

ADB Headquarters Energy Efficiency and Environment Initiatives

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Asian Development Bank**

The logo of the Asian Development Bank (ADB), consisting of the letters "ADB" in white serif font on a blue square background.

ADB

Highlights

- *About ADB Headquarters Building*
- *Energy Efficiency in the ADB Building*
- *ISO 14001 and OSHAS 18001 (EHSMS)*
- *Resource Conservation and Sustainability*
- *GHG Monitoring and Reduction*
- *Sustainable Future Rehabilitation Design*

About ADB



Asian Development Bank
Headquarters in Manila, Philippines

ADB

About ADB



- 130,000 sq.m. building nestled in 6.5 hectare lot



Asian Development Bank
Headquarters in Manila, Philippines



- 2,600 Multinational Staff



- Energy Efficient Building Design

ADB

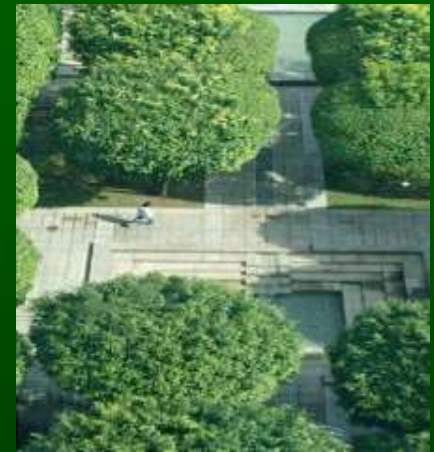
Energy Efficiency in the ADB Building



Aluminum and Timber-framed screens with translucent glass



Two atriums with sky lights let light into the library



Gardens reduce heat and pollution



The orientation of the buildings minimizes heat on the east and west facades, the areas exposed to morning and afternoon sun

Energy Efficiency in the ADB Building

AWARDS AND DISTINCTIONS

- Energy Conservation Award (first place) in 1985, by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Illinois Chapter, for the design of the new building.
- Apolinario Mabini Award in 1991 for accessibility at our headquarters for people with disabilities.
- Certificate of Energy Efficiency, awarded in 2000 by the ASEAN Energy Efficiency and Conservation Subsector Network in cooperation with the ASEAN Center for Energy.
- Don Emilio Abello Energy Efficiency Award, in 2000, from the Philippine Department of Energy (first place)

Energy Efficiency in the ADB Building



ADB promotes energy efficiency in the way such that buildings are

- ❑ Cooled
- ❑ Heated
- ❑ Ventilated
- ❑ Lighted

10 Energy Savings Project 1993-1999

Investments in Energy Efficiency Projects	
Energy Efficiency Projects	Investments (US\$)
Building Automation System (BAS)	1,207,712
Air-conditioning	
Retrofitting chillers	912,822
Chilled water pump improvement	20,994
Condenser water pump improvement	34,527
Cooling tower improvement	0
Subtotal	968,343
Lighting	
Replacement of lamps and ballasts	502,637
Installation of occupancy sensors	74,601
Downlight retrofit	107,980
Exit sign retrofit	19,907
Subtotal	705,125
Electrical Services Improvements	100,850
Consulting services	287,560
GRAND TOTAL	3,269,590



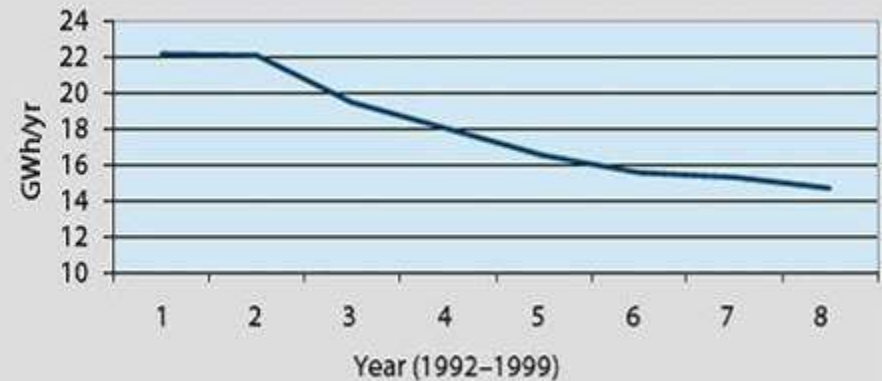
Energy Efficiency in the ADB Building

Annual Savings from 10 Energy Project

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ADB Headquarters Consumption (Energy Conservation Program, first phase)



