Clean Air & Climate Protection Software: A Tool for State & Local Governments to Improve Air Quality & Reduce Greenhouse Gas Emissions

Amy Royden-Bloom

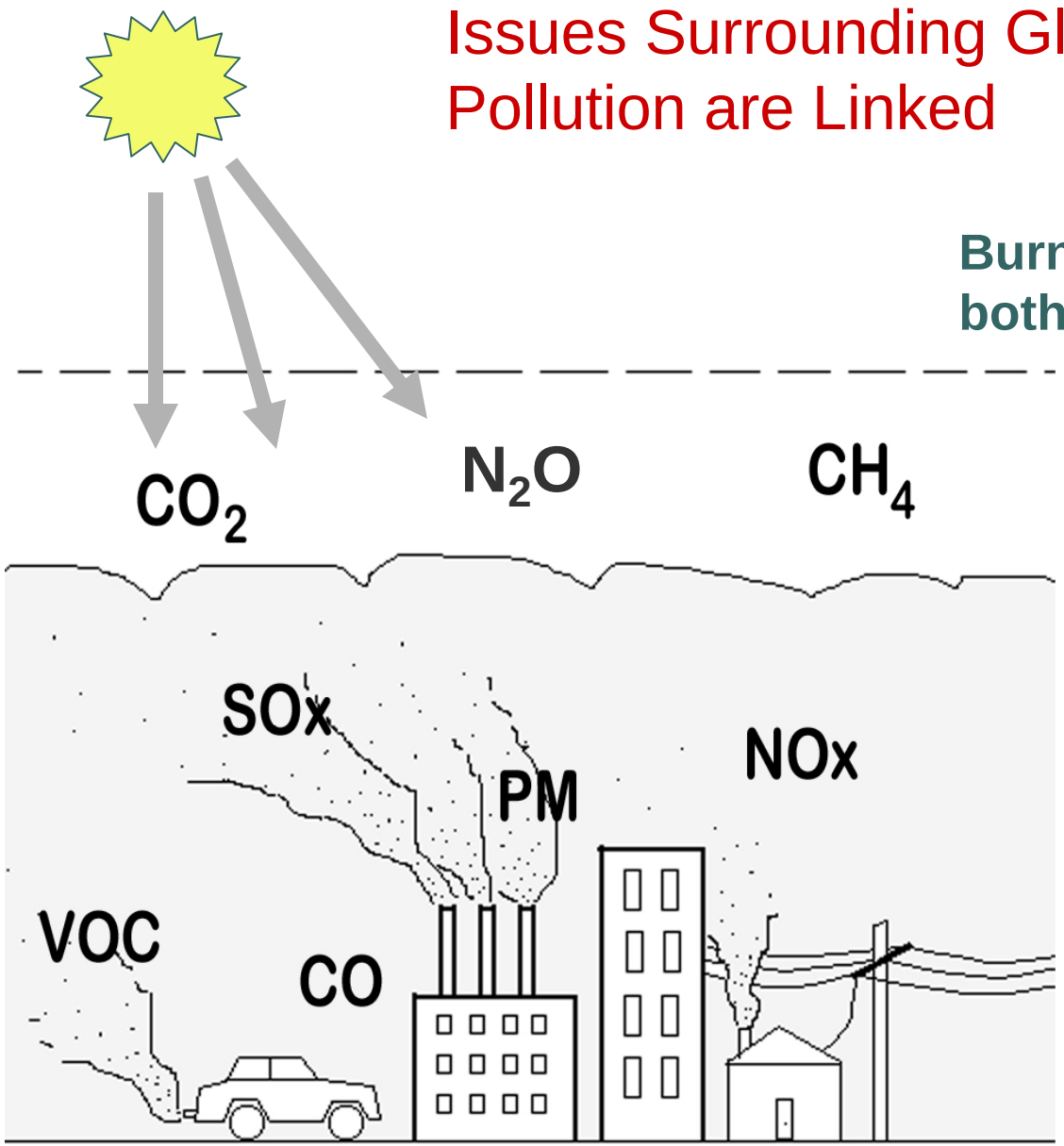
State and Territorial Air Pollution Program Administrators (STAPPA)

Association of Local Air Pollution Control Officials (ALAPCO)

Overview

- Benefits of creating an inventory of both criteria pollutants & GHGs and of designing harmonized emissions reductions strategies
- Overview of the Clean Air & Climate Protection Software
- How to get the software

Issues Surrounding Global Warming and Air Pollution are Linked



Burning fossil fuels release both:

- Heat trapping ***greenhouse gases***

- ***Air pollutants*** responsible for:
  - Ozone (smog)
  - PM
  - Health problems
  - Reduced visibility
  - Diminished quality of life

The Importance of Quantification

- Establish a firm baseline against which future action can be evaluated
- Compare the impact of alternatives, before implementation
- Develop analytical evidence to secure political and community support for actions
- Demonstrate and monitor progress towards achieving emission reduction goals
- Facilitate inter-jurisdictional comparisons and information exchanges
- Illustrate the critical role state and local agencies play in reducing emissions

Clean Air & Climate Protection Software

- User-friendly, Windows-based software
- Helps assess and quantify individual and comprehensive strategies to reduce criteria pollutants and GHG emissions
- Available free to state and local officials
- EPA provided funding for development and support (thanks EPA!)

