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PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

Pittsburgh, already a national leader in environmentally responsible and energy efficient building, has undertaken **an initiative to join hundreds of cities around the world to reduce greenhouse gas emissions and slow the effects of global warming.**



Two organizations, *Clean Air - Cool Planet* and *ICLEI: Local Governments for Sustainability*, are working together with the Green Building Alliance to provide technical assistance and support to the City of Pittsburgh to carry out this initiative.

Clean Air - Cool Planet works mainly with communities throughout the Northeast to promote climate leadership and implement policies and strategies that reduce greenhouse gas emissions.

ICLEI: Local Governments for Sustainability is an international association of local governments in 67 countries that strives to improve global environmental conditions that allow for sustainable development. Among ICLEI's various programs is Cities for Climate Protection, which aims specifically to reduce greenhouse gas emissions through their Five Milestone model.

The Green Building Alliance is a non-profit organization in Pittsburgh that promotes environmentally responsible design, construction, and operating practices in Greater Pittsburgh area.

FIVE MILESTONES FOR EMISSIONS REDUCTION

1 Baseline emissions inventory and forecast

September - December 2006

The Heinz School Research Team will conduct a comprehensive inventory of greenhouse gas emissions in Pittsburgh. The Final Report and Recommendations will be published/presented mid-December.

2 Adoption of an emissions reduction target for the forecast year.

3 Develop a Local Action Plan listing measures to be undertaken to meet the target

January - April 2007

Based on the Emissions Inventory Report, the Pittsburgh Green Government Task force will develop proposals for specific emissions targets. The Task Force will then craft a Local Action Plan (energy-saving and emissions reduction measures for municipal and community energy users) to reach the goals set in the Emissions Targets.

The final plan and document will be recommended to the City Council and the Mayor's Office.

4 Implementation of policies and measures

5 Monitor and verify results

May 2007 - December 2010

Upon adoption of a Local Action Plan, specific emissions reducing policies will be enacted for the city of Pittsburgh. In or around 2010, a new emissions inventory will be conducted to assess the effectiveness and progress of the Action Plan.

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

The Inventory

The Emissions Inventory Process consists of two components:

1. **Collection of data on energy use and emissions:**

Community data (private residences, business, transportation, etc) are collected from electric and gas utilities, planning and transportation agencies, and solid waste management departments. Municipal data (city buildings, streetlights, fleet vehicles, sewage treatment, etc.) are collected from city government sources.

2. **Documentation of reduction measures:**

Emissions reduction measures undertaken since the baseline year by municipal and community energy users in the City of Pittsburgh will be documented and quantified.

Specialized software, provided by ICLEI, will be used to estimate municipal and community emissions of greenhouse gases. *This Emissions Inventory will create a comprehensive catalog of energy use and greenhouse gas emissions in the City of Pittsburgh.*

For more information on the inventory, including examples of data and measures, see Appendix 1.

Valuable Data

The CCP process will be an **invaluable tool for the city**. Comprehensive and up-to-date measures of the amount of energy consumed by both the city government and the broader community will allow for more informed city policies and planning.

This data will allow the residents, businesses, and government of Pittsburgh to:

- **Monitor, predict, and budget** for municipal and community-wide **energy costs**
- Continually **re-evaluate options for efficiency upgrades**
- **Foresee the effects of any fluctuations** in energy prices and adapt to such changes

Key Actors for Milestones 1-3

Green Government Task Force

The Task Force, composed of local leaders and experts, will serve as a driving force throughout the first three milestones of the CCP model. The role of the Task Force involves:

- **Providing oversight and guidance** for the Heinz School Research Group during the inventory process (Milestone 1)
- **Adopting an emissions reduction target** (Milestone 2)
- **Developing a local action plan** for the city of Pittsburgh (Milestone 3)
- **Recommending approval** of final documents to City Council and the Mayor's office.

Heinz School Research Team

The Heinz School Research Team is a group of second-year **masters students** at the H. John Heinz III School of Public Policy and Management at **Carnegie Mellon University**. As part of the school's curriculum, Heinz students work with community organizations and governments to address important policy issues. The Heinz School Research Team will help the City of Pittsburgh to **complete the greenhouse gas emissions inventory and make recommendations** for an emissions reduction target and a local action plan.