Annual Savings

Year	Kilowatt-hour	US\$
1994	2,624,177	289,155
1995	4,127,101	472,594
1996	5,574,249	658,190
1997	6,526,742	711,759
1998	6,806,578	567,492
1999	7,399,090	730,660
TOTAL	33,057,937	3,429,850

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Energy Efficiency in the ADB Building

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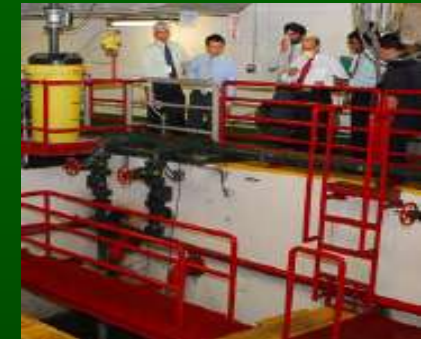
33,057,937 kWh is equivalent to
18,115.75 tons of emission estimates of CO₂.

The Environment, Health and Safety Management System (EHSMS) of ADB



Resource Conservation and Sustainability

- ❖ Electricity Conservation
- ❖ Water Conservation
- ❖ Paper Conservation
- ❖ Waste Generation Reduction



Reduce

Recycle



Reuse

The Three Rs.

Resource Conservation and Sustainability

Electricity Conservation

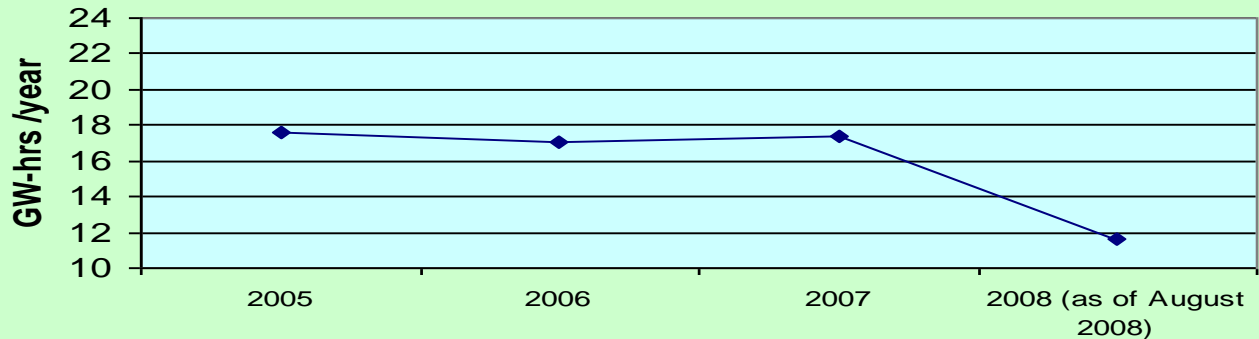
Electricity Conservation Initiatives / Projects

- Optimization of Central Air-Conditioning Chillers System
- Conversion of Incandescent Bulbs Lighting to Compact Fluorescent Lamps
- Installation of Manual Light switches for all identified big areas in ADB where sensors are seemed to be not practicable

New Projects

- Optimize Air Handling Unit Operation
- Improvement of Fan Power Unit (FPU) Air Distribution Efficiency
- Space Optimization Strategy

ADB Headquarters Electricity Annual Consumption



Areas for Improvement	2005 -2008 Data			
	2005	2006	2007	2008 (as of August 2008)
Electricity Annual Consumption (MW-hrs)	17,580.05	17,097.83	17,359.97	11,615.61
Reduction / (Increase) MW-hrs.	243.87	482.22	174.46	313.11
% Reduction Target	1%	1%	1%	1%
% Reduction / (Increase) from previous years consumption	1.36%	2.75%	0.99%	2.62%
Savings in US \$	\$32,678	\$64,617	\$23,378.33	\$48,932.60

