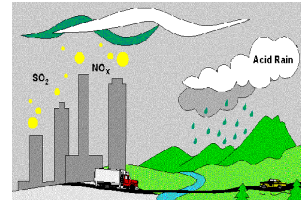


ACID RAIN IN ASIA

NEWSLETTER



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SECOND NATIONAL WORKSHOPS ON ACID RAIN AND EMISSIONS REDUCTION IN ASIA

As part of the RETA: 5702 project entitled Acid Rain and Emissions Reduction in Asia, Phase II, the second national workshop will be held in each of the primary participating Developing Member Countries (DMCs), namely: People's Republic of China, Indonesia, India, and Thailand during March 1999.

These workshops will be organized by *The Administrative Center for China's Agenda 21 (ACCA21)* in PR of China, *Environment Management Center (PURSARPEDAL)* in Indonesia, *Tata Energy Research Institute (TERI)* in India, and jointly by *Pollution Control Department (PCD)* and *King Mongkut's University of Technology (KMUTT)* in Thailand. UNEP Environment Assessment Program for Asia and the Pacific (UNEP/EAP-AP) will coordinate these workshops with the financial support from the Asian Development Bank (ADB).

These workshops will be attended by their country's high-level policy makers from the environment agencies and senior technical experts involved in energy, power and other industries. Also, resource representatives from ADB, UNEP EAP-AP, Asian Institute of Technology (AIT), and Resource Management Associates (RMA) will attend the workshops.

The second national workshop will discuss primarily on the following:

- Integration of the RAINS-ASIA model in the planning and decision making process;
- Suggestions and recommendations to address the trans-boundary movement of acid rain causing emissions (AR-CEs);
- Modifications made to adapt the model to local environmental conditions; and
- Problems and constraints encountered in using the model.

The tentative schedule of the second national workshop in each of the four primary participating countries are:

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- Beijing, PR of China 08-09 March 1999
- Jakarta, Indonesia 11-12 March 1999
- New Delhi, India 15-16 March 1999
- Bangkok, Thailand 18-19 March 1999

For further information on this second workshop, please contact the following executing agencies in each of the participating countries:

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Application of RAINS-ASIA Model to Predict SO₂ Emissions and Its Controlling Costs for the Revised Energy Scenario for Thailand

Following is the brief summary report of application of RAINS-ASIA model to predict SO₂ emissions and controlling costs for the revised energy scenario for Thailand presented by Drs. Khummongkol and Kerdkankaew, King Mongkut's University of Technology (KMUTT), Thonburi, Bangkok during the first national workshop held on September, 1998.

The report presented the results of the Regional Energy Scenario Generator (RESGEN) and Energy and Emissions (ENEM) modules of RAINS-ASIA. The recent economic crisis in Thailand resulted in the GDP growth rate down from 7-8% in 1996 to -7% in 1998. The demand for electricity is down by 5% from the previous forecast in 1997 and the vehicle fuel reduced by 8%. As change in demand for energy affect the SO₂ emissions, this study re-applies the RAINS-ASIA model to re-calculate the acid deposition in Thailand.

Tables 1 and 2 present the revised baseline data of total energy consumption by regions and the estimated SO₂ emissions respectively. The annual demand for coal, the main precursor for acid rain related emissions, is estimated to fall from 57.8% (from 2000 to 2010) to 10.3% for the same period partly due to the fall in demand for electricity. A number of Independent Power Producers (IPPs) projects have either been delayed or canceled. The estimated new emissions of SO₂ will decrease by 43% in 2000 and 47% in 2010 as compared with the previous estimates.

Regional emission control costs are shown in Table 3. With the economic down turn, the cost of controlling SO₂ is lower by 12% in 2000 and declined further to 3% in 2010 as compared to the previous estimation. However, the cost is estimated to increase again to 9.5% in 2020.

In summary, RAINS-ASIA model could be used to accomplish any change in the parameter inputs such as energy consumption, and recalculating SO₂ emissions as well as re-determining the environmental impact in terms of the acid deposition and the critical load. The comparative study in this report between the two energy scenario (before and after the economic crisis) have shown the flexi-

bility of the RAINS-ASIA model in this changing economic volatility.

