



Session 36

# Mapping a Sustainable Future:

## The West Chester Borough Success Story

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Dianne Herrin  
BLUER Chair

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Courtney Marm  
CH2M Hill

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David Ward, AICP  
Chester County PC

# Presentation Overview

- Introduction – David Ward
- The West Chester Experience – Dianne Herrin
- Using the ICLEI Model – Courtney Marm
- Accomplishments to date - All

# **Session Objectives**

- **Explore how to become a sustainable community**
- **Learn about the West Chester Borough experience**
- **Discuss what your municipality can do**

# Components of Sustainability

- **Environmental**

- Resources are finite
- “Ecological Carrying Capacity”

- **Economic**

- Growth should be linked to ecological impacts
- Depleting resources is not sustainable

- **Social**

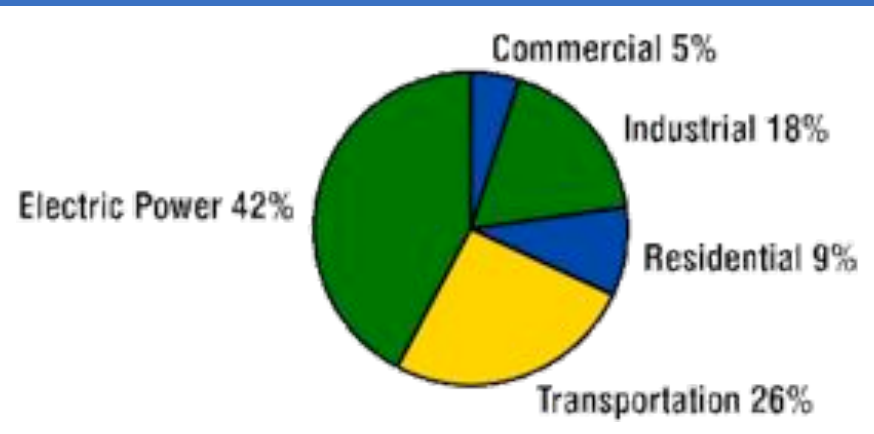
- Equitable use of shared resources
- Quality of Life/ Human welfare

# **A Key Issue with Sustainability**

**Changing how we do things to reduce  
greenhouse gases (CO<sub>2</sub>)**

# Pennsylvania's CO<sub>2</sub> Emissions

- PA had the 3<sup>rd</sup> highest CO<sub>2</sub> emissions in 2004 behind Texas and California
- Over 40% of that was from **electric power** and 26% from **transportation**



Source: U.S. EPA (2005)



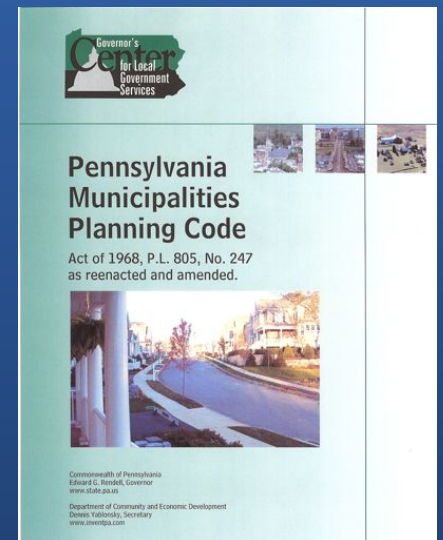
# Pennsylvania Municipalities Planning Code (Act 247)

**Article 3 — Comprehensive Plan**

**Article 4 — Official Map**

**Article 5 — Subdivision/Land Development**

**Article 6 — Zoning**



# Overview of Energy Conservation Options Available to Municipalities

- **Planning**

- Comprehensive plans – Energy Conservation Policies
- Climate Action Plans

- **Ordinances & Codes**

- Zoning incentives for Green Buildings
- Allowance for alternative energy systems