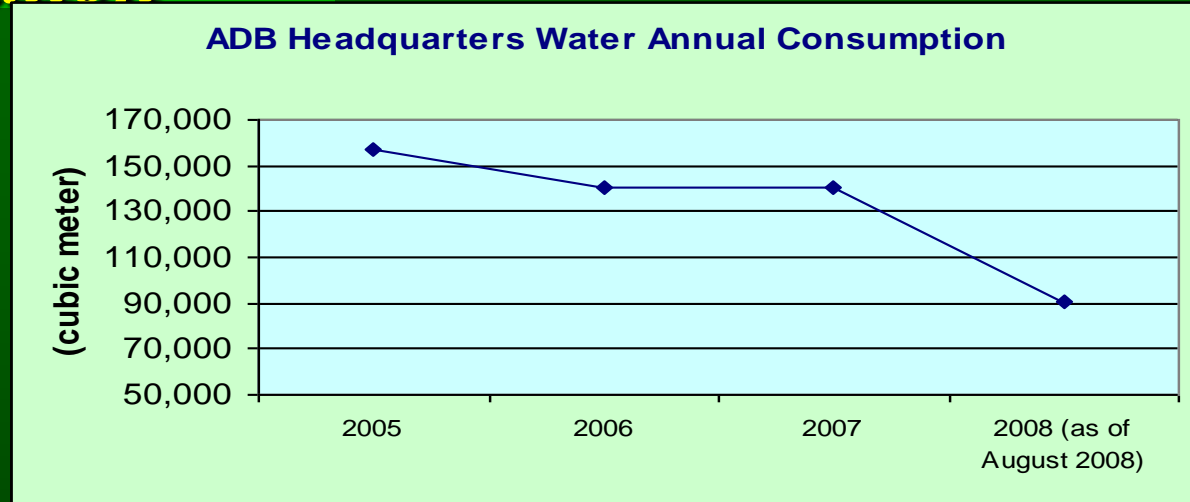
Total Savings : \$ 169,606

Resource Conservation and Sustainability

Water Conservation

Water Conservation Initiatives / Projects

- ❑ Installation of sub meters of strategic locations (kitchen,water heater) at Segment A,B, and C.
- ❑ Gradual conversion of manual valves into auto-shut off valve for sinks at kitchen
- ❑ Recycling of STP effluent for irrigation purposes
- ❑ Re-routing of water lines of water emitters at ADB side
- ❑ Monitoring and strict enforcement of controls on water consumption at the Gas Station



Areas for Improvement	2005 -2008 Data			
	2005	2006	2007	2008 (as of August 2008)
Water Annual Consumption (m3)	157,520	140,648	140,799	91,050
Reduction / (Increase) m3	21,040	16,872	(151.00)	7,383
% Reduction Target	2%	4%	8%	3%
% Reduction / (Increase) from previous years consumption	11.78%	10.71%	-0.11%	7.50%
Savings in US \$	\$11,782	\$9,447		\$7,251.67

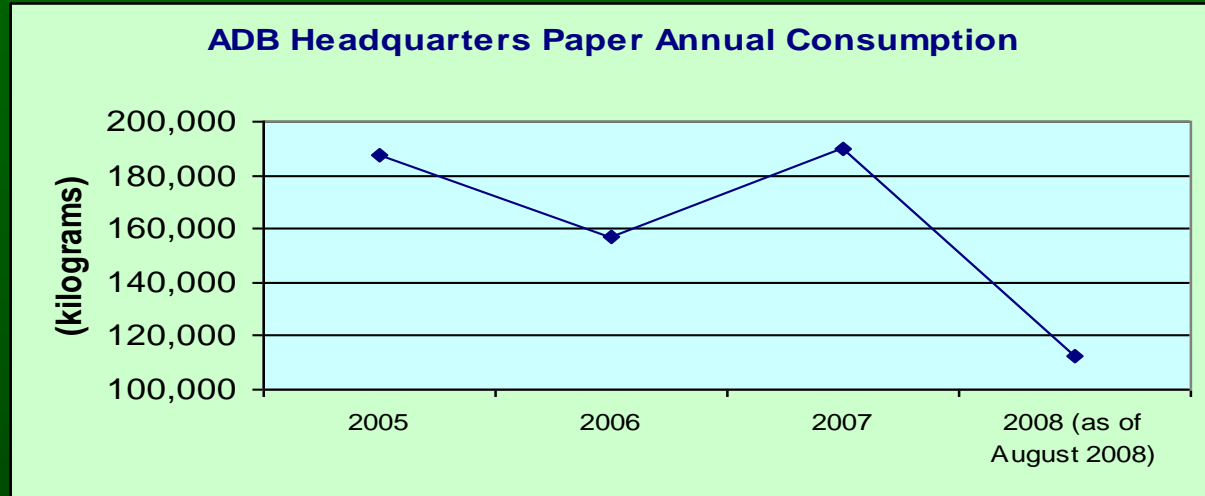
Total Savings : \$ 28,481 (since 2004)

