

## MARIAN R. CHERTOW

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Yale School of the Environment

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### UNIVERSITY APPOINTMENTS

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- 1990-present **Yale University, School of the Environment (YSE)**  
Associate Professor, Industrial Environmental Management (2011-present; tenured)  
Associate Professor with term (2007-2011)  
Assistant Professor (2002-2007)  
Director, Center for Industrial Ecology (2019-present)  
Founder and Chair, Corporate Environmental Leadership Seminar (1992-2002)  
Director, Industrial Environmental Management Program (1991-present)  
Director, Program on Solid Waste Policy (1990-present)
- 2009-present **Yale University, School of Management**  
Associate Professor (secondary appointment)
- 2001-present **National University of Singapore, School of Design and Environment**  
Visiting Associate Professor for MSc in Environmental Management Programme
- 1995-1999 **Yale University, Center for Environmental Law and Policy**  
Director, Environmental Reform: The Next Generation Project, a multi-year collaboration between Yale Law School and YSE to look back at the first 25 years of U.S. environmental policy and look ahead to consider the next 25 years
- 1989-1990 **Yale University, Institution for Social and Policy Studies**  
Visiting Fellow

### PROFESSIONAL EXPERIENCE

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- 1988-1989 The United States Conference of Mayors, Senior Fellow
- 1986-1988 Connecticut Resources Recovery Authority  
President of \$1 billion state bonding authority for environmental infrastructure
- 1983-1986 Town of Windsor, Connecticut, Assistant Town Manager, Assistant to Town Manager
- 1981-1983 City and County of San Francisco, California, Financial Manager, Solid Waste Management Program and Assistant to the Chief Administrative Officer
- 1978-1979 Resource Recovery Systems, Inc. Essex, Connecticut  
Director of Marketing and Development for materials recycling firm

### EDUCATION

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- 2000 Ph.D. Environmental Studies, Yale University  
Thesis: *Accelerating the Commercialization of Environmental Technology in the US*
- 1981 MPPM – Master of Public and Private Management, Yale School of Management
- 1978 BA, *magna cum laude*, Barnard College, Columbia University

## CURRENT RESEARCH INTERESTS

Industrial Ecology and Energy	Networks of inter-firm resource exchange (industrial symbiosis) Multi-scale waste and materials management Industrial ecology in developing countries, circular economy
Business and Environment	Economic and environmental benefits of business co-location Technoeconomic analysis of paper and cardboard processing
Urban Systems and Waste	Sustainable and low-carbon cities, urban metabolism Robotics and recycling Quantifying and categorizing non-hazardous industrial waste
Environmental Technology	Interface of environmental and technology policy

**PUBLICATIONS** *71 peer-reviewed published papers, 55 are articles and 16 are book chapters*

*Google Scholar on 10-10-21: 8431 citations, h-index 30 and i10-index of 54.*

*Of my most cited publications in Google Scholar I am sole or first author of 9/10*

### **Published Books**

Adenle, A., **Chertow, M.**, Moors, E., Pannell, D. eds. (2020). *Science, Technology and Innovation for Sustainable Development Goals: Insights from Agriculture, Health, Environment and Energy*. Oxford University Press.

Singh, S., J., Haberl, H., **Chertow, M.**, Mirtl, M., and Schmid, M., eds. (2013). *Long Term Socio-Ecological Research: Studies in Society-Nature Interactions Across Spatial and Temporal Scales*. Springer. More than 25,000 chapter downloads.

**Chertow, M.**, and Esty, D., eds. (1997). *Thinking Ecologically: The Next Generation of Environmental Policy*, New Haven: Yale University Press. Chinese Translation 2004.

**Chertow, M.**, and Portlock, M. eds. (2001). *Developing Industrial Ecosystems: Approaches, Cases, and Tools*, New Haven: Yale School of Forestry and Environmental Studies Publication Series, Bulletin No. 106, 2001.

### **Peer-Reviewed Publications - Articles and Book Chapters**

#### **Manuscripts in Prep.**

Hakim, D.A., **M.Chertow**, K. Kanoka.D. Quaranta. Data-limited industrial symbiosis: Developing methodology and application from Morocco

Li, Xiao, D. Jiang, S. Guo, **M. Chertow**, Significant climate benefits from beneficial use of pre-consumer waste paper and paperboard in the United States.

#### **Articles**

- Chertow, M.**, K.S. Kanaoka, JY Park. (2021). Tracking the diffusion of industrial symbiosis scholarship using bibliometrics: Comparing across Web of Science, Scopus, and Google Scholar. *Journal of Industrial Ecology* 25(4):913-931. <https://doi.org/10.1111/jiec.13099>
- Chen, J., X. Li, K. Huang, M. Eckelman, **M. Chertow**, D. Jiang. (2021). Non-Hazardous Industrial Waste in the United States: 100 Million Tonnes of Recoverable Resources" *Resources, Conservation and Recycling* 167(2021)1-7. 105-369 <https://doi.org/10.1016/j.resconrec.2020.105369>
- Singh, S.J., M. Fischer-Kowalski, **M. Chertow**. (2020). The Metabolism of Islands. *Sustainability* 12, 9516. <https://doi.org/10.3390/su12229516>
- Makov, T., Shepon, J. Kronos, C. Gupta, and **M. Chertow**. (2020). Social and environmental analysis of food waste abatement via the peer-to-peer sharing economy. *Nature Communications* 11, 1156. <https://doi.org/10.1038/s41467-020-14899-5>
- Li, X., **M. Chertow**, S. Guo, E. Johnson, D. Jiang. (2020). Estimating non-hazardous industrial waste generation by sector, location, and year in the United States: A methodological framework and case example of spent foundry sand. *Waste Management* 118, 563-572. <https://doi.org/10.1016/j.wasman.2020.08.056>
- Chertow, M.**, T. Graedel, K. Kanaoka, J. Park. (2020). The Hawaiian Islands: Conceptualizing an Industrial Ecology Hierarchy, *Sustainability*, 12 (8), #3104. <https://doi.org/10.3390/SU12083104>
- Makov, T., T. Fishman, **M. Chertow**, and V. Blass. (2019). "What Affects the Secondhand Value of Smartphones: Evidence from eBay." *Journal of Industrial Ecology* 23 (3):549-559. <https://doi.org/10.1111/jiec.12806>
- Chertow, M.**, M. Gordon, P. Hirsch, and A. Ramaswami. (2019). "Industrial symbiosis potential and urban infrastructure capacity in Mysuru, India." *Environmental Research Letters* 14.7: 075003. [10.1088/1748-9326/ab20ed](https://doi.org/10.1088/1748-9326/ab20ed)
- Powell, J. T. and **M. Chertow**. (2019). "Quantity, Components, and Value of Waste Materials Landfilled in the United States." *Journal of Industrial Ecology* 23.2 (2019): 466-479. [10.1111/jiec.12752](https://doi.org/10.1111/jiec.12752)
- Zhu, J. and **M. Chertow**. (2019). Authoritarian but responsive: Local regulation of industrial energy efficiency in Jiangsu, China. *Regulation and Governance* 13(3):384-404. <https://doi.org/10.1111/rego.12172>
- Chertow, M.**, R. Lifset, T. Yang. (2018). "Industrial Ecology." Article in *Oxford Bibliographies in Ecology*. Ed. David Gibson. New York: Oxford University Press, 3-28.
- van Ewijk, S., J-Y Park, **M. Chertow**. (2018). Quantifying the system-wide recovery potential of waste in the global paper life cycle. *Resources, Conservation and Recycling*, 134, 48-60. <https://doi.org/10.1016/j.resconrec.2018.02.026>

- Powell, J. T., **M. Chertow**, D. C. Esty. (2018). Where is global waste management heading? An analysis of solid waste sector commitments from nationally-determined contributions. *Waste Management*, 80:137-143. <https://doi.org/10.1016/j.wasman.2018.09.008>
- Jiang, D., W-Q Chen, W. Liu, **M. Chertow**. (2017). Inter-Sector Bisphenol A (BPA) Flows in the 2012 Chinese Economy. *Environmental Science and Technology*, 51 (15), 8654-8662.
- Ramaswami, A., K.K. Tong, A. Fang, R. Lal, A. Nagpure, Yang Li, Huajun Yu, D. Jiang, A. Russell, L. Shi, **M. Chertow**, Y. Wang, S. Wang. (2017). Urban -Sector Actions for Carbon Mitigation with Local Health Co-Benefits in China. *Nature Climate Change*. 7 (10), 736-742. <https://doi.org/10.1038/nclimate3373>
- Shi, L. and **M. Chertow**. (2017). Organizational Boundary Change in Industrial Symbiosis: Revisiting the Guitang Group in China. *Sustainability* 9 (1085). <https://doi.org/10.3390/su9071085>
- Boons, F., **M. Chertow**; J. Park; W. Spekkink; H. Shi. (2017). Industrial Symbiosis Dynamics and the Problem of Equivalence: Proposal for a Comparative Framework. *Journal of Industrial Ecology*, 21(4), 938-952. <https://doi.org/10.1111/jiec.12468>
- Pearce, J.B.B. and **M. Chertow**. (2017). Scenarios for achieving absolute reductions in phosphorus consumption in Singapore. *Journal of Cleaner Production*. 140, 1587-1601. <https://doi.org/10.1016/j.jclepro.2016.09.199>
- Zhu, J. and **M. Chertow**. (2017). Business Strategy under Institutional Constraints: Evidence from China's Energy Efficiency Regulations. *Ecological Economics*. 135, 10-21. <https://doi.org/10.1016/j.ecolecon.2017.01.007>
- Guo, Y., J. Tian, **M. Chertow**, L. Chen. (2017). Exploring Greenhouse Gas-mitigation Strategies in Chinese Eco-Industrial Parks by Targeting Energy Infrastructure Stocks. *Journal of Industrial Ecology*. <https://doi.org/10.1021/acs.est.6b02837>
- Powell, J.T., J. Pons, **M. Chertow**. (2016). Waste Informatics: Establishing Characteristics of Contemporary U.S. Landfill Quantities and Practices. *Environmental Science and Technology*, 50 (20), 10877-10884 016. <https://doi.org/10.1021/acs.est.6b02848>
- Guo, Y., J. Tian, **M. Chertow**, L. Chen. (2016). Greenhouse Gas Mitigation in Chinese Eco-Industrial Parks by Targeting Energy Infrastructure: A Vintage Stock Model. *Environmental Science and Technology*. 50 (20):11403–11413. <https://doi.org/10.1021/acs.est.6b02837>
- Zhu, J. and **Chertow, M.** (2016). Greening Industrial Production through Waste Recovery: 'Comprehensive Utilization of Resources' in China. *Environmental Science and Technology*. 50 (5):2175–2182. <https://doi.org/10.1021/acs.est.5b05098>
- Flores, B., J. Zhu, Li Xiao, **M. Chertow**. (2015). Modeled Distribution of Industrial Solid Wastes in Qinhuangdao, China to Assess Reuse Opportunities. Elsevier: *Procedia Environmental Sciences*. Mianyang, China. Discontinued 2018.10pp.

