

Ernest Lowe

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Ernest Lowe is Director of Indigo Development. He has played a central role in creating the concept of eco-industrial parks (EIP) as a model for local sustainable development. Current work also includes whole systems approaches to sustainable farming and building design.

Mr. Lowe has served as strategic planning consultant for eco-industrial park developments in Northern California, Puerto Rico, Texas, Maryland, West Virginia, Johannesburg South Africa, Thailand, the Philippines, China and Vietnam. He has led seminars and workshops on eco-industrial development in five Asian countries.

He is author of the *Eco-Industrial Handbook for Asian Developing Countries* (2001). Prepared for the Environment Department, Asian Development Bank. (Revised and updated from an earlier publication produced for US-EPA.) This is available in a Korean edition available from the Korean National Cleaner Production Center and in a Chinese edition as *Industrial Ecology and Eco-Industrial Parks*, Chemical Industries Press, Beijing.

<http://www.Indigodev.com/ADBHBdownloads.html>

Mr. Lowe is also co-author of *Discovering Industrial Ecology: an executive briefing and sourcebook* (1997). Prepared for U.S. EPA Futures Group under a cooperative agreement with Pacific National Northwest Laboratory. Earlier he co-authored *Diabetes: a guide to living well*, now in its forth edition with the American Diabetes Association as publisher.

In 2001-2002 Mr. Lowe served as Industrial Ecologist working on a year-long Asian Development Bank project promoting cleaner production in industrial estates in Sri Lanka. This project included extensive analysis of the seven authorities responsible for developing industrial estate and zones and reform of management practices needed for successful financial and environmental operations. He led a team that conducted environmental impact assessments and pre-feasibility studies for a new and for an existing estate. He was strategic planner for the Industrial Estates Authority of Thailand in 1999 in a project seeking to turn the Authority's 28 estates into eco-industrial estates. ,

Mr. Lowe guided the Dalian Development Zone in an eco-planning process for a 430-km² economic and technological development zone in Northeast China and the planning of an eco-industrial park there. This process explicitly linked the eco-industrial park with fulfillment of the Zone's obligation to model the Circular Economy mandated by Liaoning Province.

In the late eighties and early nineties Mr. Lowe was President and Senior Partner, Viable Systems, a US-Canadian partnership consulting in organization design and change management for firms ranging from large corporations to startup ventures. Clients included Boeing, Hewlett Packard, Kodak, FMC, Arcosanti, and Suntrain.

He is an advisor to the Policy Research Center for Environment and Economy, State Environmental Protection Administration (SEPA), on the Circular Economy and the role of EIPs in it. He is also a research fellow of the Yale University Industrial Ecology Program; and Eco-Industrial Development Director of the International Center for Sustainable Development, an NGO active in China.

Core capabilities

Central focus: industrial ecology, strategic environmental management, and sustainable development. Application of these fields to integrated community economic development, eco-industrial park development, farming and food processing systems, and building design and urban planning.

Understanding how the components of complex systems can better interrelate to insure sustainable business success.

Supporting the design of change management organizations and change strategies to insure stable, coherent transitions. Applying the Viable System Model and other whole systems tools to this task.

Enabling development of creative synergy in teams or networks. Identifying human resources; enlisting and managing enthusiastic participation in difficult long-term tasks.

Recognizing future trends in present realities, generally far ahead of common wisdom.

Knowledge of models for sustainability in industry, transportation and urban design.

Active in networks of expertise in industrial ecology, sustainable development, strategic environmental management, pollution prevention, green architecture, sustainable urban planning, transportation, organization design, and change management.

Experience

Director, Indigo Development 1993-2005. Lowe applies industrial ecology principles to the design and development of ecologically sound industrial parks and community economic development planning, as well as to individual businesses. Mr. Lowe is active in marketing, project management, recruitment of resources, and product development.

Projects in 2001-2004 have focused his work in China, Taiwan, Sri Lanka, Korea, and Vietnam, but have included a US eco-industrial park project in West Virginia. Current work also includes whole systems approaches to sustainable farming and high performance building design.

Mr. Lowe has worked with the Dalian Development Zone in an eco-planning process for a 430 km² economic and technological development zone in Northeast China. He has also led the creation of an eco-industrial park project in this zone to help it meet the goals of the Provincial Circular Economy Plan. He is an advisor to the State EPA's Office of Economic Policy.

In Sri Lanka he was industrial ecologist working on an Asian Development Bank cleaner production project that included extensive work with industrial estates and a plan for development of two new ones.

In West Virginia Mr. Lowe led a team in a pre-feasibility study for an eco-industrial park whose aim is spurring local economic development based on value added production from forest, farm, and resource recovery sources.

