



INITIATIVES IN ENVIRONMENT and SUSTAINABILITY

a quarterly publication of MIT's
Center for Environmental Initiatives

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Environmental Policymaking: Jack Gibbons Speaks at MIT



*"Science and discovery
allow us to develop options
that will enable us to
achieve the future we
desire."*

— Jack Gibbons

MIT's Office of the Provost and Department of Political Science jointly present Dr. Jack Gibbons as Karl Taylor Compton lecturer for 1998-99. Dr. Gibbons served as President Clinton's science advisor for five years. Starting as a nuclear physicist, he worked at Duke University and Oak Ridge National Laboratories, where he virtually invented the field of energy conservation in the early 1970s. For thirteen years he was Director of the Office of Technology Assessment (OTA) for the U.S. Congress.

In his first lecture, Gibbons said the stratosphere has been altered by ozone depletion caused by human activities, and carbon dioxide is reaching levels not seen for 50 million years. "With sufficient lead time, most of these issues can be addressed using ingenuity with science and technology," he said, "but we need the political will to recognize the handwriting *on the wall* before our back is up *against* the wall." "Health, environment and security are the overreaching concerns of Congress," Gibbons said in his second lecture. "It is important to link investment in science and technology to the social purpose being served.... If science proposals are too big or too distant, they won't be approved." Since it is impossible to tell policymakers the outcomes of proposed research, "we have to look back to evaluate the extraordinary rate of return to the public investment," he said, citing the Partnership for a New Generation of Vehicles (PNGV) and the National Bioethics Commission as examples of fruitful government support. "Another way to help Congress is to have MIT rapidly and authoritatively respond to issues—there's a great hope for MIT to do this." A third lecture is scheduled for April 26 (see back cover).

For an exclusive interview with Jack Gibbons, see page 2.

CALENDAR

march

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"DOME—An integrated modeling environment," Prof. David Wallace, MIT Dept. of Mechanical Engineering.
Tuesday, 16 March 1999, 10:00 am - 12 noon, MIT CADLab, Building 3-458.
Contact: Steven Kraines 617-258-6016 (skraines@mit.edu).

march

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"Mobility," Arnold Howitt (Harvard University, Kennedy School of Government). AGS Brown Bag Seminar Series. Wednesday, 17 March, 12:00 noon - 1:30pm, MIT Energy Laboratory, Building E40-496

april

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"Watersheds," Harold Hemond and James Gawel, MIT, Dept. of Civil and Environmental Engineering.
AGS Brown Bag Seminar Series.
Wednesday, 7 April, 12:00 noon - 1:30pm, MIT Energy Laboratory,

april

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"Sustainable growth: Fantasy Vision?" Dr. Jack Gibbons, MIT Karl Taylor Compton Lecturer.
Monday, 26 April, 4:00 pm,
Wong Auditorium, Building
Contact: Carol Clark 617-258-5879, cclark@mit.edu.

All events are held at MIT unless otherwise noted. For the most current listings, see the CEI website:
<http://curricula.mit.edu/CEI>

Please send MIT sponsored event listings to Dr. Richard St. Clair, stclair@mit.edu, fax 617-258-6590, phone 617-253-9871.

EXCLUSIVE INTERVIEW

Jack Gibbons on MIT's Consortium on Environmental Challenges

Initiatives in Environment and Sustainability [Interviewing, Dr. Richard St. Clair, CEI Publications Coordinator, MIT]:
Dr. Gibbons, MIT's President, Charles Vest, has described you as "a forceful and effective advocate for using science and technology to address larger public issues." At your first Compton Lecture here last Fall, you expressed deep concern about the trend of growing world populations outstripping our planet's resources. How do you see MIT as being part of the solution to this critical global challenge for the next millennium?

Jack Gibbons: Charles Vest is deeply committed to promoting a broad array of environmental initiatives at MIT. Innovative coalitions like the Consortium on Environmental Challenges, under the framework of a major university like MIT, are vital to the nation and the world. I'm really pleased we're trying these things here at MIT. The choice of environmental initiatives is a global phenomenon that reflects global issues best addressed through global consortia like the CEC, reaching across disciplines, distances, and time.

IE&S: Are you satisfied with the CEC's choice of focal areas of research?