- **Operations**

- Energy efficient municipal buildings
- Fuel efficient fleet

- **Community Outreach**

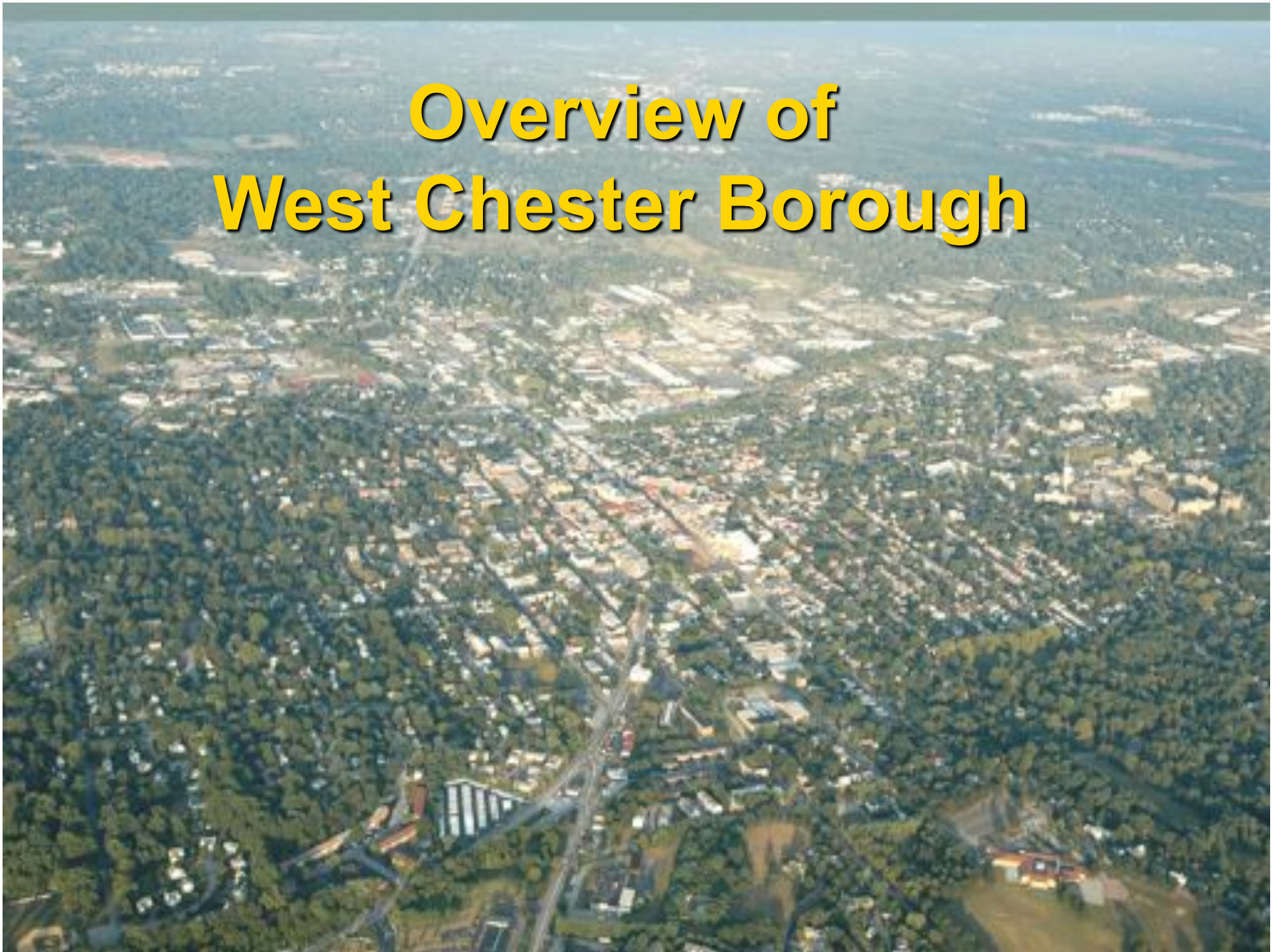
- Public education
- Grass-roots efforts for community support







# Overview of West Chester Borough























# The West Chester Experience

Dianne Herrin

## Sustainability:

- Meeting our needs without compromising the ability of future generations to meet their own, sometimes very basic, needs





# The West Chester Experience

Why *Local* Sustainability?




More than **3.3 billion** people live in cities.

The future is **now** ... the future is  
**sustainability**

# The West Chester Experience

## Why *Local* Sustainability?

A photograph of an industrial facility, likely a steel mill, with several tall smokestacks emitting thick white smoke into a hazy sky. The foreground shows dark, possibly molten, material in a large container.

**Cities** cover less than 1% of the earth's surface but consume some **75%** of the world's energy and are responsible for **80%** of greenhouse gas emissions

# The West Chester Experience

Why West Chester?

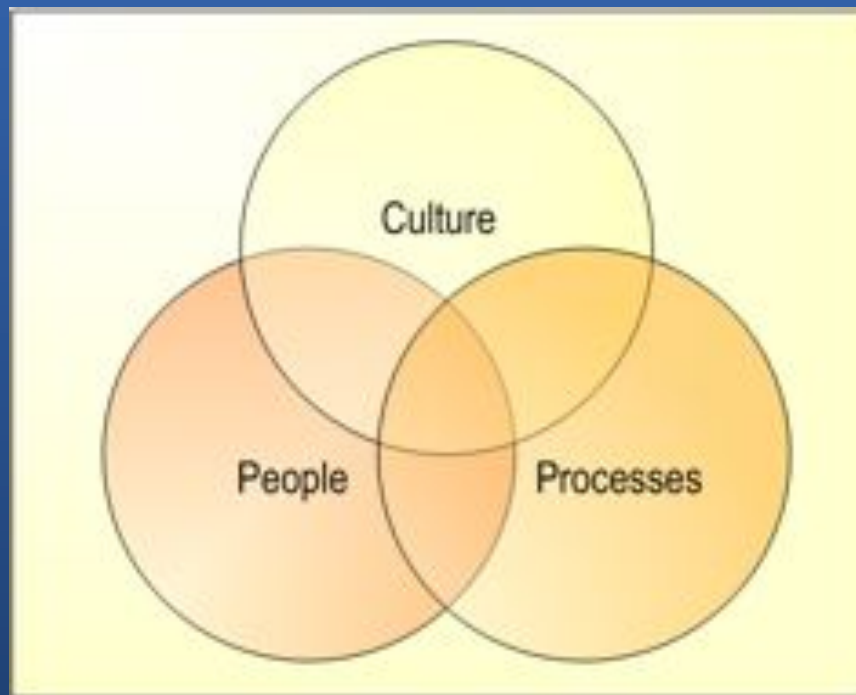
Why *not* West Chester?

*~The most important political office is that of private citizen ~*  
*Louis Brandeis*

# The West Chester Experience

## Why West Chester?

- We can be models for change
- We can learn from others who are acting as models for change





# The West Chester Experience

## Why West Chester?

*~ No culture can live if it attempts to be exclusive ~*  
*Mahatma Gandhi*

# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 1: Engage local government with solid proposal and structure



# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 2: Get all municipal representatives on board:

- Find a municipal champion, preferably neutral
- Be rational and pragmatic
- Show commitment
- Allow them to be part of process

Step 3: Open up positions to community:

- Do legwork first
- Ensure community-wide representation
- Be positive

# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 4: Create an image and clear message





# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 4:

Create an image and clear message



# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 4: Create an image and clear message

### The BLUER Motto:



**CONVERT  
CONSERVE  
REDUCE**

# The West Chester Experience

## Our Grassroots Approach: Laying the Groundwork

Step 4: Create an image and clear message

West Chester will work to secure a safer and more sustainable energy future by reducing community-wide CO<sub>2</sub> and other greenhouse gas emissions at least 10% by 2015.