In 1997-2000 he led development of the Sustainable New Town concept for *RPP International* and served as member of an international team seeking to apply this integrated approach to community development in China and the US. He also has been a member of planning teams for eco-industrial parks or estates in China, Philippines, Thailand, Sri Lanka, Oakland, Puerto Rico, and Baltimore and has continued IE-based strategic planning with Suntrain, an integrated transportation development venture. His work in Asia was with the Philippine Board of Investments and the Industrial Estate Authority of Thailand (the latter, on behalf of GTZ, a German overseas development organization). This work led to a contract with Asian Development Bank to revise and update Indigo's Eco-Industrial Park Handbook for use in Asian countries.

In 1996-7 other work by Mr. Lowe included a strategic review of Sasol Chemical Industries' ChemCity project in South Africa; planning of an eco-industrial park development in Northern California for the Economic Development Alliance for Business; and strategic planning with Sandia National Laboratory and Science Applications International Corporation on developing their industrial ecology research agendas and consulting practices. He served on the executive design team for a Prosperity Game on industrial ecology sponsored by Sandia and Los Alamos Labs.

Projects in 1994-5: research for the US Environmental Protection Agency to develop a handbook, guidelines and models for eco-industrial park development. He served as project manager and lead author of *Eco-industrial Parks: A Handbook for Local Development teams*. Mr. Lowe was also lead author of *The Source of Value, an executive briefing and sourcebook on industrial ecology* for the US EPA's Futures Group, released commercially as *Discovering Industrial Ecology*. In 2000 he updated and revised the Handbook for Asian economies for the Asian Development Bank's Environment Department. (Available at www.indigodev.com/Handbook.html.)

Director, Change Management Center, 1992-93: Consulting and R & D in industrial ecology and strategic environmental management. Applying experience in change management and organization design to the creation of strategies for sustainable industry and the evolution of the field of industrial ecology. Clients have included: SunTrain, Pacific Northwest Labs, Pacific Northwest Pollution Prevention Research Center, City of Berkeley, California Institute of Integral Studies, Sustainable Strategies Inc. and the Engineering Foundation.

Project Director and Research Associate, Change Management Network, Department of Engineering Management, Old Dominion University 1991: Co-leading design and implementation of this R&D project seeking to increase effectiveness of change in large corporations. Recruited Procter & Gamble, FMC, BellSouth, and Clorox as initial sponsors.

President and Senior Partner, Viable Systems International 1989-1991: Responsible for team building, marketing and development of consulting products in organization design and change management. Clients included Boeing, Hewlett Packard, Canadian Institute of Chartered Accountants, and Arcosanti (a laboratory of sustainable urban design).

Member, Founding Team, International Center for Organization Design 1990: Design and delivery of conferences devoted to synthesizing tools for large organization change. Presentations on Viable System Model linked with Socio-Technical Systems to support Total Quality Management.

Chairman, Global Advantage Corporation 1986-89: A business development company creating business plans for advanced entrepreneurial enterprises.

Social change consultant 1984-89: Fellow, Foundation for the Arts of Peace, 1985-1987 conducting seminars applying whole systems thinking to war, peace, and environmental issues. Fellow, Institute for Security and Cooperation in Outer Space, 1985 to 1988 developing strategies for implementing peaceful uses of space technology.

Free-lance writer, 1982-84: Co-author of *Diabetes: A Guide to Living Well*, a whole systems self-management handbook designed to empower diabetics to learn and follow medicine's most demanding regimen. Published by Chronimed Inc. (Now in third edition with John Wiley & Sons publisher)

Director, Community Learning division of Antioch University, Seattle 1979-1981: Founded the school's adult education program drawing from psychological, environmental, spiritual, and whole systems perspectives. Designed community programs on alternative community economics. Adjunct faculty teaching transpersonal counselling. Conference organizer designing holistic health, community economics, and alternative futures events.

Transpersonal counselor and seminar leader 1973-82: Working with intensive personal change processes in one-to-one and group settings.

Free-lance writer, producer, photographer, 1970-74: Work in this period included a major multi-media installation on California history at the Oakland Museum, research and writing on a

national series on fundamentalist religion at KQED, and photography of the human potential movement in California.

Writer, director, producer, KQED-TV 1965-69: Responsible for originating program ideas, organizing participants and crew, writing, research, interviewing and film and TV directing.

Freelance photographer and exhibition producer, 1965: Produced extensive multi-media exhibit on California farm workers at de Young Museum, San Francisco.

Program writer, producer, KPFA-FM, 1960-65: Research, interviewing, writing, editing, and technical assembly of radio documentaries, discussions, and dramas. Subjects included farm labor, labor history, urban and rural poverty, California history, and an early examination of the war in Southeast Asia (the latter beginning in 1963).

