INTERNATIONAL DAY OF CLIMATE ACTION

OCTOBER 24th, 2009

WHY ARE WE HERE TODAY?

- The science is CLEAR!! Global climate change is happening.

- Global climate change is caused by releasing what are called greenhouse gases (GHG); carbon dioxide, water vapor, nitrous oxide, and ozone, into the atmosphere, into the atmosphere.

- The current CO2 in the atmosphere = **387 PPM** or **820.44 GIGA TONS of CARBON DIOXIDE!**

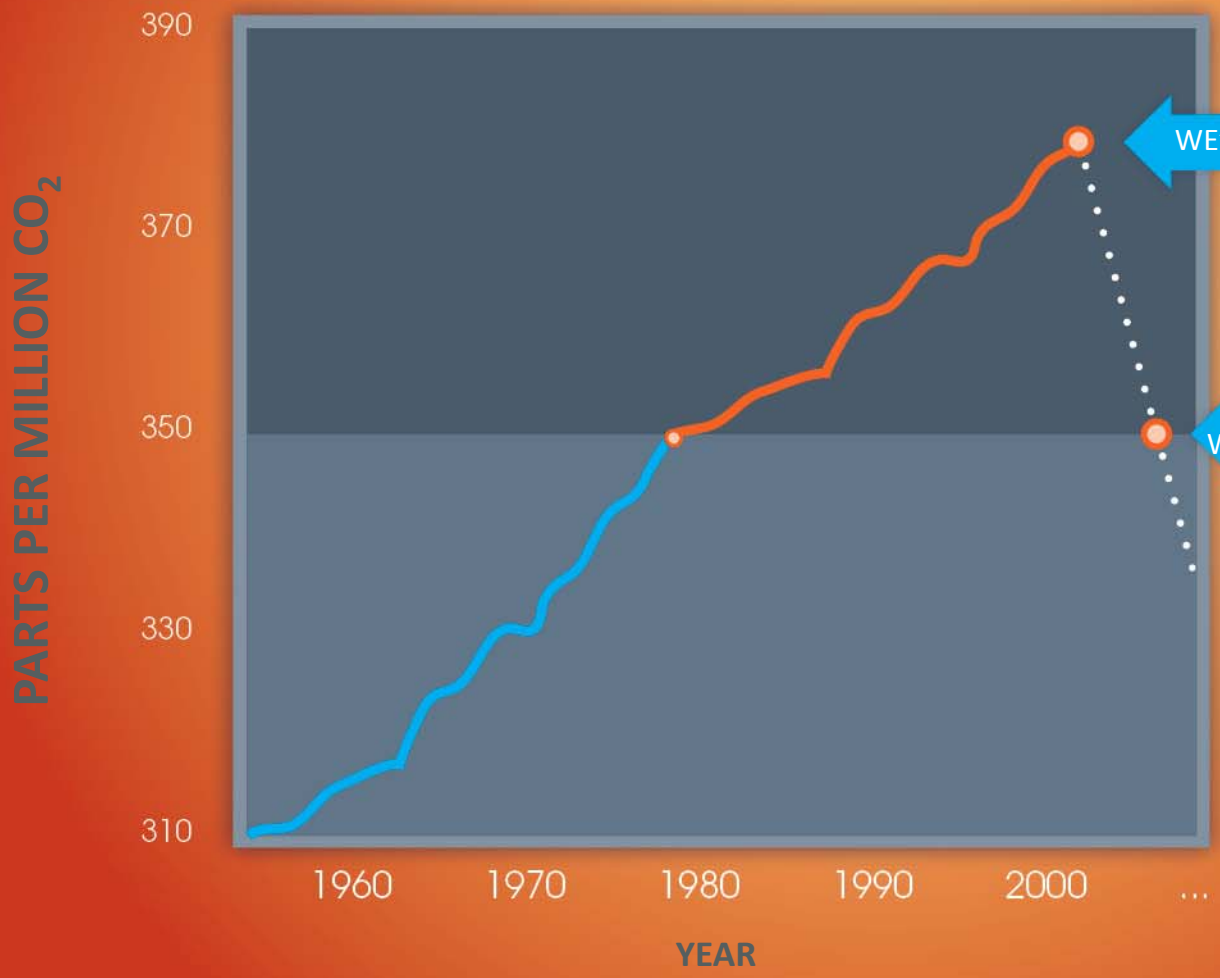
- Total Orange County Emissions* = **2,802,500 Equivalent Carbon dioxide TONS PER YEAR** (eCO2/year)

- We need to reduce our emissions to bring CO2 level from 387 ppm to 350ppm, a safe upper limit for CO2 in our atmosphere.

*base on 2005 Orange County GHG Emission Inventory

WHERE ARE WE RIGHT NOW?

CO_2 IN THE **ATMOSPHERE**



In other words…
820.44 Giga Ton CO_2
820.44 Billion tons or
820,440,000,000 tons

WE'RE HERE: **387 or 820.44** Giga Ton CO_2

In other words…
742 Giga Ton CO_2
742 Billion tons or
742,000,000,000 tons

WE NEED TO BE HERE: **350 or 742** Giga Ton CO_2

Conversion
1ppm =2.12 Giga Ton CO_2

Orange County
Greenhouse Gas (GHG) Emission Inventory 2005

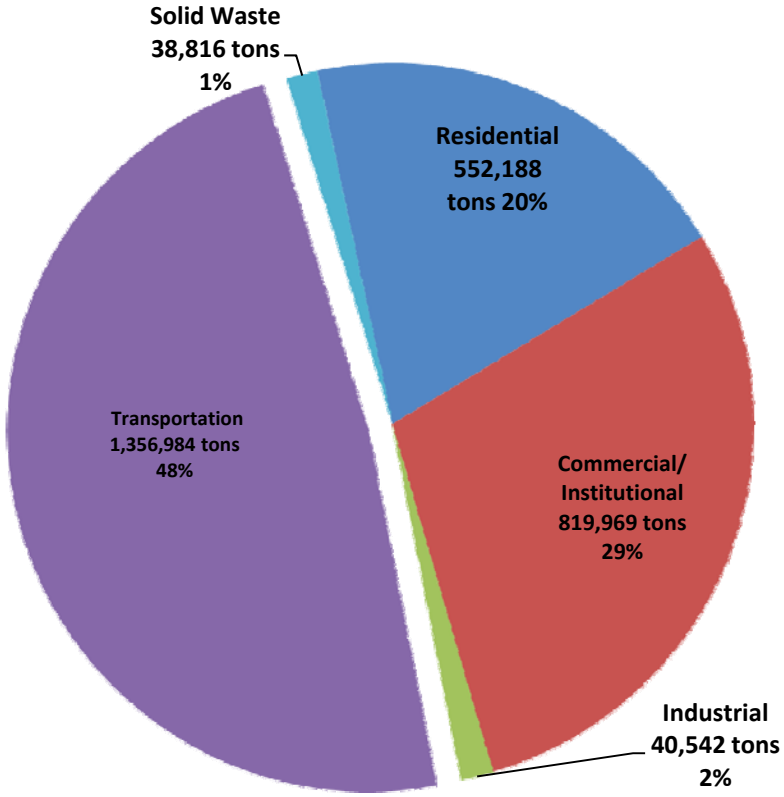
- Beginning in 2001, Carrboro, Chapel Hill, and Orange County joined Cities for Climate Protection (CCP), a program that help local governments track and reduce greenhouse gas emission from their operation and communities.