Mannino, M., E. Ninka, M. Turvani, **M. Chertow**. (2015) The Decline of Eco-industrial Development in Porto Marghera, Italy. *Journal of Cleaner Production*.100, 286-296.  
<https://doi.org/10.1016/j.jclepro.2015.03.054>

Ramaswami, A., A. Russell, **M. Chertow**, R. Hollander, S. Tripathi, Shi Lei, S. Cui, A. Nagpure. (2014). International, Interdisciplinary Education on Sustainable Infrastructure and Sustainable Cities: Key Concepts and Skills. *The Bridge National Academy of Engineering*. 44(3):5-21 Fall.

Short, S, N. Bocken, C. Barlow, **M. Chertow**. (2014). From Refining Sugar to Growing Tomatoes: Industrial Ecology and Business Model Evolution. *Journal of Industrial Ecology*. 18(5): 603-618.  
<https://doi.org/10.1111/jiec.12171>

Park, J. and **M. Chertow**. (2014) Establishing and Testing the “Reuse Potential” Indicator for Managing Wastes as Resources, *Journal of Environmental Management*, 137:45-53.  
<https://doi.org/10.1016/j.jenvman.2013.11.053>

Eckelman, M. and **M. Chertow**. (2013). Life Cycle Energy and Environmental Benefits of a U.S. Industrial Symbiosis, *International Journal of Life Cycle Assessment*, 18:1524-1532, 2013.  
<https://doi.org/10.1007/s11367-013-0601-5>

Ramaswami, A, A. Chavez, and **M. Chertow**. (2012). Carbon Footprinting of Cities and Implications for Analysis of Urban Material and Energy Flows, *Journal of Industrial Ecology*, 16(5):783-785, 2012.  
<https://doi.org/10.1111/j.1530-9290.2012.00569.x>

Desai, A., N. Nassar, **M. Chertow**. (2012) American Seams: An Exploration of Hybrid Fast Fashion and Domestic Manufacturing Models in Relocalized Apparel Production, *Journal of Corporate Citizenship*, Issue 45, Spring 2012.

**Chertow, M.**, J. Ehrenfeld. (2012). Organizing Self-Organizing Systems: Toward a Theory of Industrial Symbiosis, *Journal of Industrial Ecology*, 16(1), 13-27. <https://doi.org/10.1111/j.1530-9290.2011.00450.x>

**Chertow, M.**, Y. Miyata. (2011). Assessing Collective Firm Behavior: Comparing Industrial Symbiosis with Possible Alternatives for Individual Companies in Oahu, Hawaii, *Business Strategy and the Environment*, 20(4), 266–280. <https://doi.org/10.1002/bse.694>

Eckelman, M., R. Ramaswamy, M. Shenoy, **M. Chertow**.(2010). Applying Industrial Ecology Tools to Demand-Side Water Management in Bangalore, India, *Asian Journal of Water, Environment and Pollution*, 7(4):71-79.

Bain, A., M. Shenoy, W. Ashton, **M. Chertow**. (2010). Industrial Symbiosis and Waste Recovery in an Indian Industrial Area, *Resources, Conservation and Recycling*, 54(12), 1278-1287.  
<https://doi.org/10.1016/j.resconrec.2010.04.007>

- Shi, H., **M. Chertow**, Y. Song. (2010). Developing Country Experience with Eco-Industrial Parks: A Case Study of the Tianjin Economic-Technological Development Area in China, *Journal of Cleaner Production*, 18(3), 191-199. <https://doi.org/10.1016/j.jclepro.2009.10.002>
- Eckelman, M., **M. Chertow**. (2009). Using Material Flow Analysis to Illuminate Long-Term Waste Management Solutions in Oahu, Hawai'i, U.S., *Journal of Industrial Ecology*, 13(5), 758-774.
- Chertow, M.** (2009). The Ecology of Recycling, *UN Chronicle*, Vol. XLVI (3-4), 56-59.
- Johnson, J, **M. Chertow**. (2009). Climate Stabilization Wedges in Action: A Systems Approach to Energy Sustainability for Hawaii Island, *Environmental Science and Technology*, 43(7), 2234–2240. <https://doi.org/10.1109/HICSS.2009.40>
- Eckelman, M., **M. Chertow**. (2009). Quantifying Life Cycle Environmental Benefits from the Reuse of Industrial Materials in Pennsylvania, *Environmental Science and Technology*, 43(7), 2550-2556. <https://doi.org/10.1021/es802345a>
- Chertow, M.**, W. Ashton, J. Espinosa. (2008). Industrial Symbiosis in Puerto Rico: Environmentally Related Agglomeration Economies, *Regional Studies*, 42(10), 1299-1312. <https://doi.org/10.1080/00343400701874123>
- Chertow, M.** (2007). Industrial Symbiosis, In: Cleveland, C. J., ed., *Encyclopedia of Earth* [online article]. Available from: <http://www.eoearth.org>, October 2007.
- Chertow, M.** (2007). Uncovering Industrial Symbiosis, *Journal of Industrial Ecology*, 11(1), 11-30. <https://doi.org/10.1162/jiec.2007.1110>
- Chertow, M.**, D.L. Lombardi. (2005). Quantifying Economic and Environmental Benefits of Co-located Firms, *Environmental Science and Technology*, 39(17), 6535 –6541. <https://doi.org/10.1021/es050050+>
- Deschenes, P.J., **M. Chertow**. (2004). An Island Approach to Industrial Ecology, *Journal of Environmental Planning and Management*, 47(2), 201-217. <https://doi.org/10.1080/0964056042000209102>
- Chertow, M.** (2004). Industrial Symbiosis, In: Cleveland, C. J., ed., *Encyclopedia of Energy*, Elsevier Academic Press 6:407-415.
- Chertow, M.** (2002). Pursuing Sustainable Solid Waste Management, *The Environmental Law Reporter*, 32(7), 10812-10821.
- Chertow, M.** (2001). The IPAT Equation and its Variants: Changing Views of Technology and Environmental Impact, *Journal of Industrial Ecology*, 4(4): 13-29, 2001. Selected for inclusion in four-volume reference set: *International Environmental Politics*, Ronald Mitchell, ed., Sage Publications, October 2008. <https://doi.org/10.1162/10881980052541927>

**Chertow, M.** (2000) Industrial Symbiosis: Literature and Taxonomy, *Annual Review of Energy and Environment*, 25, 313-337. <https://doi.org/10.1146/annurev.energy.25.1.313>

**Chertow, M.** (1998). The Eco-Industrial Park Model Reconsidered, *Journal of Industrial Ecology*, 2(3), 8-10. <https://doi.org/10.1162/jiec.1998.2.3.8>

**Chertow, M.** (1998). Waste, Industrial Ecology, and Sustainability, *Social Research*, Vol. 65(1), 31-53.

**Chertow, M., D. Esty.** (1997) Environmental Policy: The Next Generation, *Issues in Science and Technology*. 14(1), Fall.

**Chertow, M.**(1993). Environmental Pollution, *World Book Encyclopedia*, 10p feature article, 1993-2006.

**Chertow, M** and R, Lifset. 1990. The Politics of Product Bans. *The Environmental Forum* 7(2):12-14.

Lifset, R., **M. Chertow.** (1990). Changing the Waste Makers, *The American Prospect*, 83-88, Fall 1990.

### **Peer-Reviewed Book Chapters**

Ashton, W., **M. Chertow**, S. Althaf (2022). Industrial Symbiosis: Novel Supply Networks for the Circular Economy. Chapter in *Circular Economy Supply Chains – From Chains to Systems*. Eds. L. Bals, W. Tate, L. Ellram. Emerald, In Press.

**Chertow, M.**, K. Kanaoka, R. Miller, P. Berrill, P. Wolfram, N. Heeren, T. Fishman. (2020). The Systems Science of Industrial Ecology: Tools and Strategies Toward Meeting the Sustainable Development Goals. Chapter in *Science, Technology and Innovation for Sustainable Development Goals: Insights from Agriculture, Health, Environment and Energy*. Oxford University Press. Eds. A. Adenle et al. Ch. 8:148-173.