JG: The notion of picking areas we can get our arms around is important—areas like transportation, climate change and so on, which themselves are very broad. One reason I am pleased to be at MIT is that it is a place where information is freely shared and interactions are explicitly encouraged across disciplines—almost as a part of one's job. Much of the really good stuff spills across departments. The CEC shows that an insti-

tution like MIT, where interaction is encouraged, can be greater than the sum of its parts. MIT is a classic leader in breaking down barriers between departments in order to tackle challenging problems.

IE&S: Is there anything else about MIT that you find special as a venue for environmental issues?

JG: MIT has substantial involvement with the industrial sector. Industry will have to bear the brunt of change, which is why it is no surprise that we see industry trying to defeat some new policies. But if industry is approached with an appropriate time element to induce these changes gracefully, then we can all win. It is important for MIT to take a leadership position, because the institute already deals with the university-industry-government triad and is integrating across these sectors.

IE&S: At a recent meeting at MIT, Peter Beardmore of Ford Motor Company's Research Laboratory was optimistic about MIT being a resource of unimpeachable scientific evidence upon which more effective environmental policy can be built.

JG: Evidence may be "unimpeachable," but it is still full of caveats. It has been said that "Science has the first word on everything and the last word on nothing." Cases supporting the old notion that "the best science can give you an unchallengeable answer" are a rarity. Of course, there was the instance of stratospheric ozone, with its extraordinary evidence. There were very few nay-sayers there (though there were some). In the real world of policy making, you not only have to find the best scientific evidence, but you also find yourself dealing in a world of special pleading and clever market strategies by many stakeholders.

IE&S: How can you represent honest differences of interpretation of scientific evidence without conveying the impression that there are opposing sets of facts?



JG: Even though the evidence is challengeable, we have arrived at information on the best traditions of science. Senator Moynihan said, "We can each have our own opinions, but we cannot each have our own facts." Arguing from the same basis of facts we try to make clear where the evidence is, in a way that is "unimpeachable." But in many instances of policy-relevant science the answers aren't so certain, so we must deal both with evidence and with judgement.

IE&S: How can the work of the environmental researchers get better heard in the policymaking sector?

JG: We're dealing with an imperative of coalescing key stakeholders. To be heard in the policymaking sector, you have to get the issues narrowed to frame the debate, then focus it so the decisionmakers can be aided in their process. We have to remember there are lots of people who believe in analysis as a way of constraining rather than enabling decisionmaking. There's a need to resolve perspectives and values.

IE&S: How do you view "progress" in a sustainability-constrained developing world?

JG: The way to measure progress is not how much we consume (GNP) but by how much we are achieving in terms such as increasing one's individuality. How much of a full life are we leading? What are we cultivating in young people? The notion of intergenerational equity transcends decisions that affect future generations. It challenges the ingenuity of science and of governments across disciplines, parties, nations and generations.

IE&S: And how about MIT's Consortium on Environmental Challenges—how do you view it in the long run?

JG: I think the focus [of the Consortium] is important because of the many socio-economic issues it faces: The local is included in the global; it's on the very front edge of the 21st century; it's a challenge to humanity, how to deal with the desires and needs of people in a very sustainable way for the long term and appropriate in the stewardship of the planet's resources. The role of the university is to try to put into context the future generations, not just our own lives. If we're smart, we can provide for the present as well as enable a brighter future. 🌍

Annual meeting: AGS looks at self, at world

What the AGS has accomplished

- ***Projects:***
*37 international projects
over 30 faculty and graduate
students actively engaged*
- ***New paradigm for knowledge
creation:***
*A result oriented methodology
to create integrated,
policy-ready knowledge*
- ***New knowledge:***
*Important new knowledge
in six substantive areas*
- ***Support for sustainable
development:***
*A growing network of
scholars, industry and
government decision-makers
focused on sustainability
worldwide*
- ***New institutional priorities:***
*Fundamental realignment
of priorities at the
participating universities*
- ***A vision for the future and the
potential to achieve it***

In January, 1999 the Fourth Annual Meeting of the Alliance for Global Sustainability in Tokyo focused on the results of projects funded since 1997 and ways to achieve the AGS goal of quickly transferring knowledge into action. Principal investigators reported on projects moving toward pilot demonstrations, shared results across disciplines and discussed ways to accelerate implementation.