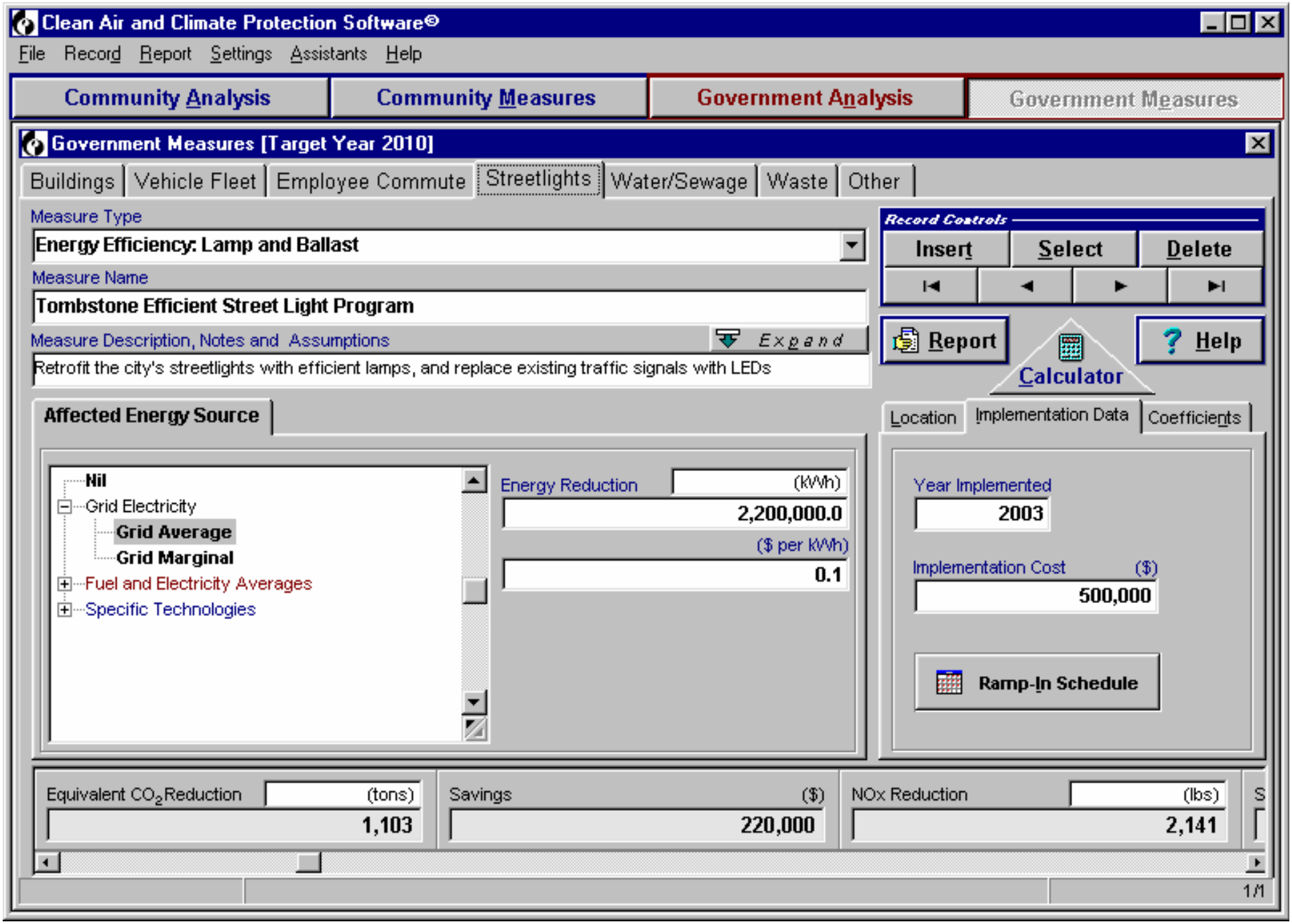
What will the software do?

- Helps create an emissions inventory
- Facilitates development of emission reduction action plans
- Quantifies emission reductions
- Forecast predicted emissions in future years under a “business-as-usual” scenario (i.e. the target year)
- Produces reports detailing emission reductions, measures and cost savings
- Tracks changes over time and progress towards meeting targets