- The final report "**Carrboro, Chapel Hill, Hillsborough, and Orange County Greenhouse Gas Emissions Inventory and Forecast"** was presented in February, 2009

- The final report includes
  - 2005 GHG Inventory
  - Forecast
  - Emission Reduction Measures
  - Local Action Plan

- Local governments have selected **2030** as the year by which the communities will achieve **a voluntary GHG Emission reduction target.**

Orange County Emission Base Year 2005 (tons/year)



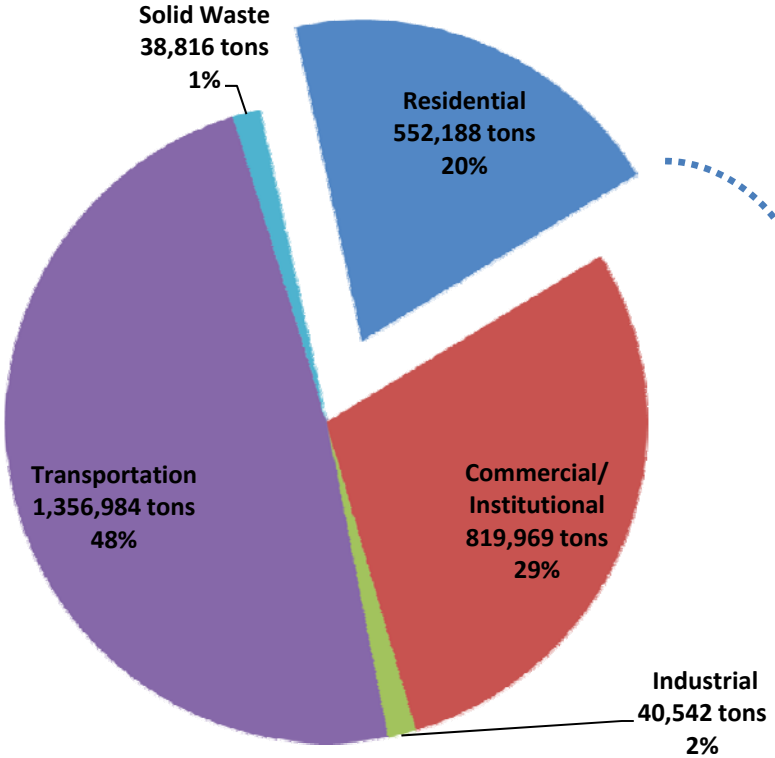
Total Orange County Emissions = 2,802,500 tons per year

Table 1: Orange County and United States GHG Emissions 2005

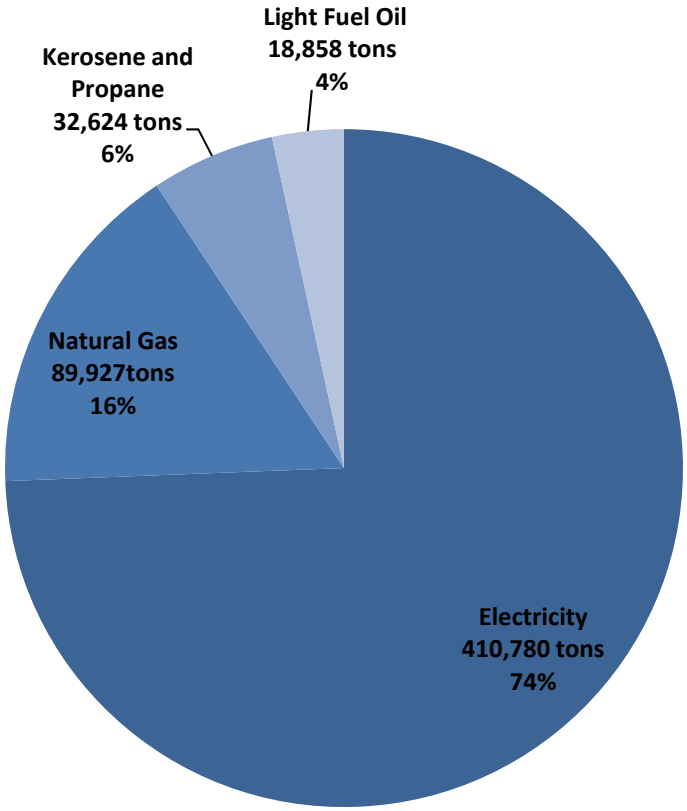
Level	Transportation	Comm/Inst	Residential	Industrial	Waste
Orange County	48%	29%	20%	2%	1%
United States	33%	18%	21%	27%	--

Source:http://www.epa.gov/climatechange/emissions/downloads/2009GHGFastFacts.pdf

Residential Emission Base Year 2005 (tons/year)



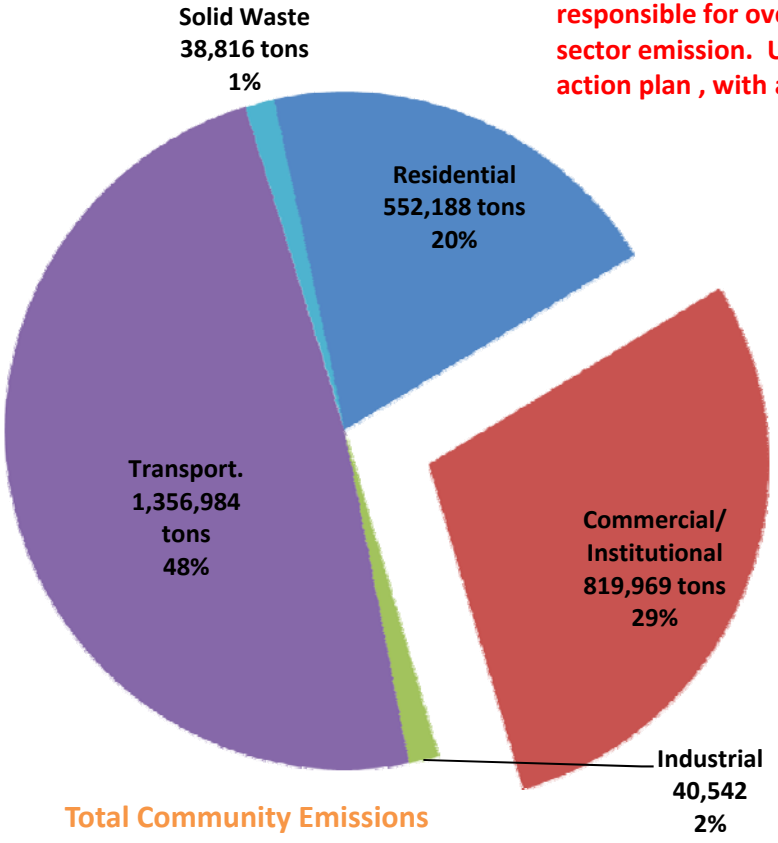
Total Orange Community Emissions
= 2,802,500 tons per year



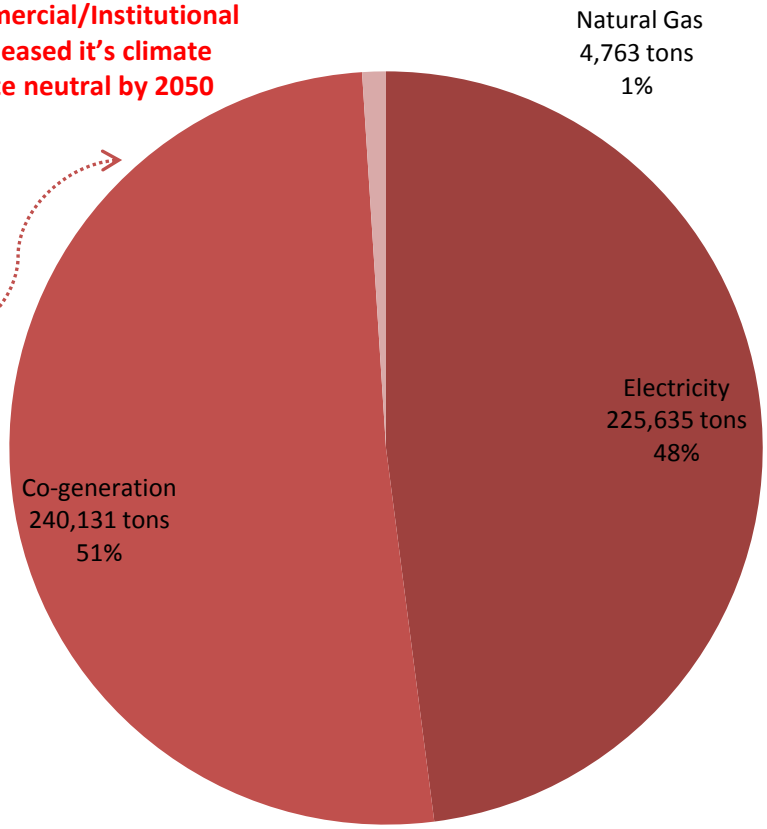
Orange County Residential Emissions
= 552,188 tons per year

UNC Emission Base Year 2005 (tons/year)

UNC is the largest employer in Orange County, and is responsible for over half of Commercial/Institutional sector emission. UNC has just released it's climate action plan , with a goal of climate neutral by 2050