**Chertow, M.** and M. Gordon. (2019). Waste and Materials Management: From Harm Reduction to Value Creation. Chapter in *A Better Planet: Forty Big Ideas for a Sustainable Future*. D. Esty, ed. Yale University Press. Ch 27:250-265.

Chavez, A., C. Kennedy, B. Chen, **M. Chertow**, T. Baynes, S. Chen, X. Bai. (2018). Understanding, Implementing, and Tracking Urban Metabolism is Key to Urban Futures. Chapter in *The Urban Planet: Knowledge Towards Sustainable Cities*. Cambridge University Press. Eds. T. Elmqvist et al. Ch 3:68-91.

**Chertow, M.**, J. Zhu, and V. Moye. (2016). Positive Externalities in the Urban Boundary: the Case of Industrial Symbiosis. in *The Routledge Handbook of Urbanization and Global Environmental Change*. Eds. K. Seto, W. Solecki, and C. Griffith, eds. Routledge International Handbooks. Ch 31:18pp.

**Chertow, M.** and J. Y. Park. (2016). Scholarship and Practice in Industrial Symbiosis: 1989-2014. Chapter 5 in *Taking Stock of Industrial Ecology*. R. Clift and A. Druckman, eds. Springer DOI 10.1007/978-3-319-20571-7. [https://doi.org/10.1007/978-3-319-20571-7\\_5](https://doi.org/10.1007/978-3-319-20571-7_5)

**Chertow, M.,** W. Ashton, E. Fugate. (2013). The Intimacy of Human-Nature Interactions on Islands. *In: S. Singh, et al, eds., Long Term Socio-Ecological Research: Studies in Society-Nature Interactions Across Spatial and Temporal Scales.* Springer. Ch 14:315-337.

<https://doi.org/10.1007/978-94-007-1177-8>

**Chertow, M.,** E. Choi, and K. Lee. (2011). The material consumption of Singapore's economy: an industrial ecology approach *In: V. Savage and L.H. Lye, eds., Environment and Climate Change in Asia: Ecological Footprints and Green Prospects.* Pearson: Prentice Hall.Ch 5: 20pp.

**Chertow, M.,** J.Y. Park. (2011). Reusing Non-hazardous Industrial Waste Across Business Clusters, *In: T. Letcher, D. Vallero, eds., Waste: A Handbook for Management.* Elsevier, 2011, Updated for 2<sup>nd</sup> addition 2019. Ch 14:197-206. <https://doi.org/10.1016/B978-0-12-381475-3.10014-2>

**Chertow, M.,** W. Ashton. (2009). The Social Embeddedness of Industrial Symbiosis Linkages in Puerto Rican Industrial Regions, *In: F.A. Boons, J. Howard-Grenville, eds., The Social Embeddedness of Industrial Ecology.* Edward Elgar Publishers, Cheltenham, U.K., pp. 128-151.

**Chertow, M.** (2009). Dynamics of Geographically Based Industrial Ecosystems, *In: M. Ruth, B. Davidssdottir, eds., The Dynamics of Regions and Networks in Industrial Ecosystems,* Edward Elgar Publishers, Cheltenham, U.K., 6-30.

**Chertow, M.** (2008). Municipal Solid Waste: Building Stronger Connections to Jobs and the Economy, *In: J. Dernbach, ed., Agenda for a Sustainable America,* The Environmental Law Institute, Island Press.Ch. 22:335-349.

**Chertow, M.** (2008) Industrial Ecology in a Developing Context, *In: C. Clini, I. Musu, M. Gullino, eds., Sustainable Development and Environmental Management,* Springer Ch 16:301-314.

**Chertow, M.** (2003). Evaluating the Success of Eco-Industrial Development, *In: E. Cohen-Rosenthal, J. Musnikow, eds., Eco-Industrial Strategies: Unleashing Synergy between Economic Development and the Environment,* Greenleaf Publishing, 258-268.

Ehrenfeld, J., **M. Chertow.** (2002). Industrial Symbiosis: the Legacy of Kalundborg, *In: Ayers, R., L. Ayres eds., Handbook of Industrial Ecology,* Edward Elgar Publishers, 334-350.

Powers, C., **M. Chertow.** (1997). Industrial Ecology: Overcoming Policy Fragmentation, *In: Chertow, M., D. Esty, eds., Thinking Ecologically: The Next Generation of Environmental Policy,* Yale University Press, 19-36.

### **Conference Papers, Proceedings, Reports, Blogs, and Other Publications**

Krones, J., **M. Chertow,** X Li. Making up for Lost Time (and Space): Quantifying Non-hazardous Industrial Waste Generation in the US. Environmental Research and Education Foundation. December 2020.



Revellio, F., L. Shi, E.G. Hansen, **M. Chertow**. Sustainability Paradoxes for Product Modularity: the Case of Smartphones. Electronics Goes Green 2020+, Berlin, Germany, August 2020.

Mangan, A. and **M. Chertow**. Materials Management as Carbon Reduction Strategy. US Business Council for Sustainable Development, Blog Post. December 5, 2014.  
<http://usbcsd.org/2014/12/05/materials-management-as-carbon-reduction-strategy/>

**Chertow, M.** and J.Y. Park. Industrial Ecology and Greening Architecture, *KIRA: Korea Institute of Registered Architects*, November, 2014.

**Chertow, M.** Gains in Plain Sight: The Common Sense of Cooperative Resource Management, *Huffington Post*, May 16, 2012.

**Chertow, M.** Conserving Resources: The Case for Industrial Symbiosis in India. *Energy Manager: a quarterly magazine of the Society of Energy Engineers and Managers, India*, 2010.

Ashton, W. **M. Chertow, M. Shenoy**. Industrial Ecology – Developing Systemic Solutions to Climate Change and Other Environmental Challenges in Indian Industry, *Sustainability Tomorrow: Confederation of Indian Industries*, 4(4), 48-55, 2009.

Eckelman, M., **M. Chertow**. Linking Waste and Material Flows on the Island of Oahu, Hawaii: The Search for Sustainable Solutions. Sponsored by the Hawai'i Community Foundation. New Haven: Yale School of Forestry and Environmental Studies, Report Number 21. 2009.

**Chertow, M.** Resource Productivity and Material Flows: A View of Asian Circular Economies. *Proceedings of the Sustainability: Resources Circulation and Low Carbon Society Conference*, Osaka: Osaka University Research Institute for Sustainability Science (RISS). 2009.

Johnson, J., **M. Chertow**. A Systems Approach to Energy Sustainability in Hawai'i County. *Proceedings of the 42<sup>nd</sup> Annual Hawaii International Conference on System Sciences*, Oahu, HI. 2009.

Ashton, W., **M. Chertow**. *Puerto Rico's Industrial Legacy: Finding a Path to Sustainability*. Final Report of the Puerto Rico: An Island of Sustainability Project 2001-2008. New Haven: Yale School of Forestry and Environmental Studies. 2008.

**Chertow, M.**, W. Ashton. *Aligning Firm Competitiveness with Regional Sustainability*. New Haven: United Technologies Corporation. 2007.

**Chertow, M.** *Industrial Ecology in Asia: Barriers and Opportunities*. Manila: Asian Development Bank. 2007.

**Chertow, M.** Planning Eco-Industrial Parks: The Record So Far. *Proceedings of the 3rd International Conference on Circular Economy*, Tianjin, China. 2006.

**Chertow, M.** and D.R. Lombardi, Economic and Environmental Impacts from Industrial Symbiosis Exchanges: Guayama, Puerto Rico, *Rensselaer Working Papers in Economics* RPI, Economics Department 2004. 217 downloads

**Chertow, M.**, W. Ashton, R. Kuppalli. *The Industrial Symbiosis Research Symposium at Yale: Advancing the Study of Industry and Environment*. New Haven: Yale School of Forestry and Environmental Studies. Report Number 3, 2004.

**Chertow, M.**, W. Ashton, J. Espinosa and J. Guarnaccia. *Sustainable Industrial Development Model for Puerto Rico*. Washington, DC: Final Report EDA Project No. 01-79-07795, 53pp. 2004.

**Chertow, M.** Differentiating Industrial Complexes and Industrial Symbiosis. Economic Development and Industrial Symbiosis: Results from Puerto Rico. *Proceedings of the Association of American Geographers 2004 Annual Meeting*, March 15-17, Philadelphia. 2004.

**Chertow, M.** Industrial Symbiosis: Building a Framework for Economic Development Planning. *Proceedings of the Fifth International Conference on EcoBalance*, Tsukuba, Japan. 2002.

**Chertow, M.** The 'Gap' in Commercializing Environmental Technology. *American Association for the Advancement of Science Annual Meeting*, San Francisco. 2001.

**Chertow, M.** Industrial Symbiosis: A Multi-Firm Approach to Sustainability. *Greening of Industry Network Conference*, November 15, Chapel Hill: University of North Carolina. 1999.

**Chertow, M.** Industrial Ecology at Yale. *Conference Proceedings of the Third Industrial Ecology Seminar and Workshop*, October 15-16. Trondheim: Norwegian Academy of Technological Sciences. 1998.

**Chertow, M.** CalRecovery, Inc, Waste Prevention in New York City: Analysis and Strategy, *New York City Solid Waste Management Plan*. 1992.

**Chertow, M.** Garbage Solutions: A Public Official's Guide to Recycling and Alternative Solid Waste Management Technologies. The United States Conference of Mayors, 1989.