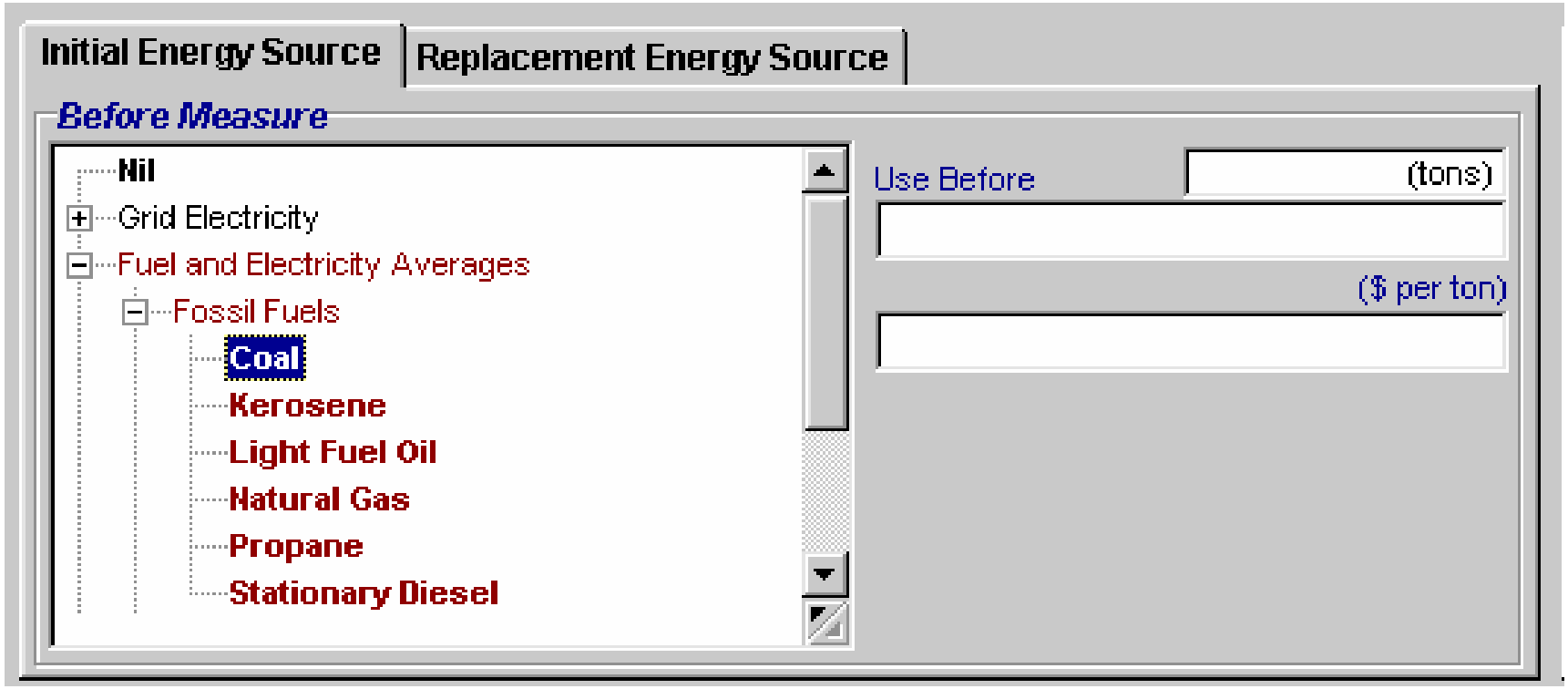
What is Tracked?

- Greenhouse Gases
  - Carbon Dioxide (CO_2)
  - Methane (CH_4)
  - Nitrous Oxide (N_2O)
- Criteria Air Pollutants
  - NO_X
  - SO_X
  - CO
  - VOCs
  - (PM10)