During the first national workshop held on September 1998, some the following technical papers were also presented:

1. Harvey, N. W., *Acid Exceedances over Critical Load*, King Mongkut's University of Technology (KMUTT), Thonburi, Bangkok.
2. Somboon, W., *Rain Water Quality in Bangkok*, King Mongkut's University of Technology (KMUTT), Thonburi, Bangkok.
3. Khunasopa, D., *Regional Background Acidity and Chemical Composition of Precipitation in Thailand*, Environmental Research and Training Center (ERTC), Department of Environmental Quality Promotion, Bangkok, Thailand.
4. Khunasopa, D., Sukasem, P., Morknoy, D., Granat, L., and Tabucanon, M., *Chemical Composition of Precipitation in Thailand*, ERTC, Thailand and Department of Meteorology, Stockholm University, Sweden.
5. Wangwongvattana, S., *National Monitoring Plan*, Pollution Control Department (PCD), Bangkok.
6. Charasaiya, T., Khunnasopa, D., Sukusem, P. and Tabucanon, M., *Investigation on Acid Deposition in Pathum-thani Province, Thailand*, ERTC, Bangkok.

Region	Previous Demand Forecast			Revised Demand Forecast		
	2000	2010	2020	2000	2010	2020
Bangkok	957	1,519	2,353	806	1,284	2,064
Central Valley	874	1,554	2,548	567	931	1,526
Northeastern Plateau	380	547	725	252	402	652
Northern Highlands	445	631	933	312	396	560
Southern Peninsula	342	794	1,455	214	357	686
Total	3,016	5,117	8,014	2,151	3,370	5,488

Region	Previous Demand Forecast			Revised Demand Forecast		
	2000	2010	2020	2000	2010	2020
Bangkok	295	437	588	150	184	195
Central Valley	134	336	755	110	180	375
Northeastern Plateau	45	65	92	18	25	38
Northern Highlands	453	176	224	127	93	79
Southern Peninsula	58	163	336	22	42	87
Total	675	1,177	1,995	427	524	774

7. Jirapraditkul, V., *Revised Energy Scenario for Thailand*,

Region	Previous Demand Forecast			Revised Demand Forecast		
	2000	2010	2020	2000	2010	2020
Bangkok	736	1,068	1,419	658	1,092	1,777
Central Valley	290	455	790	223	388	719
Northeastern Plateau	205	255	307	195	295	425
Northern Highlands	310	364	349	273	359	389
Southern Peninsula	195	358	520	177	297	457
Total	1,736	2,500	3,395	1,536	2,431	3,767

Do all regions have the same acid-neutralizing capacity?

No. Different types of bedrock contain variable amounts of contain variable amounts of alkaline chemicals. Regions with bedrock containing less alkali have a lower capacity for reducing acidity, and thus are more sensitive to acid deposition.

Is acid deposition always wet?

No. The acids can be transformed chemically into sulphur dioxide gas or into sulphur and nitrogen salts. In this form they are deposited 'dry', causing the same damage as when they land dissolved in rain or snow. In this form they can also do internal damage to plants as they are taken up from the soil.

Air Pollution –Selected Cities in Asia

Country	City	Population thousands 1995	TSP ug/cu. m. 1995a	SO ₂ ug/cu. m. 1995a	NO ₂ ug/cu. m. 1995a
China	Shanghai	13,584	246	53	73
	Beijing	11,299	377	90	122
	Tianjin	9,415	306	82	50
India	Bombay	15,138	240	33	39
	Calcutta	11,923	375	49	34
	Delhi	9,948	415	24	41
Indonesia	Jakarta	8,621	271
Japan	Tokyo	26,959	49	18	68
	Osaka	10,609	43	19	63
	Yokohama	3,178	..	100	13
Korea, Rep	Seoul	11,609	84	44	60
	Pusan	4,082	94	60	51
	Taegu	2,432	72	81	62
Malaysia	Kuala Lumpur	1,238	85	24	..
Philippines	Manila	9,286	200	33	..
Singapore	Singapore	2,848	..	20	30
Thailand	Bangkok	6,547	223	11	23

It is estimated that within next decade, more than half of the world's population will be living in urban areas - a change with vast implications both for human well being and the environment. The most rapid change is occurring in the developing world. Environmental problems such as lack of access to clean drinking water, urban air pollution, green house gas emissions etc. create a range of social impacts. They may impair human health, cause economic and other welfare losses, or damage to ecosystems either directly or indirectly. The following table presents the level of air pollution in some of the selected cities in Asia.