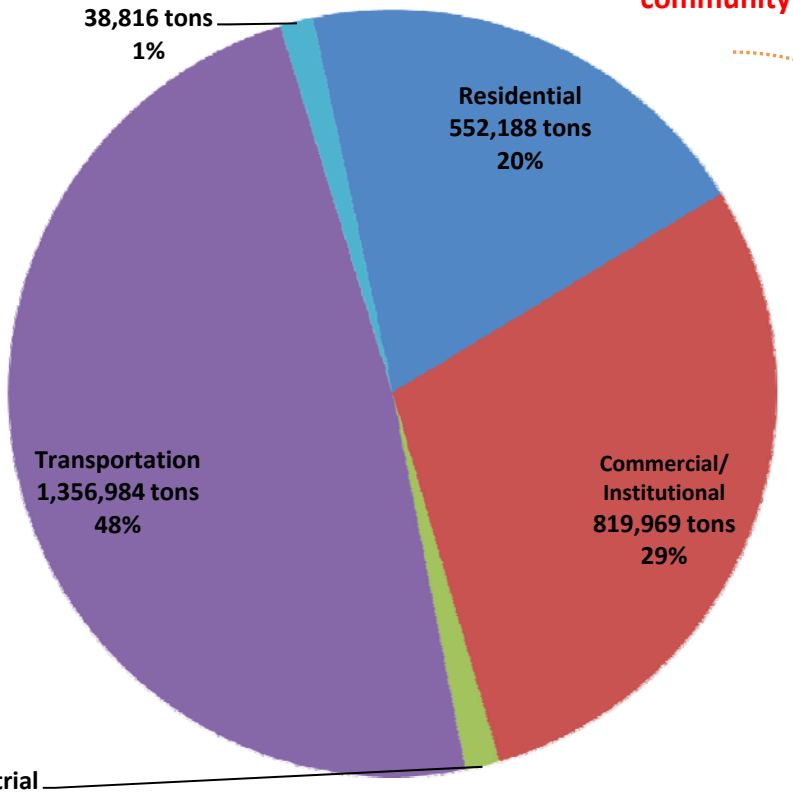
Total Community Emissions = 2,802,500 tons per year



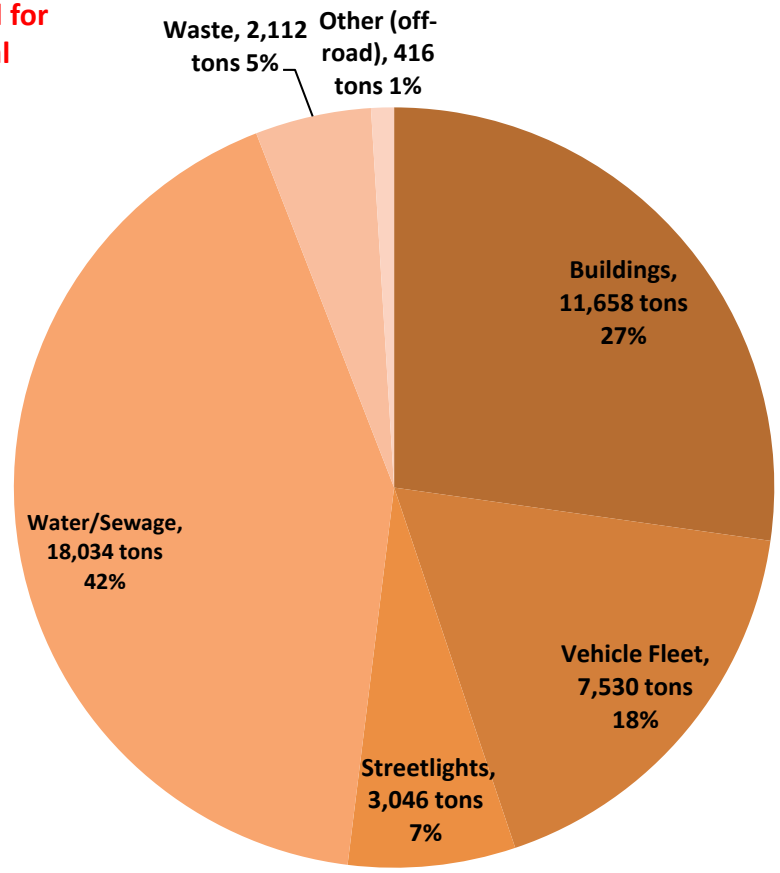
Total UNC GHG Emissions =470,259 tons per year

Local Government Emission Base Year 2005 (tons/year)

Local governments accounted for approximately 2% of the total community emissions



Total Community Emission = 2,802,500 tons per year



*Local Government Emission = 42,840 tons per year

*Local government emission is a subset of the community emission.

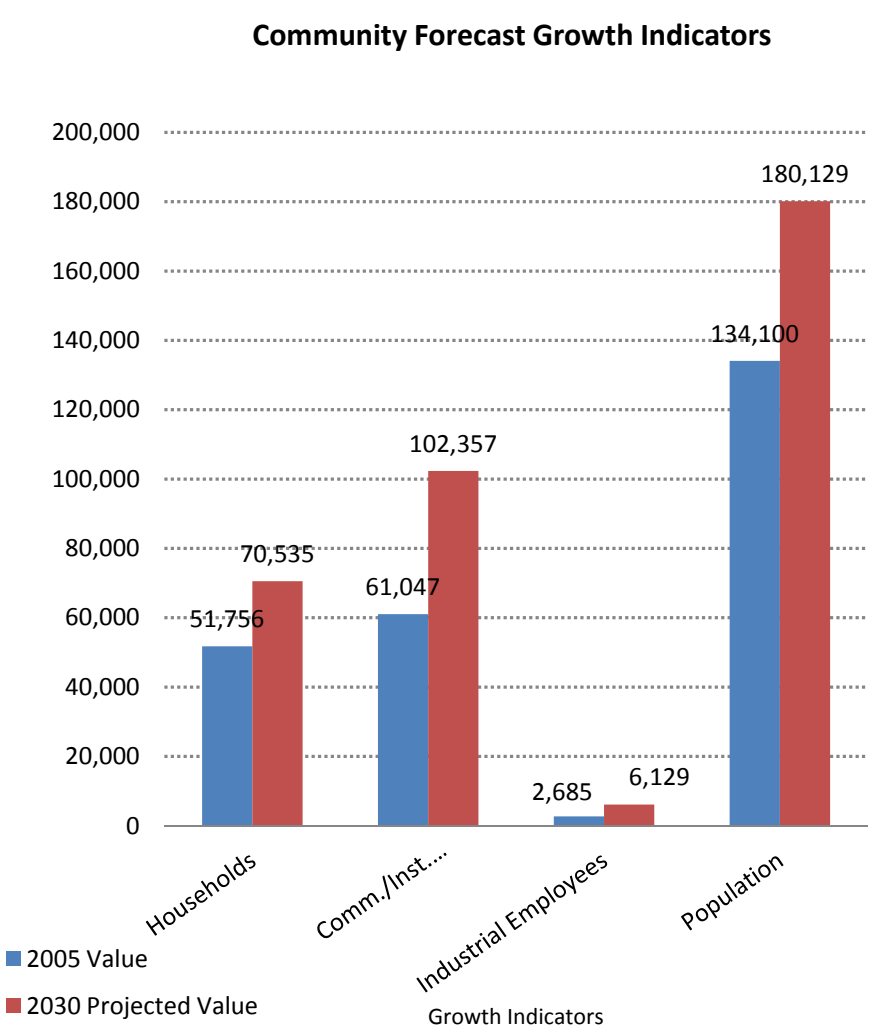
Orange County Greenhouse Gas(GHG) Emission Forecast from 2005-2030

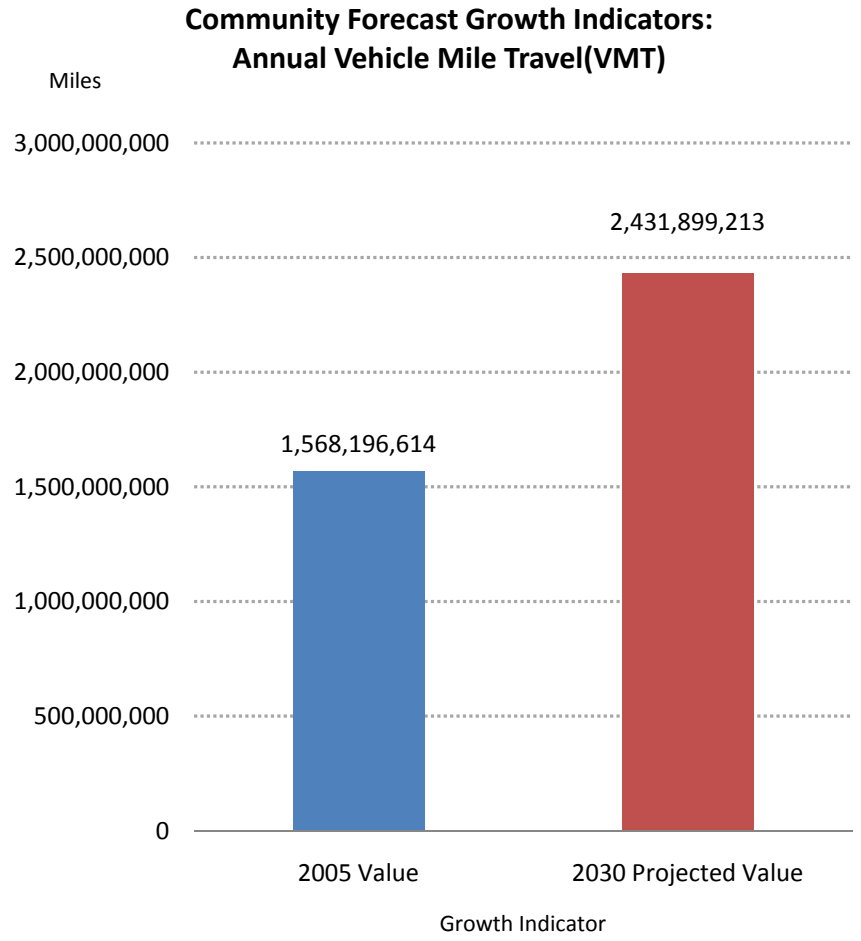
Orange County Emission Forecast

A set of growth factors were taken into account to determine the 2030 Business As Usual(BAU) emission in relative to 2005 baseline year emission.