### **Congressional Testimony**

U.S. House of Representatives Committee Hearing on the DeLauro-Lowey Water Pollution Control and Estuary Restoration Financing Act, **Testimony of Marian R. Chertow** before the Subcommittee on Water Resources of the Committee on Public Works and Transportation, Oct. 13, 1992.

U.S. House of Representatives Hearing on Municipal Waste Recycling, **Testimony of Marian R. Chertow**, before the Subcommittee on Transportation and Hazardous Materials, Energy and Commerce Committee, Washington D.C. July 12, 1989.

U.S. Senate Testimony, **Statement of Marian R. Chertow**, President, Connecticut Resources Recovery Authority, before the Subcommittee on Hazardous Waste and Toxic Substances of the Committee on Environment and Public Works, Washington, D.C., December 3, 1987.

**RESEARCH FUNDING: GRANTS, GIFTS AND CONTRACTS |TOTAL AMOUNT~\$5.7 million**

- 2021-2022 Additive Manufacturer Green Trade Association – Principal Investigator with Dr. Yuan Yao, YSE. “Sustainability of Additive Manufacturing Research Fund.” Gift of \$100,000 to Center for Industrial Ecology.
- 2021-2022 Pratt and Whitney – Principal Investigator. “Advance Scholarly Activity in Industrial Ecology.” \$75,000 gift.
- 2019-2023 U.S. National Science Foundation – Sub-Project Principal Investigator with Co-PD/PI Dr. Barbara Reck at YSE. Lead PI is Dr. Berke Calli at Worcester Polytech. YSE FW-HTF-RL: Collaborative Research: “Shared Autonomy for the Dull, Dirty, and Dangerous: Exploring Division of Labor for Humans and Robots to Transform the Recycling Sorting Industry.” CMMI-1928448. Total grant \$2.5 million, Yale PI is Dr. Aaron Dollar. Co-PI share \$420,000.
- 2020-2021 REMADE INSTITUTE – Co-Principal Investigator. “A Dynamic Technoeconomic Systems Modeling Framework for U.S. Fiber Recycling.” Sub award No: 60057665 YALE Co-PI w/ subcontract with Lead PI Dr. Eric Masanet, Northwestern University. Co-PI share is \$98,402.
- 2019-2021 UTC/Pratt and Whitney – Principal Investigator. “Advance Scholarly Activity in Industrial Ecology.” \$100,000 gift.
- 2019-2020 MacMillan Center Faculty Research Grants –Principal Investigator. “Small State Self-Determination to Achieve Social and Economic Stability: Rwanda and Local Industrial Development.” \$18,000.
- 2018-2020 Sloan Foundation and the Environmental Law Institute – Consortium of Research Groups Yale Co-Principal Investigator. Energy and Environmental Impacts of the Digital Economy Grant Program: “Uncovering the Structure and Dynamics of the Sharing Economy: Evidence from a Food Sharing Platform.” \$35,000.
- 2017-2021 U.S. National Science Foundation – Principal Investigator. “Reusing Non-Hazardous Industrial Waste in the U.S.: A Geo-Specific Estimate of Quantities and Benefits.” CBET-1706097. \$300,000. Sub-award to Dr. Daqian Jiang at Montana Tech.
- 2016-2018 Environmental Research and Education Foundation – Principal Investigator, "Making up for Lost Time (and Space): Quantifying Non-hazardous Industrial Waste Output and Beneficial Use Opportunities in the US." \$150,000.

- 2013-2017 Ellen MacArthur Foundation – Principal Investigator, Schmidt-MacArthur Fellowship on Circular Economy. \$44,600 (Year 1); \$44,600 (Year 2); \$32,000 (Year 3).
- 2014-2016 Sobotka Research Fund – Principal Investigator. “The Power of Information: Bringing to Scale an Industrial Symbiosis Database to Address Market Inefficiency in Resource Reuse among Industrial Firms.” \$14,000.
- 2012-2018 U.S. National Science Foundation – Co-principal Investigator, PIRE Award. “Developing Low-Carbon Cities in the USA, China and India Through Inter-Disciplinary Integration Across Engineering, Environmental Sciences, Social Sciences and Public Health.” C150995. Total grant – \$4.45 million; Lead PI – Dr. Anu Ramaswami, U. of Minnesota. Yale Co-PI portion - \$712,535.
- 2012-2015 U.S. National Science Foundation – SEES Fellow/Post-doctoral Mentor. “Re-localization and Sustainability - Linking Industrial and Political Ecology on Molokai and the Big Island, Hawaii.” PI: Anjali Gupta. \$382,944.
- 2011-2016 U.S. National Science Foundation – Co-principal Investigator, RCN Award, “Sustainable Cities - People, Infrastructures and the Energy-Climate-Water Nexus.” C150993. Total grant \$750,000, Lead PI – Dr. Anu Ramaswami, University of Colorado Denver. Co-PI share \$25,000.
- 2010-2011 The Japan Foundation, Center for Global Partnership – Principal Investigator. “Island Industrial Ecology and Sustainability.” C140303. \$60,000.
- 2010-2017 Pratt and Whitney – Principal Investigator. Self-directed environmental research. \$175,000.
- 2009-2013 U.S. National Science Foundation – Principal Investigator. Co-PI Dr. Karen Seto - YSE. ULTRA-Ex Award. “Human-Nature Interactions in an Urbanized Island Setting: Hilo and Kailua-Kona, Hawai‘i as a Model Socio-Ecological Systems.” C137866. \$145,416.
- 2009-2013 Ministry of National Development, Singapore with National University of Singapore – Yale Principal Investigator. “Planning and Development for Sustainable High Density Living: Urban Metabolism Studies.” C143933. \$300,000.
- 2009 Great Wall Enterprises, Beijing, China – Principal Investigator. “Circular Economy Plan for Tianjin Economic-Technological Development Area.” \$20,000.
- 2008-2011 Rice Family Foundation Asia Environmental Fund – Principal Investigator. “Industrial Ecology in Developing Countries.” \$200,000.
- 2008-2009 Hawai‘i Community Foundation – Principal Investigator. “Waste and Material Flows on Oahu: An Industrial Ecology Approach.” \$87,720.

- 2007 Contract award from United Technologies Corporation. Director. "Firm Competitiveness and Regional Sustainability." \$9,000.
- 2007-2009 Private donor support for start-up of the "Program on Industrial Ecology in Developing Countries." Director. \$140,000.
- 2007 Yale McMillan Center for International and Area Studies Faculty Research Grant. Principal Investigator. "Spontaneity and Central Planning: Organizing Industry in China." \$5,000.
- 2006 Yale Hixon Center for Urban Ecology Award (with Ph.D student H. Shi). "Patterns of Household Water and Electricity Consumption and their Underlying Determining Factors in Beijing." \$4,800.
- 2005 The Kohala Center, to support industrial ecology field research Spring 2006 for eight researchers in Hawaii, (with A. Grubler and T. Graedel). \$18,000.
- 2004-2005 National Science Foundation Education Grant, supplemental to "Multilevel Cycles, Models, and Scenarios for Iron Alloying Elements led by Prof Tom Graedel." Puerto Rico supplemental project funded with PI - \$29,921.
- 2004 State Environmental Protection Administration, China – Principal Investigator (with Dan Esty). Award for 12-day environmental executive training program for director generals. \$180,350.
- 2001-2006 Henry Luce Foundation – Co-principal Investigator with Reid Lifset and Dr. Thomas Graedel for "Collaborative Industrial Ecology in Asia." \$1.2 million.
- 2003 Support for Industrial Symbiosis Research Symposium. Principal Investigator. Coca-Cola World Fund, \$5000 and Windmar Associates, \$5,000.
- 2002-2004 US Economic Development Administration with Luis Munoz Marin Foundation, Project # 01-79-07795 – Co-principal investigator. "Sustainable Industrial Development Model for Puerto Rico." \$75,600.
- 2002 Banco Popular – Principal Investigator. "Puerto Rico: An Island of Sustainability." \$25,000.
- 2001 Luis Munoz Marin Foundation– Principal Investigator. "Puerto Rico: An Island of Sustainability." \$50,000.
- 1995-1999 Environmental Reform: The Next Generation Project- a collaboration with YSL and the Center for Environmental Law and Policy. Director of project that raised \$750,000 total including the following: Avina Foundation, Geraldine R. Dodge Foundation, GE Fund, German Marshall Fund, The Energy Foundation, Hughes Foundation, the Kendall Foundation, and the McKnight Foundation.

1991-1993 US Marine Corps on Recycling Planning at Quantico, Virginia, Twenty-Nine Palms, California, and Okinawa, Japan – Principal Investigator. \$30,000.

## **AWARDS AND RECOGNITION**

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2020-2021 Selected by the Council of Canadian Academies to serve as a member of an Expert Panel investigating “Circular Economy in Canada.”

2020 Invited to speak at two G20 meetings in June and July 2020 – first on Waste Management and Climate Change and second on Resource Efficiency and Circular Business Models

2019 Awarded highest recognition of the International Society for Industrial Ecology, the Society Prize, for “outstanding contributions to the field of industrial ecology.” July  
Inducted into the Connecticut Women’s Hall of Fame, November 4.

2018-Present Selected for Board of Directors of TerraCycle U.S. Inc.

2016-2017 Selected by the National Academies for Committee to Review EPA’s “Science to Achieve Results” Research Grants Program.

