

## Poison in the air

Further studies and actions essential to reduce atmospheric lead in Dhaka

DR SWAPAN KUMAR BISWAS

THE data on lead in Dhaka air published in Daily Star, 7 September 2002 is from the study carried out during 1992-94 by the BAEC scientists and thus rather old. The samples were collected in two size fractions MP2.5 (particle size less than 2.5 micrometer diameter) and MP10-2.5 (particle size between 2.5 and 10 micro-meter diameter) at a semi-residential area in Dhaka City. At that time, it was reported that the lead concentration in PM 2.5 fractions (463 nano-gram/m<sup>3</sup>) during low rainfall period (November-January) was one of the highest in the world. The yearly average lead concentration was 312 nano-gram/ m<sup>3</sup> and reached maximum value of 370 ng/ m<sup>3</sup> in the PM2.5 fraction in 1998. This report had drawn a lot of attention of the national and international media and the Government of Bangladesh. One of the positive impacts of this finding was an administrative intervention of the Government in the form of the ban on the use of leaded gasoline with effect from 1 July 1999.

Corporation (BPC) is the sole agency concerned with the import, refining and marketing of petroleum

gradually phase out lead over a period of time. For example, in the eighties, the lead content in regular

The early averages of lead concentration in ambient air of Dhaka city along with the standard

### Changes in lead concentration (nano-gram ) in PM2.5 particles before and after introduction of unleaded gasoline and comparison with the concentrations in some other cities of the world.

Area		Pb (Pre-1996)	Pb (Post-Oct)	Comments
	LRF	463	212	Average over LRF months
Dhaka	MRF	253	170	Average over MRF months
	HRF	160	66	Average over HRF months
Average		312	106	Average over 12 month period
México City		383		Yearly average (Cohen et al., 1995)
Bombay		360		Yearly average (Sadasiyan et al., 1995)
Sydney		333		Yearly average (Cohen, Bailey et al., 1995)
Santiago		230		Yearly average (Cohen, Bailey et al., 1995)
Los Angeles		70		Yearly average (Cohen, Bailey et al., 1995)
Kyoto		40		Yearly average (Cohen, Bailey et al., 1995)

RF-Low rainfall period (November-January); MRF-Medium rainfall period (February-May, September-October); and HRF-High rainfall period (June-August). products in Bangladesh. Even prior to the stated government intervention BPC has been working to

octane was 0.8 gram/litre and it was reduced to an average of 0.4 gram/litre by 1997 (private communication Eastern Refinery Ltd.). In 1998, low octane (regular) gasoline was made lead free but the high octane (premium) gasoline still continued to contain 0.4 gram/litre of lead until early 1999. BAEC scientists carried out measurements on lead concentrations in the gasoline dispensed at the different petrol pumps in 2000. The result confirmed that the gasoline contain only residual amount of lead, i.e., less than 13 milligram/litre.

deviations are also shown below to help understand the long term average trend: Unfortunately, the story of environmental lead in Bangladesh is still unfinished and further decline is likely to be comparatively slower. There is a substantial amount of accumulated lead in dust from earlier depositions and this is going to be around for a considerable time to come. Although, vehicular emissions from the use of leaded gasoline were considered to be the single major source of lead pollution in the atmospheric air, yet there are other sources as well. For example, lead

### Yearly average concentration of Pb in different PM fractions.

Year	PM2.5		PM2.5-PM10		PM 10	
	Average	SD	Average	SD	Average	SD
1994	312	485	210	376	522	614
1997	256	532	205	563	461	775
1998	370	636	137	209	507	669
1999	225	370	117	199	342	420
2000	106	179	53.6	69.9	160	192

Further study conducted on the lead concentration in Dhaka air shows that in 2000 the yearly average concentration has decreased to about one-third (106 nano-gram/m<sup>3</sup>) from the higher earlier values as a result of the introduction of unleaded gasoline in 1999.

The concentrations of lead in different periods of the year are shown below: This shows the average over different rainfall season in addition to yearly average. It can be seen from the table that the yearly average lead concentration in the ambient air has declined by about two-thirds (in 2000) from their earlier values after introduction of the unleaded gasoline.

is still being used in an uncontrolled manner in paint, battery and other industries. It is therefore, essential to continue the fight for decreasing lead level in atmospheric air through the removal of lead in paints and through the control of emission from related industries such as lead based battery industries by regulatory measures.

Further study is underway in the BAEC laboratories to see the long-term effect of using unleaded gasoline on the lead concentration in atmospheric air.

Dr Swapan Kumar Biswas is Chief Scientific Officer Atomic Energy Centre, Dhaka Bangladesh Atomic Energy Commission

## ENVIRONMENT WATCH

### Climate Justice Forum Environmentalists plan shadow conference to UN meet

NEW DELHI

Environmental activists said on October 21 they would hold a shadow conference to a high-powered UN meet in New Delhi on climate change, saying progress at the talks would likely be blocked by powerful industry groups.