More than 250 faculty and students, as well as invited guests from industry, government and NGOs, attended this year's annual meeting. The program included individual project meetings that brought scholars from North America, Europe and Asia together to address specific issues in the six areas of sustainability and on policy and related cross-cutting initiatives of the AGS. Attendees also participated in half-day workshops to identify ways in which their research in specific sectors of sustainability was complementary.

Now in the third year of its funded research program, the Alliance is a new strategic approach to problems affecting the "global commons" and the transboundary issues that contribute to them. Three of the world's leading research universities—MIT, the Swiss Federal Institutes of Technology (ETH), and the University of Tokyo (UT)—contribute their intellectual strengths and bring their unique regional perspectives to the AGS.

A number of AGS projects which received initial funding in 1997 are moving toward pilot demonstrations—one, for example, focuses on means to ascertain water needs in arid and semi-arid regions and establishes a model for identifying robust solutions to water availability issues in those regions. Researchers also described an integrated project, "The Tokyo Half" initiative, which will draw upon expertise across several focus areas of the



*AGS Coordinator for the
University of Tokyo, the host
of the 1999 AGS Annual
Meeting, Professor Nomonori
Matsuo, Department of
Urban Engineering*

AGS to develop recommendations to reduce CO₂ emissions in Tokyo by 50% by 2020.

Projects focused on China are addressing the mitigation of air pollution problems at local, regional and global levels stemming from the extensive use of coal, and assessing the impacts of coke production in township and village enterprises (TVEs) upon households (see story, page 8 ff). A day-long meeting on the “Clean and Efficient Use of Coal in China” was attended by representatives of major aid providers to China’s burgeoning energy sector, including representatives of the World Bank and major Japanese lending organizations. The meeting focused on both the technology and policy improvements that could lead to near-term benefits to communities that now experience intensive pollution from use of coal-fired boilers while at the same time reducing CO₂ emissions.

Paul Tebo, Vice-President of DuPont Corporation, and chairman of the AGS International Advisory Board meeting, praised the AGS for its “strong bias for action.” He attributed the interest of multinational corporations in the AGS to its uniqueness for collaborations across universities and cultures and bringing the word “sustainability” to the forefront. IAB Member Livio D. DeSimone, CEO of the 3M Company of Minneapolis, said “AGS projects are focused on the most critical sustainability issues worldwide; we are confident that as the AGS enters its fourth year, it will contribute significant practical, action-oriented results.”

Building pathways to sustainability

The AGS is working to build pathways for moving society from the current state of environmental crisis to a desirable future state of sustainable human society. In 1996 substantial funding was provided by Swiss industrialist Stephan Schmidheiny which provided the foundation for an ambitious research agenda to address knowledge gaps in cultural pathways to sustainability. Since then, the AGS has launched 37 projects and involving over 125 faculty and 150 graduate students at the founding universities. The AGS Governing Board awarded funding for ten projects during the Tokyo meeting.

The six pathways or sectors in sustainability of AGS research are: Climate change, energy, mobility, cleaner technologies (including processes for design and assessment), urban systems, and water and agriculture (natural resources), as well as cross-cutting areas of policy and communications. Researchers at the member universities are developing new knowledge, concepts and technologies as well as decision-making tools to address issues in each of these sectors. Examples reported on at the annual meeting include:

- the potential for low-cost, lower-pollution technology for nations, such as China, that remain heavily dependent on coal-fired energy sources;
- better tools and methods to measure the impact of human population on water resources;
- studies that demonstrate how some kinds of financial and economic aid actually over-promote the use of expensive energy alternatives;
- comparative studies of transportation alternatives to understand what works and what does not in insuring mobility for growing populations;
- a sophisticated understanding of models for predicting climate change and sea level rise; and
- recommended policy and program options for efficient and sustainable building construction in developing countries.

Mapping the AGS portfolio

Highlights from the research carried out to date were raised in the report of the AGS mapping project, led by MIT AGS Coordinator, Dr. Joanne Kauffman, Associate Director of the MIT Center for Environmental Initiatives. The mapping report provided a stimulating backdrop to the Tokyo meeting by providing both a run-down of the accomplishments of the nascent organization to date and a road map for its future research objectives with a focus on water, energy and mobility issues.

The mapping project was initiated by the AGS International Advisory Board last year to give coherence to the large undertaking represented by the AGS and to provide the basis for a road map to the future of AGS projects. The results of

continued on page 6

*CEO of 3M Company
and AGS International
Advisory Board Member,
Livio D. DeSimone*



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the mapping project are four white papers on the major AGS focus areas, which can be viewed on the MIT AGS website at <http://curricula.mit.edu/CEI/Research/AGS/about.html>.