On a global scale, the most urgent challenge is to provide for the basic needs of the urban poor and thereby alleviate the toll of human misery associated with degraded urban environment.

Kyoto costs overstated, scientists say August 1998

Despite claims to the contrary, the United States can meet its obligations under the Kyoto climate treaty at an overall economic savings or at a modest cost, according a recent study. The study, conducted by the Union of Concerned Scientists, contradicts other studies that say meeting the goals of the climate treaty would be detrimental to the economy.

"Contrary to the doomsday economic predictions of the fossil fuel industry and its supporters, we can stem global warming without slowing the economy," said Alden Meyer, Director of Government Relations at the Union of Concerned Scientists. "The U.S. can meet the Kyoto target and save consumers money through common sense energy use at home."

If Congress ratifies the Kyoto Protocol, the U.S. would be required to cut its emissions of heat-trapping gases to seven percent below 1990 levels by the period 2008-2012. According the study's analysis of a host of respected reports on this issue, the Union of Concerned Scientists says the U.S. could reduce emissions by as much as 13 percent below 1990 levels by 2010 with net savings.

The U.S. can obtain this goal through the implementation of energy-efficient and low-carbon technologies at the heart of the American economy, according to the report. Climate skeptics base their doomsday predictions of sharp declines in employment, income and gross domestic product "upon pessimistic and unrealistic assumptions about energy technologies and the economy itself," the report says. The Global Climate Coalition, an organization of private companies and business trade associations, is skeptical about the United States' ability to reach the goals of the Kyoto climate treaty.

"With each passing day it becomes more apparent that the stringent targets and timetables agreed to in Kyoto are unrealistic and impractical," said Gail McDonald, president of the organization. "Our children deserve the same economic opportunities that we enjoy today. This treaty puts those opportunities in harm's way," McDonald said. The sentiment that the climate treaty could be detrimental to the American economy was echoed last year when the Senate voted 95-0 to not ratify any climate treaty that did not include developing nations and could hurt the U.S. economy. The Union of Concerned Scientists report concludes, however, that the "United States should not be unduly worried about losing out competitively on the world stage for taking steps to reduce emissions."

The organization believes that because the U.S. can achieve the reductions with no net impact to the economy it actually "stands to benefit from attaining leadership in technologies that will become increasingly important in the 21st century," the

Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia

On 22 April 1998 the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia was discussed and signed by Ministers of the Environment at the seventh meeting of the Governing Council of South Asia Cooperative Environment Programme (SACEP) in Malé, Republic of Maldives. The Malé Declaration makes provision for baseline studies and an action plan for air pollution. For further information, please contact UNEP/EAP-AP, Bangkok, Thailand.

Participating Countries of Acid Rain in Asia Project

A. Primary Participating Developing Member Countries (DMCs) and Executing Agencies:

1. People's Republic of China
2. India
3. Indonesia
4. Thailand

B. Other Participating DMCs/regions:

- | | |
|-----------------|-----------------------|
| 1. Bangladesh | 2. Bhutan |
| 3. Cambodia | 4. Hong Kong, China |
| 5. Lao, PDR | 6. Malaysia |
| 7. Myanmar | 8. Nepal |
| 9. Mongolia | 10. Pakistan |
| 11. Philippines | 12. Republic of Korea |
| 13. Singapore | 14. Taipei, China |
| 15. Vietnam | |

C. Participating Non-DMC

Upcoming Events

- **Second National Workshop** on "Acid Rain and Emissions Reduction in Asia" will be held in each of the four primary participating countries:

Bangkok, Thailand	08-09 March 1999
Jakarta, Indonesia	11-12 March 1999
New Delhi, India	15-16 March 1999
Beijing, PR of China	18-19 March 1999

- **Second Regional Seminar** on "Acid Rain and Emissions Reduction in Asia" to be held tentatively on 25-26 May, 1999 at Bangkok, Thailand.

- **Inception Workshop** on Implementation of Male' Declaration will be held on 22-23 February, 1999 in Kathmandu, Nepal.

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