For the **Contact Info** of Task Force Members, the Heinz School Research Team, and other contacts, see Appendix 8.

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

THE BENEFITS OF AN ENERGY PLAN

The benefits of Pittsburgh taking part in the Cities for Climate Protection process are numerous. This process presents very **real implications for the economy, environment, and image of the city**. The track record in similar cities across the country speaks for itself:

Today, more than 159 local governments in the United States participate in the Cities for Climate Protection campaign. These governments collectively represent 55 million people.

Together, CCP participants save in excess of **\$535 million in energy and fuel costs annually**. These have resulted from a decrease in consumption of 74 million gallons of gasoline, 4,000 gigawatt hours of electricity, and 6 million therms of natural gas.

- The city of **New Haven, CT** has averaged annual **savings of \$4 million** over the past four years. Installation of real-time energy monitoring and controls in municipal buildings, replacement of the city's roadway lighting system, and the start of a school renovation program have contributed to these savings.
- Weatherproofing buildings with insulation, repairs, and storm windows reduces winter and summer energy use, and related emissions. **Chicago** has instituted a municipal building retrofit program that **saves the city nearly \$1 million annually**.
- **Frederick, MD** has saved an estimated **\$1 million** using highly reflective roofing and tree plantings which dramatically reduce air conditioning use in the summer.
- In **Burlington, VT**, measures to reduce energy demand have saved \$4.3 million a year in energy costs. These measures include a revolving energy efficiency fund to improve energy efficiency in municipal buildings through various retrofits, use of sustainable biomass for community heating and cooling, and more efficient transportation planning.

For detailed case studies, please see Appendices 2 & 3

Grant Money

In addition to savings from efficiency upgrades that have already been achieved in cities across the country, **Pittsburgh can take advantage of a large pool of state, federal, and private grant money that is currently available for energy efficiency projects.**

The Pennsylvania Department of Environmental Protection offers a wide range of grants, with average **awards of anywhere between \$7,500 and \$1,000,000** for businesses, municipalities, authorities, school districts, non-profits, and partnerships. In addition, **more than \$100 million is available** through the New Pennsylvania Venture Funds, as well as several other private and public sources.

Tax Incentives

A large number of **state and federal tax incentives are available for energy efficiency projects**. State tax incentives for alternative fuels and sustainable energy projects are available through the Alternative Fuels Incentive Program and the Sustainable Energy Funds. **Federal tax incentives of more than \$2 billion** for advanced energy-savings projects are provided by the Federal Energy Policy Act of 2005.

For a thorough list of available grants and tax incentives, see Appendix 4

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

Environmental Impacts

Cincinnati, OH converted 288 buses to biodiesel fuel in 2000, contributing to better air quality and greatly reducing the city's CO₂ emissions. Biodiesel is a renewable source of fuel that can be used in any diesel engine. Alternative fuels are becoming increasingly important to financially struggling public transit systems as the price of gas continues to be high.

Phoenix, AZ recently adopted legislation to update their existing building codes to promote energy efficiency. The new code requires that all buildings constructed after July 1, 2005 meet minimum efficiency standards established by the International Energy Conservation Codes (IECC). By enacting the new standards, Phoenix is using less energy and emitting fewer pollutants into the environment.

St. Paul, MN replaced their incandescent traffic light signals at 200 intersections with energy efficient LED fixtures. The new signals will use 90% less power and last ten times longer than the average incandescent bulb. By simply changing the traffic lights the city has successfully reduced their CO₂ emission by 1,250 tons.

"Together CCP participants annually reduced greenhouse gas emissions by 23 million tons, eliminating more than 43,000 tons of local air pollutants [...] equivalent to the emissions produced annually by: 4 million passenger vehicles, 1.8 million households, and 2.1 billion gallons of gasoline." ICLEI

Public Health Impacts

Cleaner Air = Better Health. In 2004, PennEnvironment Research & Policy Center released a study stating that Pittsburgh ranks **2nd nationwide for the highest levels of soot pollution**. Soot, a product of diesel engines, contributes to **237 premature deaths, 340 non-fatal heart attacks, and 3,399 asthma attacks each year in Pittsburgh**. Therefore, converting diesel operated vehicles to cleaner fuels will have a tremendous local impact.