Knowledge transfer to developing countries

A special workshop was held on the crucial issue of knowledge and technology transfer to the developing world and the role of the AGS in assisting that transfer. At the workshop, leaders from developing countries included Dr. R. K. Pachauri, Director of the Tata Energy Research Institute (TERI) in New Delhi, Dr. Leena Srivastava, Dean of the Policy Analysis Division, TERI, Professor Jinghua Fang, Department of Thermal Engineering in Taiyuan University of Technology, and Professor Guangxi Yue, Department of Thermal Engineering in Tsinghua University, Beijing.

Joining in a roundtable discussion on building relations between the AGS and implementers of sustainable development in the developing world, Prof. Mark Mwandosya, Director/Chairman of the Centre for Energy Environment Science and Technology (CEEST) and Chairman of Energy, Technology and Management at the University of Dar es Salaam, Tanzania, urged the AGS to add information technology to its next generation of priority areas, as well as promote more student exchange with developing countries and continue to build a dialogue with sustainability institutions. Dr. Pachauri drew attention to the importance of paying heed to the cultural dimensions of globalization and sustainability.

Theme for MIT 2000: "Education writ large"

The next annual meeting of the AGS will be held at the MIT campus January 19-22, 2000. In announcing the meeting dates, Professor David H. Marks, MIT AGS Coordinator and Director of MIT's Center for Environmental Initiatives, said the theme of the next meeting is "Education: How we translate what we have learned into our own classrooms, at every level of society, and—most important—in the guidance of good policy." 

China: improving coal technologies

A one-day conference on International Aid and Clean and Efficient Coal Technology in China held was held in Tokyo on January 18 in conjunction with the Fourth Annual Meeting of the Alliance for Global Sustainability. MIT, the University of Tokyo, the Swiss Federal Institutes of Technology and Tsinghua University have been working collaboratively on cleaner and more efficient utilization of coal in China for the past two years through the support of the AGS, the major donor of the collaborative project. The aim of this research is to understand better the problems and constraints affecting the efficient utilization of coal by China, reduce greenhouse gas (GHG) emissions, and contribute to sustainable economic development in China in the form of readily utilizable, policy-ready findings.

The Tokyo conference featured roundtables of scholars and practitioners on technical options, domestic regulatory and economic factors, and international trade and aid rules. Chinese and international boiler manufacturers, officials from China's state planning commission and environmental agencies, and World Bank and bilateral donor officials joined members of the inter-university research team in the panels.

By combining the cross-disciplinary expertise of technical, economic, financial and political research, the program aims to avoid designs and methods that can be too costly for widespread adoption in China. One of the research groups at MIT has found a practical way to significantly reduce air pollution by improving the efficiency of China's industrial coal-fired boilers (*story, page 8*).

While China's shortage of effective internal environmental regulations is compounded by a debt crisis and lack of financial flows for certain domestic enterprises, the researchers have identified external problems including (1) potential problems that low-cost efficiency-enhancing activities in China may face in qualifying for credits under proposed systems for GHG emission accounting, and (2) distortions in the supply of international aid and trade finance provided to China through bilateral and multilateral programs. The researchers further suggest that the very types of projects identified through the program's technical work that may be most effective in promoting clean and efficient coal combustion are also the very types of projects that are most difficult to reconcile with existing and prospective international disincentives for some modes of transferring environmental technology.

(related stories starting on next page)

China's cokemaking industry: a behemoth in transition

Researchers in the AGS China Coal program are considering ways to achieve health and environmental benefits for China through a number of options aimed at reducing emissions of greenhouse gases (GHG), particulates, and oxides of sulfur and nitrogen. MIT Professor Karen R. Polenske is leading an AGS research team on technological change, energy use, and pollution in Chinese township and village enterprises (TVEs). This study focuses on energy-efficient, low-pollution technologies for China's large cokemaking industry. She recently reported findings from her two-week visit to China in August 1998, when her research team visited several relatively large TVE coke-making plants. In January 1999 they continued this field research, focusing on smaller TVEs and visiting one of the eight state-owned cokemaking plants.