Growth Indicator	2005 Value	2030 Projected	Growth (%)
Households	51,756	70,535	36%
Commercial/ Institutional Employees	61,047	102,357	67%
Industrial Employees	2,685	6,129	128%
Population	134,100	180,129	34%
Annual Vehicle Miles Traveled(VMT)	1,568,196,614	2,431,899,213	68%

Orange County Forecast Growth Indicators



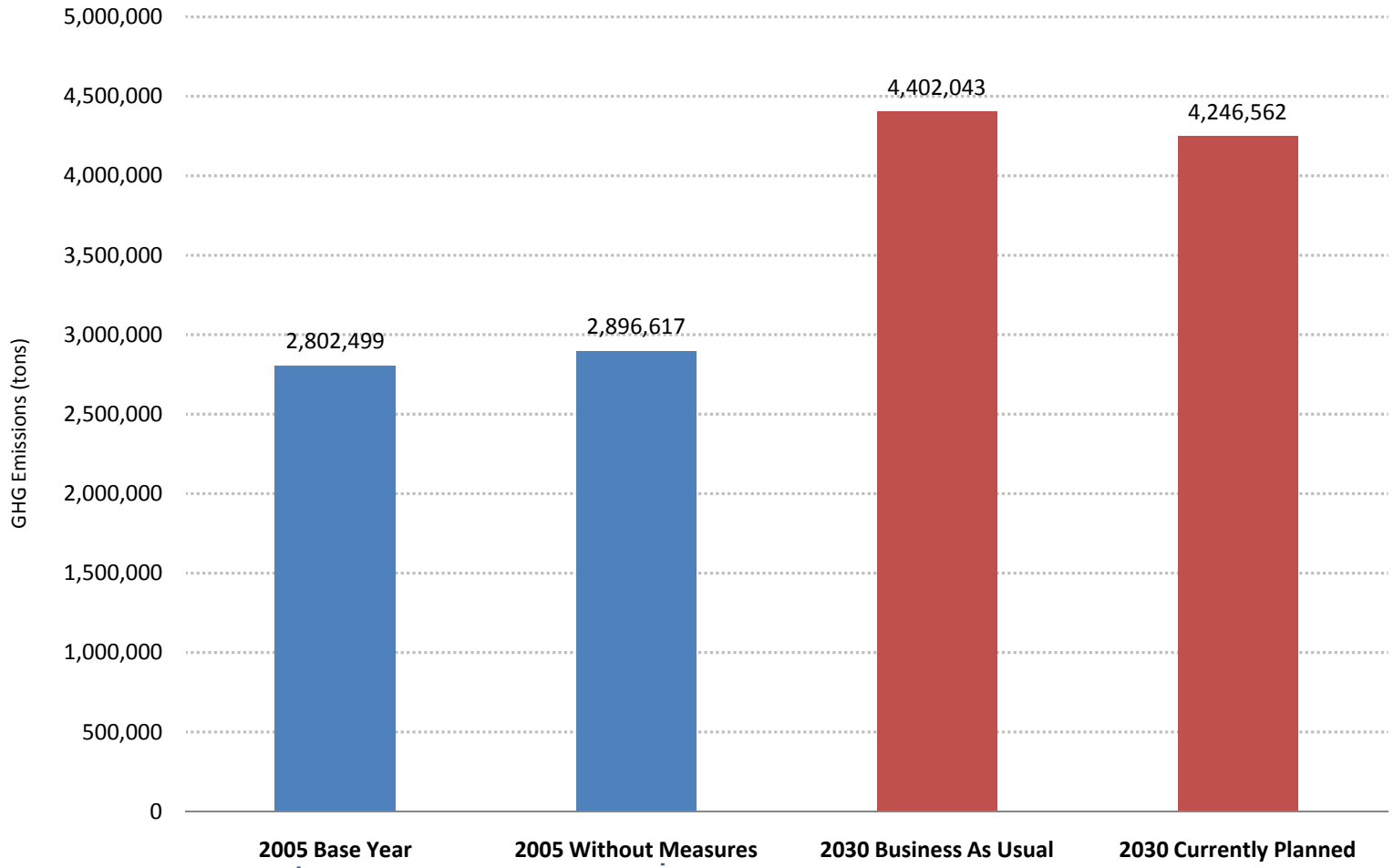


Orange County Emission Forecast

The **projected growth in 2030** helps to determine the level of emission reductions in target year 2030. Two Forecasts were developed.

1. **2030 Business As Usual (BAU)Forecast**: An estimate of GHG emissions in 2030 ***if no new measures are implemented*** between 2005-2030.
2. **2030 Currently Planned Forecast**: An estimate of GHG emission in 2030 **if currently planned measures are implemented** between 2005-2030.

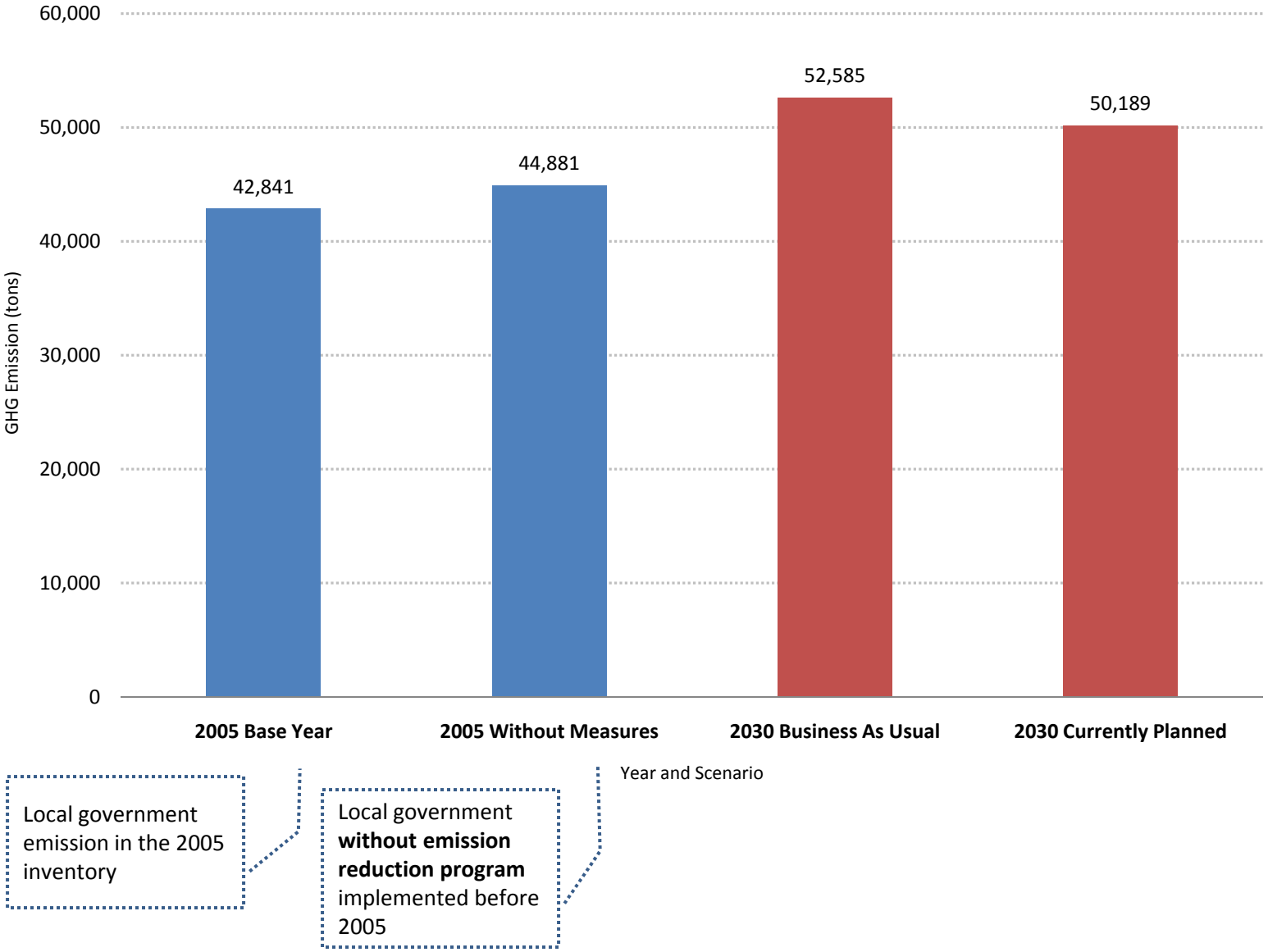
Community GHG Emission Scenarios 2005 and 2030



