Session 36

Mapping a Sustainable Future:
The West Chester Borough Success Story

Dianne Herrin
BLUER Chair

Courtney Marm
CH2M Hill

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$_2$)
Pennsylvania’s CO$_2$ Emissions

- PA had the 3$^{rd}$ highest CO$_2$ emissions in 2004 behind Texas and California
- Over 40% of that was from electric power and 26% from transportation

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
It's the perfect solution! We can't afford to drive the SUV and we can't afford to heat the house!
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
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
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 CO₂ 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

- Leadership Commitment
  - Milestone 1: Inventory Emissions
  - Milestone 2: Establish Target
  - Milestone 3: Develop Climate Action Plan
  - Milestone 4: Implement Climate Action Plan
  - Milestone 5: Monitor/Evaluate Progress

ICLEI
Local Governments for Sustainability

Borough of West Chester
Chester County Pennsylvania
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
<table>
<thead>
<tr>
<th>Sector</th>
<th>Data Category</th>
<th>Data Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential; Commercial; Industrial</td>
<td>Required Base Year Data</td>
<td>Aggregate quantity consumed of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Electricity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Natural gas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Heating oil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Propane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Other significant fuels</td>
</tr>
<tr>
<td></td>
<td>Target Year Forecast Indicators</td>
<td>Predicted change in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Population &amp; number of households</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Commercial and industrial floor area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Commercial and industrial employment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Energy use rate per sector</td>
</tr>
<tr>
<td>Transportation (Non-Municipal Community Transportation)</td>
<td>Required Base Year Data</td>
<td>Total community vehicle miles traveled (VMT), broken down by vehicle and fuel type to the extent possible. Total length of roads categorized by frequency of use and annual average daily traffic (AADT) counts/vehicle type.</td>
</tr>
<tr>
<td></td>
<td>Target Year Forecast Indicators</td>
<td>Predicted change in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- VMT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Population &amp; number of households</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Local employment</td>
</tr>
<tr>
<td>Waste (Non-Municipal community-generated waste)</td>
<td>Required Base Year Data</td>
<td>Amount of waste generated in the base year.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percent composition by major waste type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estimation of methane recovery rate at utilized landfills. (This methodology often used for open landfill)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amount of landfilled waste in place in base year, along with landfill opening and closing dates and methane recovery factor. (This methodology often used for closed landfill).</td>
</tr>
<tr>
<td></td>
<td>Target Year Forecast Indicators</td>
<td>Expected change in amount of waste in landfill and composition, or change in population.</td>
</tr>
<tr>
<td>Other</td>
<td>Required Base Year Data</td>
<td>Absolute emissions generated from sources not captured in above categories.</td>
</tr>
<tr>
<td></td>
<td>Target Year Forecast Indicators</td>
<td>Any indicators necessary for those noting change in emissions by.</td>
</tr>
<tr>
<td>Sector</td>
<td>Data Category</td>
<td>Data Requirements</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>
| Buildings (old municipally managed facilities) | Required Base Year Energy Data | Quantity in 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 |
| Streetlights (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 in energy consumption estimates for new streetlights |
| Water & Sewage (treatment, pumping) | Required Base Year Energy Data | Energy consumption  
Electricity and gas costs per unit consumed  
Volume of water pumped, treated |
| Optional Base Year Indicators | Energy consumption and cost estimates for new facilities |
| Target Year Forecast Indicators | |
| Vehicle Fleet (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)  
Number of vehicles in fleet  
Distance traveled per vehicle by vehicle type  
Fuel costs by fuel type |
| Optional Base Year Indicators | |
| Target Year Forecast Indicators | Fuel consumption and cost estimates for new vehicles |
| Waste (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 utilized landfills |
| Optional Base Year Indicators | Number of municipal employees |
| Target Year Forecast Indicators | |
| Other (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 |
## Government Analysis for Year 2005