Resource Conservation and Sustainability

Paper Conservation

Paper Conservation Initiatives / Projects

- ❏ Incentive awards for the division with the least amount of paper consumed at the end of every quarter
- ❏ Continued Auditing of Paper Consumption
- ❏ Explore use of Online in some other areas such as issuance of applicable forms
- ❏ Reduction of Publication Request
 - Use of CD for Selective Publication
 - Sharing of Publication



Areas for Improvement	2005 -2008 Data			
	2005	2006	2007	2008 (as of August 2008)
Cumulative Paper Consumption (kgs)	187,406	157,083	189,652.58	112,884.82
Reduction / (Increase) kgs	35,149	30,323	15,071.18	10,697.81
% Reduction Target	5%	2%	4%	4%
% Reduction / (Increase) from previous years consumption	15.79%	16.18%	7.36%	8.66%
Savings in US \$	\$33,329	\$28,781	\$19,504.94	\$8,876.59

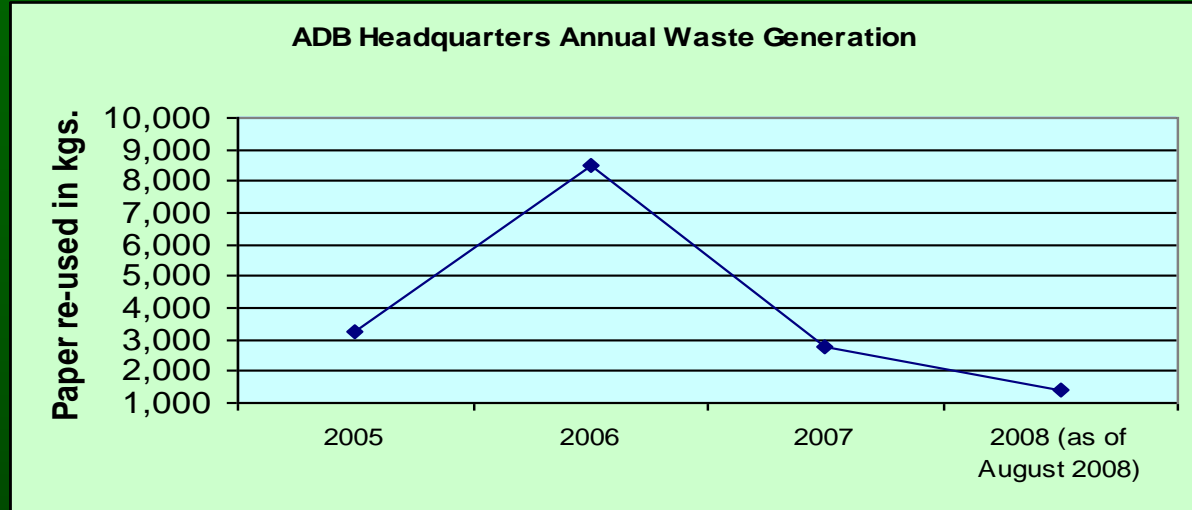
Total Savings : \$ 90,492

Resource Conservation and Sustainability

Waste Generation Reduction

Waste Generation Reduction Initiatives / Projects

- ❖ Implementation of take back scheme for Commissary and Times Trading
- ❖ Posting of "SAVE PAPERS, SAVE TREES" in all comfort rooms.
- ❖ Established weekly monitoring of hand towel and paper consumption per comfort rooms.
- ❖ Conducted random check on the effectiveness of implementation of waste segregation in all relevant sections