Orange county emission in the 2005 inventory

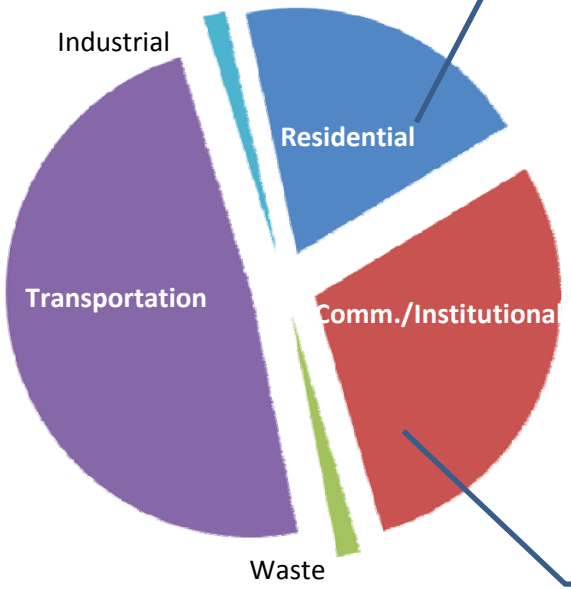
Orange county **without emission reduction program** implemented before 2005

Local Government GHG Emission Scenario 2005 and 2030



Orange County GHG Emission Reduction Measures

Existing Community Measures :
Selected initiatives before 2005 baseline year
(see p. 44 of report for complete list)



- Solar hot water systems
- Meadowmont Energy Efficient Homes
- Utility programs/initiatives

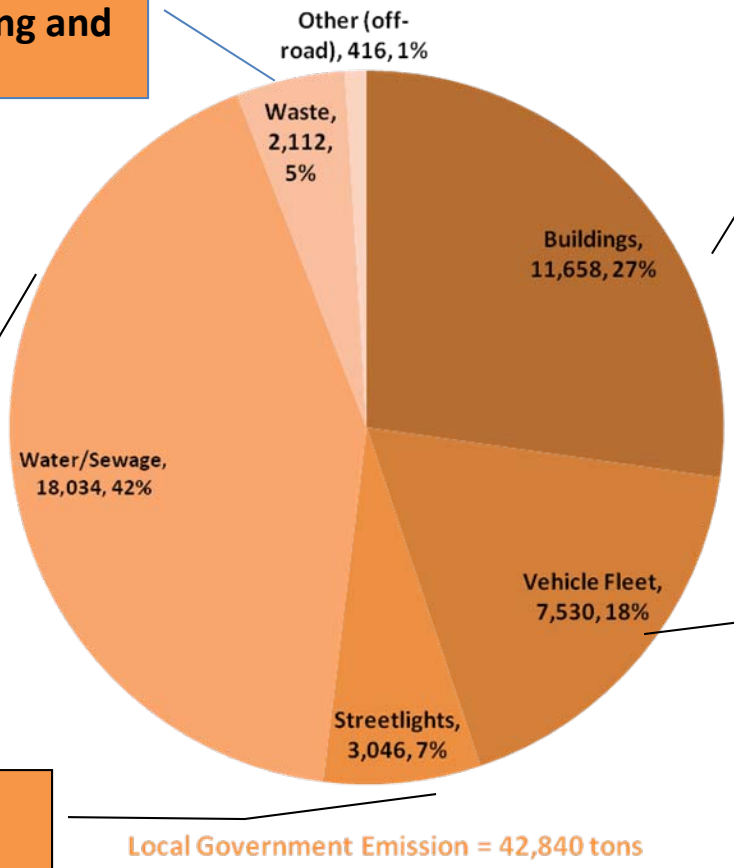
- UNC Hybrid Vehicle
- Chapel Hill Fare-Free Transit.
- 20%Biodiesel by UNC fleet
- Community Biodiesel use

- Chapel Hill-Carrboro City School: reducing electricity use by 20 %
- UNC Energy Savings program(2002-2005)

Regulated Recyclable Material Ordinance
Other recycling efforts

Existing Local Government Measures:
The implemented initiatives before 2005 baseline year

Solid Waste Recycling and awareness



Water Reclamation Project

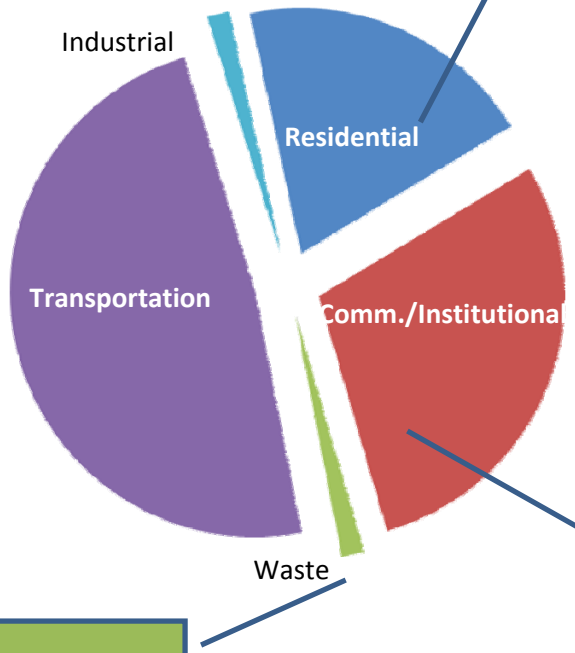
- **Energy Conservation Ordinance Retrofit of Fire station**
- **OWASA Best practice in energy use and design**

- **Use Compressed Natural Gas (CNG)**
- **B20, Biodiesel 20%**
- **Bicycles for use by Town employees**
- **Hybrid Vehicles**

- **LED Retrofits**
- **Replace high efficient street lights.**

Currently Planned Community Measures:
The initiatives that are planned to be implemented after 2005 baseline year

- Long Range Transportation Plan
- I-40 High Occupancy Vehicle Lane
- New Bike Lanes
- UNC/Chapel Hill Parking Restrictions
- Biodiesel use

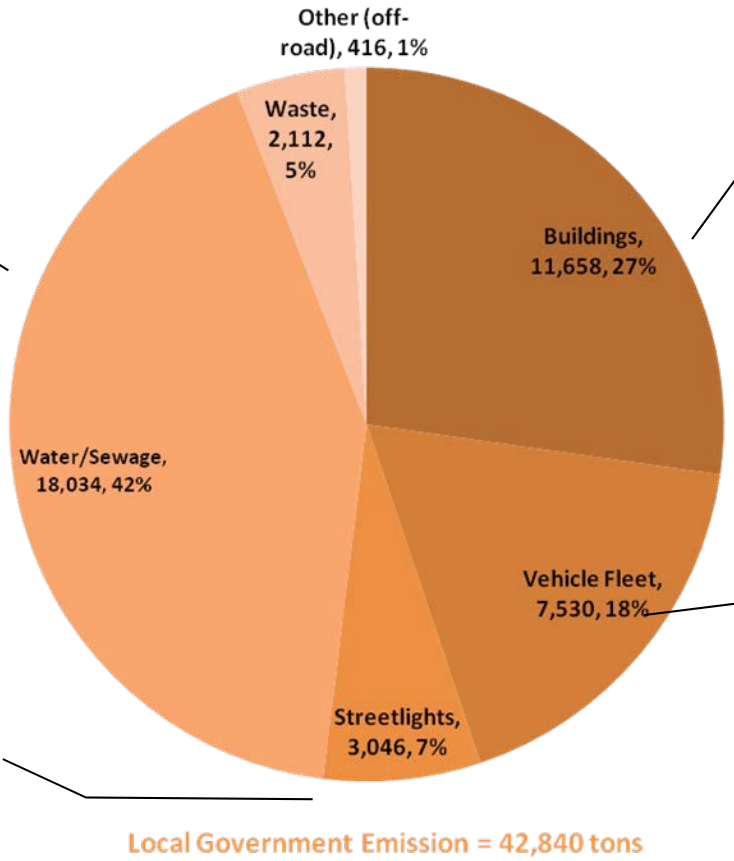


- Million Solar Roofs Initiative
- Green Power
- Manufactured Home Heat Pump program
- Solar Home

- Commercial building audit
- UNC Strategic Energy& Water Plan

- Expansion of existing curbside recycling program
- Landfill Gas Capture and Utilization

Currently Planned Local Government Measures:
The initiatives that are planned to be implemented after 2005 baseline year.



