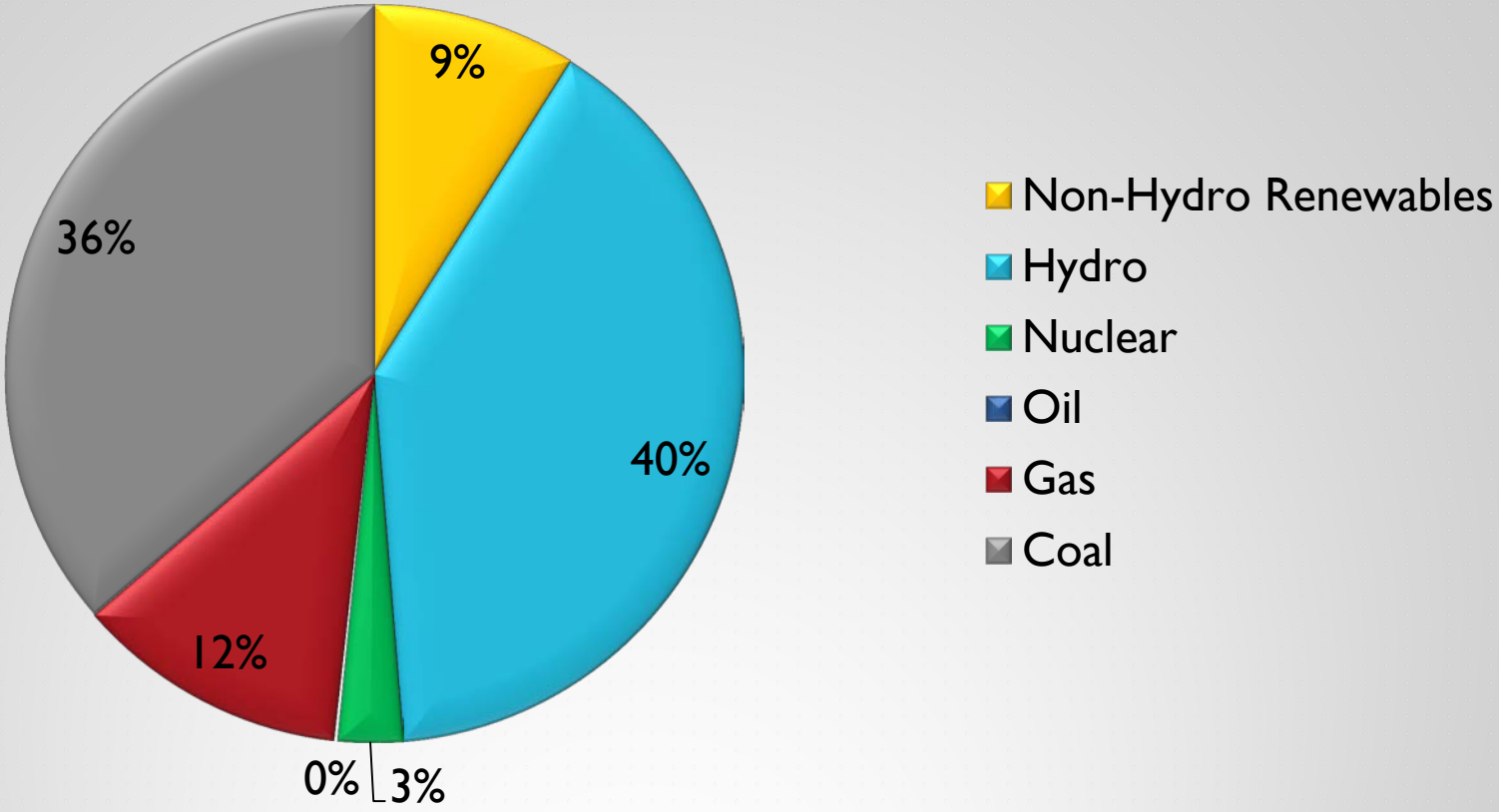
Lolo: 2,800
El Mar: 1,243
Lewis & Clark: 105
Sunset West: 98



eGRID: Emissions & Generated Resource Integrated Database.

