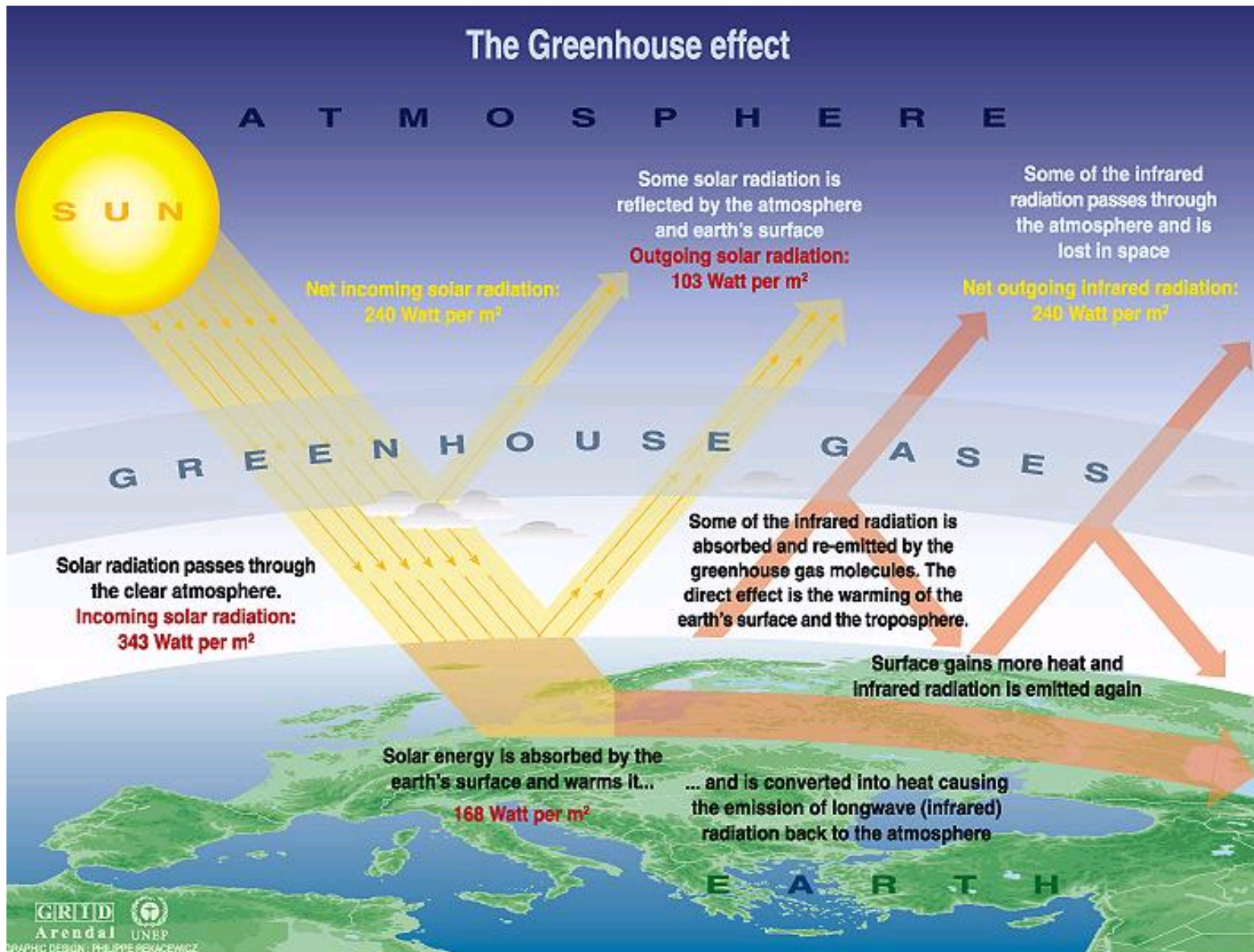


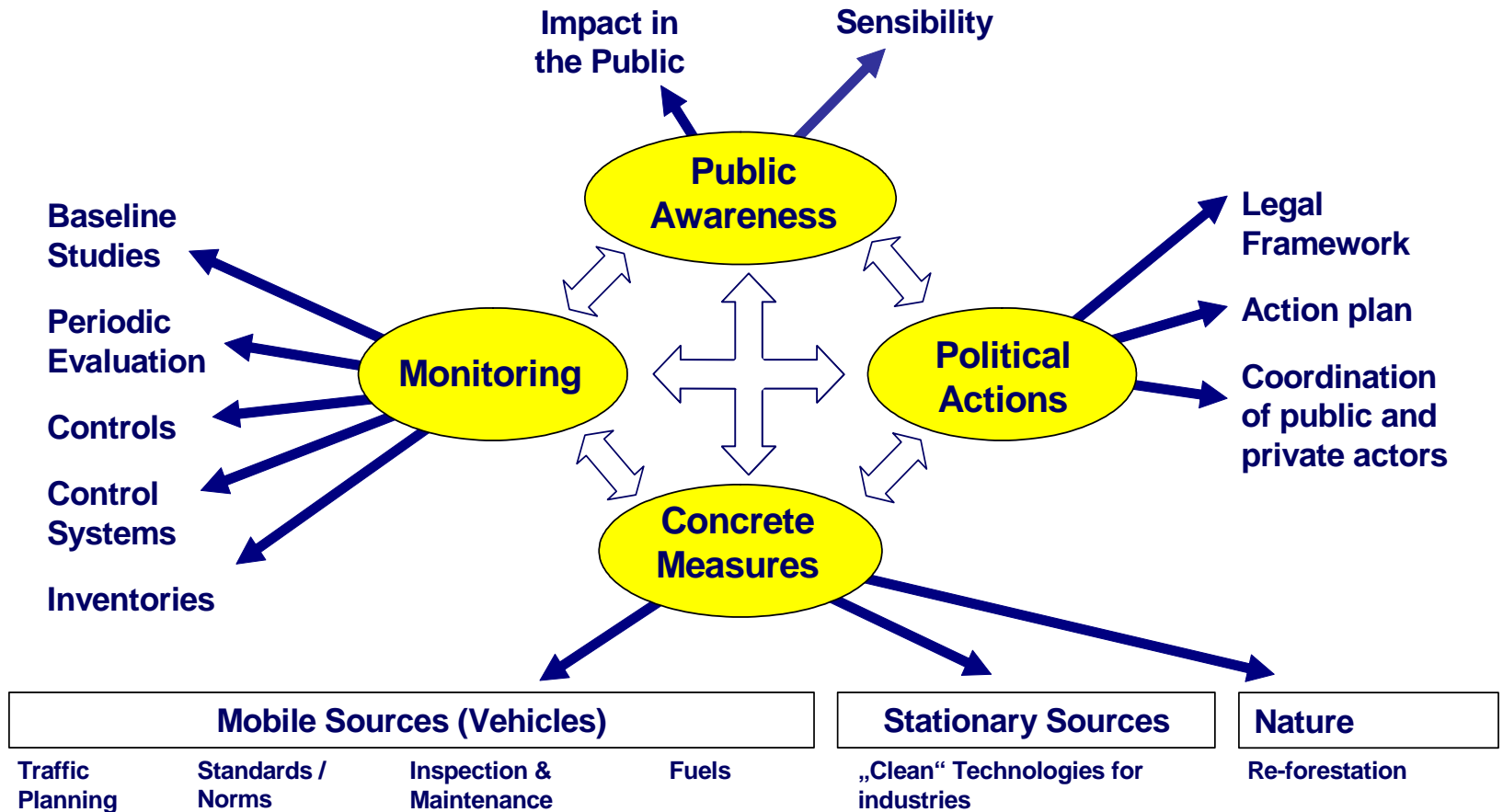
CLEAN BUS PROGRAM

A practical example on how to apply
Cleaner Development Mechanism

Global Challenges



Clean Air Projects - 4 areas of Intervention



Clean Bus Program

To reduce emission and fuel consumption of the public buses and to improve reliability & safety of buses on the road.