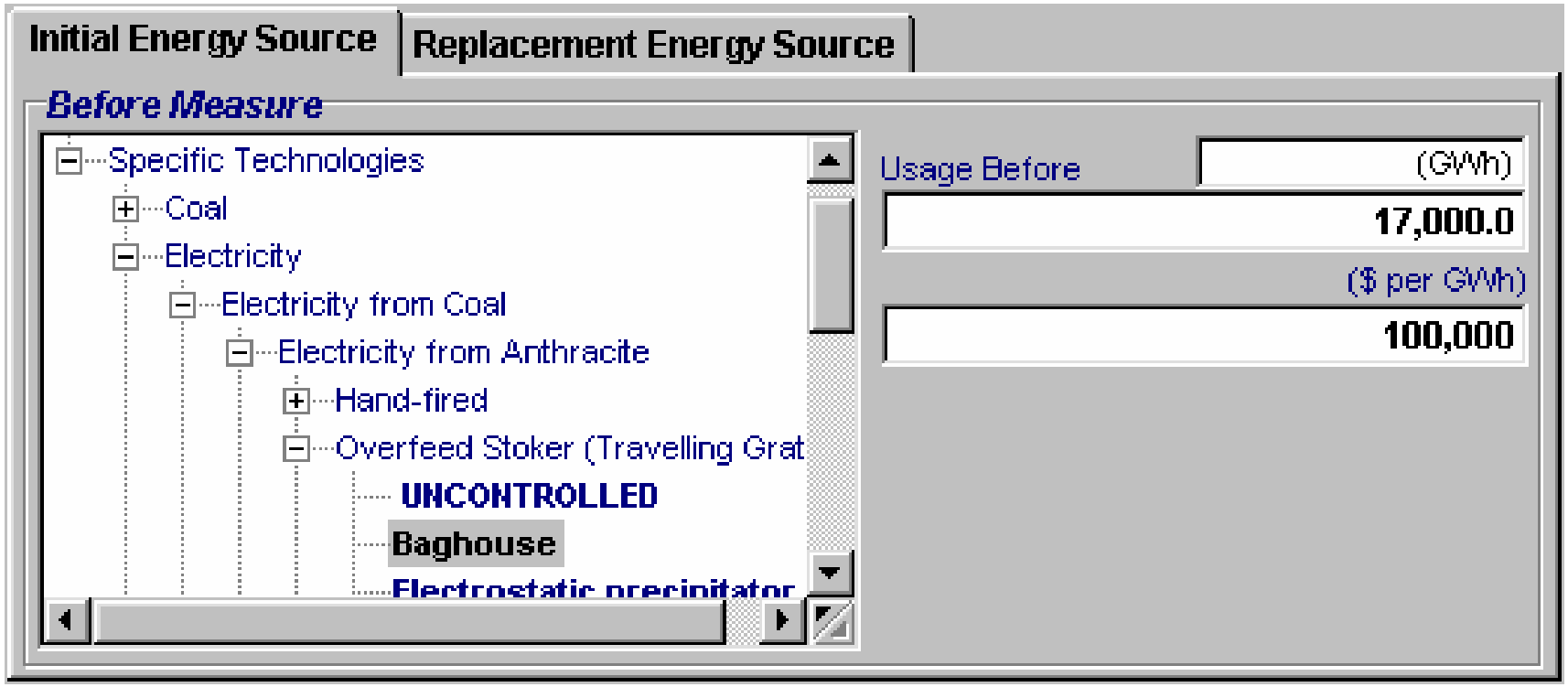

STAPPA/ALAPCO and ICLEI's
Clean Air and Climate Protection Software
State and Territorial Air Pollution Program Administrators and
Association of Local Air Pollution Control Officials
International Council for Local Environmental Initiatives