2015 Selected by US EPA as the representative of the U.S. at the launch of the G7 Alliance for Resource Efficiency in Berlin, Germany

2014 Distinguished Visitors Program-Corona Chair, Universidad de los Andes School of Management, Bogota, Colombia

2013-2014 President of the International Society for Industrial Ecology (elected to two-year term)

2010-2012 Appointed by US EPA Administrator to the National Advisory Council for Environmental Policy and Technology (NACEPT)

2000-2007 Appointed by Speaker of the Connecticut House to the Founding Advisory Board of the Connecticut Clean Energy Fund

2000 Won Clyde O. Fisher Award, Connecticut Bar Association, Environmental Law Section

1999-2000 Teresa Heinz Scholar for Environmental Research

1997 Environmental Merit Award. U.S. Environmental Protection Agency – Region 1

1993-2000 Appointed by Governor to the Connecticut Council for Environmental Quality

1981-1983 Presidential Management Intern

1980-1981 HEW Fellowship (tuition plus stipend), Yale SOM

## **SELECTED PRESENTATIONS**

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### ***Invited Talks and Seminars to 2021***

Sept 15, 2021 *Increasing Business Efficiency and Community through Industrial Symbiosis*  
Biomes Annual Lecture Series – Yale School of the Environment

June 30, 2021 *Industrial Ecology and Industrial Symbiosis Closing the Loops*  
Yale Young Global Scholars Online

June 21, 2021 *Roundtable Chair: Circular Economy and the Future of Industrial Ecology* IE Day:  
24 hour global virtual conference by the International Society for Industrial Ecology

- June 18, 2021 *Industrial Ecosystems - Implementing Circularity at Commercial Scale*  
25<sup>th</sup> Annual Green Chemistry and Engineering Conference
- June 5, 2021 *Ecosystems and Industrial Ecosystems*. Tata Steel World Environment Day Mumbai, India (Online)
- Mar 30, 2021 *Re-Start 360: Industrial Ecology and the Circular Economy*  
University of Victoria, British Columbia, Canada
- Mar 8, 2021 *Waste, Reuse, and Industrial Symbiosis: Closing Material Loops*  
Connecticut College
- Oct 28, 2020 *Increasing Business Efficiency and Community through Industrial Symbiosis*  
Yale Alumni Association Webinar – Climate Change Conversations
- Oct 7, 2020 *Eco-Industrial Parks and Circular Economy*  
World Bank Panel on Circular Economy and Private Sector Development (Online)
- Aug 18, 2020 *Could Waste be a Valuable Resource? A Virtual Panel on Industrial Symbiosis*  
NATURE x DESIGN A TeaLeaves Virtual Festival – Overall audience: 800
- Aug 8, 2020 *Theorizing for Circular Economy: Broadening our Sight of Organizations and Resources*. Academy of Management
- July 1, 2020 *Resource Efficiency and Circular Business Models*  
G20 Climate Stewardship Working Group Workshop: Circular Carbon Economy
- June 20, 2020 *Waste Management and Climate Change*  
G20 Workshop-Synergy between Adaptation and Mitigation
- June 5, 2020 *Pathways to a Sustainable Future*  
World Environment Day panel in partnership with the United Nations Institute for Training and Research (UNITAR) and Yale Environmental Dialogue
- Oct 21, 2019 *Industrial Ecology: Closing the Loops around Circular Economy and the Sustainable Development Goals*. CEID Colombia XII Congreso Internacional, Bogota, Colombia
- July 20, 2019 *Industrial Ecology and Island Sustainability*  
Yale Educational Travel Andean Highlands, Ecuador.
- July 6, 2019 *Transformations: Industrial Symbiosis Development and Waste Reduction in Industry and Cities*. 16<sup>th</sup> Annual Industrial Symbiosis Research Symposium, Beijing, China
- Apr 17, 2019 *Circular Economy and Industrial Ecology: Closing the Loops along the Value Chain Series: Elements of Sustainability*. University of Michigan - Erb Institute and Dow
- Jan 20, 2019 *Industrial Ecology and the Circular Economy – Closing the Loops*  
National University of Singapore, School of Design and Environment
- Jan 11, 2019 *Industrial Ecology: Closing the Loop*  
Yangon Winter School – LJM Center, Myanmar
- Oct 30, 2018 *Historical Contributions of Industrial Ecology and Industrial Symbiosis to Green Transformations* The 15<sup>th</sup> Annual Industrial Symbiosis Research Symposium  
Tecnológico de Costa Rica (TEC)
- Jun 14, 2018 *Food and Industrial Symbiosis: Scales of Circularity*

- The International Conference on Circular Economy for Agri-Food Resource Management, Seoul National University, Korea
- Dec 18, 2017 *International Experience with Eco-Industrial Parks and Industrial Symbiosis: Emergence, Development and Outcomes*  
International Forum on Sustainable Solutions for New Era of Ecological Civilization, Tsinghua University, China
- Nov 20, 2017 *Carbon Neutral Landscapes: Building Strategies in a Model Socio-Ecological System*  
University of Hawaii.
- Oct 24, 2017 *Small Islands and Resource Use*  
Workshop on Sustaining Small Islands in the Context of Global Environmental Change, Waterloo University, Ontario, Canada
- May 9, 2017 *Developing Low-Carbon and Sustainable Cities in the US, China, and India*  
*Workshop on Waste Management, Waste Reuse and Industrial Symbiosis in Indian Cities.* Bangalore, India
- Mar 17, 2017 *Industrial Ecology: Closing the Loop. Sustainability Across Disciplines Conference*  
Concordia University, Montreal, Canada
- Feb 17, 2017 *Industrial Symbiosis Dynamics and the Problem of Equivalence*  
Strategic Management and Public Policy George Washington University
- Oct 21, 2016 *Emergence and Development of Industrial Symbiosis: Inter-firm Resource Sharing Across the Globe,* Erb Institute, University of Michigan
- Jun 29, 2016 *Industry Trends – How will Cities Plan for the Future?*  
Deloitte Global Think Tank, New Haven, Connecticut
- Jun 19, 2016 *Improving Industrial Systems: The Contribution of Industrial Ecology to Innovation in the Business Sector.* (Plenary Session) Gordon Research Conference on Industrial Ecology, Stowe, VT
- Feb 16, 2016 *Industrial Symbiosis and Materials Management: Physical Resource Sharing Among Proximate Firms* (Plenary Session)  
The Minerals Metals and Materials Society (TMS), Nashville, TN
- Oct 29, 2015 *Comparative Analysis in Industrial Symbiosis: Local to Global*  
G7 Alliance for Resource Efficiency Workshop on Industrial Symbiosis  
Birmingham, UK
- Oct 2, 2015 *Promoting Resource Efficiency: Contextualizing Research and Innovation*  
G7 Alliance for Resource Efficiency (launch) Berlin, Germany
- Jul 8, 2015 *Industrial Symbiosis Dynamics: Empirical Studies of Three Different Dynamic Types*  
International Society for Industrial Ecology, University of Surrey
- Feb 4-17, 2015 *Environment and Economy from Bangkok to Bali*  
Yale Educational Travel (Southeast Asia)
- Oct 27, 2014 *China: Where Planetary Boundaries Meet Unprecedented Economic Growth*  
Yale Center Beijing Opening Conference, Beijing, China



- Oct 18, 2014 *Environment, Sustainability, and Competitive Advantage*, SOM Reunion Lecture
- Jul 10, 2014 *Industrial Ecology, Industrial Symbiosis, and Opportunities for Urban Intervention*  
NSF PIRE – Sustainable and Low Carbon Cities Summer School Tsinghua  
University, Beijing, China
- May 7, 2014 *Integrating Industrial Ecology and Applied Sustainability with Resilience Thinking*  
Resilience 2014, Montpellier, France
- Feb 19, 2014 *Powers of Ten: Industrial Symbiosis and Urban Agglomeration*  
Yale School of Architecture
- Feb 7, 2014 *Organizing Self-Organizing Systems: Material, Energy, and Industrial Ecology*  
Universidad de los Andes School of Management, Bogota, Colombia,
- Jul 1, 2013 *Two Decades of Industrial Ecology: Growing an Interdisciplinary Environmental  
Field*. Seoul National University, Seoul, Korea
- Jun 28, 2013 *Historical Material Flows in Hawaii over 200 Years: A Theory of Material  
Succession*. 7<sup>th</sup> Conference of the International Society for Industrial Ecology  
Ulsan, Korea
- May 24, 2013 *Yale, New England, and the Founding of Modern Hawai'i*  
Yale Alumni Reunions
- Feb 20, 2013 *Industrial Symbiosis and Urban Agglomeration*  
Harvard Graduate School of Design, Cambridge, MA
- Feb 13, 2013 US Congress - *Briefing on Electronic Waste with American Chemical Society*
- Dec 10, 2012 *Two Decades of Industrial Ecology: From Oxymoron to Interdisciplinary Field*  
State University of New York, College of Environmental Science and Forestry
- Oct 21, 2012 *Industrial Ecology, ISIE, and the Competition for Resources*. Tsinghua University –  
ISIE-Asia Pacific, Beijing, China
- Oct 19, 2012 *Industrial Symbiosis: Planning vs Self Organization?*  
9th Annual Industrial Symbiosis Research Symposium  
TEDA Industrial Park – Tianjin, China
- Oct 3, 2012 *Setting the Stage: Outlook on Sustainability of Resources*  
UBS Q Series® Inflection Points: Toward Sustainability Conference Bloomberg  
Center, New York, NY
- Sep 11-12, 2012 Two talks: *New Solutions to Waste Management and Shaping the Circular Economy*  
*World Economic Forum, Tianjin, China*
- Feb 25, 2012 *Comparing Socio-Ecological Change over 200 Years in Two Urban Systems in  
Hawai'i, Symposium 11 – The Ultra-Ex Network*. The American Association of  
Geographers, New York, NY
- Jan 26, 2012 *Designing Sustainable Products and Processes*. Soundwaters Stamford, Connecticut
- Dec 28, 2011 *Industrial Symbiosis: Resource Sharing across Business Clusters*  
University of Tel Aviv, Israel,
- Dec 15, 2011 *Industrial Ecology in Asia: Why Waste Waste?* National University of Singapore