Methane gas capture and reuse

- **Boiler Replacement**
- **LEED Certification Fire Station**

- **Hybrid Vehicle (in Hillsborough)**
- **Vehicle Right-Sizing (in Hillsborough)**

- **Retrofits all remaining incandescent with LEDs**
- **Replace high efficient street lights.**

Orange County GHG Emission Reduction Targets

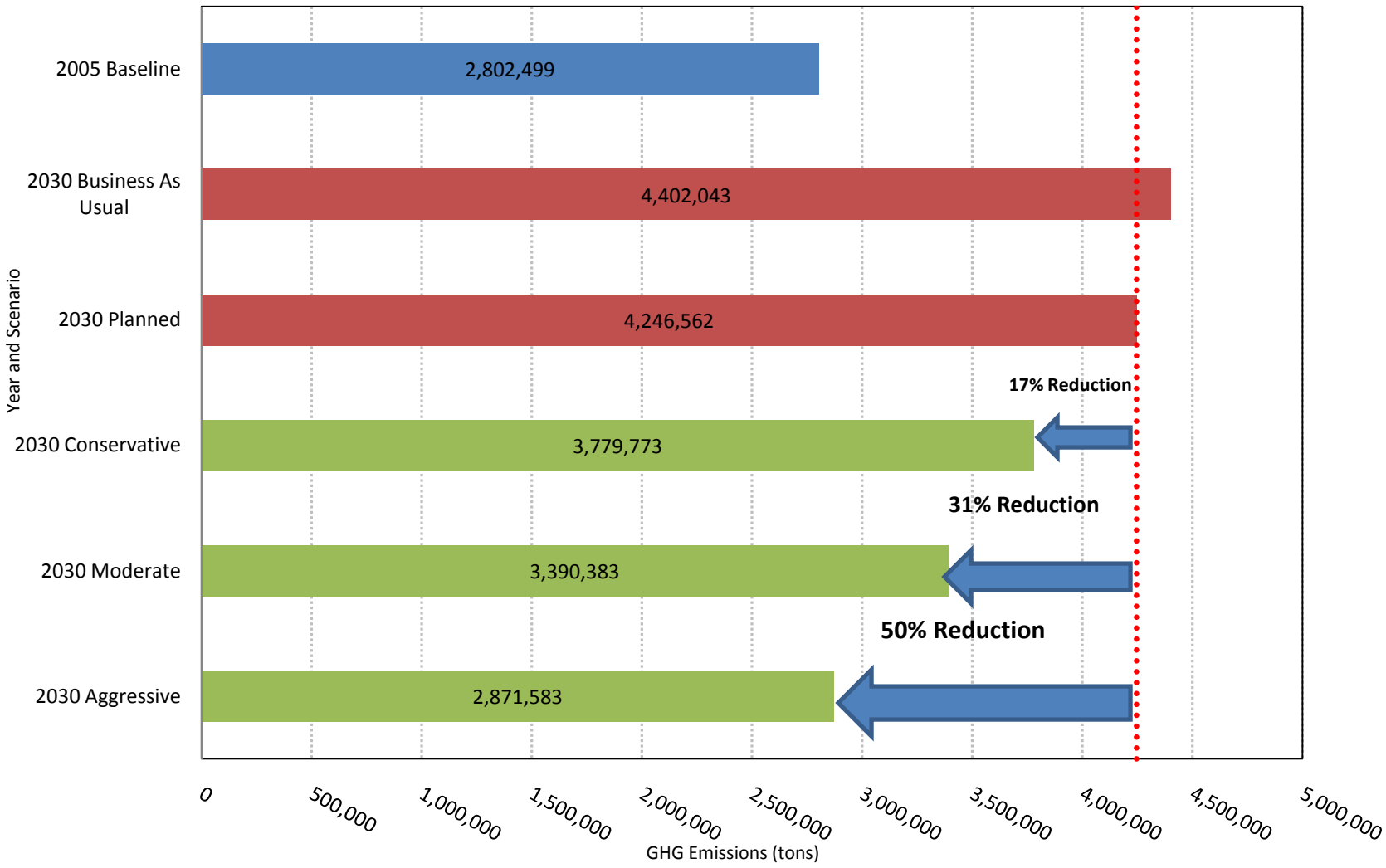
Orange County Reduction Target

Orange County selected **2030** as **a voluntary GHG Emission reduction target.**

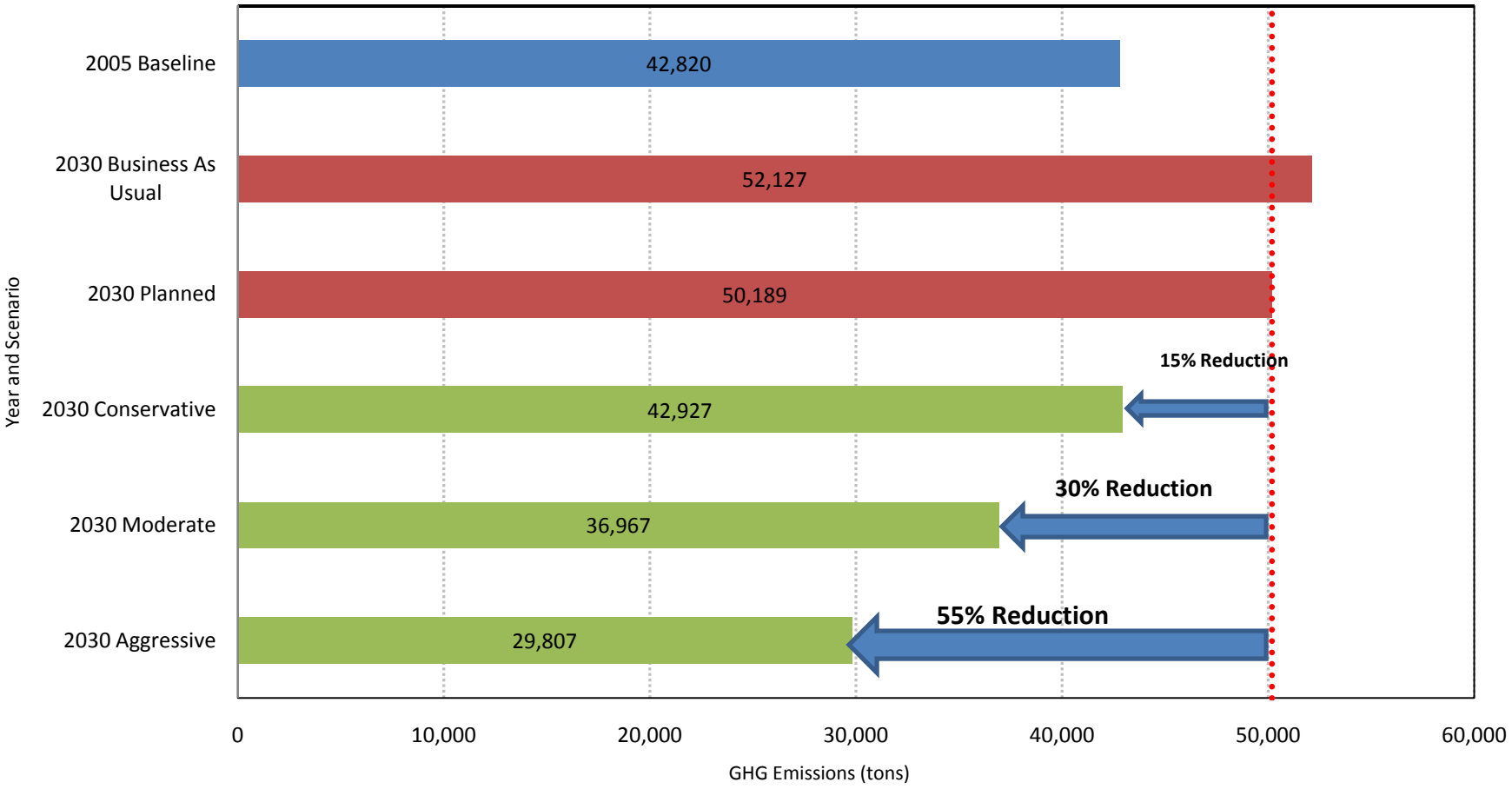
ICLEI ("Ick-Lee"), Local Government Sustainability Organization *proposed 3 different scenarios* to reach the emission reduction target in 2030. Each scenarios varied by *level of commitment, investment and ingenuity* relative to the planned measures in both community and local government sectors. Below are the example of scenarios