Program: Improvement of internal I&M system
 Improvement of HR quality at the workshops
 Improvement of driving knowledge and skills
 Support on equipment and spare parts

Involved Buses:	Jakarta: 9 bus companies	5200 units
	Manila: 2 bus companies	281 units



Results achieved in Jakarta

Summary	2001	2002	Total
Number of emission tests performed	5'857	7'200	13'057
Number of buses with emission over the limit (before service)	1'982	1'800	3'782
Number of buses with emission over the limit (after service)	321	400	721
Reduction of opacity, %	30.0%	33.7%	31.7%
Corrections that did not require additional costs, average %	83.1%	80.4%	81.8%
Corrections that required additional costs, average %	16.9%	19.6%	18.3%

- ✓ 89 technicians and 1372 drivers trained
- ✓ Training material developed
- ✓ Potential fuel saving: 5% from regular maintenance and
 16% through improved driving



Results achieved in Metro Manila

Number of emission tests performed	117	164	281
Number of buses with emission over the limit (before service)	46	38	84
Number of buses with emission over the limit (after service)	5	18	23
Reduction of opacity, %	32.9%	15.8%	24.2%
Corrections that did not require additional costs, average %	67.0%	25.0%	46.0%
Corrections that required additional costs, average %	33.0%	75.0%	54.0%

- ✓ 18 technicians and 6 trainers trained
- ✓ Training material translated and/or developed
- ✓ 5.5% potential fuel saving: through regular maintenance
- ✓ 50% reduced road breakdowns



Experiences used for CDM

With a fleet of 5000 Buses like in Jakarta and a fuel savings of 5% per year the CO₂-Emission can be reduced by more than 24'000 t !!

The potential for emission reduction is high. Swisscontact has identified bus companies in Jakarta which are willing to cooperate on fuel reduction measures.

- Number of buses 1'400
- Average consumption of fuel (diesel) per bus and day 120 l
- Average days of operation 300 days
- Savings on fuel (conservative assumption) 5%
- potential fuel savings per year 2'520'000 l diesel
- CO₂ emission factor of diesel 2.61 t CO₂ per 1000 l
- potential CO₂ reduction (per year) 6'580 t CO₂



CDM Project Progress

- bus company, PT Mayasari Bhakti, owning more than 1400 buses as implementing partner
- 2 – 3 additional companies will be identified
- Project Identification Note (PIN) completed in April 2004
- Endorsement letter from the Designated National Authority (DNA) July 2005
- Project Design Document (PDD) is in the process to be developed



CDM – economic benefit

In Indonesia diesel fuel price went up again in early August from IRp 2,200 (CHF 0.275) per liter to Rp 5,480 per liter
(The Jakarta Post, August 25, 2005)

Bus company:

- ✓ Reliability: with an improved I&M system
=> less on road break down of buses
- ✓ Savings: an average of 5 %
= 1'800 l diesel per bus and year
= IDR 10'000'000 or CHF 1'250.- per bus and year
(with current fuel price !)
- ✓ Example: for *PT Mayasari Bhakti* with its 1'400 buses
=> 2'520'000 l diesel per year
=> CHF 1'750'000.- per year



CDM – health benefit

Improved Air Quality:

- ✓ Through fuel saving of 2'520'000 l diesel per year:

		g / l	t per year
=>	CO	15.0	37.8
=>	HC	5.3	13.3
=>	NOx	36.5	92.0
=>	PM	2.24	5.64
=>	CO ₂	2'610	6'580

- ✓ Diesel soots or particulate matter (PM), is a dangerous pollutant that can penetrate deep into the lungs. People exposed to diesel soot can suffer from severe respiratory and cardiovascular illnesses, chronic bronchitis, cancer, and premature death.



CDM – financed through CER

Emission Certificate (CER):

- CERs are a commodity to be negotiated freely in the market
=> CER Market prices varies
between CHF 3.75 /t (World Bank)
and CHF 15.- /t (German Government)

<u>Sales Price (CHF) per ton CO₂</u>	<u>10.--</u>	<u>15.--</u>
Gross revenue 6'500 t	65'000	97'500
CDM monitoring and verification	21'100	25'650
<u>Revenue per year (2007-2012)</u>	<u>43'900</u>	<u>71'850</u>
Total revenue 2007-12	263'400	431'100

- Project implementation costs CHF 352'500



We create opportunities !

THANK YOU for your Attention!

DR. URS EGGER

Executive Director
Swisscontact