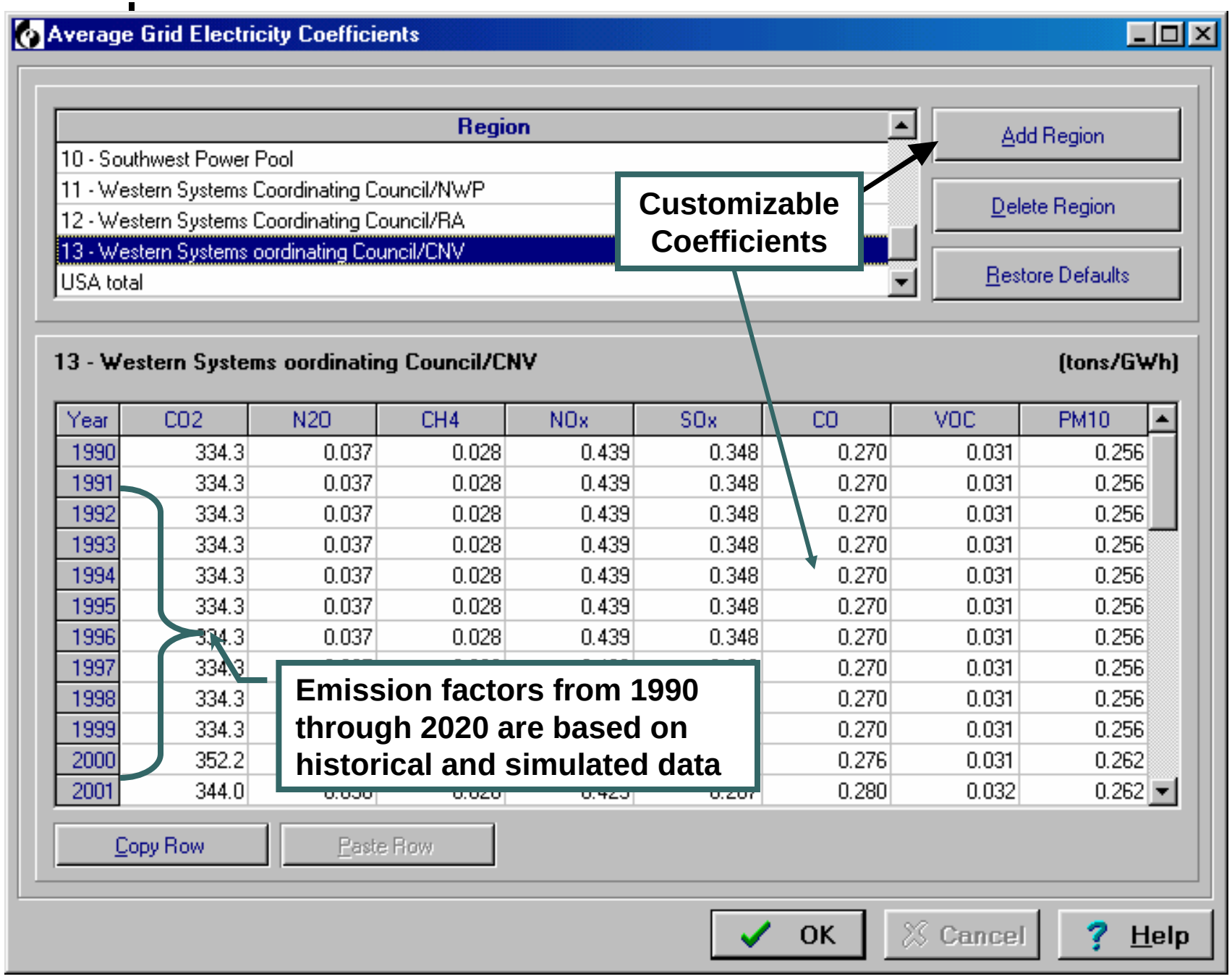

Clean Air and Climate Protection Software®
File Record Report Settings Assistants Help
Community Analysis
Community Measures
Government Analysis
Government Measures
Government Measures [Target Year 2010]
Buildings
Vehicle Fleet
Employee Commute
Streetlights
Water/Sewage
Waste
Other
Measure Type
Energy Efficiency: Lamp and Ballast
Measure Name
Tombstone Efficient Street Light Program
Measure Description, Notes and Assumptions
Expand
Retrofit the city's streetlights with efficient lamps, and replace existing traffic signals with LEDs
Record Controls
Insert
Select
Delete
Report
Calculator
Help
Affected Energy Source
Nil
Grid Electricity
Grid Average
Grid Marginal
Fuel and Electricity Averages
Specific Technologies
Energy Reduction (kWh)
2,200,000.0
($ per kWh)
0.1
Location
Implementation Data
Coefficients
Year Implemented
2003
Implementation Cost ($)
500,000
Ramp-In Schedule
Equivalent CO2 Reduction (tons)
1,103
Savings ($)
220,000
NOx Reduction (lbs)
2,141
1/1

Generic fuel technologies can be used



Specific technologies can be selected, if known




Average Grid Electricity Coefficients
Region
10 - Southwest Power Pool
11 - Western Systems Coordinating Council/NWP
12 - Western Systems Coordinating Council/RA
13 - Western Systems oordinating Council/CNV
USA total
Add Region
Delete Region
Restore Defaults
Customizable Coefficients
13 - Western Systems oordinating Council/CNV
(tons/GWh)
Year CO2 N2O CH4 NOx SOx CO VOC PM10
1990 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1991 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1992 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1993 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1994 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1995 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1996 334.3 0.037 0.028 0.439 0.348 0.270 0.031 0.256
1997 334.3 0.270 0.031 0.256
1998 334.3 0.270 0.031 0.256
1999 334.3 0.270 0.031 0.256
2000 352.2 0.276 0.031 0.262
2001 344.0 0.280 0.032 0.262
Emission factors from 1990 through 2020 are based on historical and simulated data
Copy Row
Paste Row
OK
Cancel
Help

Reports, summarize the emission reductions and savings from all measures in the emissions reduction plan.

Sample Community

Target Year Measures Summary Report

Measures Summary	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (GJ)	Energy Cost Savings ($)
Residential Sector	370,529	21.9	3,934,500	28,849,875
Commercial Sector	605,537	35.8	8,692,000	45,000,000
Industrial Sector	191,270	11.3	900,000	17,500,000
Transportation Sector	326,386	19.3	4,789,619	76,003,767
Waste Sector	198,000	11.7		3,000,000
Total	1,691,722	100.0	18,316,119	170,353,642

Local Action Plan	(tonnes)
Base Year Emissions	6,129,846
Target Year Emissions Forecast	7,279,122
Target Emissions Level	4,903,877
Emissions Reductions Required to Meet Target	2,375,245

Measures Summaries compare:

- **the base year emissions,**
- **predicted emissions,**
- **target emissions level,**

With the impact of the actions taken.

22/07/02

Sample Community

Community Greenhouse Gas Emissions Reductions in 2010

Target Year Measures Summary

Measures Summary	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (million Btu)	Energy Cost Savings ($)
Residenti				
Commerc				
Industrial				
Transport				
Total				

22/07/02

Sample Community

Community Criteria Air Pollutant Reductions in 2010

Target Year Measures Summary

Measures Summary	NOx (lbs)	SOx (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)
Residential Sector	185,462	351,706	23,992	4,033	9,945
Commercial Sector	23,531	61,537	1,870	208	1,472
Industrial Sector	65,571	186,248	4,186	315	4,285
Transportation Sector	200,592	9,397	1,937,610	204,885	4,173
Total	475,155	608,889	1,967,659	209,441	19,875

Sample Community

Community Greenhouse Gas Emissions Reductions in 2010
Target Year Measures Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (million Btu)	Energy Cost Savings ($)
Residential Sector				
Energy Efficiency: Buildings				
Energy Retrofit Program	60,270	51.1	436,102	7,650,000
Subtotal Residential	60,270	51.1	436,102	7,650,000
Commercial Sector				
Energy Efficiency: Equipment and Lighting				
Lighting Retrofit Program	7,257	6.2	22,526	660,000
Subtotal Commercial	7,257	6.2	22,526	660,000
Industrial Sector				
Energy Efficiency: Buildings				
	19,883	16.9	34,130	2,000,000
Subtotal Industrial	19,883	16.9	34,130	2,000,000
Transportation Sector				
Car/Van Pooling				
Van Pooling Program	30,473	25.8	355,070	4,240,394
Subtotal Transportation	30,473	25.8	355,070	4,240,394
Total	117,884	100.0	847,827	14,550,394