# **The West Chester Experience**

## **Our Grassroots Approach: Laying the Groundwork**

**Step 5: Follow through**

# Using the ICLEI Model

Courtney Marm



# **ICLEI Milestone 1:**

## **Borough-wide GHG Emissions Inventory**

- **ICLEI “Clean Air and Climate Protection” Software**
- **Many datasets needed**
- **Somewhat time-consuming effort to obtain data (i.e. monthly bills) and convert to proper format (annual kWh)**
- **Inventory completed in May 2008**

### Community Inventory Data Requirements

Sector	Data Category	Data Requirements
<b>Residential, Commercial, Industrial</b>	Required Base Year Energy Data	Aggregate quantity consumed of <ul style="list-style-type: none"> <li>• Electricity</li> <li>• Natural gas</li> <li>• Heating oil</li> <li>• Propane</li> <li>• Other significant fuels</li> </ul>
	Target Year Forecast Indicators	Predicted change in: <ul style="list-style-type: none"> <li>• Population &amp; number of households</li> <li>• Commercial and industrial floor area</li> <li>• Commercial and industrial employment</li> <li>• Energy use rate per sector</li> </ul>
<b>Transportation (Sub-municipal community transportation)</b>	Required Base Year Data	Total community vehicle miles traveled (VMT), broken down by vehicle and fuel type to the extent possible - sum Total length of roads categorized by frequency of use and Annual Average Daily Traffic (AADT) counts/vehicle type
	Target Year Forecast Indicators	Predicted change in: <ul style="list-style-type: none"> <li>• VMT</li> <li>• Population &amp; number of households</li> <li>• Local employment</li> </ul>
<b>Waste (Sub-municipal community- generated waste)</b>	Required Base Year Waste Data	Amount of waste generated in the base year Percent composition by major waste type Estimation of methane recovery rate at closed landfill (this methodology often used for open landfill) - random Amount of <u>landfilled</u> waste in place in base year, along with landfill opening and closing dates and methane recovery factor (this methodology often used for closed landfill)
	Target Year Forecast Indicators	Expected change in amount of waste in landfill and composition, or change in population.
<b>Other (Emissions not captured in above)</b>	Required Base Year Data	Absolute emissions generated from sources not captured in above categories
	Target Year	Any indicators necessary to forecast change in emissions by



## Municipal Operations Inventory Data Requirements

Section	Data Category	Data Requirements
<b>Buildings</b> (all municipally managed facilities)	Required Base Year Energy Data	Quantity of each of the following consumed by facility: • Electricity • Natural gas • Other significant fuels
	Optional Base Year Indicators	Electricity and gas costs per unit consumed Building area Hours of operation Number of staff
	Target Year Forecast Indicators	Energy consumption or floor area estimates for new buildings
<b>Streetlights</b> (all outdoor lighting - traffic, street etc)	Required Base Year Energy Data	Electricity consumption
	Optional Base Year Indicators	Number of streetlights Electricity costs per unit consumed
	Target Year Forecast Indicators	Quantity or energy consumption estimates for new streetlights
<b>Water &amp; Sewage</b> (treatment, pumping)	Required Base Year Energy Data	Energy consumption Electricity and gas costs per unit consumed
	Optional Base Year Indicators	Volume of water pumped, treated
	Target Year Forecast Indicators	Energy consumption and cost estimates for new facilities
<b>Vehicle Fleet</b> (all vehicles in municipally managed fleet)	Required Base Year Fleet Data	Fuel consumption per vehicle/vehicle type (may substitute vehicle miles traveled by vehicle type)
	Optional Base Year Indicators	Number of vehicles in fleet Distance traveled per vehicle by vehicle type Fuel costs by fuel type
	Target Year Forecast Indicators	Fuel consumption and cost estimates for new vehicles
<b>Waste</b> (generated by municipal operations)	Required Base Year Waste Data	Amount of waste generated in the base year Percent composition by major waste type Estimation of methane recovery rate at landfill/landfills
	Optional Base Year Indicators	Number of municipal employees
	Target Year Forecast Indicators	Expected change in amount of waste to landfill and composition, or change in number of employees
<b>Other</b> (Emissions not captured in above categories)	Required Base Year Data	Absolute emissions generated from sources not captured in above categories
	Target Year Forecast Indicators	Any indicators necessary for forecasting change in emissions by target year



## Clean Air and Climate Protection Software

File Year Record Report Settings Assistants Help

Community Analysis

Community Measures

Government Analysis

Government Measures

## Government Analysis for Year 2005

Buildings Vehicle Fleet Employee Commute Streetlights Water/Sewage Waste Other

Name of Building or Building Group

Borough: Fire companies

Record Controls

Insert

Select

Delete



Report



Help

Assistants Categories Indicators Coefficients



Forecast Builder

Fuel Type	Units	Energy Use	Energy Cost (\$)
Electricity (Grid Average)	(kWh)	298,762	0
Coal	(tons)	0	0
Light Fuel Oil	(US gal)	0	0
Natural Gas	(thousand cu ft)	734	0
Propane	(US gal)	0	0
Biomethane	(thousand cu ft)	0	0
Fuelwood (Air Dry)	(cords)	0	0
Solar	(MMBtu)	0	0
Green Electricity	(kWh)	0	0

Notes Regarding Building or Group Data

Data recorded by Dianne Herrin in spring 2007 from records provided by the Borough.