Standard source of emissions data for electricity generated in the U.S.

NWPP ENERGY MIX



WHY MEASURE GREENHOUSE GASES?

- Growth Policy, Goal 4: Reduce Missoula County's contribution to climate change while building resiliency
- How much is Missoula County contributing to climate change?

HOW DOES CLIMATE CHANGE AFFECT MONTANA?

In a business-as-usual scenario…

- 4-5 degree increase by 2055, 6.5 degrees in winter, according to recent report by Montana Wildlife Federation
- Less snow, increased rate of runoff, less runoff into streams
- Summer droughts, increased wildfire potential

OUR CHANGING ECOSYSTEMS

- 200-500% increase in acreage burned by 2055
- Ponderosa pines, Douglas firs → Spruce-fir
- Grasslands → sage, scrubs
- Less moisture + higher temperatures= more disease and beetle kill

- Increased stream temperatures + decreased water levels due to less snow runoff = decrease in native fish populations
- Increase in competition with invasive species more suitable for warmer water environments
- Cutthroat trout habitat has declined by 85%, with expected additional 58% decline by 2080

HEALTH IMPACTS

- **Changes in temperatures and precipitation will have profound impacts on human health and wellbeing:**
  - **Increase in wildfires → increase in particulate matter → decrease in air quality → respiratory and cardiovascular illness**
  - **Increasing temperatures → decrease in body's ability to thermoregulate → heat stroke, sometimes death**
  - **Increase in CO2 levels and temperatures and altered precipitation → higher pollen concentration and longer pollen seasons → worsened allergy conditions**