MIT Prof. Karen Polenske (rear, fourth from right) and the China-Coke research team from the Chinese Academy of Science, Taiyuan University of Technology, ETH-Zürich, and the University of Tokyo

The research team is initially focusing on cokemaking technologies in Shanxi Province. Prof. Polenske noted that the team wants to expand to an examination of the entire cokemaking supply chain, comprised of coal-mining technologies, coal and coke transportation technologies and end-user technologies (e.g., iron and steel manufacturing), all of which affect the demand for and supply of coke. Members of the research team are at the Chinese Academy of Science, Taiyuan University of Technology, ETH-Zürich, and the University of Tokyo, and currently include János M. Beér, Hans H. Siegmann, Masayoshi Sadakata, Xikang Chen, Jinghua Fang, Zhiqiang Qian, Steven Kraines, Xiaoming Pan and gradu-

ate students. They are receiving cooperation from Agenda 21 China, the State Statistical Bureau of China, the Chinese Ministry of Agriculture and the Shanxi Environmental Protection Bureau, and the Shanxi Science and Technology Commission, and the Shanxi Statistical Bureau. AGS funding to initiate and support this project has been buttressed by grants from the MIT International Science and Technology Initiatives (MISTI), the U.S. National Science Foundation, and the China National Natural Science Foundation.

China's energy consumption intensity [consumption per unit of output] has decreased by a remarkable 50% over twenty years (1977-1996).

"When you look at such a drop in energy use per unit per machine, that says something: this is a real phenomenon," Polenske observed. A major component of the research on the cokemaking industry in China is to understand how individual industries are contributing to this dramatic change. Commenting to CEI's *Initiatives in Environment and Sustainability*, Prof. Polenske said, "China is genuinely committed to improving its environmental performance and has already done well with very limited resources." The central government, for example, took a major across-the-board action to close down all, or most, of the indigenous cokemaking plants, some of China's worst polluters.

Shanxi Province, a middle-sized province of some forty million population, produces one-quarter of China's coal. The provincial government is targeting a large portion of the province as a 'clean energy region.' Although achieving a region of "only clean technologies" may be unrealistic in practical terms, Polenske cautions, she feels this program demonstrates that the Chinese are genuinely concerned about the environment. Top national and provincial officials in China, Polenske reports, are involved in Agenda 21 China and China's Science and Technology Commission, and are working closely with the MIT project to make important improvements in air quality.

A major effort is under way in China to build or modify coke plants that both are environmentally sounder and produce higher-quality coke than at present.

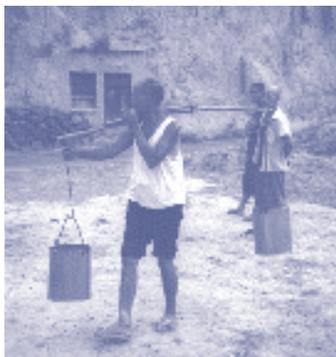
With the recent closing of most indigenous coke plants, there was a major trade-off between creating environmentally healthier conditions and putting thousands of

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people out of work. Prof. Polenske points out that a new study by the Shanxi Science and Technology Commission indicates that the fifth-generation modified indigenous cokemaking plants can be further modified to improve their energy and environmental performance while keeping people employed. The MIT researchers will use advanced input-output, green-accounting, and other socio-economic research methods to help the Chinese determine the socio-economic and pollution consequences of such large-scale changes.

A major problem in China's energy sector is the inadequate maintenance of deteriorating cokemaking plants and boilers.

A simple, but costly solution is to purchase new, efficient machinery from the west, which would require minimal maintenance. Yet, although China has had a huge trade surplus for several years, it is not nearly enough to allow China to invest in such equipment for a population so large. Taking these realities into account, the China Coal project has already identified and presented a low cost option for the efficient and clean utilization of coal in the industrial boiler sector of China (*see story, right*). For further information contact Prof. Karen Polenske, MIT Dept. of Urban Studies & Planning, 617-253-6881 (krp@mit.edu). 



Above: Peasant in Shanxi Province displaced by nationwide shutdown of traditional cokemaking plants and worker layoffs.