Energy Consumption	(kWh)	Equivalent CO <sub>2</sub> Production	(tons)	Cost	(\$)	Net
	510,268		209		0	

# ICLEI Milestone 1:

## Borough-wide GHG Emissions Inventory

- Electrical consumption dataset difficult to obtain
- BLUER found a dedicated ‘number-cruncher’ at PECO to create **methodology**
- Subsequent request from DVRPC for regional GHG inventory
- BLUER laid the foundation for future requests, including the work needed to perform DVRPC’s regional inventory

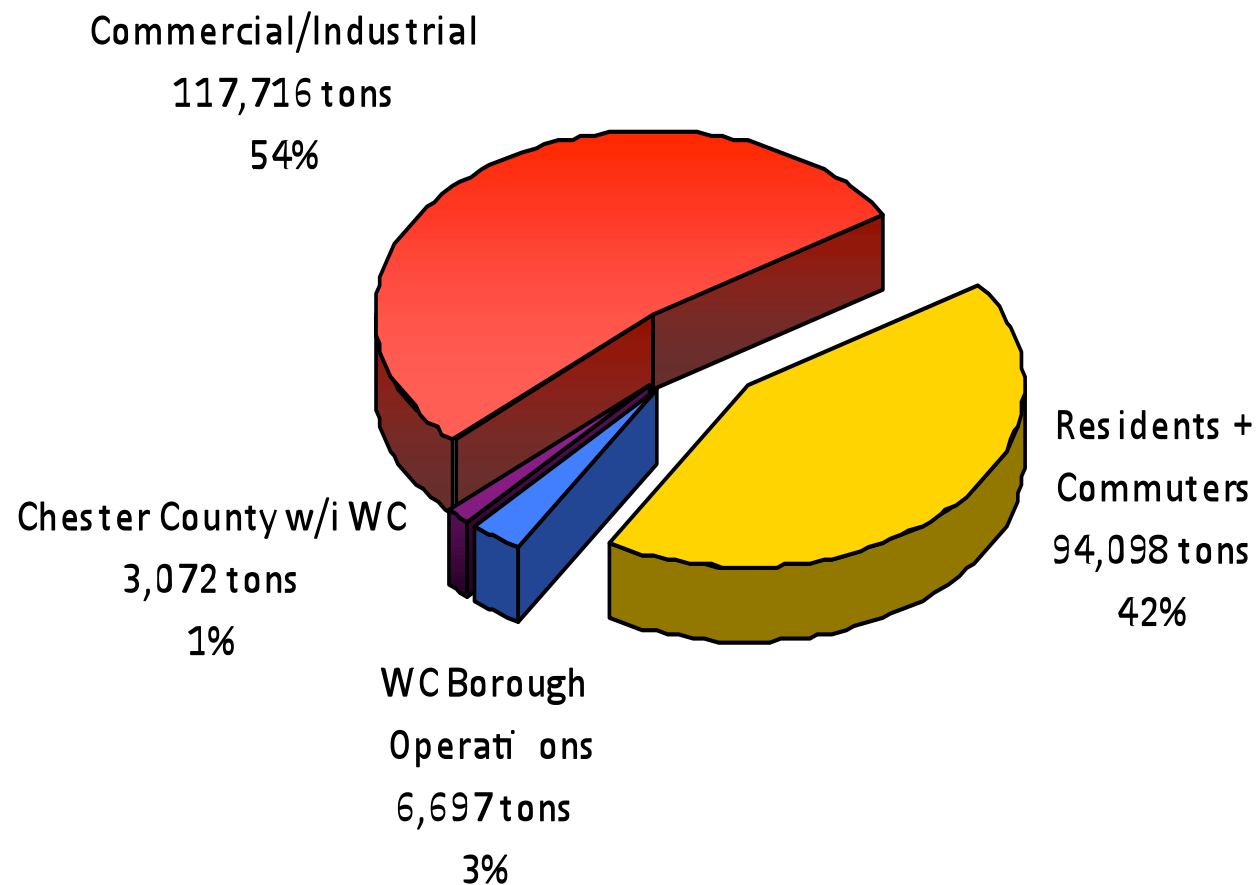
# Inventory Results

**In 2005, West Chester  
Borough emitted over  
220,000 tons of CO<sub>2</sub>  
into the atmosphere**

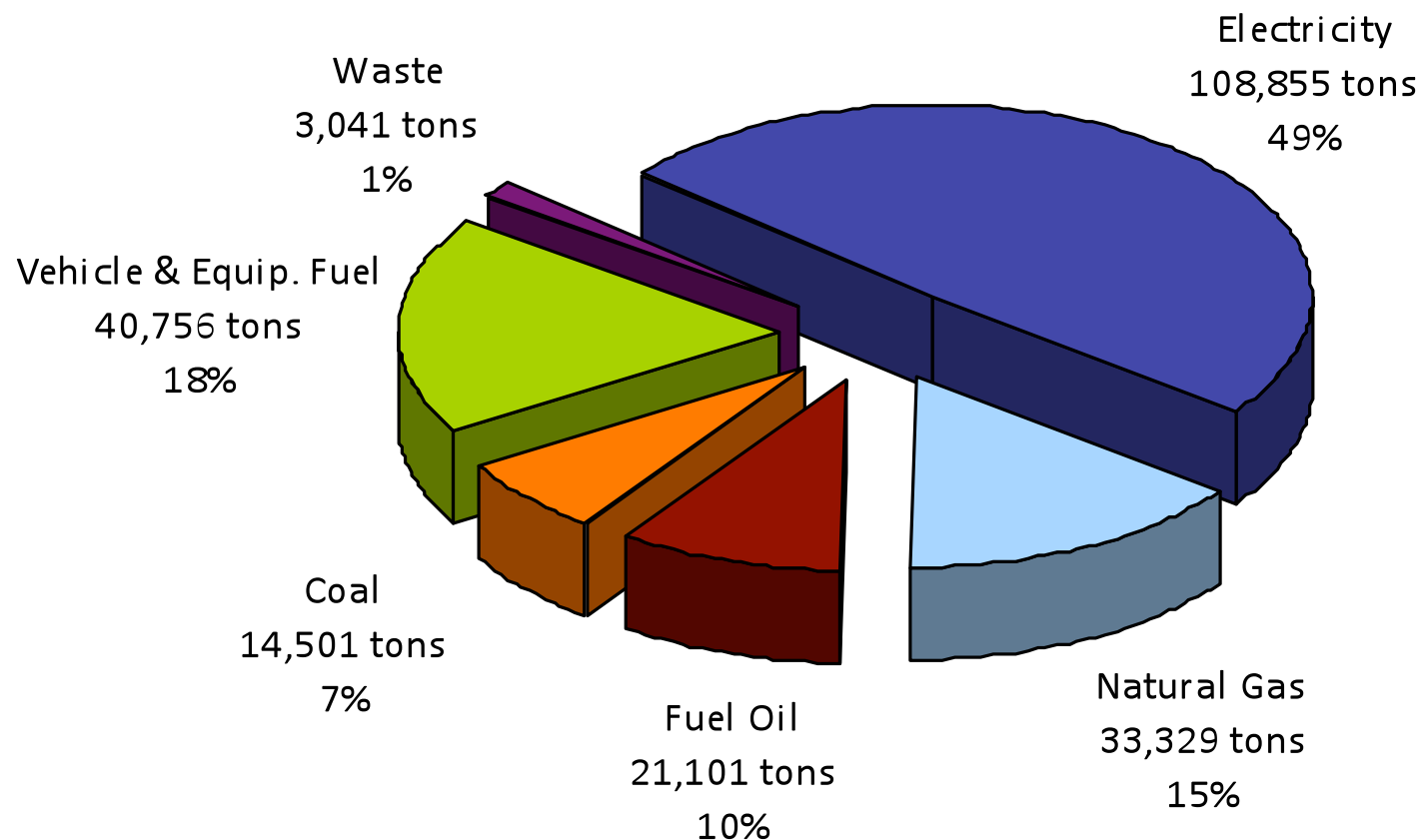


**OVER  
220,000  
TONS!**

# 2005 Emissions by Sector

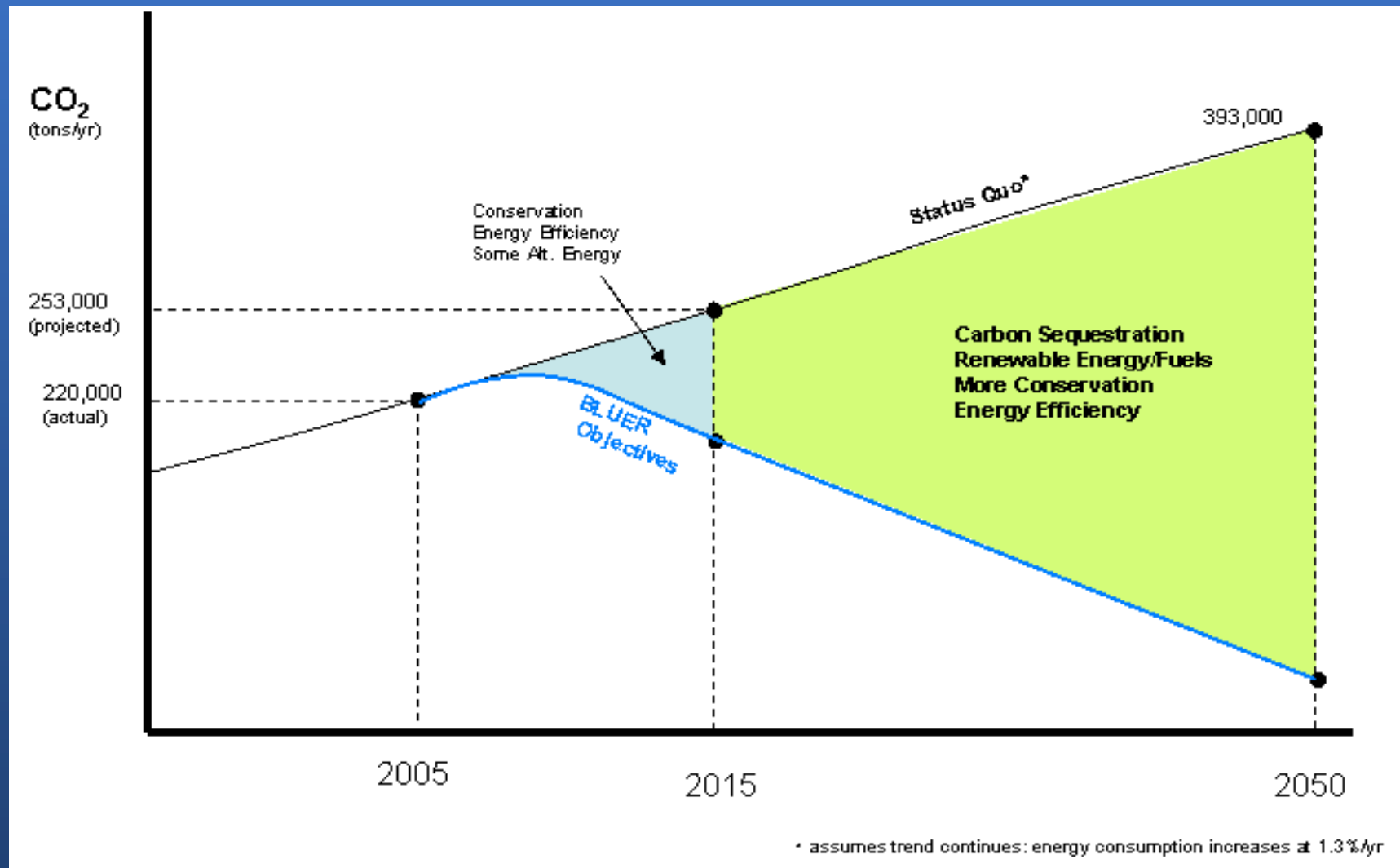


# 2005 CO<sub>2</sub> Emissions by Source



# Visualizing the Inventory

How does this relate to BLUER's 10% goal?



# Visualizing the Inventory

What do my emissions look like?