- Aug 10, 2011 *Material Flows and Land Use Change in Two Urban Areas of Hawai'i Island*  
Ecological Society of America, Austin, Texas
- Jun 9, 2011 *A Behavioral Economics View of Industrial Symbiosis*  
International Society of Industrial Ecology, Berkeley, California
- Feb 21, 2011 *China, Rare Earth Elements and the Quest for Resources*  
Yale – China Social Science Seminar
- Jul 20, 2010 *Approaching Modern China*  
Association of Yale Alumni, Tsinghua University, Department of Environmental  
Science and Engineering, Beijing, China
- Jun 23, 2010 *Upcycling, Waste, and Industrial Ecology*  
Singularity University, NASA-Ames Research Center, Moffett Field, California
- May 14, 2010 *Collective Environmental Advantage: Toward a Theory of Industrial Symbiosis*  
Alliance for Research on Corporate Sustainability (ARCS)  
Harvard Business School
- Apr 28, 2010 *Industrial Symbiosis: A Global Review of Research and Progress*  
Linköping University, Sweden
- Aug 9, 2009 *Industrial Symbiosis: Collective Action for Sustainable Material and Energy Use*  
Academy of Management Annual Meeting All Academy Workshop: Toward a  
Research Agenda for Industrial Symbiosis in Organizational Studies, Chicago, Ill
- Jul 29, 2009 *The 20th Birthday of Industrial Ecology: Insights from the Study of Material and  
Energy Flows.* Fellows Lecture, Pratt and Whitney
- Jul 22, 2009 *Resource Productivity and Material Flows: A View of Asian Circular Economies*  
Research Institute for Sustainability Science (RISS), Osaka University
- Jun 22, 2009 *Billions and Billions: Sustainable Management of Non-Hazardous Industrial  
Waste.* International Society for Industrial Ecology, Lisbon, Portugal
- Apr 29, 2009 *A Systematic Methodology for Eco-industrial Development.* American Planning  
Association National Conference, Minneapolis, Minnesota
- Mar 21, 2009 *Asian Economic Power and Environment.* Yale Redpath Seminar on the Future of  
Asia, San Francisco, California
- Feb 23, 2009 *Urban Metabolism and the City.* Workshop on Sustainable High Density Cities,  
National University of Singapore, School of Design and Environment, Singapore

### **Selected Academic Conference Presentations**

- 2019 International Society for Industrial Ecology, Tsinghua University, Beijing, China
- 2018 The Int'l Conference on Circular Economy for Agri-Food Resource Management, Seoul, Korea
- 2018 15<sup>th</sup> Annual Industrial Symbiosis Research Symposium, Cartago, Costa Rica
- 2017 International Society for Industrial Ecology, Chicago, Illinois, USA
- 2016 ISIE Americas, Bogota, Colombia
- 2015 International Society for Industrial Ecology, Surrey, U.K.

- 2014 Gordon Research Conference on Industrial Ecology, June
- 2014 Resilience Conference, Montpellier, France
- 2014 International Society of Ecological Economics
- 2013 International Society for Industrial Ecology, Ulsan, Korea
- 2012 Association of American Geographers, New York, New York, USA
- 2011 International Society for Industrial Ecology, Berkeley, California, USA
- 2011 Ecological Society of America
- 2011 Urban India Conference, Mysore, India
- 2010 Alliance for Research on Corporate Sustainability, Harvard Business School
- 2010 International Society for Industrial Ecology – Asia Pacific
- 2009 Sustainability: Resources Circulation and Low Carbon Society, Osaka University Research
- 2009 Institute for Sustainability Science, Japan
- 2009 International Society of Industrial Ecology, Lisbon, Portugal
- 2009 Academy of Management Annual Meeting, Chicago, Illinois, USA
- 2007 International Society for Industrial Ecology, Toronto, Canada
- 2006 Gordon Research Conference on Industrial Ecology, Oxford, U.K.
- 2006 Expert Meeting, Toyo University, Center for Regional Industrial Symbiosis, Japan 3rd International Conference on Circular Economy, Tianjin, China
- 2005 International Society for Industrial Ecology, Stockholm, Sweden
- 2005 MIT Building Technology Lecture, Cambridge, Massachusetts, USA.  
Can You Plan Industrial Ecosystems?
- 2004 The Industrial Symbiosis Research Symposium at Yale: Advancing the Study of Industry and Environment, New Haven, Connecticut, USA
- 2004 Association of American Geographers 2004 Annual Meeting, Philadelphia, Pennsylvania, USA
- 2003 NSF Sponsored Symposium on Sustainable Industrial Development, University of Southern California, Los Angeles, California, USA
- 2003 International Society of Industrial Ecology, University of Michigan, Ann Arbor, Michigan, USA
- 2002 Gordon Research Conference on Industrial Ecology, Holderness, New Hampshire
- 2002 Fifth International Conference on EcoBalance, Tsukuba, Japan
- 2001 Between Invention and Innovation: Mapping the Funding for Early Stage, Technology-based Innovation. Kennedy School of Government, Harvard University
- International Society for Industrial Ecology, Leiden, The Netherlands
- American Association for the Advancement of Science (AAAS) Annual Meeting, Washington DC
- 1999 Greening of Industry Network Conference, UNC-Chapel Hill
- 3<sup>rd</sup> Industrial Ecology Seminar and Workshop, NTNU, Trondheim, Norway
- 1998 Linking Industrial Ecology to Public Policy. NSF-sponsored Workshop, White House Conference Center, Washington DC

### **Universities Visited**

#### **International Universities**

- |   |   |
|---|---|
| TU Delft, The Netherlands                                       | TERI University School of Advanced Studies, India |
| Tsinghua University, Beijing, China                             | Lund University, Sweden                           |
| Nanjing University, Nanjing, China                              |   |
| Central Party School, Beijing, China (group visiting New Haven) | University of Tel Aviv, Israel                    |
| Linköping University, Sweden                                    | National University of Singapore                  |
| Osaka University, Japan   | Seoul National University, Korea                  |
|   | University of the Andes, Bogota, Colombia         |

Concordia University, Montreal, Canada  
Waterloo University, Ontario, Canada  
Tecnológico de Costa Rica (TEC)

**American Universities**

Carnegie Mellon University  
Cornell University  
MIT (3 talks)  
Harvard (3)  
RPI (3)  
University of North Carolina at Chapel Hill  
University of Tulsa School of Law  
Pace University  
University of Minnesota (3)  
Washington State University

University of Victoria, British Columbia, Canada  
University of Surrey

University of Southern Maine  
Rice University  
Dartmouth College  
University of Puerto Rico  
University of Hawaii  
State University of New York -  
College of Environmental Science and Forestry  
University of Michigan  
George Washington University  
Connecticut College

**Selected Presentations to Civic and Practitioner Groups**

2020 Branford Forum  
2019 Whitney Center  
2018 Air and Waste Management Association  
2018 National Council for Science and the Environment (NCSE)  
2017 Yale Sustainability Leadership Forum  
All-China Youth Federation  
2016 US Business Council for Sustainable Development  
GE – Fairfield, CT  
Tata North America  
2015 World Business Council for Sustainable Development  
2013 US Congress – Briefing with American Chemical Society  
2012 UBS Bank  
World Economic Forum (2 talks)  
2010 Singularity University  
Environment and Sustainable Development Leadership Program for Chinese public officials  
2009 American Planning Association  
Pratt and Whitney  
2008 Executive Environmental Sustainability Forum, Tuck School of Business  
Young Presidents' Organization  
United Nations Environment Programme - North American Workshop on Sustainable  
Consumption and Production  
State of Karnataka Pollution Control Board, Bangalore, India  
2007 International Symposium on Circular Economy, Chinese Ministry of Information Industry, Beijing  
China Development Forum, Tianjin, China  
Asian Development Bank, Manila, Philippines  
2006 Canadian Pollution Prevention Roundtable  
The Kohala Center, Hawaii Island  
Kawasaki International Business Forum, Japan  
2005 Brown Forman Company, Louisville, Kentucky  
Byproducts Beneficial Use Summit, US Environmental Protection Agency  
North Dakota Department of Commerce  
Yale-BP Seminar on Urbanization

- 2004 Puerto Rico Manufacturers Association Board of Directors
- 2003 Jepsen and Jessen EHS Group, Malaysia
- 2000 The Brookings Institution Seminar on Science and Technology Policy
- 1999 National Research Summit on Environmental Management Systems  
US Environmental Protection Agency
- 1998 New York Academy of Sciences  
White House Regional Conference - Implementing an Action Plan for a Sustainable  
New England  
Environmental Protection Agency Region 10
- 1997 AT&T Bell Labs  
United Nations Development Programme Manila, Philippines
- 1996 Environmental Law Institute Board of Directors Retreat  
General Electric EHS Managers
- 1989 The Chautauqua Institution, Chautauqua, New York

## **SYNERGISTIC PROFESSIONAL AND SCIENTIFIC MEETINGS**

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### **The Industrial Symbiosis Research Symposium – Founder and co-convener of annual meeting**