Conservative Scenario	Moderate Scenario	Aggressive Scenario
• 2x the effort of the 2030 planned emission reduction measure • x% Increase of alternative fuel • x% emission reduction from 2030 planned scenario	• 3x the effort of the 2030 planned emission reduction measure • xx% Increase of alternative fuel • xx% emission reduction from 2030 planned scenario	• 5x the effort of the 2030 planned emission reduction measure • xxx% Increase of alternative fuel • 5% emission reduction from 2030 planned scenario

Community Emission Reduction Scenarios



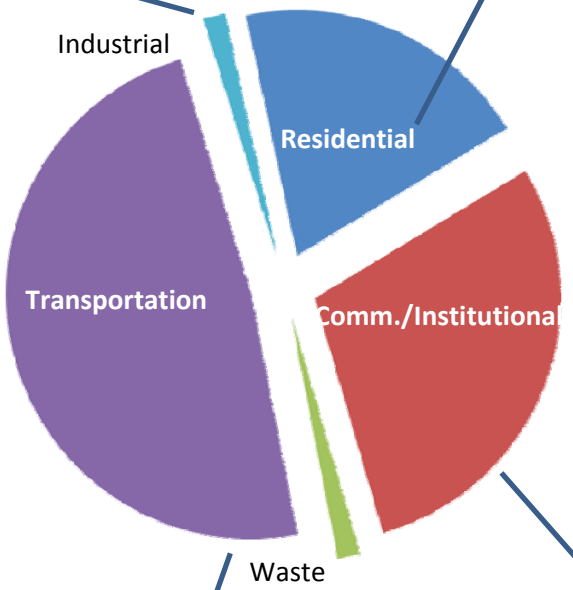
Local Government Emission Reduction Scenarios



Selected Planned Community Measures:

Recommended Action Plan can be engaged by various levels; conservative, moderate and aggressive (see Table 27 in report for details)

- Upgrade efficiency of buildings
- Utilization of alternative fuel source
- Demand and Supply management



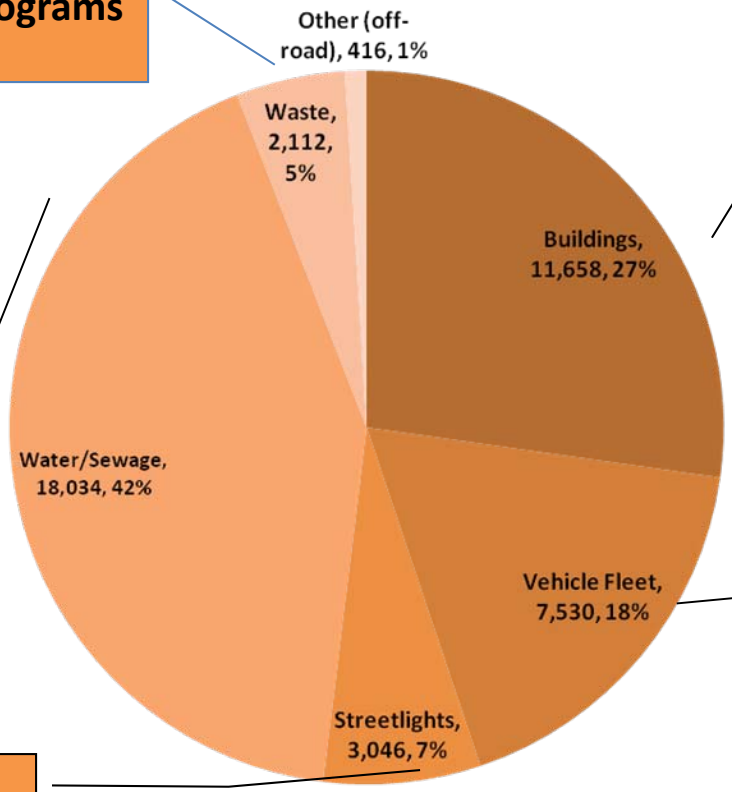
- **Expand Conservation Measures: Home Audit & Energy Conservation**
- **Expand Alternative Energy Measures: NC Green Power, Program, Solar Home, Solar roofs**

- Land-use planning
- Alternative Fuel Buses
- Initiate Transportation Demand Management(carpooling, telecommuting and reduce peak travel)

- Energy Conservation Programming
- New construction Energy Efficiency
- Alternative Energy Purchases/Utilization

Proposed Local Government Measures:
Recommended Action Plan can be engaged by various levels; conservative, moderate and aggressive (see Section 6.3.1 in report for details)

Waste reduction programs



Local Government Emission = 42,840 tons

•Energy efficiency upgrades/expansion of existing programs
•Renewable and Alternative Energy Sources

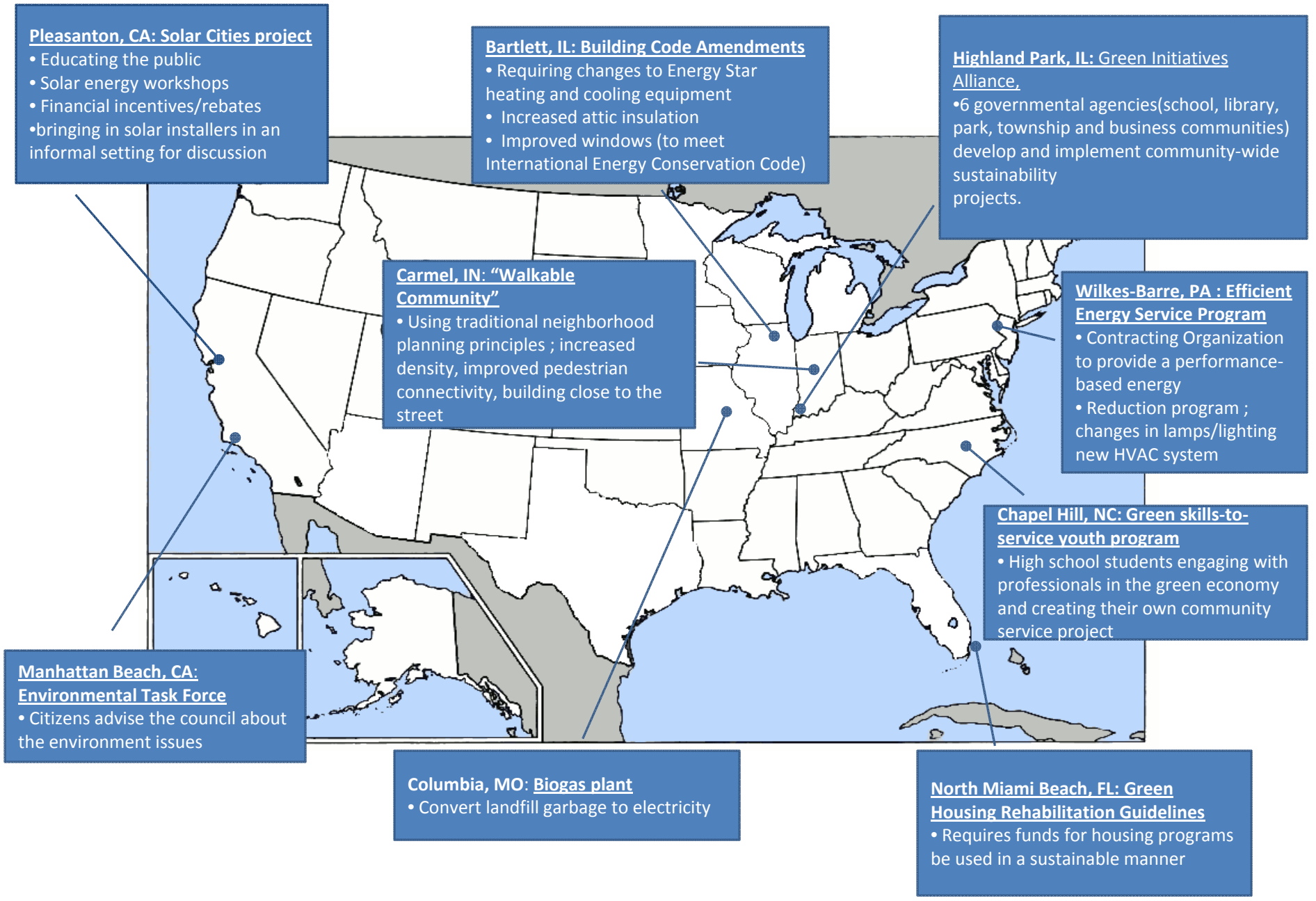
•Water Conservation program expansion
•Retrofits of plants (OWASA)
•Alternative Energy