**Borough: Fire companies**

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Units</th>
<th>Energy Use</th>
<th>Energy Cost ($)</th>
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</thead>
<tbody>
<tr>
<td>Electricity (Grid Average)</td>
<td>kWh</td>
<td>290,762</td>
<td>0</td>
</tr>
<tr>
<td>Coal</td>
<td>(ton)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Light Fuel Oil</td>
<td>(US gal)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>(thousand cu ft)</td>
<td>734</td>
<td>0</td>
</tr>
<tr>
<td>Propane</td>
<td>(US gal)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Biogas</td>
<td>(thousand cu ft)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fuelwood (Air Dry)</td>
<td>(cords)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Solar</td>
<td>(MMBtu)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Green Electricity</td>
<td>(kWh)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Notes Regarding Building or Group Data**

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

<table>
<thead>
<tr>
<th>Energy Consumption</th>
<th>Equivalent CO₂ Production</th>
<th>Cost</th>
<th>($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>510,268</td>
<td>209</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
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
In 2005, West Chester Borough emitted over 220,000 tons of CO$_2$ into the atmosphere.
2005 Emissions by Sector

- Commercial/Industrial: 117,716 tons (54%)
- Chester County w/i WC: 3,072 tons (1%)
- WC Borough Operations: 6,697 tons (3%)
- Residents + Commuters: 94,098 tons (42%)
2005 CO₂ Emissions by Source

- Electricity: 108,855 tons (49%)
- Natural Gas: 33,329 tons (15%)
- Fuel Oil: 21,101 tons (10%)
- Coal: 14,501 tons (7%)
- Vehicle & Equip. Fuel: 40,756 tons (18%)
- Waste: 3,041 tons (1%)
Visualizing the Inventory
How does this relate to BLUER’s 10% goal?

* assumes trend continues: energy consumption increases at 1.3%/yr
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$_2$ and other greenhouse gas emissions 10% by 2015 over 2005 levels.
ICLEI Milestone 3: Develop Climate Action Plan
Climate Action Plan
Adopted April 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 CO2 Emissions (vs 39% nationally)
Why We Focus on Buildings

West Chester Sources of CO2 Pollution

- Electricity: 49%
- Cars/Trucks: 18%
- Natural Gas: 15%
- Heating Oil: 10%
- WCU Coal*: 7%
- Waste: 1%

*On-site coal fired generator being phased out.
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 CO2 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
4 Outreach Actions:

Recommendation 4:
Maintain Updated Website

BLUER is

An ad-hoc committee formed by the West Chester Borough Council in winter 2006; BLUER's mission is to help our entire community—including our municipal and County government operations, residents, businesses, and nonprofits—reduce greenhouse gas pollution 10% over 2005 levels by the year 2015. This will help us break the trend toward rising greenhouse emissions and put West Chester on a track toward further greenhouse gas reductions, and toward a more sustainable economic and environmental future.

More about Us

Wise Words
What can you find at wcbluer.org?

Inventory
Breakdown of Borough Emissions Sources

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

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

Get Involved
BLUER Meetings Contribute

Free Money
Grant and Tax Incentives for energy efficiency projects.
- KeystoneHelp
- PA-depweb
- Sust Dev Fund

Home
BLUER is a committee formed by the West Chester Borough Council to promote the reduction of greenhouse gases in WC.

About
Our Mission
ICLIE
BLUER’s Strategy
Mtg Minutes
News
Events

Energy Star
About the EPA program and WC ordinance

Alternative Energy
Wind, Solar, Fuels Elec Vehicles

Links
Related Stuff

Climate Change FAQ
How? Why? When?

BLUER Partners
Organizations and people that have helped BLUER

Everything you need to reduce carbon emissions

Inventory
Emissions Calculators
ICLEI Milestone 4: Implement Climate Action Plan

Leadership Commitment

Milestone 1
Inventory Emissions

Milestone 2
Establish Target

Milestone 3
Develop Climate Action Plan

Milestone 4
Implement Climate Action Plan

Milestone 5
Monitor/Evaluate Progress
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$_2$ 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

Carbon Dioxide Emissions in West Chester

CO₂ (tons/yr)

220,000 (actual)

2005  2015  2050

Conservation
Energy Star
Some Alt. Energy Credits

Status Quo

Carbon Sequestration
Renewable Energy/Fuels
More Conservation
Energy Star

BLUER Objectives

* Assumes trend continues: energy consumption increases at 1.5% yr
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