IMPACTS ON AGRICULTURE

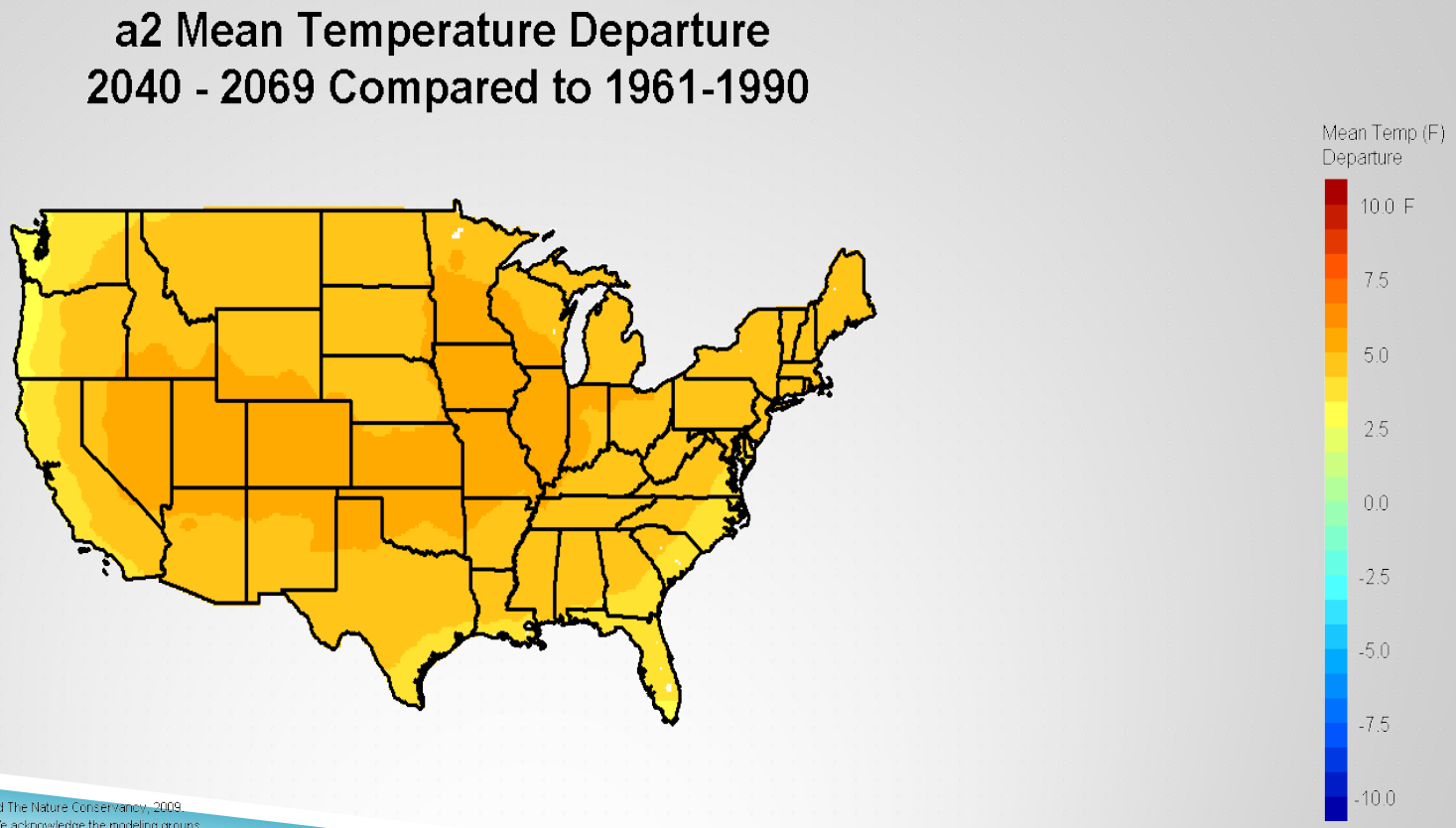
- **Increase in CO2 → plants grow faster and take-up less nitrogen → less plant nutrients (both wheat and plants for livestock)**
- **Decrease in moisture during summer + increase in CO2 → fast growing, dry plants → increase in wildfire → degradation of vegetation for livestock**
- **According to a 2016 report by the Montana Farmers Union, by 2050…**
  - **Cattle raising: 20% decline in production**
    - **Loss in jobs: 12,167 = $364 million labor earnings**
  - **Crops: 25% decline in production**
    - **Loss in jobs: 12,457 = $372 million labor earnings**

ECONOMIC CONSEQUENCES

- Tourism second largest industry in Montana
- 3.1 million people visit Missoula every year and spend around $310 million, according to the Missoula Economic Partnership
- Increased temperatures → shorter winters → less winter tourism; 1/3 decrease by 2050
  - Loss of 1,500 winter-sport jobs
  - $37 million in labor earnings
- Montana's outdoor economy could experience a total loss of 11,000 jobs and $281 million

CLIMATE REFUGEES

- People from coastal regions and the South will be likely be seeking refuge in Missoula