A West Chester resident  
“emits” the equivalent of  
2.5 bags of charcoal  
**every day**

The per capita pile of  
emissions after just **one**  
**year** is 4.7 feet high and  
3.3 feet wide



# West Chester's total 2005 emissions look like...

...A mountain of  
“coal” that is  
122 ft wide  
and 349 ft  
high





# ICLEI Milestone 2: Establish Target



# ICLEI Milestone 2: Establish Target

West Chester BLUER will work to secure a safer and more sustainable energy future by **reducing** community-wide CO<sub>2</sub> and other **greenhouse gas emissions 10% by 2015** over 2005 levels

# ICLEI Milestone 3: Develop Climate Action Plan



# Climate Action Plan

Adopted April 2009



## Climate Action Plan West Chester Borough *Chester County Pennsylvania*



Prepared by the Borough Leaders  
Submitted for Executive Production

February 2009

# April 2009 Climate Action Plan

- Began to write CAP in late summer 2008
- Six committee members had 6 different ideas for what an implementable Action Plan
- Resulted in a strategic **phased-approach**, with implementable Phase I actions:
  - Municipal model for community
  - Foundation of education

# Climate Action Plan – Phased Approach

- Phase I – **10 Immediate Action Items**
  - 6 Municipal Actions
  - 4 Outreach Actions
  - Only 1 requires added financial investment
- Phase II – **Over 30 Possible Actions**

# **6 Municipal Actions:**

**Recommendations 1-3:  
Put New Construction on a  
Path Toward Carbon Neutrality**

**#1 - BLUER will Develop a “Green Features” Guide**

**#2 - BLUER will Create Zoning Incentive(s) to Further  
Promote ENERGY STAR Compliant Buildings  
(Tredyffrin, Doylestown, Lower Merion)**

**#3 - Borough Council will Support a Mandatory  
State-Wide Green Building Program (DVRPC  
Climate Change Initiatives Program; PA  
League of Cities and Municipalities Resolution)**



# Why We Focus on Buildings

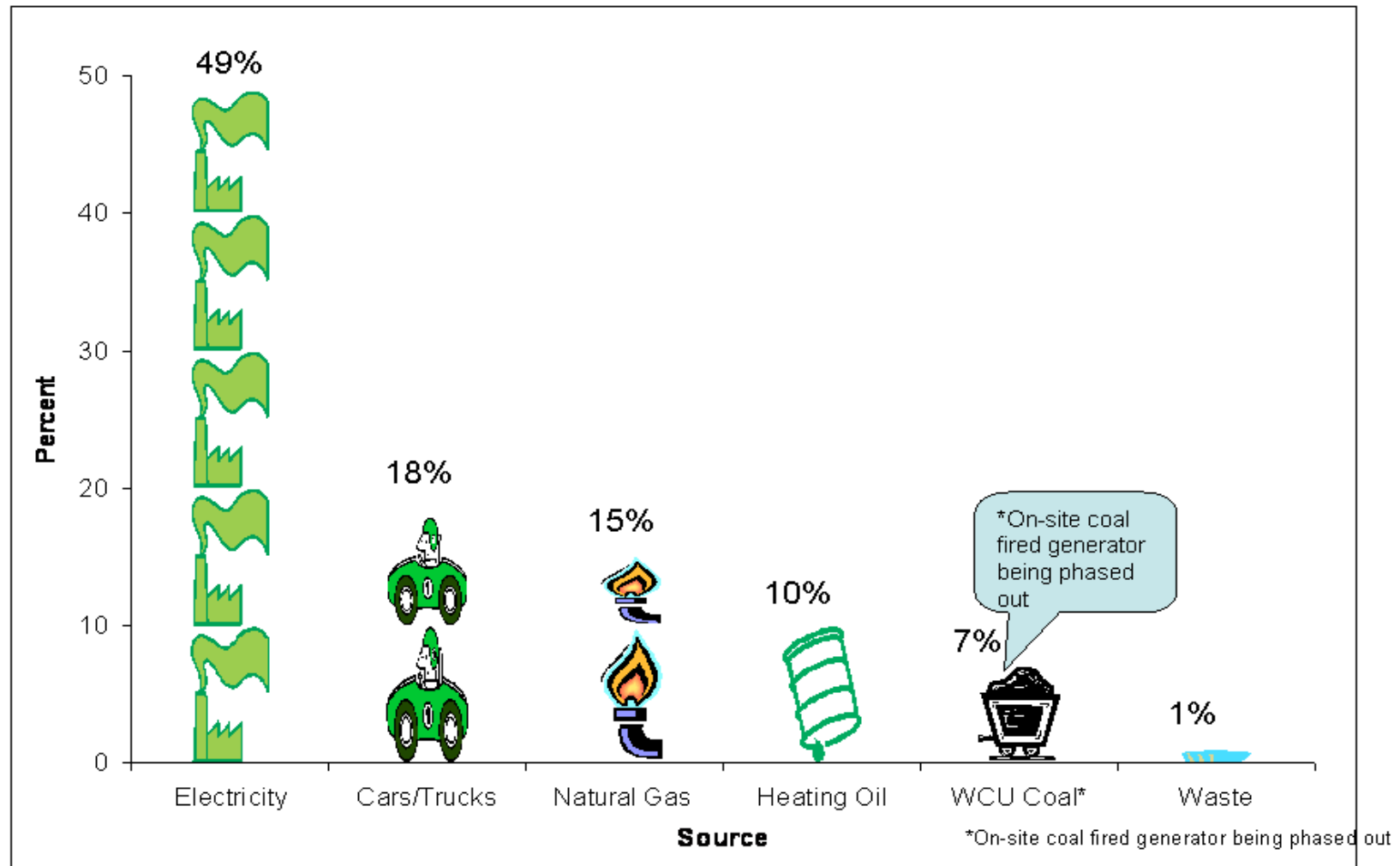
## Impact of Buildings on Resources

### Buildings Account for:

- 40% Energy Use
- 72% of Electricity Consumption
- 14% of Potable Water Use
- **Over 50% of CO<sub>2</sub> Emissions** (vs 39% nationally)