Publications

Lowe, Ernest A. and Geng Yong. 2003. *Industrial Ecology and Eco-Industrial Parks Handbook*. Chinese edition published by Chemical Industries Press, Beijing.

Lowe, Ernest A. 2001. *Eco-Industrial Handbook for Asian Developing Countries*. Prepared for the Environment Department, Asian Development Bank. (www.indigodev.com/Handbook.html)

Lowe, Ernest and Weber, Ivan. 2004. *Manure into Gold*, a strategic framework for manure management in Ontario. Prepared for the Centre for Research in Earth and Space Technology, Toronto, Canada. This strategic plan embeds the specific subject of manure management in the larger transition to sustainable farming in Ontario. <http://www.indigodev.com/crestech.htm>

Lowe, Ernest, Weber, Ivan, et al. 2003. *Spencer Eco-Industrial Park Report*. Completed under a grant from the US Economic Development Administration to the Mid-Ohio Valley Regional Council. This report includes strategies for regional initiatives in sustainable forestry and farming as well as recruitment candidates serving these areas for the EIP. http://www.indigodev.com/Spencer_EIP_Report.html

Lowe, Ernest A. 1999. *Industrial Ecosystems: Methods for Creating By-product Exchanges Among Companies*. A manual developed for the Philippine Board of Investments to support creation of an exchange among five industrial estates in Laguna Province.

Lowe, Ernest. 1999. "The Sustainable New Town" in a book edited by Charles Kibert, *Reshaping the Built Environment, Ecology, Ethics, and Economics*, Island Press, Washington DC. (Compiled and produced by the University of Florida, Center for Construction and the Environment.)

Lowe, Ernest, Moran, Stephen, and Holmes, Douglas. 1995. *Fieldbook for the Development of Eco-Industrial Parks*, prepared for U.S. EPA under a cooperative agreement with Research Triangle Institute. (Released by Indigo Development as *Eco-Industrial Parks, a handbook for local development teams*.)

Lowe, Ernest and Warren, John. *The Source of Value: an executive briefing and sourcebook on industrial ecology*. Prepared for U.S. EPA Futures Group under a cooperative agreement with Pacific Northwest Laboratory. (A Battelle Press trade edition of a revised text is Lowe, Ernest, Warren, John, and Moran, Stephen. 1997. *Discovering Industrial Ecology: an executive briefing and sourcebook*.)

Lowe, Ernest and Harris, Robert, "Taking Climate Change Seriously: British Petroleum's Business Strategy," *Corporate Environmental Strategy*, Winter, 1998, 5:2, pp 22-31. Troy, NY.

Ernest A. Lowe. 1997. *Regional Resource Recovery, and Eco-Industrial Parks: An Integrated Strategy*. Prepared for the Symposium, Verwertungsnetz Obersteiermark Innovation durch regionale Recycling-Netzwerke at Karl-Franzens-Universität Graz April 28-29, 1997. An RPP/Indigo Development Working Paper available at www.indigodev.com/Eipresrecov.html

Lowe, Ernest A. "Creating by-product resource exchanges: strategies for eco-industrial parks," *Journal of Cleaner Production*, 1997, Vol 5, Number 1-2. Elsevier Science, Oxford.

Lowe, Ernest, "Industrial Ecology: a context for design and decision," in *Design for Environment*, edited by Joseph Fiksel, McGraw Hill. New York. 1995.

Lowe, Ernest and Evans, Laurence, "Industrial ecology and industrial ecosystems," *Journal of Cleaner Production*, Vol 3, No 1-2, 1995. Oxford.

Lowe, Ernest, Industrial Ecology: implications for corporate strategy, *Journal of Corporate Environmental Strategy*, Summer 1994, Troy, NY.

Lowe, Ernest, Industrial Ecology, *Total Quality Environmental Management*, pp 73-85 Fall 1993, Executive Enterprises, NY.

Lowe, Ernest, *Applying Industrial Ecology*, 1993, a report of the Change Management Center. An exploration of business implications of IE and ways to implement IE concepts and tools in business organizations. (Produced for Engineering Foundation Pollution Prevention Pays conference, January 1993).

Lowe, Ernest, *Discovering Industrial Ecology*, 1992-93, Change Management Center publication circulated broadly as introduction to this field.

Clemson, Barry and Lowe, Ernest, Total Quality Management and Comprehensive Change, *Engineering Management J*, V 5, No 1, March 1993. (Best Paper Award at 1992 ASEM-IEEE Conference)

Clemson, Barry and Lowe, Ernest, Which Way to Rome: Choosing a Path for Change, *Engineering Management J*, V 5, No. 4, December, 1993.

Lowe, Ernest, Arsham, Gary. 1989, 1993, & 1997. *Diabetes: A Guide to Living Well*, Chronimed. (A systemic guide to learning all aspects of diabetes self-care, including gaining the willingness to follow a complex regimen) (Publisher now is the American Diabetes Association with a fourth edition Summer 2004.)