Sample Community

Community Greenhouse Gas Emissions Reductions in 2010
Target Year Measures Detailed Report

	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (million Btu)	Energy Cost Savings ($)
Residential Sector				
Energy Efficiency: Buildings				
Energy Retrofit Program				
Subtotal Residential				
Commercial Sector				
Energy Efficiency: Equipment				
Lighting Retrofit Program				
Subtotal Commercial				
Industrial Sector				
Energy Efficiency: Buildings				
Subtotal Industrial				
Transportation Sector				
Car/Van Pooling				
Van Pooling Program				
Subtotal Transportation				
Total				

Community Criteria Air Pollutant Reductions in 2010
Target Year Measures Summary

	NOx (lbs)	SOx (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)
Residential Sector					
Energy Efficiency: Buildings					
Energy Retrofit Program	185,461.7	351,706.2	23,991.7	4,033.1	9,945.1
Subtotal Residential	185,461.7	351,706.2	23,991.7	4,033.1	9,945.1
Commercial Sector					
Energy Efficiency: Equipment and Lighting					
Lighting Retrofit Program	23,530.6	61,537.3	1,870.1	208.0	1,471.8
Subtotal Commercial	23,530.6	61,537.3	1,870.1	208.0	1,471.8
Industrial Sector					
Energy Efficiency: Buildings					
	65,571.0	186,248.3	4,186.5	314.6	4,284.6
Subtotal Industrial	65,571.0	186,248.3	4,186.5	314.6	4,284.6
Transportation Sector					
Car/Van Pooling					
Van Pooling Program	200,591.6	9,397.4	1,937,610.2	204,885.0	4,173.1
Subtotal Transportation	200,591.6	9,397.4	1,937,610.2	204,885.0	4,173.1
All Measures	**475,154.8**	**608,889.3**	**1,967,658.5**	**209,440.8**	**19,874.6**

Sample Community

Community Greenhouse Gas and Criteria Air Pollutant Reductions in 2010 Target Year Measures Listing