# Why We Focus on Buildings

## West Chester Sources of CO2 Pollution



# Why We Focus on Buildings

## Impact of Buildings on Resources

### Buildings Account for:

- 40% Energy Use
- 72% of Electricity Consumption
- 14% of Potable Water Use
- **Over 50% of CO<sub>2</sub> Emissions** (vs 39% nationally)

# 6 Municipal Actions:

## Recommendation 4:

### Initiate Progressive Wind Purchasing Program

- We can eliminate the municipality's carbon contribution from electricity by purchasing our electricity from a source that does not produce any carbon emissions – wind



# 6 Municipal Actions:

## Recommendation 5: Create an Efficient Borough Fleet

- Define life-cycle costs: factor fuel cost and emissions into purchases
- Use readily accessible tools (EPA SmartWay) along with ICLEI software to assess carbon footprint BLUER to provide input into the decision-making process ...so the most fuel efficient (and cost effective) options can be recommended

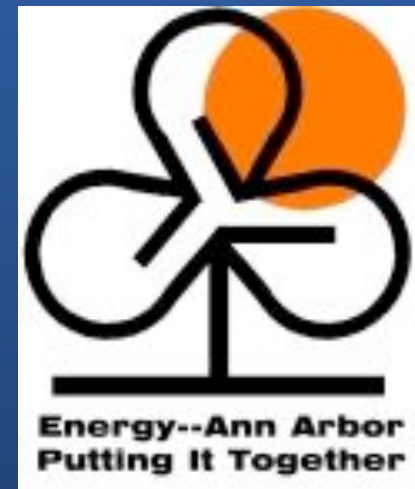
*In 2008, the Borough purchased 84,000 gallons of fuel*

# 6 Municipal Actions:

## Recommendation 6: Create a West Chester Area Energy Office

- Self-financing
- Resolutions to pursue funding from 6 local COG participants

*ICLEI: A **self-financing energy program** is the single best way for a local government to **reduce greenhouse gas emissions** and has proven to reduce municipal energy costs*



# Phase 2

## 4 Outreach Actions:

### Recommendation 1: Create Residential Outreach Program

- BLUER will serve as an **energy information clearinghouse**: EPA Yardstick, grant funding, financing programs, energy audits
- Communications vehicles: Residential workshop, local placemat ads, video, pamphlets, local radio, website, Borough newsletter
- Primary Targets: Churches, community orgs



# **4 Outreach Actions:**

## **Recommendation 2: Create Business Outreach Program**

- **3 Phases:**
  - (1) Overview energy efficiency/conservation breakfast  
(with Chamber of Commerce)**
  - (2) Q&A session with expert panelists**
  - (3) BLUER Business Awards**

# 4 Outreach Actions:

## Recommendation 3: Create Industrial Outreach Program

- Highlight experience with Sartomer/DOE Industrial Assessment Center



### **Sartomer Company Partners with BLUER and IAC to save \$40K, Cut CO2 Emissions 264 Tons/Year**

Dear Industrial Neighbor:

Last year, Sartomer Company teamed up with the West Chester Borough's BLUER Committee and the University of Delaware's Industrial Assessment Center (IAC) to evaluate ways to reduce our energy use, and thereby cut Greenhouse emissions. The IAC, a program funded by the Department of Energy, provided us with a free energy audit and suggested several actions. While we were a bit skeptical at first, the audit went very well, and it showed us that we could save money and cut emissions simply by operating our facilities differently, including capturing and reusing our waste heat in ways we hadn't thought of before.

We have since implemented two of the IAC's recommendations and are in the process of evaluating a third. The projected result of the two projects that were implemented is:

- We will save \$40,000 a year, with a payback of less than 2 years.
- We will reduce Carbon Dioxide (CO2) emissions by as much as 264 tons a year.
- We will reduce Carbon Monoxide (CO) emissions by 353 pounds and Nitrogen oxides (NOx) by 440 pounds annually.

In addition, the audit exercise prompted us to benchmark with similar industrial users and has revealed other projects with potential energy and cost savings. We ask that you, too, consider joining us and the all-volunteer BLUER Committee in working to conserve energy and protect our community.

I am more than happy to answer any questions you may have about our experience and look forward to hearing from you!

Sincerely,

Joann Cortese, CHMM  
Sartomer Company, Inc.  
Oaklands Corporate Center  
502 Thomas Jones Way  
Exton, PA 19341  
610-363-4811

Visit Borough Leaders United for Emissions Reduction (BLUER): [www.wcbluer.org](http://www.wcbluer.org)  
For more information on the IAC program, see: <http://www.ecx.udel.edu/iac/>  
Contact: Ralph Nigro, [ralphnigro@comcast.net](mailto:ralphnigro@comcast.net)

# 4 Outreach Actions:

## Recommendation 4: Maintain Updated Website



# What can you find at **wcbluer.org**?

Everything you need to reduce  
carbon emissions

## Home

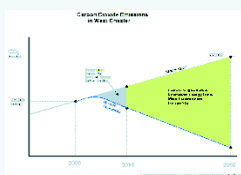
BLUER is a committee formed by the [West Chester Borough Council](#) to promote the reduction of greenhouse gasses in WC.



## About

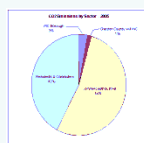
Our Mission  
ICLIE  
BLUER's Strategy  
Mtg Minutes  
News  
Events

## Big Picture Why Reduce? Timeline



## Inventory

Breakdown of  
Borough Emissions  
Sources



Emissions  
Calculators

## Climate Action Plan

Step by step  
recommendations  
for the Borough  
Council and the  
community for  
how to reach our  
goals.