- 2019 Hosted by Tsinghua University, Beijing, July 5-6.
- 2018 Hosted by Tecnológico de Costa Rica (TEC), Cartago, Costa Rica, Oct 30-31.
- 2017 Hosted by Illinois Institute of Technology, Chicago, Ill. June 24.
- 2016 Hosted by Devens Enterprise Commission, Devens, Mass. June 17-18.
- 2014 Hosted by Australian Industrial Ecology Association, November 25.
- 2015 Hosted by Lausanne University, Switzerland, July 5-6.
- 2012 Hosted by Tianjin Economic and Technological Development Area (TEDA), October 19-20.
- 2013 Hosted by Ulsan University, Korea, June 23-24.
- 2011 Hosted by Yale University, San Francisco, California, June 5-6.
- 2010 Hosted by Tsinghua University, Chinese Academy of Science, Ulsan University, Korea, and the  
National Institute for Environmental Studies in Japan; Kawasaki, Japan, November 5-6.
- 2009 Hosted by Industrial Symbiosis Institute, Kalundborg, Denmark, June 18-20.
- 2008 Hosted by Devens Enterprise Commission, Devens, Mass. August 15-17.
- 2007 Hosted by Dalhousie University at University of Toronto, June 11.
- 2006 Hosted by National Industrial Symbiosis Programme, Birmingham, UK, August 5-6.
- 2005 Sponsored by the Nordic Council of Ministers and hosted by Lund University, Roskilde  
University and the Norwegian University. of Science and Technology, Stockholm, June 11.
- 2004 Hosted by Yale School of Forestry and Environmental Studies, January 7-9.

### **Additional Meetings – Invited participant, moderator, section leader**

- 2020 ISIE Americas, Lima, Peru
- 2017 Resources Optimization Initiative, Bangalore, India
- 2016 ICLEI South Asia, Delhi
- 2015 Yale Symposium on Chinese Overseas Investment and its Environmental and Social Impacts,  
April

- 2014 How Do Leaders Advance Sustainability in Complex Organizations? Yale Insights - Moderator  
 2013 Rio+20 to 2015: A New Architecture for a Sustainable New World – Cities Panel Moderator  
 2011 Association of Chinese Students and Scholars at Yale, April 23-24, 2011.  
 2010 Urban Metabolism Workshop, MIT School of Architecture, January 13-14.  
 2009 Individual Consumption and Systemic Social Transformation, Sustainable Consumption Research and Action Network (SCORAI), Clark University, October 15-17.  
 2008 Corporate Environmental Indicator Workshop, Yale Center for Environmental Law and Policy, December 9-10.  
 2005 Yale Conference on Climate Change: From Science to Action, Aspen, Colorado October 6-8.  
 2003 Economic and Social Research Council, Oxford University, “Democratic Governance of Technological Change in an Era of Globalization,” Lisbon, Portugal, February 23-25.  
 1999 National Town Meeting for a Sustainable America, Detroit, Michigan, May 2-5.  
 1998 BP’s Washington Environmental Forum, Washington, D.C., July 13.  
 1995 White House Conference on Environmental Technology, Washington D.C., December

## TEACHING

### Yale Graduate Teaching \*\*\*\*

2000-2019	YSE/MGT*	<i>Corporate Environmental Management and Strategy</i> Course director except 3 years without data: Sp 2005, Fall 2009, Fall 2010. Taught Sp 2000-2008, Fall 2011-2019
1997-2020	YSE/MGT	<i>Industrial Ecology</i> Co-director/collaborator Sp 1997-Sp 2015 with T. Graedel as lead. Director since Fall 2016. Did not teach Spring 2013 or Fall 2018. Others from the Center for Industrial Ecology teach some classes based on expertise.
Sp 2021	YSE	<i>Advanced Industrial Ecology Seminar: Industrial Symbiosis Value Creation through Data and Resource Sharing</i> Course Director
Sp 2017 Sp 2018	YSE	<i>Waste and Materials Management: Fundamentals and Frontiers</i> Course Director
Sp 2014	YSE	<i>Advanced Industrial Ecology Seminar: Dynamics of Industrial Symbiosis</i> (Director with J. Park)
2013	YSE	<i>Seminar on Interdisciplinarity in Environmental Research</i> Co-Director with C. Gupta
Sp 2012	YSE	FES/MGT Seminar on Energy Industries and Technologies (with Director W. Ellis)
2011, 2013, 2014	YSE	<i>Field Experience in Industrial Operations</i> (Course Director) 1-credit course
Sp 2010, Sp 2011	YSE/MGT	<i>Seminar on Business Strategy and Industrial Ecology</i> (Course Director)
Fall 2009, 2010	YSE/MGT/ENVE**	<i>Greening Business Operations</i> (Co-Director)
Sp 2008, 2009	YSE	<i>Seminar on Industrial Ecology in Developing Countries</i> Course Director

Fall 2007	YSE/MGT/ENVE	<i>Greening Business Operations (Co-Director)</i>
Sp 2006	YSE	<i>Seminar on Industrial Ecology and the Circular Economy in China (Course Director)</i>
Fall 2004	YSE	<i>Greening the Industrial Facility (Co-Directors)</i>
Fall 2003	YSE/ENAS***	<i>Seminar on the Environmental Aspects of Emerging Technologies (Co-director with T. Graedel)</i>
Fall 1995	YSE/LAW/MGT	<i>Environmental Policy: the Next Generation Seminar (Co-directed with D. Esty)</i>
1993-2006	YSE/MGT	<i>Business Concepts for Environmental Managers (Course Director with L. Schiffres, W. Ellis and other colleagues) Taught Sp 1993-1999, Sp 2001 and Fall 2002, 2003, 2005, 2006</i>
Fall 1992	YSE	<i>Seminar on Society and Natural Resources (Assisted Course Director W. Burch)</i>
Sp 1990- 1995	YSE	<i>Multiple Aspects of Solid Waste Management (Course Director)</i>

\* Cross Listed with SOM

\*\* Cross Listed with Environmental Engineering

\*\*\* Cross Listed with Engineering and Applied Science

\*\*\*\* Additional information is available from Yale University teaching records

### **Teaching-Related Field Study**

Since its founding YSE has been dedicated to field work. The Industrial Environmental Management Program/Center for Industrial Ecology, in turn, has actively organized class field work and projects to support the teaching program. Over 200 industrial ecology students have completed field study projects in New Haven, East Coast states, and beyond, including class-sponsored field work in Puerto Rico and Hawaii over 10 years of study in these two venues. Greening Business Operations had four company field visits per semester and Corporate Environmental Management and Strategy has had one-two visits per year. A one-credit course offered in 2011, 2013, and 2014 was dedicated to field visits. These have included industrial plants that have produced: electricity from waste and hydrogen fuel cells, helicopters, jet engines, packaging, powdered metals, pharmaceuticals, ultrasonics, food, office supply distribution, and many other industries.

### **Guest Lectures in Yale Undergraduate and Graduate Courses**

Advanced Studio, Yale Architecture School; Introduction to Environmental Studies; Environmental Politics; Environmental Aspects of the Technological Society; Designing the Eco-City; Science and Politics of the Environment; Creating Science Narratives for Solutions; Seminar on Multi-Scale Industrial Ecology; Qualitative Research Methods; Introduction to Environmental Engineering; Ecological Urbanism: New Approaches to Urban Ecology and City Planning; Natural Development: Toward Creation of a Code; Yale College Urban Studies Colloquium; Building Science Networks for Climate Solutions; Sustainable Development Goals and Implementation; YSE Writing Workshop

### **Training and Executive Education**

- 2016- 2019 Yale Sustainability Leadership Forum, Yale Sustainability Accelerator
- 2015-2016 Yale Sustainability Accelerator
- 2014-2019 Faculty, Yale Executive MBA – Sustainability – semester long course at Yale SOM
- 2010-2011 Faculty, Environment and Sustainable Development Leadership Program (for Chinese public officials) summer program in New Haven.
- 2006-2008 Faculty, The Energy Research Institute (TERI) School of Advanced Studies (New Delhi, India) summer program in New Haven.
- 2004 Organized and chaired 12-day Executive Course for Chinese State Environmental Protection Administration (SEPA) Director Generals at Yale.
- 2004 Co-organized a workshop on the teaching of industrial ecology in Beijing at Tsinghua University attended by 50 professors from 35 Chinese universities with funding from the Henry Luce Foundation. This workshop led to the creation of a listserv among the professors and the initiation of numerous new courses in industrial ecology in China.
- 1992-2002 Initiated and co-chaired The Corporate Environmental Leadership Seminar at Yale School of Forestry and Environmental Studies, a 2-week training course for global environmental executives.
- 2002 Sustainable Development Leadership Program, Aetna School of Management, Shanghai Jiao Tong University, Shanghai, China, May 5-11.
- 2000 Faculty, Sustainable Development Leadership Program – Nanjing, China

### **Teaching and Training External to Yale University**

- 2019 Yangon Winter School, Myanmar - 2 week course, January
- 2016 PIRE Winter School, China and India – 3 week course, January
- 2015 World Business Council for Sustainable Development, Geneva, Switzerland GNAM Week – 2 sessions Creating Shared Value, Industrial Ecology and Business Strategy
- 2014 PIRE Summer School, Tsinghua University - 5 week course, July
- 2013 PIRE Summer School, IIT Kanpur, India - 6 week course, June
- 2012 INSEAD (Course Instructor) - Environmental Management in a Global Economy, June
- 2010 Singularity University NASA-Ames Campus, California (Faculty) - Upcycling Program, June-August
- 2010 Linköping University, Sweden (Visitor) - to assist with planning world's first doctoral program in Industrial Symbiosis, April
- 2005, 2006 Singapore Ministry of Environment and Water Resources (Faculty) - Environmental Management Executive Programme, August
- 2004, 2005 Venice International University (Faculty) - Advanced Training Program on Environmental Management and Sustainable Development, November and June