Residential Sector **Location of Measure:**

Type of Measure: Energy Efficiency: Buildings

Measure Name

Energy Retrofit Program

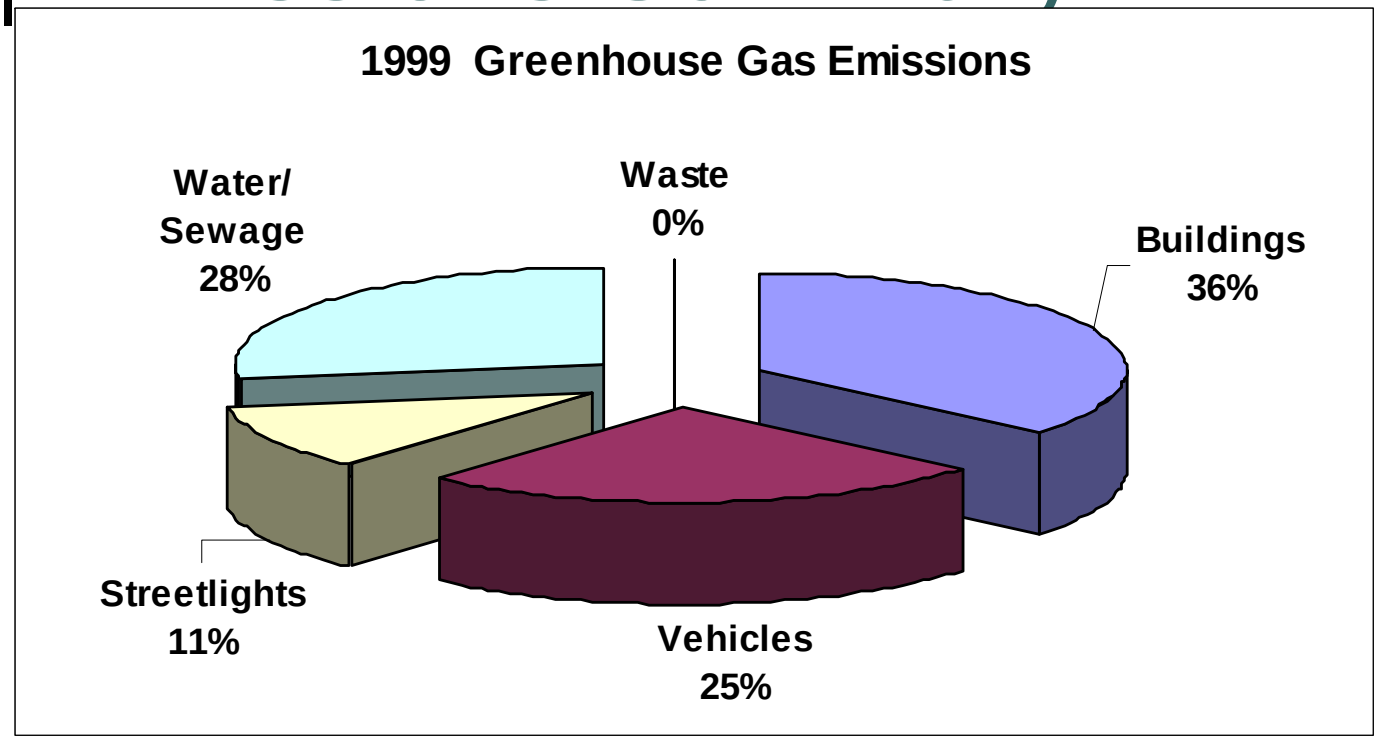
Measure Details

Affected Energy Source 1		Affected Energy Source 2	
Electricity		Natural Gas	Commercial
Energy Reduction	37,500,000	Energy Reduction	302,042
Unit	(kWh)	Unit	(thous cu ft)
Price per Unit	$.10	Price per Unit	$12.91
Ramp-In Factor	100%	Energy Reduction (million Btu)	436,102
Year Implemented	1999	Emission Reduction (tons eCO2)	60,270
Implementation Cost	$50,000,000	Savings ($/year)	$7,650,000
		Payback Period (years)	6.5

The emission reduction from this measure as a percentage of total reductions: *51.1%*

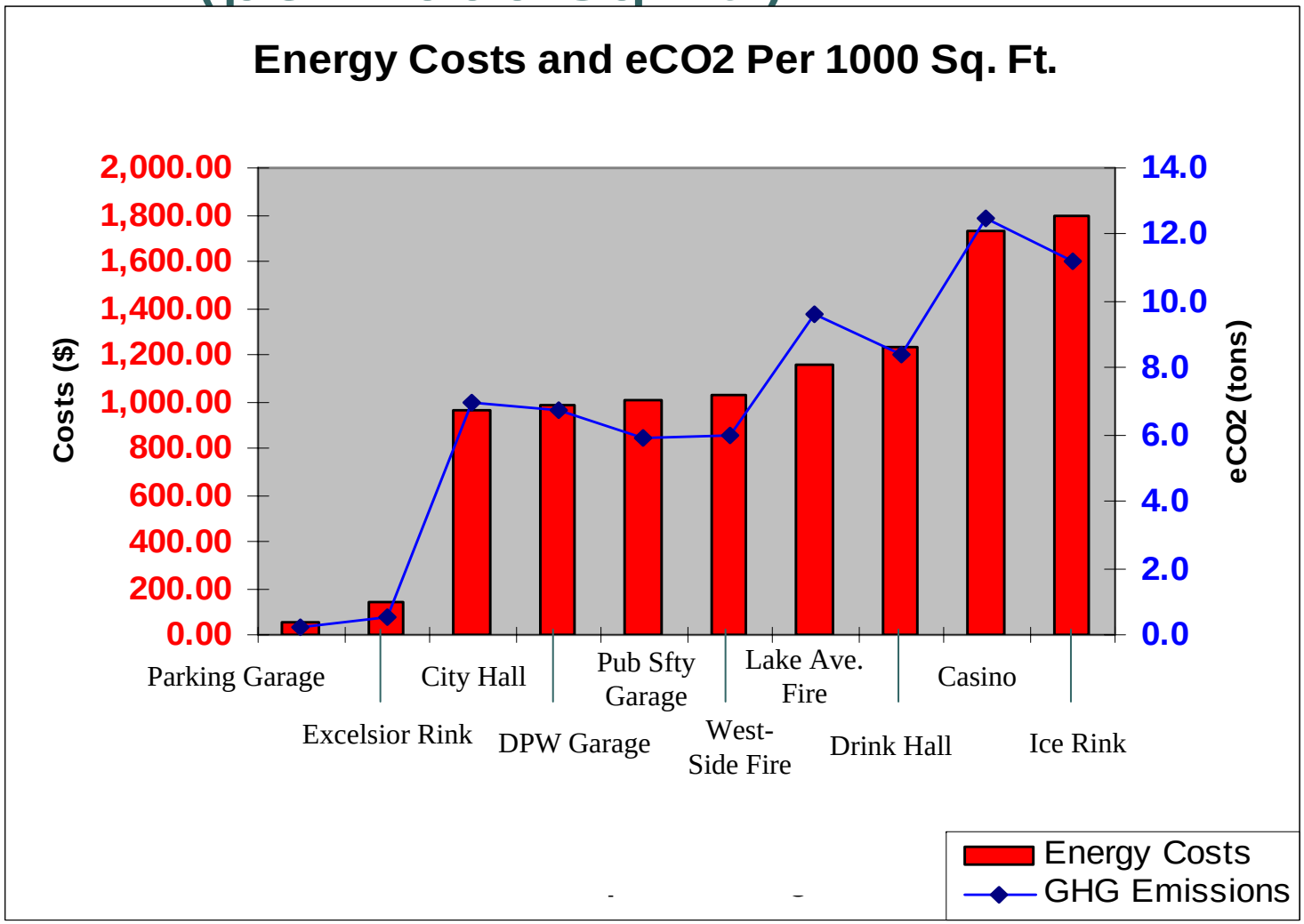
NOx Reduction (lbs)	SOx Reduction (lbs)	CO Reduction (lbs)	VOC Reduction (lbs)	PM10 Reduction (lbs)
185,462	351,706	23,992	4,033	9,945