## Outreach

Business Survey  
Industrial Assessment  
ENERGY STAR  
Guide to a Greener  
Home

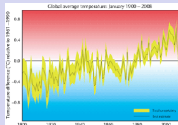
## Act Now

Tips for:  
Homeowners  
Contractors  
Industrial  
Tenants  
Business  
Owners  
Government  
Landlords  
Commuters

## Get Involved

BLUER Meetings  
Contribute

## Climate Change FAQ How? Why? When?

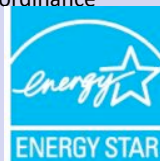


## BLUER Partners

Organizations and  
people that have  
helped BLUER

## ENERGY STAR

About the EPA  
program and WC  
ordinance



## Alternative Energy

Wind, Solar, Fuels  
Elec Vehicles



## Links

Related Stuff

## Free Money

Grant and Tax  
Incentives for  
energy efficiency  
projects.

KeystoneHelp  
PA-depweb  
Sust Dev Fund



# ICLEI Milestone 4: Implement Climate Action Plan



# ICLEI Milestone 5: Monitor/Evaluate Progress



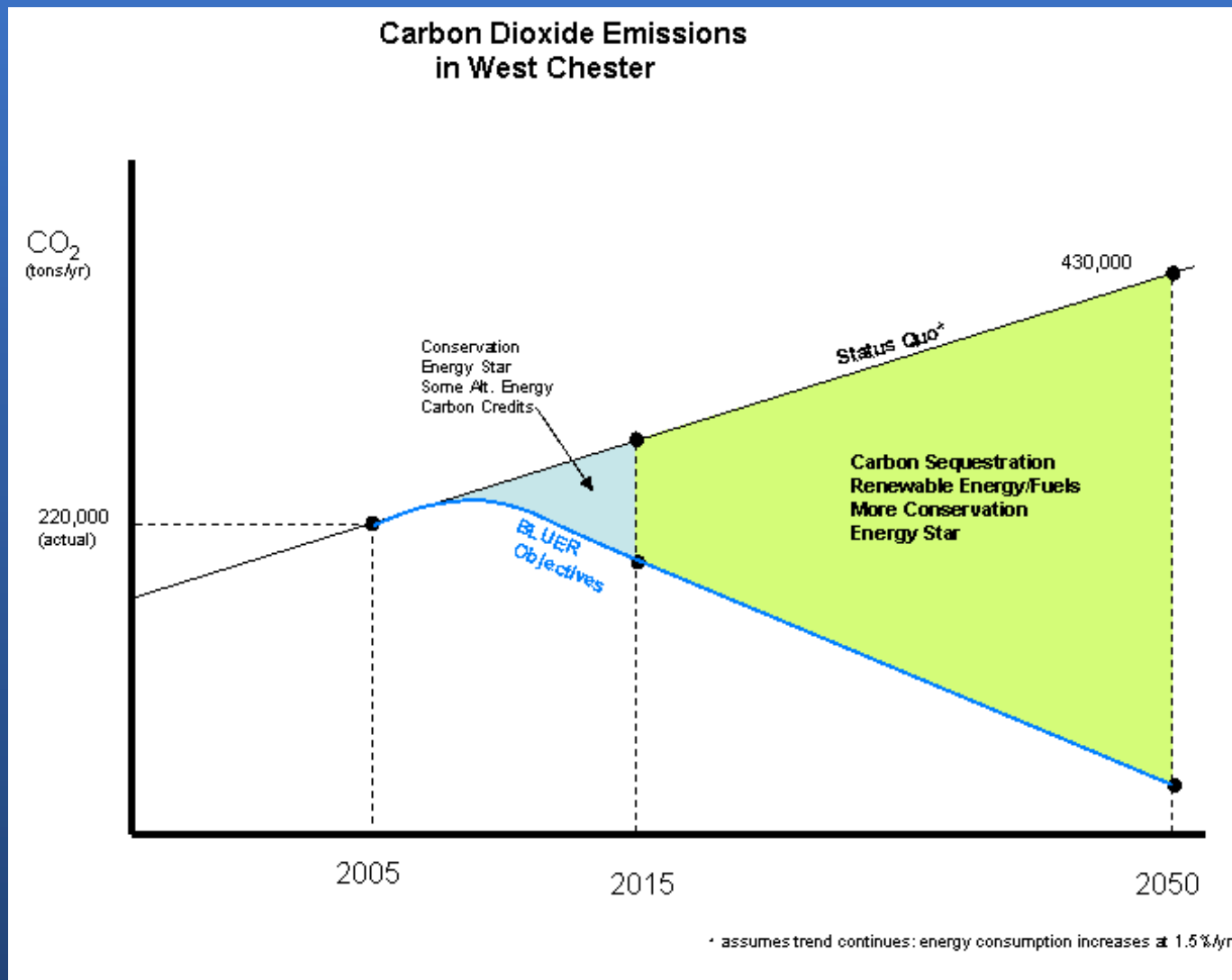
# **What West Chester Has Accomplished to Date**

- **Inventory/GHG Reduction Target/Climate Action Plan**
- **Energy STAR Zoning Ordinance: First in the nation**
- **Energy Office Commitment**
- **Business Outreach/Partnership with Chamber of Commerce**
- **Biggest Industrial Player Reducing CO<sub>2</sub> 925+ Tons**
- **Municipal Wind Power/Energy Audit & Cost Savings**

# Lessons Learned

- Bending the curve will take **conservation**
- Conservation takes **outreach**
- **Partner** – don't preach
- **Tailor** the message
- Engage municipal players
- Think ahead
- Think positively
- Think **outside the code**

# Reducing Our Carbon Footprint







Session 36

# Mapping a Sustainable Future:

## The West Chester Borough Success Story

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Dianne Herrin  
BLUER Chair

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Courtney Marm  
CH2M Hill

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Chester County PC