Steve Sawyer of Greenpeace said progress on climate change has eluded global leaders despite years of negotiations, because of powerful interest groups.

"Why is it (progress) not happening? What we are up against is the largest vested interest group in the world, which is the fossil fuel industry," he said.

Sawyer accused industry of pouring money into building a case that climate changes were not conclusively linked to emissions.

He said because of this Greenpeace, Friends of the Earth, the Third World Network and other environmental and social groups would hold a "Climate Justice Forum" to highlight the real issues affecting communities.

The activist groups also criticised the conference for not including representatives of poor communities that are most affected by climate change.

"It is unquestionably the poor who will be the most affected, particularly the poor in developing countries. And they are not represented in the conference," said Kate Hampton, coordinator of the climate change campaign for Friends of the Earth International.

The conference in New Delhi, spread over two weeks, has drawn delegates from 185 nations including senior ministers who will hold talks on global warming and ways to check its impact and to cut down emissions.

The focus will be on preparations to be made before the Kyoto Protocol of 1997 comes into effect from next year. The agreement has been rejected by US President George W. Bush.

The activists said the developed world has not done enough to target the world's pollution, although they produce most of it.

"The biggest injustice of climate change is that the hardest hit communities are the least responsible for creating the problem," the Climate Justice Forum said in a statement.

The environmental groups also said the Kyoto Protocol alone would not be enough to check the problems of climate changes.

"The most affected by these climate changes would be people like farmers, fishermen and indigenous people, who could not only stand to lose their livelihood, but also be uprooted from their ancestral lands," said Amit Srivastava, coordinator of the Climate Justice initiative.

### Power, polluter

US electricity sector makes twice as much greenhouse gas as Europe: report

PARIS

The US electricity sector emits nearly twice as much carbon dioxide - the main gas behind global warming - as European energy makers, consulting group PricewaterhouseCoopers said in a study on October 21.

US plants pump out an average of 720 kilograms (1,600 pounds) of carbon dioxide per megawatt/hour of electricity production, compared to 353 kilograms for European companies, said the study published in the French industry newsletter Enerpresse.

The United States only produces 50 per cent more electricity than Europe, however, it noted.

The study drew its data from 23 energy companies in the European Union and one Slovenian and one Norwegian utility that together, create three-quarters of European electricity production.

They were compared with monitoring of the 100 leading companies in the United States, where utility management is spread among a greater number of firms than in Europe.

PricewaterhouseCoopers also compared the 10 biggest electricity producers on each side of the Atlantic and found that European companies together put out a third more electricity than their US counterparts - but a third less carbon dioxide.

Part of the disparity was the result of a greater dependence on nuclear plants to produce electricity in Europe - 33 per cent of such production, compared to 20 percent in the United States.

But it also found that fossil fuel-burning plants in Europe put out 10 to 25 per cent more energy than similar US installations.

The study was released just ahead of a meeting in India on Wednesday of the signatories of the Kyoto Protocol, the UN pact aimed at cutting global warming.

The agreement has been spurned by the United States, which is the world's biggest energy consumer and the biggest source of greenhouse gas emissions.

### The carbon sink riddle

Kyoto forests may do more harm than good, says study

PARIS

Efforts under the UN's Kyoto Protocol to plant forests to offset global warming may in fact contribute to climate change if the new trees are harvested within a decade, according to Italian research.

The landmark pact, currently being discussed at a major conference in New Delhi, encourages countries to plant forests, as growing trees naturally soak up airborne carbon dioxide (CO<sub>2</sub>), the principal "greenhouse gas" to blame for the warming problem.

But a study reported in next Saturday's issue of New Scientist says these new forests may end up doing more harm than good.

Scientists led by Ricard Valentini of the University of Tuscia measured the CO<sub>2</sub> in soil that is cleared for tree planting.

This ground is typically thick in decaying vegetation - the remains of trees, leaves and undergrowth over hundreds of years - and turning it over to plant trees suddenly releases the stored-up CO<sub>2</sub> into the atmosphere, they found.

The surge of CO<sub>2</sub> typically exceeds the amount of gas that would be absorbed by the first 10 years of growth by the new forest, they suggest. There would be no overall reduction in CO<sub>2</sub>, and even a net increase, if forest is harvested for its lumber before that time.

The best CO<sub>2</sub> sponges, says Valentini, are old, undisturbed forests, but Kyoto offers no incentive for conserving them and may in fact threaten them, because countries could be able to claim credits by chopping them down and replacing them with tree plantations.

Valentini's project is called CarboEurope, a European Union-funded programme that has installed CO<sub>2</sub> monitoring devices at more than 30 sites in European forests.

He gave the findings last week at a conference in Valencia, Spain, New Scientist said.