Cooler Plant = Longer Healthier Lives. Approximately **40 heat related deaths occur each summer** in Pittsburgh. If nothing is done to mitigate the effects of global warming and temperatures continue to rise, Pittsburgh can expect to see this number **increase by 50% over the next 50 years**. By adopting CO₂ reduction standards, Pittsburgh can do their part to prevent heat related deaths.

Public Image

Pittsburgh has come a long way in changing its image from the legendary "smoky city." Today, Pittsburgh is among the **top 5 cities nationwide in the number of certified green buildings**. Additionally, almost **100 projects in western Pennsylvania have been logged**.

Pittsburgh's very own David L Lawrence Convention Center receive Gold LEED certification in 2003, and was the first **certified green convention center in the world**. (LEED: Leadership in Environmental and Energy Design, is a nationally accepted rating system used for green buildings). In 2008, Pittsburgh will celebrate another notable accomplishment when PNC completes their 23-story skyscraper downtown, which will be deemed **the largest mixed use green building in the US**.

Pittsburgh has clearly established themselves as a leader in green building. By taking the next step and adopting standards to reduce pollution **we can change our image from a dirty industrial town to the greenest city in the nation**.

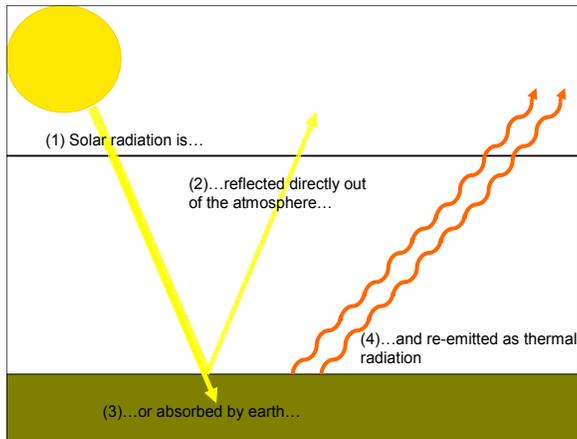
City	Projects Certified
Seattle	20
Portland	18
Pittsburgh	16
Atlanta	14
Chicago	12

For more information on public image, economic, health, and other impacts on human life in Pittsburgh, see Appendix 5.

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

THE SCIENCE OF GLOBAL WARMING

The world scientific community has reached a consensus about the dangers of global warming and its potential impact on human life. Although there is no single solution to the problem of global warming, there are many strategies which can reduce the emission of greenhouse gases and slow the effects of climate change. *For more on the science and causes of Global Warming, see Appendix 6.*