Photo: Karen Polenske

Improving China's coal-fired industrial boilers

A cooperative research team at MIT and in China has found a feasible way of significantly reducing a major area of air pollution in China by improving the country's industrial boilers. This team consists of Prof. Jinghua Fang (MIT, visiting from Taiyuan Institute of Technology, Shanxi Province, China) and Dr. Taofang Zeng (who recently completed his doctorate at MIT), Lynn I Shen Yang (supported by MISTI - the MIT Science and Technology Initiative from the Freeman Foundation), and MIT Professors Kenneth Oye, Adel F. Sarofim (visiting), and János M. Beér. This research venture was made possible by core funding from the Alliance for Global Sustainability (AGS), which leveraged further support from the Center for Global Partnership (the Japan Foundation), the New Energy Development Organization of Japan, and ABB Company. The findings of the team were presented by Prof. Beér to the 4th International Greenhouse Gas Conference in Interlaken, Switzerland (September 1998), in a paper entitled, "Coal utilization in industrial boilers in China: A prospect for mitigating CO₂ emission."

The most abundant human-generated GHG in the world is carbon dioxide (CO₂), which results from burning carbonaceous fuels—primarily natural gas, liquid petroleum fuel and coal. The burning of coal emits the largest amount of CO₂ per unit of heat produced because the carbon-to-hydrogen ratio in its chemical composition is the highest of the carbonaceous fuels. Coal is the principal fuel burned in China. One-third of China's entire coal output is consumed by the nearly half-million industrial boilers in that nation. The industrial boiler sector is thus the main contributor to pollution in China, and its environmental impacts stretch far beyond China's borders. Due to boiler inefficiency, 75 million tons of coal are wasted and 130 million tons of excess CO₂ are poured into the atmosphere each year along with over 6 million tons of particulates and over 5 million tons of sulfur dioxide (SO₂). With the fast growth of the Chinese economy, these annual levels are steadily increasing.

Energy conservation is clearly the most direct way of reducing CO₂ emissions, both at the user end and through more efficient production of power and heat. Knowledge of how boiler operating performance affects CO₂ emissions is necessary for the control of the emissions. The researchers attribute low levels of boiler efficiency and high air pollution

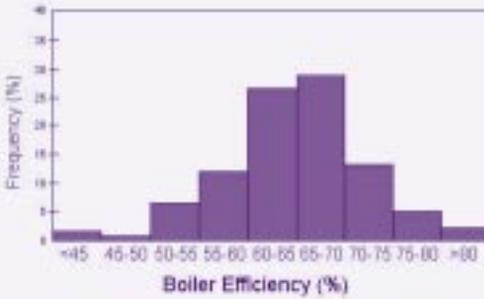


Fig. 1 Histogram of Boiler Efficiency



Fig. 2 Histogram of Excess Air Factor

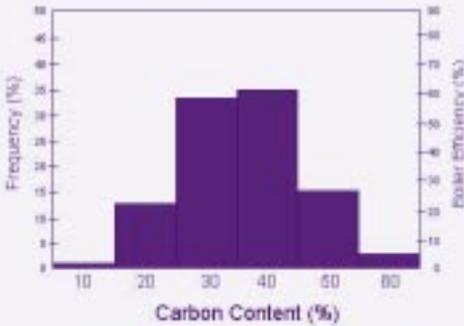


Fig. 3 Efficiency and Histogram of Carbon in Slag and Ash

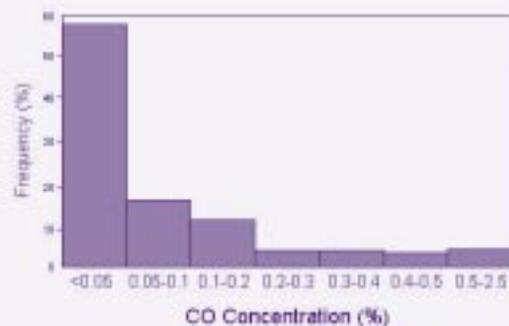


Fig. 4 Histogram of CO Concentration in Waste Gas

in China to a number of causes: Greater excess air and waste gas temperatures in boiler operation raise CO_2 emissions; carbon monoxide (CO) resulting from the incomplete burning of coal is oxidized into CO_2 in the atmosphere; and non-technical factors such as coal price, financial difficulty, non-implementation of existing environment regulations, and poor management contribute significantly to the country's poor boiler performance and resulting GHG pollution.

A recent United Nations report proposed that advanced technology be transferred from developed countries to Chinese boiler manufacturers in a massive boiler replacement endeavor. The time and expense required to accomplish this render the proposal impractical. The China-MIT study recommends that remedial rather than replacement action be taken. It would be feasible and affordable for the Chinese to improve the performance of their industrial boilers and significantly reduce the leading source of GHG pollution, according to the China-MIT study. And, of great importance, it could be accomplished in far less time.