Government Operations Emissions Summary

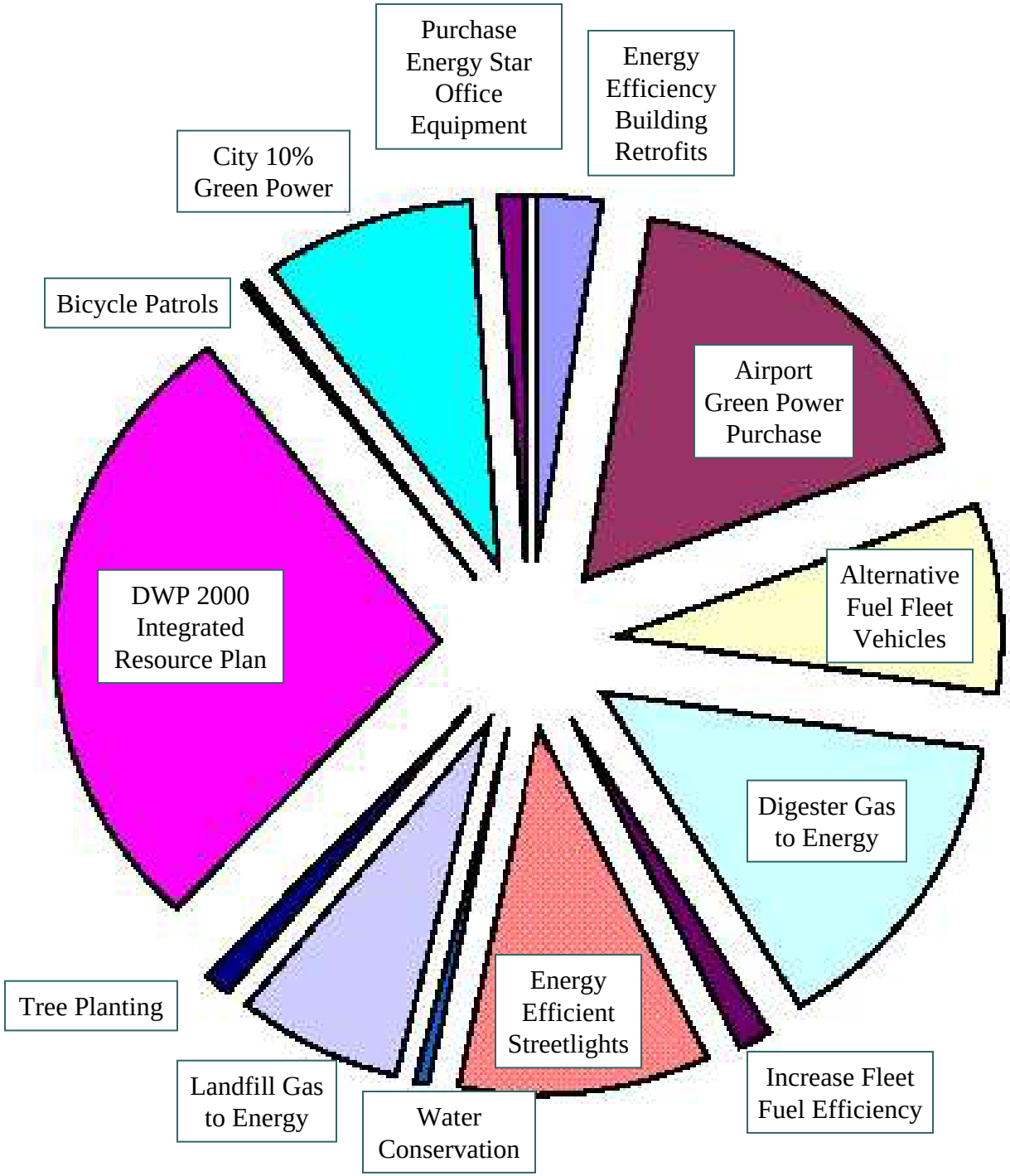


Total Government GHG Emissions:
Base Year: 1999
Total Emissions: 6,070 tons eCO_2

Energy Costs of Government Buildings (per 1000 sq. ft.)



Side by Side Measure Comparisons



How do I get the software and learn how to use it?

- State and local air, energy and utility officials – go to www.cacpsoftware.org and click on link “Register as a new user”
- More information, including a free user’s guide, is available at www.4cleanair.org – under “our Projects” go to CACP Software
- Free technical assistance available
- Free training sessions available

Contact Information

Amy Royden-Bloom
STAPPA/ALAPCO
www.4cleanair.org
202-624-7864
Aroyden-bloom@4cleanair.org