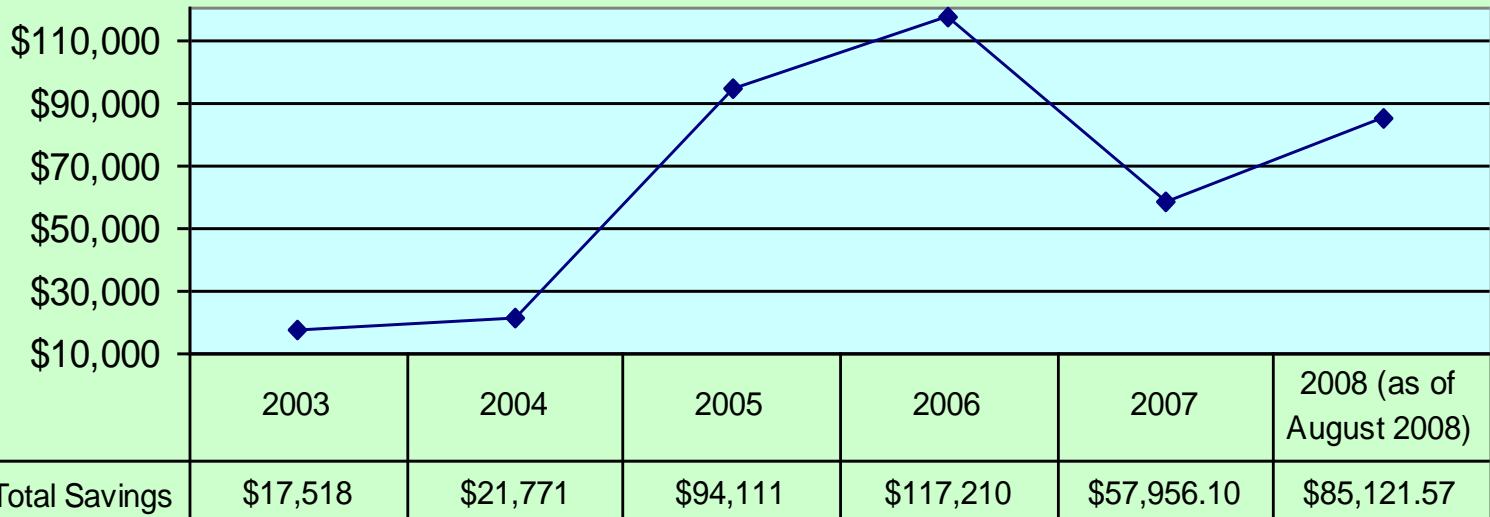


Areas for Improvement	2005 -2008 Data			
	2005	2006	2007	2008 (as of August 2008)
Volume of paper re-used (kgs.)	3,251	8,503	2,760.50	1,381
Cumulative Solid Waste Generation (kgs.)	565,930	493,580	543,065.66	313,874.94
Reduction / (Increase) kgs.	41,330	72,350	(49,484.98)	17,642.75
% Reduction Target	Establishing baseline data	Establishing baseline data	4%	4%
% Reduction / (Increase) from previous years generation	6.80%	12.78%	-10.03%	5.32%
Waste Recovery Savings in US \$	\$16,322	\$14,365	\$15,073.19	\$20,060.71

Total Savings : \$ 101,007 (since 2003)

