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CITIES FOR
CLIMATE PROTECTION

## Cities for Climate Protection in Southeast Asia

In 1999 ICLEI began its first work with cities in Non-annex 1 countries with the launch of Cities for Climate Protection in the Philippines. From an initial base of five Philippine cities, the Southeast Asia Campaign has expanded to sixteen cities in three countries: Indonesia, Philippines, and Thailand. Support for these activities has been provided by the US and Canadian governments.

**Local Government Participants:**

*Philippines:*
Baguio City • Batangas City • Bohol Province • Butuan City • Cagayan de Oro City • Cebu City • Dagupan City • Mandaue City • Naga City • Puerto Princesa City • Tagbilaran City

*Indonesia:*
Bogor • Surabaya • Yogyakarta

*Thailand:*
Chiang Mai • Nonthaburi • Paak Praek • Phuket • Rayong

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*Cagayan de Oro, Philippines*

# Efficiency at Public Market Cuts Electricity 1.1 Million KWh

*Population: 470,000*

From waste management and land-use planning to transport improvements and building retrofits, Cagayan de Oro has integrated greenhouse gas emission reduction and avoidance strategies into the bulk of city operations. Cagayan de Oro is also working with the local utility to green its energy supply and make demand-side improvements. By 2010, Cagayan de Oro plans to reduce greenhouse gas emissions by 10% against forecasted emissions growth.

## Public Market Retrofit

Working with Cepalco (the City's local electric utility) and the United Market Vendors Association, Cagayan de Oro completely upgraded the electricity infrastructure of the city's public market. The upgrade discourages illegal wiretapping, reduces technical losses and saves money. Three of the changes were technology-based: installing new electricity meters, replacing incandescent lamps with compact fluorescent lamps, and daylighting the market through the installation of transparent roofing. The fourth change was policy-based: making individual stall owners responsible for paying the electricity accounts.

*Annual Emission Reduction:* 850 tonnes $CO_2$
*Energy Savings:* 1.1 million kWh per year
*Financial Savings:* US $22,000 (Php1.1 million)
*Status:* Implemented

## Energy-Efficient Streetlighting

Cagayan de Oro plans to convert 4,600 municipal lighting fixtures from mercury vapor to high-pressure sodium technology. The retrofit will save an estimated 1.7 gigawatt-hours per year and decrease peak demand by an estimated 364 kilowatts.

*Annual Emission Reduction:* 1,400 tonnes $CO_2$
*Financial Savings:* US $34,000 (Php1.7 million)
*Status:* Project design completed

### Information

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## Cities for Climate Protection in South Africa

Cities for Climate Protection was established as a component of South Africa's National Climate Change Project under the direction of the National Department of Environmental Affairs and Tourism. The Campaign receives funding support from the US Agency for International Development.

In South Africa eight cities have already committed to reduce their $CO_2$ emissions and are at various stages of project development and implementation.

**Local Government Participants:**

Buffalo City (East London)
Cape Town
eThekwini (Durban)
Johannesburg
Potchefstroom
Saldanha Bay
Sol Plaatje (Kimberley)
Tshwane (Pretoria)

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*Potchefstroom, South Africa*

# Sewage Plant Methane Capture Cuts 7,000 Tonnes $eCO_2$

*Population: 230,000*

Potchefstroom, South Africa (Potch to locals) began participating in Cities for Climate Protection in 2001. In the space of a year, Potch transformed the way it does business. In addition to building a new energy efficient City Hall (which will be South Africa's first certified green building), Potch officials have engaged the local University to train city staff to integrate climate protection into Potch's sustainability plan. Potchefstroom also partnered with the City of Heidelberg, Germany to exchange technical assistance on energy efficiency and other greenhouse gas emission reduction measures.

## Sewage Treatment Plant: Methane Reduction and Recovery

The retrofit and expansion of Potchefstroom's wastewater treatment plant resulted in an emissions reduction of 78% compared to the original facility. The retrofit included a process change that reduced total methane emissions and a system to capture the remaining methane. Captured methane is now used to fuel the plant's incinerator, displacing the diesel fuel that was previously used.

*Annual Emission Reduction:* 7,000 tonnes $eCO_2$
*Cost:* US $210,000 (ZAR2.2 million) for methane capture component
*Status:* Implemented

## Lighting Retrofits

Potchefstroom is undertaking a multi-faceted upgrade of its public lighting. In the first phase of the project, the City retrofitted runway lights at the airport and replaced 110 incandescent streetlights with high-pressure sodium lamps. In the next phase, the City will replace the remaining airport taxiway lights and retrofit an additional 1,300 streetlights.

*Energy Savings:* Phase One – Annual savings 47,000 kWh
Phase Two – Annual savings 290,000 kWh
*Annual Emission Reductions:* Phase One – 40 tonnes $CO_2$
Phase Two – 250 tonnes $CO_2$
*Cost:* Phase One – US $23,800 (ZAR240,000)
Phase Two – US $93,300 (ZAR980,000)
*Status:* Phase One – Implemented
Phase Two – Project design completed

## Information

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## Cities for Climate Protection in India/South Asia

The CCP South Asia Campaign began working with cities in India in 2001. The program is now expanding to municipalities in the South Asia region to assist them in finding cost-effective solutions for improving urban and environmental management in ways that also reduce GHG emissions. Support to establish campaign activities has been provided by the US Agency for International Development's Regional Urban Development Office (RUDO) as part of its Financial Institutions Reform and Expansion Project (FIRE-D) project.