The researchers say that the average efficiency of three-fourths of China's half-million industrial boilers could be raised from 65% to 72% through installation of simple

gas analysis equipment and training of boiler operating personnel, at an average cost of only about \$3,500/boiler, far less than the cost of replacement. The total cost of this plan would be around \$1,312 million. What this would mean for China in coal savings would amount to nearly \$700 million annually, repaying the investment in only two years' time. This would save 34 million tons/year coal and reduce CO_2 emission by a dramatic 63 million tons/year at a cost of less than \$10/ton of CO_2 . As a bonus, the additional average steaming capacity of the boilers which could result from these improvements—as much as \$10,000 per boiler—would itself repay the cost of improving them.

Of course, the improvement of China's boilers is not a purely technical problem. Implementation of improved boiler house practices falls in the complicated area of industrial policy. Yet, regardless of whether China's industrial boilers are replaced or upgraded, the researchers say that implementation of better coal preparation and essential diagnostic instrumentation, and improved training of personnel are indispensable to effect meaningful reductions in the boilers' CO_2 emission. For further information on the China industrial boiler study, contact Prof. János M. Béer, MIT Dept. of Chemical Engineering, 617-253-6661 (jmbeer@mit.edu). 

AGS Wednesday noon “Brown Bag” seminars continue at MIT

“Sound science and technology must be

brought to bear on environmental issues;

wise environmentalism is a good business

practice; and a global problem requires

global cooperation for its solution.

In my view, the AGS is founded on these

three basic principles.”

Charles Vest, President of MIT
AGS Annual Meeting,
Tokyo, January 1999

MIT's Alliance for Global Sustainability Brown Bag Lunch Series resumed in the Spring Term with a report by MIT's AGS Coordinators, Prof. David H. Marks (Director, Center for Environmental Initiatives at MIT) and Dr. Joanne Kauffman (Assistant Director, CEI) on the January 1999 AGS annual meeting at the University of Tokyo. The Brown Bag series gives MIT faculty, students and visitors an opportunity to hear about AGS funded research projects in the working stage and to share useful information and viewpoints. All meetings are Wednesday, 12 noon to 1:30pm at MIT's Energy Lab, Building E40-496. Refreshments are served.

On February 17, Prof. Steven Kraines of the University of Tokyo's Department of Chemical Engineering (visiting scholar at MIT) gave a presentation on the DOME (Distributed Object Modeling & Evaluation) model and Tokyo “Half” Project. On February 24, Prof. Jiminji Hao of the Department of Environmental Science & Engineering at Tsinghua University (Beijing) presented a study on “Vehicular pollution control in China.” On March 3, Stephen Connors of the MIT Energy Lab spoke on “Criteria, attributes and indicators: Balancing completeness and comprehension in the search for sustainability.” Forthcoming presentations are listed below. There will be no meeting on March 24 (MIT Spring Break). The series will conclude with a wrap-up by Prof. Marks and Dr. Kauffman on May 19. For further information on upcoming talks, or to propose a presentation to this group, contact Mr. Stephen Connors (617-253-7985, connors@mit.edu) or Dr. Joanne Kauffman (617-253-0769, jmkauffm@mit.edu). 

AGS “Brown Bag” Schedule, Spring 1999

Mobility, Climate Change and Urban Systems

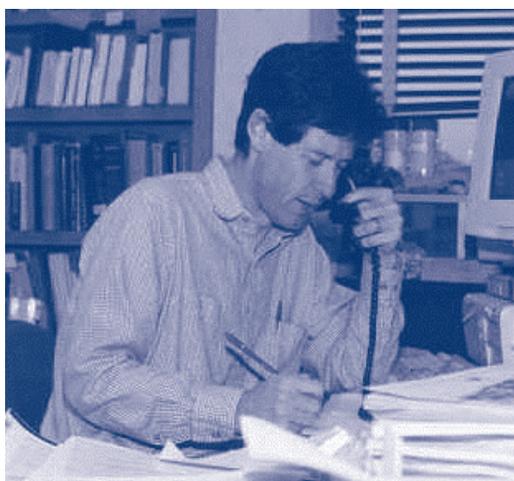
- March 10 —
- March 17—Arnold Howitt (Harvard University, Kennedy School of Government)
- March 31 Fred Moavenzadeh (MIT, CTPID*)
- April 7 —Prof. Harold Hemond and Dr. James Gawel (MIT, Dept. of Civil & Environmental Engineering) (*Watersheds*)
- April 14 —
- April 21 —
- April 28 —Veronique Bugnion (MIT, EAPS-TPP)
- May 5 —Andreas Schafer (MIT Center for Technology, Policy and Industrial Development* [CTPID])
- May 12 —Leslie Norford (MIT, Dept. of Architecture)
- May 19 —