•Increasing the utilization of Alternative Fuels

•Increasing Fleet Efficiency

•Alternative energy sources

Local Communities Climate Action


Pleasanton, CA: Solar Cities project
• Educating the public
• Solar energy workshops
• Financial incentives/rebates
•bringing in solar installers in an informal setting for discussion
Bartlett, IL: Building Code Amendments
• Requiring changes to Energy Star heating and cooling equipment
• Increased attic insulation
• Improved windows (to meet International Energy Conservation Code)
Highland Park, IL: Green Initiatives Alliance,
•6 governmental agencies(school, library, park, township and business communities) develop and implement community-wide sustainability projects.
Carmel, IN: "Walkable Community"
• Using traditional neighborhood planning principles ; increased density, improved pedestrian connectivity, building close to the street
Wilkes-Barre, PA : Efficient Energy Service Program
• Contracting Organization to provide a performance-based energy
• Reduction program ; changes in lamps/lighting new HVAC system
Chapel Hill, NC: Green skills-to-service youth program
• High school students engaging with professionals in the green economy and creating their own community service project
Manhattan Beach, CA: Environmental Task Force
• Citizens advise the council about the environment issues
Columbia, MO: Biogas plant
• Convert landfill garbage to electricity
North Miami Beach, FL: Green Housing Rehabilitation Guidelines
• Requires funds for housing programs be used in a sustainable manner

ICLEI Recommendation: Small Southeast communities

ENERGY

- Municipal operations: buildings could use nearly 1/3 less energy through low-cost or no-cost improvements
- Schools give potential for increased energy efficiency.
- Use green power as energy supply (energy generates by clean sources; wind, sun, biofuel etc.)

TRANSPORTATION

- Continue to promote mass and alternative transit.
- Increase access to renewable fuels
- Increase use of fuel efficient vehicles.

URBAN PLANNING

- Urban heat island reduction; Green roof, Cool pavements
- Mixed land uses (live/work/play)
- Compact building design
- Emphasizing walkability
- Preservation of some natural areas
- Directing development towards existing communities.

Regional Climate Action

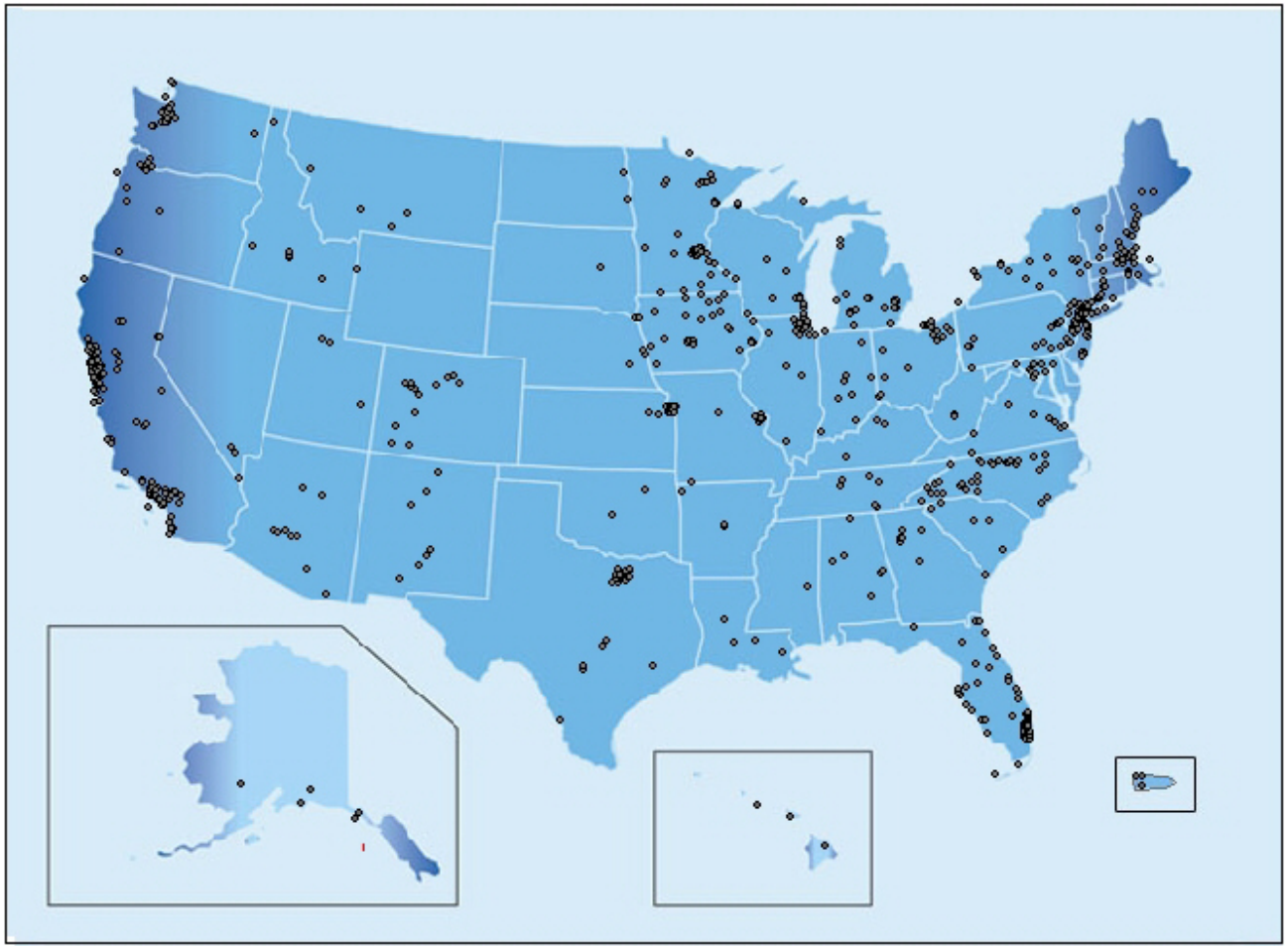
Mayor Climate Protection Agreement

- Agree to meet Kyoto Protocol targets 7 % reduction from 1990 emissions levels by 2012)
- Inventory emissions/set targets/make action plan;
- Land-use policies
- Ttransportation options/incentives
- Increase use of clean, alternative energy
- Make energy efficiency a priority
- Energy Star purchases
- Sustainable building using LEED
- Municipal fleet vehicle adjustments
- Opportunities to increase pump efficiency
- Increase recycling; trees; education

Mayors' Climate Protection Agreement

Cities That Have Signed On

1010 as of 10/20/2009



http://usmayors.org/climateprotection/ClimateChange.asp

LOCAL CLIMATE ACTIONS
Would you… Could you…

At Home

- Give home energy audit
- Install solar roof and/or green roof
- Install solar water heater system
- Insulate your house
- Install low-flow shower
- Install double-pane windows
- Lower Thermostat by 2 degree during the winter
- Plant tree/Give plants to neighbors
- Use Chemical free, natural cleaning product
- Wash clothes in cold or warm water
- Run dishwasher when you have to
- Switch of appliances when not using them
- Replace light bulbs with energy efficient bulbs
- Make compost pile

At Work

- Share a ride with someone to work
- Take public transportation to work
- Bike to work
- Telecommute
- Join carpool
- Start carpool
- Use recycled paper
- Recycle printer cartridges
- Get office plants
- Water office plants
- Start compost heap
- Switch off office equipments when not using them
- Use stairs instead of elevators
- Carpool to lunch
- Walk to lunch
- Bring your own lunch

Lifestyles

- Use own bag when shopping
- Stop buying bottled water
- Drink fair trade coffee, tea
- Buy local vegetables
- Eat all your vegetables
- Donate read books to local library
- Turn off engine when car is stationary
- Get a hybrid
- Sell a car
- Buy a bike
- Buy a horse
- Bike/walk to shops
- Take public transportation
- Holiday nearby
- Holiday at home