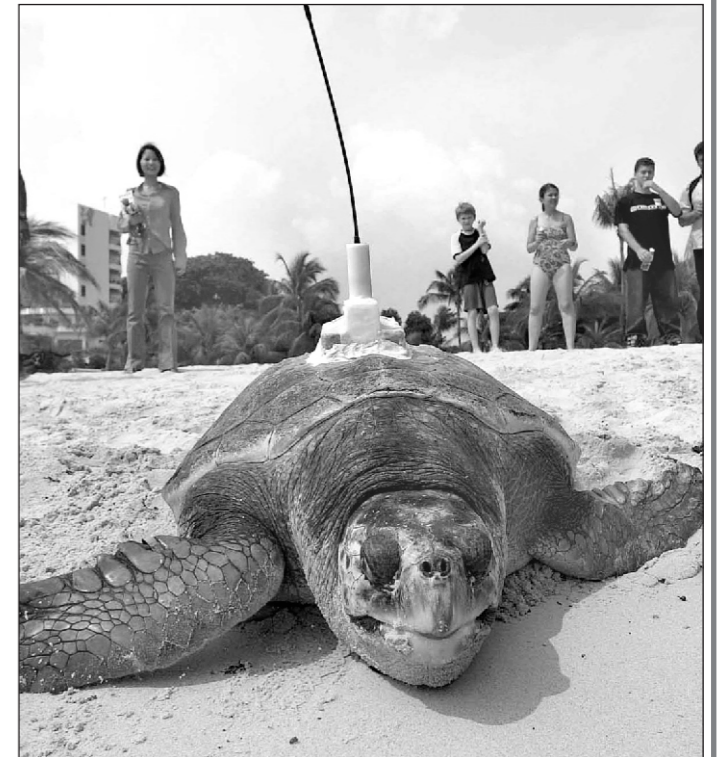
Under Kyoto, rich industrialised countries - with the notable exception of the United States, which last year walked away from the pact - are committed to reducing emissions of six greenhouse gases by a timeframe of 2008-2012.

The pollution results overwhelmingly from the burning of coal, natural gas and oil. Emissions are now so high that scientists say that far deeper cuts are required if the world wants to stave off higher atmospheric temperatures that would lead to lasting and potential catastrophic climate change.

CarboEurope found that Europe's forests absorb up to 400 million tonnes of CO<sub>2</sub> per year, or 30 per cent of the continent's emissions, the report says.

### Monster iceberg heads

### Backpacked turtles



Odysseus, a loggerhead turtle attached with a box-like transmitter and a flexible antenna makes its way to the open sea in Singapore on October 22. Three loggerhead turtles are being released in Singapore as part of a project to find out if they can find their way 5,000 kilometres home to the beaches of Nagoya, Japan.

### into Antarctic waters

PARIS

An iceberg more than twice the size of Luxembourg has ventured into the south polar seas after wrenching itself free of the Antarctic ice shelf, an expert said on October 22.

Two hundred kilometres long, 32 kilometres wide and about 200 metres thick, C-19 is one of the biggest icebergs seen in recent years, David Vaughan of the British Antarctic Survey (BAS) told AFP.

"The iceberg is still in the Ross Sea, about 300 kilometres away from the ice front where it broke off from," he said in an interview from Cambridge, England.

"It won't start melting until it leaves the cold polar waters. Icebergs can last for years and years and years, absolutely years, as long as they stay in the cold water.

"As soon as they get out of the cold water and into warmer and stormy waters they can break up within a few weeks or months."

C-19's formation on the Ross Ice Shelf was first spotted in May by the US National Ice Center.

Over the next five months, a new European environment satellite, Envisat, monitored its gradual breakout into the open sea, the European Space Agency (ESA) said in a statement.

Envisat's pictures, posted on the ESA website (www.esa.int), show C-19 jostling to reach the sea against an older iceberg, B-15a, which is resting aground in shallow water.

B-15a, slightly smaller than C-19, is a fragment of B-15, a vast iceberg which at its peak measured around 11,000 square kilometres (4,400 square miles), making it the size of Jamaica.

B-15 split off from the shelf -- "calved" in scientific terms -- in March 2000 and later broke up into several pieces.

Vaughan said he believed that the emergence of two vast icebergs from the Ross Ice Shelf in so short a time should not be a cause for worry about global warming.

"Every now and again a big iceberg breaks off the ice shelf and that is absolutely nothing to worry about because they've always done that.

"That's the normal, natural cycle of the ice shelf. There are areas where we've seen ice shelves retreating over the last 50 years, and we think that is a response to climate change, but this is not one of those areas.

"The Antarctic peninsula is where climate has been changing most rapidly and where the ice shelves have been retreated. But they don't retreat like this, producing one big iceberg every now and again. They retreat by year-on-year production of lots of little icebergs, a kind of constant retreat."