Technology & Education

- Peter Groenewegen (Free University, The Netherlands)
- Prof. Anthony Sinskey (MIT, Biology Dept.) (*Biotechnology*)
- Prof. Jeffrey Steinfeld (MIT, Dept. of Chemistry and Director of PEER) and Dr. Matthew Gardner (Dept. of Chemistry)
- Prof. David H. Marks (Director, MIT, CEI) and Dr. Joanne Kauffman (Associate Director, CEI) (*end-of-year wrap-up*)

Gschwend named new Co-Director of PEER

MIT's Program for Environmental Education and Research (PEER) has appointed Professor Philip M. Gschwend of MIT's Department of Civil and Environmental Engineering as a new Co-Director of PEER, serving with Professors Jeffrey Steinfeld (Dept. of Chemistry) and Vicki Norberg-Bohm (Dept. of Urban Studies and Planning). He assumes the position held by Dr. John Ehrenfeld for some time. Says Co-Director Steinfeld, "I think Phil will be a great asset and bring some needed perspectives to our efforts."



New Co-Director of PEER, Professor Philip M. Gschwend of MIT's Department of Civil and Environmental Engineering.

Professor at MIT since 1981, Gschwend's fields of interest are environmental organic chemistry and geochemistry. Prof. Gschwend's research and academic teaching are directed towards developing means to predict the fates of organic chemicals in natural and engineered environments. His recent activities have focused on: (1) predicting the transport of organic compounds like benzene and diphenylsulfone away from hazardous waste sites (such as the Industri-Plex Superfund site in Woburn, Massachusetts), (2) assessing the fates of organic chemicals like polycyclic aromatic hydrocarbons and polychlorinated biphenyls in coastal marine environments, and (3) manipulating groundwater composition to mobilize colloidal phases during the clean up of contaminated subsurface

media. In addition to being widely published in leading environmental journals, Prof. Gschwend is co-author of the text, *Environmental Organic Chemistry and Environmental Organic Chemistry: Illustrative Examples, Problems, and Case Studies* (Wiley-Interscience, NY). He was also the 1995 Bose Award winner for excellence in teaching.

PEER is the education and outreach arm of MIT's Center for Environmental Initiatives headed by Prof. David H. Marks, Crafts Professor of Civil and Environmental Engineering. Its purpose is to strengthen awareness of the environment in the Institute by coordinating the rapidly growing interest in environment-related concerns among faculty and students. PEER is expanding its focus to reach all of MIT's schools. 🌐

*"Departments in every
school at MIT have
something to contribute
to understanding global
sustainability."*

Prof. Jeffrey Steinfeld,
PEER Director,
MIT Department of Chemistry

March 1999, Volume 1, No. 3

Initiatives in Environment and Sustainability is published by MIT's Center for Environmental Initiatives. For more information about the Center, please see the Center's website: <http://curricula.mit.edu/CEI/> or contact the center staff at:

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Jack Gibbons TO GIVE THIRD *Compton Lecture* *April 26*

"Sustainable growth: Fantasy or vision?" is the title of the third Karl Taylor Compton Lecture given by Dr. Jack Gibbons, former Science Advisor to President Clinton from 1993 to early 1998. Prior to serving the Administration, Gibbons was Director of the Office of Technology Assessment in the U.S. Congress for thirteen years. An accomplished nuclear physicist, Dr. Gibbons worked earlier at Duke University and Oak Ridge National Laboratories, where he did pioneer work in energy conservation research and development.

Last Fall at MIT, Dr. Gibbons spoke on the relationship of science and technology to society and the realities of their governance. The lecture starts at 4:00 pm in Wong Auditorium, Building E51-115. A reception will follow. For further information, contact Ms. Carol Clark, MIT Political Science Department. Tel.: (617) 258-5879 (email: cclark@mit.edu).

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