Resource Conservation and Sustainability

**ADB Headquarters Annual Savings
from Resource Conservation Programs**



Total Cumulative Savings : \$ 393,687.67

Green House Gas Monitoring and Reduction

GHG Inventory Operational Boundaries at ADB HQ

SCOPE	SOURCES
Scope 1 Direct emissions	<ul style="list-style-type: none"> i) Combustion of diesel fuel for standby electricity generation ii) Combustion of LPG for cooking and heat/steam generation in ADB recreational facilities iii) ADB-owned vehicles for official trips iv) Fugitive emissions of HFC-134a from repair and maintenance of refrigeration systems
Scope 2 Indirect emissions	<ul style="list-style-type: none"> i) Generation of purchased electricity
Scope 3 Indirect emissions	<ul style="list-style-type: none"> i) Rented vehicles for official trips ii) Business travel by ADB staff, consultants and guests booked by ADB travel services at ADB HQ (air travel and hotel stays) iii) Transport of waste: recyclable wastes to end-users/recyclers ; hazardous waste to treaters; non-recyclable wastes for disposal to landfill; and sewage treatment plant (STP) sludge iv) Biodegradable wastes at landfill v) Postage and Freight of ADB documents vi) Shipment of Goods (Official, Personal by ADB Staff and Commissary)

Green House Gas Monitoring and Reduction

ADB Headquarters GHG Emissions from 2005 and 2008 Q2

Source	CO ₂ eq Emissions, tons				
	2005	2006	2007	2008 Q1	2008 Q2
Scope 1: Direct emissions					
Power Generator	57.14	160.87	83.66	3.92	18.32
LPG-fired cook stoves and heaters	227.5	230.25	227.93	51.87	56.29
ADB-owned vehicles for official trips	129.27	171.7	203.54	43.77	54.30
Refrigeration system (use of HFC134a)	16.55	35.3	29.77	10.08	12.68
TOTAL (Direct)	430.46	598.12	544.9	109.64	141.59
Scope 2: Indirect Emissions					
Use of Electricity	9,633.87	9,608.87	9610.00	2320.00	2515.32
Scope 3: Indirect Emissions					
Rented vehicles for official trips	60.6	16.3	7.4	1.4	1.60
- Air travel	5713.09	4,857.17	4948	1303.42	1803.59
- Hotel stays	635.82	559.71	554.29	141.2	167.34
Transport of Solid Waste and STP sludge for Disposal	4.2	3.6	2.82	1.08	0.55
Methane (CH ₄) emission of biodegradable waste in landfill	503.25	227.1	209.62	16.61	15.25
	(23.96 ton CH ₄)	(10.81 ton CH ₄)	(9.98 ton CH ₄)	(0.79 ton CH ₄)	(0.73 ton CH ₄)
Postage and Freight of ADB documents	231	187.76	168.64	28.01	127.89
Shipment of Goods (Official, Personal by ADB Staff and Commissary)	414.66	406.41	222.17	35.09	23.22
TOTAL (Scope-3)	7,562.62	6,258.05	6112.94	1526.81	2139.44
OVERALL TOTAL	17,626.95	16,465.04	16267.84	3956.45	4796.35