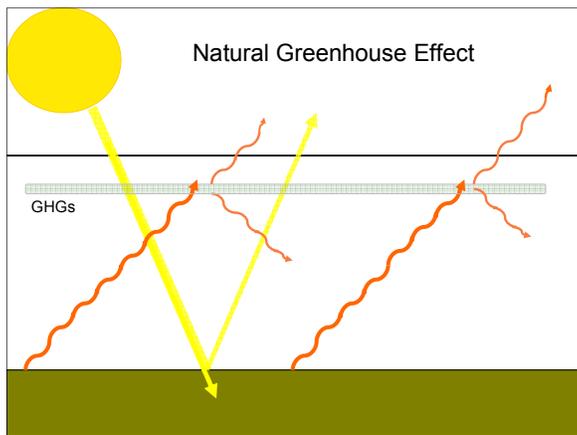


Planetary Energy Budget

Total Energy IN = Total Energy OUT

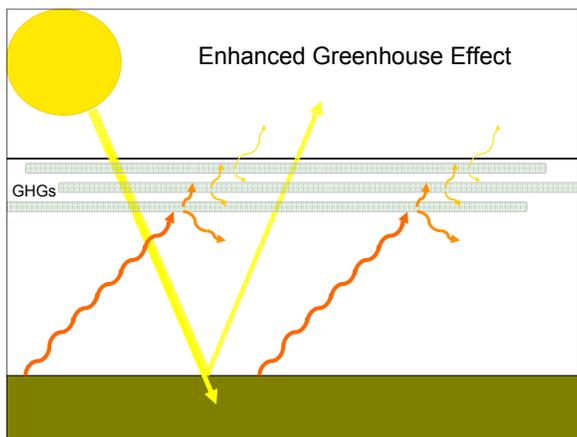
Sunlight enters the atmosphere. **Some of it is reflected** and leaves the atmosphere without turning into heat energy. **Some of it is absorbed by the ground**, which then emits thermal radiation.

The **greenhouse effect** is a naturally occurring phenomenon. Specific gases in the atmosphere (called **greenhouse gases**, or GHGs) **absorb the radiation from the ground**. These gases then emit thermal radiation, but in both directions.



The greenhouse effect creates **more total heat energy**, some of which stays inside the atmosphere and **raises the surface temperature**. It ensures that Planetary Energy Budget is followed while **making the earth warm enough to support human life**.

Global warming is this same mechanism. But, increased concentrations of GHGs in the atmosphere means that **less thermal radiation is escaping** into higher layers of the atmosphere to fulfill the Planetary Energy Budget. The **surface temperature gets warmer** because of the increased amount of thermal energy that is retained in the atmosphere.



Sources of Greenhouse Gasses

Of the eight major greenhouse gases that are **generated by human activity**, carbon dioxide (CO₂) and methane (CH₄) have the highest atmospheric concentrations. Natural and anthropogenic sources of CO₂ and CH₄ include:

CO₂: deforestation, transportation, energy generation

CH₄: livestock and agriculture, changes in land use, landfills

For more on the causes of greenhouse gases, see Appendix 6.

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

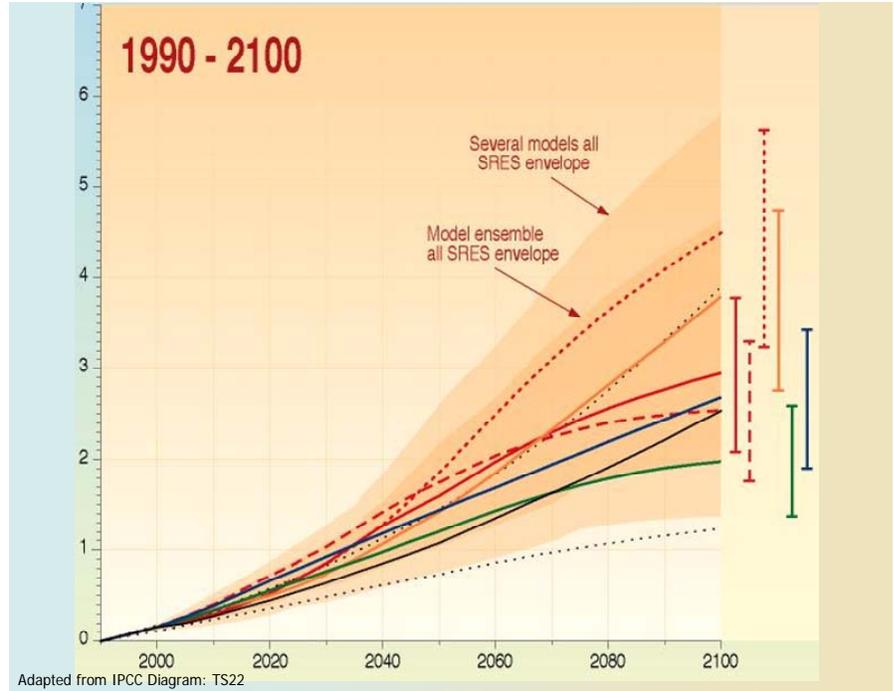
PHYSICAL IMPACTS OF GLOBAL WARMING

Rising Temperatures

Given the current elevated concentrations of GHGs in the atmosphere and the projected increases in emissions of major GHGs over the next century, the **global average temperature is expected to increase by up to 5 degrees Celsius, or almost 10 degrees Fahrenheit.** (see Figure to right).

