

# CLIMATE CHANGE

A tall, white water tower stands against a dramatic sky at sunset. The sky is filled with large, billowing clouds that are illuminated from below, creating a warm, orange and pink glow. The water tower is a simple, cylindrical structure with a rounded top and a few small antennas or sensors on its peak. The bottom of the image shows the dark silhouettes of trees and foliage.

**OVERVIEW,  
PROJECTED CHANGES,  
MITIGATION STRATEGIES,  
ADAPTATION STRATEGIES,**

# CLIMATE CHANGE



Climate change and global warming often used interchangeably

- **Climate Change** = Long-term regional or global averages of temperature, humidity and rainfall patterns over seasons, years or decades from both natural and anthropogenic causes.
- **Global Warming** = Specific to the rapid temperature increases due primarily to increased greenhouse gases from anthropogenic causes.

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## Greenhouse Gas Emissions Include:

- **Carbon Dioxide (CO<sub>2</sub>):** Primarily burning fossil fuels, solid waste, wood  
Persists in atmosphere to thousands of years. (Abundant) GWP = 1
- **Methane (CH<sub>4</sub>):** fossil fuels, livestock, agriculture  
Persists in atmosphere average 12 years. GWP = 25<sup>1</sup>
- **Nitrous Oxide (N<sub>2</sub>O):** Agriculture and industrial activities  
Persists in atmosphere average 114 years. GWP = 298<sup>1</sup>
- **Fluorinated Gases (F-Gases):** Industrial processes  
Persists in atmosphere up to 50,000 years. GWP = 7,390 to 22,800<sup>1</sup>



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## Water Vapor

- Most abundant greenhouse gas
- Persists in atmosphere hours to days
- Not a driver of global warming
- Changes in water vapor is a result of changes in temperature
- Water vapor is both a positive and a negative feedback

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## Projected Changes For Midwest and Chicago Region Include:

- Increased precipitation, storm intensity, flooding
- Longer dry periods between storms (summer drought)
- More frequent and intense heat, increased avg high up to 117°
- Warmer winters, more freeze thaw
- Increased number of pests, diseases, invasive species
- More damage to property, roads and infrastructure
- Longer growing seasons and increased CO<sub>2</sub> may increase agricultural yields, but gains likely offset by extreme weather, increased pests

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- **Mitigation** = Taking actions to reduce greenhouse gas emissions and increase net uptake of atmospheric carbon
- **Adaptation** = Developing ways to protect people and places by reducing vulnerability to climate change

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Local partners to help plan, develop, and implement mitigation and adaptation strategies

## **Chicago Metropolitan Agency for Planning**

- Greenhouse Gas Emissions Study
- Climate Change Adaptation Handbook
- Currently preparing a Regional Climate Action Plan

## **Metropolitan Mayor's Caucus**

- Greenest Living Compact (GRC)

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**Climate Change Mitigation** - *The County, municipalities, businesses and individuals should develop and implement climate change mitigation strategies to reduce their GHG emissions and to improve the capacity of natural systems to absorb and store carbon.*

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## CMAP 2015 Greenhouse Gas Emissions Study for Chicago Region

2015 Emissions (MMTCO<sub>2</sub>eq)

| Sector  | McHenry County Total |
|---|----------------------|
| <b>Stationary Energy</b>                              | <b>2.55</b>          |
| Residential Buildings                                 | 1.32                 |
| Commercial and institutional buildings and facilities | 0.80                 |
| Manufacturing industries                              | 0.43                 |
| Energy industries                                     | -                    |
| Fugitive emissions from oil and natural gas systems   | 0.00                 |
| <b>Transportation</b>                                 | <b>1.54</b>          |
| On-road   | 1.27                 |
| Railways  | 0.01                 |
| Waterborne navigation                                 | 0.00                 |
| Aviation  | -                    |
| Off-road  | 0.25                 |
| <b>Waste</b>  | <b>0.10</b>          |
| Disposal of solid waste generated in the city         | 0.09                 |
| Biological treatment of waste generated in the city   | 0.00                 |
| Wastewater generated in the city                      | 0.00                 |
| <b>Total</b>  | <b>4.19</b>          |
| Percent of Total Emissions in Chicago Region          | 4%                   |

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## **Buildings and Community**

- Collaborate with partners – Implement Smart Growth – Weatherize – Energy Efficiency

## **Energy**

- Expand production and use of renewable energy (solar and wind)

## **Transportation**

- Efficient alternative energy vehicles – Public transportation – Bike/pedestrian – Anti-idling

## **Waste**

- Composting/waste minimization/recycling - WWTP optimize CH<sub>4</sub> oxidation & gas recovery

## **Natural Resources and Environment**

- Expand & restore natural areas to enhance “regions” ability to absorb atmospheric CO<sub>2</sub>

## **Agriculture**

- Improve crop/grazing practices to absorb CO<sub>2</sub> & Reduce CH<sub>4</sub> and N<sub>2</sub>O emissions

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**Climate Change Adaptation** - *The County, municipalities, businesses and individuals should develop and implement climate change adaptation strategies that improve resilience to unavoidable, rapid changes in climate.*

# CLIMATE CHANGE

## **Buildings and Community**

- Collaborate with partners – Update infrastructure/Green infrastructure – Water conservation

## **Energy**

- Expand distributed renewable energy (solar and wind) – Improve energy efficiency

## **Transportation**

- Update infrastructure/Green infrastructure – Street trees – High albedo & Solar shading

## **Waste**

- Improve flood protection at WWTP's - Use climate resilient designs for new WWTP's

## **Natural Resources and Environment**

- Enhance urban forest – Green infrastructure & turf to native – buffer/restore natural areas

## **Agriculture**

- No-till/cover crop for soil health – Diversify crops – Use buffers/BMPs – Efficient irrigation