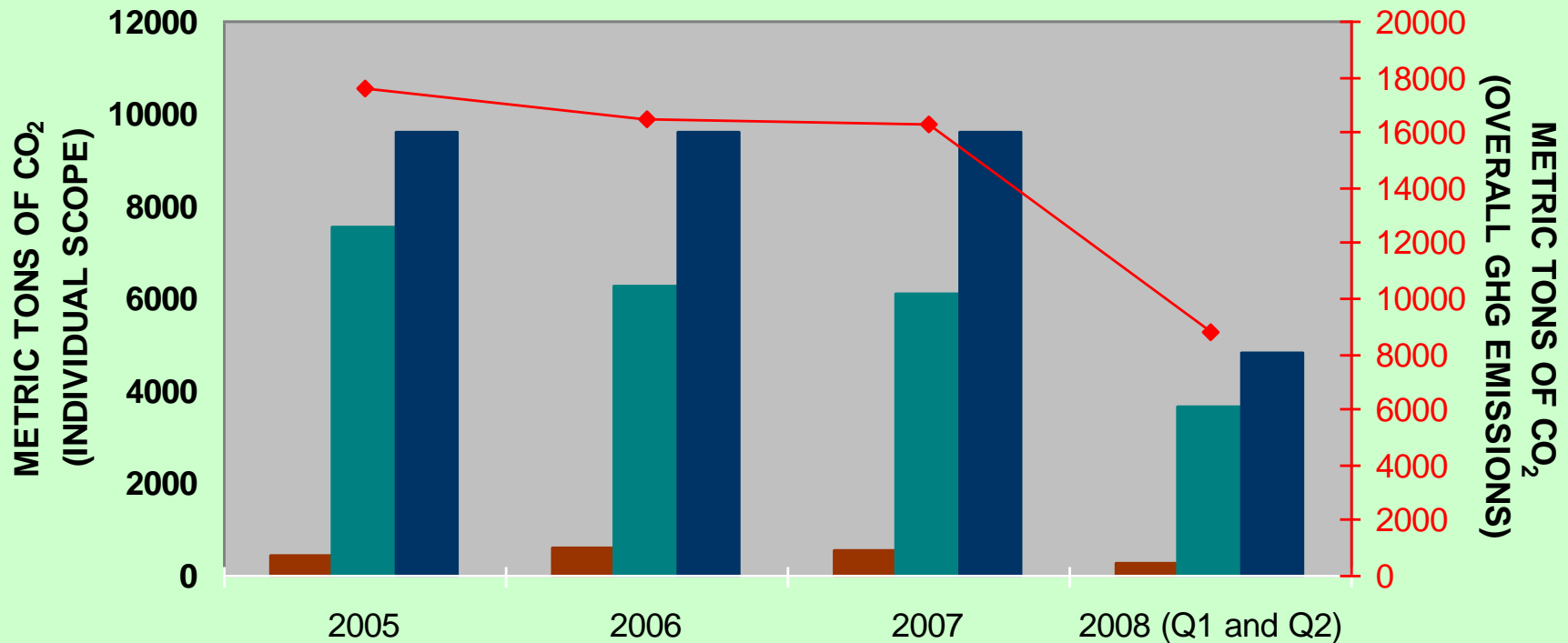
Green House Gas Monitoring and Reduction

Estimated GHG Emissions from ADB HQ Building and Facilities Operations

- ❖ 2005 – 17,626.95 tons CO₂eq
- ❖ 2006 – 16,465.04 tons CO₂eq
- ❖ 2007 – 16,267.84 tons CO₂eq
- ❖ 2008Q1 – 3,956.45 tons CO₂eq
- ❖ 2008Q2 – 4,796.35 tons CO₂eq

ADB HEADQUARTERS GHG EMISSIONS

METRIC TONS OF CO2 EQUIVALENT 2005- 2008 (Q1 and Q2)



- Scope 1 : Direct Emissions- Power Generator / LPG-fired Cooking Stoves and Heaters / ADB Owned Vehicles for Official Trips / Refrigeration System (use of HFC134a)
- Scope 2 : Indirect Emissions - Use of Electricity
- Scope 3 : Indirect Emissions -Rented Vehicles/ Air Travel / Hotel Stays/ Transport of Solid Waste and STP Sludge for Disposal/ Biodegradable Waste to Landfill/ Postage and Freight of ADB Documents/ Shipment of Goods
- ◆ Overall GHG Emissions

Sustainable Future Rehabilitation Design Initiatives of the Headquarters Building

Reduce Energy Consumption :

- High efficiency electric chillers in the central plant.
- Daylight harvesting system – solar panels , photovoltaic panels – to tap solar energy to power both lighting and water heaters.
- Variable speed drives to operate ventilation equipment.
- Purchase electricity through potential bilateral agreements with power generating companies using **renewable energy** .
- Replacement of incandescent lamps/ high pressure mercury and sodium vapor to compact fluorescent.

Sustainable Future Rehabilitation Design Initiatives of the Headquarters Building

Reduce Water :

- Recycling rain water from the roof decks of office tower and the special facilities blocks .
- Recycle backwash water from the water treatment system .

Atmosphere and Air Quality :

- Use reduced-GHG coolants in refrigeration.

Sustainable Future Rehabilitation Design Initiatives of the Headquarters Building

Materials :

- Recycle and reuse building materials.

People and Policies :

- Green housekeeping.
- Education and outreach programs.

The GHG inventory report from our headquarters will help us to prioritize further our emissions reductions.

This program will be extended to our Field Offices

Thank You

ADB