For more on emission projections, refer to the graphs in Appendix 6.

This increase in global average temperature will have **dramatic impacts on the physical environment and human life.**



Increased Average Global Temperature	<u>Direct Effects</u>	<u>Global Impacts</u>	<u>National Impacts</u>	<u>Local Impacts</u>
	<i>Rising Sea Levels</i>	Loss of low-lying coastline → Mass relocations Saline contamination of fresh water sources → Water shortages, Reduced agricultural output	Damage to low-lying coastal ports → Reduced shipping capacity	Shortages of and/or higher prices for common goods
	<i>Increase in Extreme Weather Events</i>	Increase in number and intensity of extreme weather events → Increased damage and loss of life	Increased public expenditures in relief and rebuilding efforts Impact of storms on infrastructure can lead to higher prices	
	<i>Changes in Weather and Precipitation Patterns</i>	More floods, More droughts → Reduced agricultural output, Damage and loss of life Changes in geographic range of plantlife → Reduced agricultural output		Pittsburgh is susceptible to flooding → More damage Higher food prices
	<i>Health Effects</i>	Expanded geographic range for many infectious diseases → More cases, Higher healthcare expenditures Increase in number of days with extreme temperatures → More heat-related illness and deaths		

PITTSBURGH'S CLIMATE PROTECTION INITIATIVE

POLICY INITIATIVES TO COMBAT GLOBAL WARMING

Global Initiatives

The **Kyoto Protocol** was created in 1998 as an amendment to the United Nations Framework Convention on Climate Change (UNFCCC). Countries that ratify the Protocol commit to **reducing the national production of carbon dioxide and other greenhouse gases** to predetermined target levels. Alternatively, if they choose to maintain their current emissions level, they can engage in an **emissions trading program**. The initial UNFCCC agreement recognized that the primary producers of greenhouse gases were developed nations and nations undergoing a transition to market economies. Therefore, these are the only countries currently required to reduce production by a targeted amount.

Nations noticeably missing from the list of ratifying parties included Australia and the United States. The **U.S. decision not to ratify** was due in large part to the lack of immediate reduction targets for other "super" greenhouse gas producers such as China, India, and Brazil. *For more information on the requirements of the Protocol, see the full text in Appendix 7.*

National Initiatives

The United States' reluctance to participate in the Kyoto Protocol has led to the emergence of a number of country-wide initiatives to reduce the emission of carbon dioxide and other greenhouse gases. One initiative that has gained particular support is the newly formed Chicago Climate Exchange.

The **Chicago Climate Exchange (CCX)**, inaugurated in December 2003, provides a virtual market for interested parties to **trade greenhouse gas emission allowances**. As the first program of its kind in North America, CCX aims to inform the public on the risks of global warming and cost-effective greenhouse gas reduction. Participants sign a voluntary but legally binding agreement that requires them to reduce emissions to 6% below the current baseline level in the United States.

Participants range from corporations such as the Ford Motor Company, to public institutions like the University of Iowa. *For a full list of members, see Appendix 7.*

Regional and Local Initiatives

Along with a rise in national initiatives has come a rise in programs targeting the regional and local emission of greenhouse gases. For instance, **Clean Air-Cool Planet** has emerged in the Northeast as the leading organization dedicated to finding and promoting solutions for global warming. Clean Air-Cool Planet helps companies and individuals understand the impact of global warming, and advocates the use of effective policy solutions to reduce greenhouse gases.

Like Cool Air-Clean Planet, **ICLEI Local Governments for Sustainability** encourages cities across the world to improve local air quality and implement climate change policies. In collaboration with one another, and with the **City of Pittsburgh Mayor's Office and City Council**, these organizations **will lead Pittsburgh to make sustainable improvements in air quality and become one of many environmentally progressive cities in the United States.**

For articles on Regional and Local initiatives, see Appendix 7.