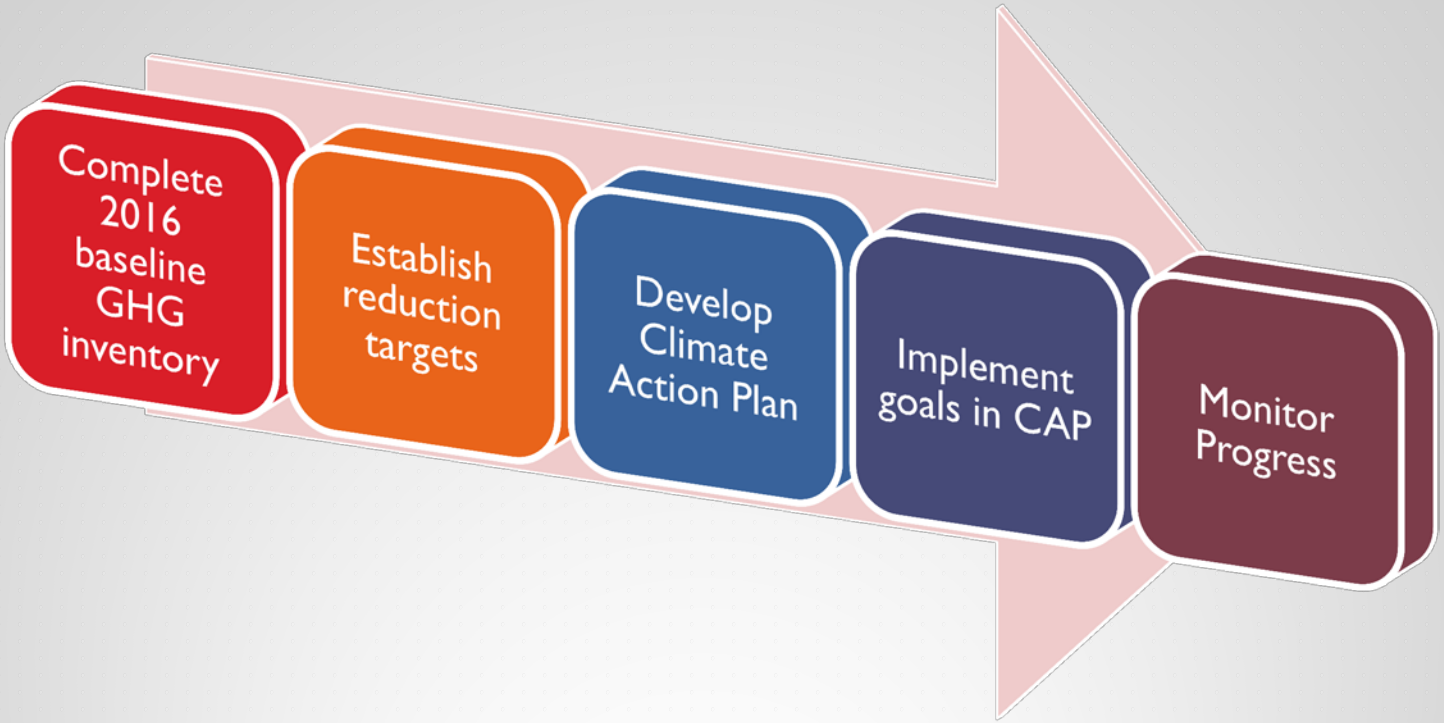
Map produced by ClimateWizard (c) University of Washington and The Nature Conservancy, 2009.
Base climate projections downscaled by Maurer, et al. (2007). We acknowledge the modeling groups, the Program for Climate Model Diagnosis and Intercomparison (PCMDI) and the WCRP's Working Group on Coupled Modelling (WGCM) for their roles in making available the WCRP CMIP3 multi-model dataset. Support of this dataset is provided by the Office of Science, U.S. Department of Energy.

WHERE ARE WE NOW?

Efforts already made in sustainability:

- Waste Reduction and Recycling Policy (Policy No. 2012-04, November 13, 2012)
- Green Building Policy (Resolution 2010-070, June 10, 2010)
- Motor Pool Vehicle Procurement Policy (Policy No. 2007-04, September 20, 2007)
- Disposal of County Surplus Property Policy (Policy No. 2011-02, May 31, 2011)
- Addition of Climate Change Provisions in County's Growth Policy
- SITES Certification of Fort Missoula Regional Park (FMRP)
- LEED Certification of County Courthouse
- Upgrades to Lighting, Heating, Cooling, and Ventilation Systems (HE appliances)
- Commitment to Renewable Energy through Community-Oriented Programs
  - MEC Solar
  - SolSmart
- Habitat Certification of 5 County Parks

LOOKING AHEAD



- Facilities Locator and Emissions map:
- http://172.16.33.28/CAPS/MissoulaCountyFacilityLocator/