Presentations and Conference Planning

Eco-Industrial Development. Seminar on Environmental Science and Technology Parks in Taiwan, sponsored by Taiwan EPA and the Industrial Technology Research Institute. May 2004.

Eco-Industrial Development, Challenges and Opportunities, 2004 Conference: Eco City Development Experience Exchange, Yangzhou, China, April 2004.

Summary Closing Presentation, Eco-Industrial Estates Asia Network Conference, Bangkok, March 2004. Member of steering committee for workshop and conference planning.

Eco-Industrial Development in Asia, Industrial Symbiosis Seminar, Yale University School of Forestry and Environmental Management. January 2004.

Workshop on eco-industrial parks and eco-city planning at Dalian Development Zone, September 2002.

Presentation on Integrative Action Learning, at International Conference on Cleaner Production, organized by Tsinghua University, Beijing, September 2001.

Seminar on industrial ecology at Dalian University of Technology, School of Management, China, April 2001, July 2001.

Presenter and member of planning team in a one-day Conference and three-day Workshop on Eco-Industrial Development in Asia, Manila, April 2001, sponsored by United Nations Development Program, United Nations Environment Program, Philippine Board of Investments, and other organizations. (this was attended by participants from eleven Asian countries.)

Lead presenter of Eco-Industrial Park Seminar, November 1999, a three-day event in Manila, sponsored by Philippine Board of Investments, United Nations Development Program, and Chamber of Industrial Estates.

Opportunities in Eco-Industrial Development, a day-long seminar in Manila, June 1999, sponsored by Philippine Board of Investments.

The Sustainable New Town, Rinker Eminent Scholar Lecture Series on The Sustainable Built Environment, University of Florida, Gainesville, Florida, April 20, 1998.

Business Opportunities in Industrial Ecology, Industrial Ecology Retreat for Science Applications International Corporation, August 19-20, 1997.

Member of executive design team for an Industrial Ecology Prosperity Game organized by Sandia National Laboratory and staff member for the game.

Regional Resource Recovery, and Eco-Industrial Parks: An Integrated Strategy, presented at the Symposium, Verwertungsnetz Obersteiermark Innovation durch regionale Recycling-Netzwerke at Karl-Franzens-Universität Graz April 28-29, 1997

Presentations at the President's Council on Sustainable Development Eco-Industrial Park conference held in Cape Charles, VA, October 1996.

Presentation on eco-industrial parks at The First International Workshop of the Industrial Maturation Multiplier, Kalundborg, Denmark, May 29-June 1, 1996.

Industrial Ecology one day workshop at California Institute of Integral Studies, May 18, 1996. This course was organized as a role-playing exercise, with students in teams applying industrial ecology to development issues in a developing country.

Business Opportunities in Industrial Ecology: an executive briefing and workshop at Sandia National Laboratory, April 23, 1996.

Strategies for Development of Eco-Industrial Parks, presentation in the Industrial Park of the Future conference at University of California San Diego, May 5-6, 1995.

Presentations on eco-industrial parks and industrial ecology November 1994, February, and March 1995 to developers, economic development staff, city, state, and federal regulatory staff, and local businesses in Brownsville, Texas and Matamoros, Tamaulipas. (Support to local planning of an eco-industrial park in connection to the case study for US-EPA project Indigo Development did with Research Triangle Institute.)

Engineering Foundation Pollution Prevention Conferences January, 1993 and 1994: As a member of the design team Mr. Lowe developed the process for these week-long events as simulations of a corporation doing strategic planning to apply industrial ecology. He presented on industrial ecology and organized presentations of other presenters.

Eco-Expo Los Angeles 1994: Presentation on eco-industrial parks as part of panel on industrial ecology.

Workshop on industrial ecology at George Washington University, Continuing Education in Engineering. November, 1993.

Workshop on industrial ecology for Society of Logistics Engineers, November 1993.

Early introduction of industrial ecology concepts in seminars at US-EPA, May 1993.

Northwest Pollution Prevention Research Center, November 1992: A series of presentations on industrial ecology to corporate environmental officers, US-EPA staff, and environmental leaders in Seattle and Portland. Presentation on IE at Pacific Northwest Laboratory.

Organization Systems Design Conference, May 1992: Presentation on industrial ecology and its relationship to organizational design.

US-EPA Pollution Prevention Program, May 1992: Presentation on industrial ecology to P2 staff.

Goal QPC TQM Conference Fall, 1991: Presented on the Viable System Model and change management.

International Center for Organization Design 1990: Member of design team for two conferences on filling gaps in Total Quality Management and one on integration of methods for organization design and change management. Presented on the Viable System Model in all three.