**Local Government Participants:**

Ludhiana
Kolkata (Calcutta)
Jabalpur
Sangli
Vadodara (Baroda)
Hyderabad
Guntur

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*Kolkata, India*

# Water Pumping Retrofit to Cut 1,100 tonnes $CO_2$

*Population: 15 million*

In India the provision and treatment of water is the most energy intensive service that a municipality provides, accounting for 50-90% of a municipal corporation's electricity consumption. Kolkata (Calcutta) is investigating the energy and GHG savings of retrofitting the water pumping stations through the implementation of measures that have a quick payback period. Assuming that approximately 25% energy savings is possible at all of Kolkata's pumping stations, city-wide energy and GHG savings would amount to 3,500,000 kWh and 43,000 tonnes/year, respectively.

## RSM Booster Pumping Station Retrofit

Kolkata's RSM booster pumping station serves treated water to roughly 5% of the city. A recent audit revealed that an estimated 30-40% of energy consumed at the station is wasted: the pumps are improperly designed and operate at very low at efficiencies of 65-75%, and malfunctioning valves allow wasteful backflow. The city is considering resizing and replacing five of six pumps, installing capacitors, replacing poorly functioning valves, and updating operation and maintenance procedures.

*Annual Emissions Reduction:* 1,100 tonnes $eCO_2$
*Annual Energy Savings:* 940,000 kWh
*Cost:* $167,000
*Payback Period:* ~2 years, based on energy savings of $83,000/year.
*Status:* Project design completed

## Street Lighting Retrofit

Retrofitting streetlights offers another potential source for GHG mitigation. Kolkata's streets, walkways, and parks are commonly lit with 40 watt fluorescent tube lights with ballasts that consume an additional 10-13 watts. To reduce energy consumption, the city is studying the feasibility of replacing 50,000 tubes with more efficient 28 watt tubes that don't require ballasts. These have a higher luminaries rating, a longer lifetime, and perform better under the highly fluctuating voltages that plague the city's electricity supply.

*Annual Emission Reductions:* 6,000 tonnes of $CO_2$
*Annual Energy Savings:* 4,800,000 kWh
*Estimated Cost:* $900,00
*Payback Period:* ~2 years, based on an energy savings of $420,000/year
*Status:* Project design completed

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## Cities for Climate Protection in Latin America

Cities for Climate Protection in Latin America was first established with four cities in Mexico in 1998. In 2001 the program expanded to the southern cone countries of Argentina, Brazil, and Chile. Today 13 cities participate in the CCP in Latin America. In Mexico, the CCP is managed on ICLEI's behalf by the Mexican Association of Municipalities.

**Local Government Participants:**

*Argentina:*
Avellaneda
Buenos Aires

*Brazil:*
Betim
Goiânia
Niterói
Porto Alegre
Rio de Janeiro
Volta Redonda

*Chile:*
Tomé

*Mexico:*
Cuajimalpa
Mexico City
Querétaro
Tlalpan

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*Mexico City, Mexico*

# Solar Water Heating to Cut 24,896 Tonnes $CO_2$

*Population: 8 million+*

In 1995, Mexico City undertook a new and comprehensive effort to improve the region's air quality. The objective of the air quality plan, known as "Proaire," is to achieve integration between air quality and climate protection. As a result the measures in the plan cut emissions of both standard air pollutants such as NOx and SOx, and greenhouse gases. In this phase of the Proaire project, Mexico City has identified over 85 actions to be implemented over an 8-year period. The actions include energy efficiency improvements, protection of forests and green spaces, and public transportation enhancements.

## Residential Solar Water Heating

The City plans to install solar water heating systems in 50,000 new housing units over a 5-year period. The project will be initiated with an 8-month pilot phase during which various solar water heaters will be assessed for their performance characteristics, cost effectiveness, and suitability.

*Annual Emissions Reduction:* 24,896 tonnes $CO_2$
*Cost:* US $860 per unit
*Cost Per Tonne $CO_2$ Avoided:* US $92.38
*Status:* Project design completed

## Water and Energy Efficiency in Social Housing

Water and energy efficiency measures will be directly installed into 30,000 new housing units and retrofitted into 45,000 existing housing units over a 3-year period (25,000 units per year). The measures include replacing incandescent lights with compact fluorescent bulbs (annual savings of 142 million kilowatt-hours) and install low-flow showerheads and tap aerators in 75,000 social housing units. Phase I involves installing all features in 10,000 new housing units and retrofitting them into 15,000 existing housing units.

*Annual Emissions Reduction:* Phase I – 30,996 tonnes $CO_2$
*Cost:* Phase I - US $1,063,600
*Cost Per Tonne $CO_2$ Avoided:* Phase I – US $11.43
*Status:* Phase 1: water efficiency measures implemented, lightbulbs planned
*Phase II:* Project design completed

### Information

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