2001-present National University of Singapore (Visiting Associate Professor) - Business and Environment – teach core course in MEM curriculum for 20 years

Industrial Ecology Training Sessions: United Nations Development Programme; Intertec; US Environmental Protection Agency; National Recycling Coalition; Brown Forman Company; Connecticut Department of Environmental Protection, Tata North America

**Academic Doctoral Service- External to Yale University**

2021 Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna (BOKU), Doctoral Dissertation Reviewer

2021 Lausanne University, Switzerland, Faculty of Geosciences and Environmental Studies, Doctoral Defense Jury 2021

2016 Erasmus University, The Netherlands - Doctoral Defense

2016 MIT, Cambridge, Massachusetts – Served on doctoral committee and participated on the defense

2015 TU Delft, The Netherlands - Doctoral Defense

2013 State University of New York, College of Environmental Science and Forestry, Syracuse  
Served on doctoral committee

2003 International Institute for Industrial Environmental Economics, Lund University, Sweden  
Opponent for defense of doctoral dissertation, September.

**ACADEMIC ADVISING**

**Completed Doctoral Dissertations – Doctoral Advisor and Committee Chair**

**T. Reed Miller, May 2021. E&AS** “Environmental Assessments of Capital-Intensive Product Systems.” Now- Post-doctoral Fellow, Yale Center for Environmental Law and Policy.

**Tamar Makov, October 2019.** “The Environmental Implications of Reuse: Three Circular Consumption Models.”  
Now-Assistant Professor, Faculty of Business and Management, Ben-Gurion University, Israel.

**Jon Powell, May 2018. E&AS** “Enabling and Enhancing Sustainable Materials Management through Waste Informatics.” Now Executive Director at Closed Loop Partners, Chicago, USA.

**Gabriel Grant, December 2017.** “A Self-determined Pursuit of Personal, Organizational, and Planetary Flourishing.” Founder of Human Partners.

**Bin Bin Jiang Pearce, March 2015.** “Phosphorus Cycles in Urban Systems and Implications for Sustainable Urban Resource Management.”  
Now- Senior Scientist at Swiss Federal Institute of Technology Zurich (ETH Zürich).

**Jooyoung Park, October 2012.** “Wastes as Resources: The Case of Coal Combustion By-products in the United States.” Assistant Professor, School of Management, University of the Andes, Bogota, Colombia. Now Associate Professor, Graduate School of Energy and Environment, Korea University.

**Shi Han, October 2009.** “Industrial Symbiosis from the Perspectives of Transaction Cost Economics and Institutional Theory.”

Assistant Professor, City University, Hong Kong. Now government consultant.

**Weslyne Ashton, March 2008** “Coordinated Resource Management in Regional Industrial Ecosystems.” Now - Associate Professor, Stewart School of Business, Illinois Institute of Technology.

**Completed Doctoral Dissertations – Doctoral Committee and/or Reader**

**Timothy Terway, April 2018.** "Sustained in Signs With(out) Context and Ourselves: Expert Environmental Knowledge and 'Social-Ecological Systems'" *Reader*. Now Knowledge Architect and Community Ambassador, The Vermont Center for Geographic Information.

**Yitian Wang, August 2013.** “The Emergence of Domestic Carbon Trading in China: Institutional Development and International Influences.” *Doctoral Committee, Reader*.

Now Assistant Professor, Fudan University, China - International Studies.

**Angel Hsu, April 2013.** “Advancing Data-Driven Environmental Decision-Making and Governance in China.” *Reader*, Assistant Professor, Yale-NUS, Singapore. Now Assistant Professor of Public Policy at University of North Carolina - Chapel Hill

**Jennifer Baka, August 2012.** “Biofuels and Marginal Lands: An Interdisciplinary Examination of Jatropha Biodiesel Promotion in Tamil Nadu, India” *Doctoral Committee and Reader*. Assistant Professor, London School of Economics. Now Assistant Professor, Department of Geography Penn State University

**Matthew Eckelman, December 2009.** “Production and Costs, Recycling and Loss: Modeling Energy and Environmental Impacts of Global Material Systems” *Doctoral Committee and Reader*. Professor, Northeastern University.

**Anastasia O’Rourke, March 2009.** “The Emergence of Cleantech: Essays in Venture Capital Investments, Funds and Frames” *Doctoral Committee and Reader*. Now - Managing Director at the Carbon Containment Lab, Yale University.

**Tao Wang, November 2007.** “Forging the Anthropogenic Iron Cycle” *Doctoral Committee and Reader*. Ritsumeikan University, China.

**Ermelinda Harper, March 2007** “Multi-Level Approach to Historical Material Flow Analysis: Tungsten as a Case Study” *Doctoral Committee and Reader*

**Robert Klee, March 2005.** “Material Flow Analysis of Industrial Systems in Antarctica” *Reader*, former Commissioner, Connecticut Department of Energy and Environmental Protection. Now - Lecturer, Yale School of the Environment.

**Current Chair of Doctoral Committee**

<b>Name</b>	<b>Affiliation</b>	<b>Graduation</b>
Matthew Gordon	YSE	2022-2023 (Expected)
Koichi Kanaoka	YSE	2023-2024 (Expected)
Alyssa Menz	YSE	2026-2027 (Expected)

**Post Doctoral Scholars: Dates shown with previous university affiliation**

2020-present	Stijn van Ewijk, University College London – REMADE and Industrial Ecology- <i>Accepted position ladder track position at University College London 2022</i>
2018- 20	Xiao Li, Tsinghua University – NSF funded projects – PIRE and NHIW grants
2016-18	Jonathan Krones, MIT – EREF funded project – industrial processes and waste <i>Assistant Professor Position at Boston College</i>
2013-16	Junming Zhu, University of Maryland – NSF funded PIRE project – low carbon cities <i>Associate Professor at Tsinghua University School of Public Policy and Management</i>
2015-2017	Daqian Jiang, Assistant Professor, University of Minnesota, now <i>Assistant Professor at University of Alabama, Department of Civil, Construction and Environmental Eng.</i>
2012-15	Clare Gupta, University of California – Berkeley – NSF funded SEES Fellow <i>Cooperative Extension Assistant Specialist in Public Policy</i>
2012-14	Jooyoung Park, Yale University – Resource-based vs. waste-based paradigm (see above)
2012-13	Jennifer Baka, Yale University, Interdisciplinary studies (see above)
2008	Megha Shenoy, Indian Institute of Science, Industrial ecology in developing countries
2006	Ilda Mannino, Venice International University, <i>Industrial symbiosis in Porto Marghera</i> <i>Scientific Coordinator, Venice International University</i>
2005	Zengwei Yuan, Nanjing University, Comparing industrial symbiosis in US and China <i>Professor and President Lishui Institute of Ecology and Environment, Nanjing Univ</i>
2004-05	Rachel Lombardi, Yale School of Engineering, Industrial environmental management <i>Director of Business Development, International Synergies, Ltd.</i>

**Supervision of Masters Projects/Independent Study/Selected Advisees at YSE** (partial list)

2021	E-Waste Business Model (Shubhra Verma MEM 2021); YC Senior Thesis – industrial symbiosis and food (Amanda Zhang)
2019	Prospects of Industrial Symbiosis in Singapore (Xueyin Tong, MEM)
2016-2017	Evaluating the Greenhouse Gas Impacts of Public Transit: A Life Cycle Assessment of NYC Transit Options (Michael Cox MEdSc 2017)

- 2015-2016 Comparing Design Results of the European Passivhaus Standard with the Climate-Specific PHIUS+ 2015 Passive House Standard – North America (Stephanie Johns MEdSc 2016).
- 2014-2015 Desalination financial model (Michael Warrady, MEM/MBA 2017),  
Input-Output analysis for industrial symbiosis (Brendan Edgerton MEM/MBA 2015)
- 2013-2014 Stranded Assets: an analysis of Bloomberg’s carbon risk valuation tool (Tyler Van Leeuwen, SOM)  
Sustainable apparel production (Annie Barry YC 2014).
- 2012-2013 Industrial Symbiosis Potential: A Case Study at Qinhuangdao City in China (Rui He, MEdSc)  
Social-environmental monitoring framework (SEMF) for Small Island Tourist Economies (SITE): Case Studies in Lana’i (USA), St John (USVI) and Fernando de Noronha’s (Brazil)
- 2011-2012 Industrial Symbiosis in the Chinese Solar Industry (Zhouwei Diao, MEdSc);  
By-Product Exchanges in the Suzhou Industrial Park (Ran Tao, MEM);  
Advancing Sustainable Apparel Production in the US (Anuj Desai, MEM);  
Hawaii Energy Sustainability Projects: Bryant Cannon – Hawai’i Island Energy Sustainability Plan: Legal and Regulatory Context;  
Christina Dietrich - Case Studies and Best Practices;  
Erin Gill – Hawaii Island: Energy Sustainability Decision Framework;
- 2010-2011 “Building Deconstruction in New Haven, Connecticut: A Systems Dynamics Analysis and Policy Tool” (Thomas Chase, MEdSc);  
“Reframing Energy Efficiency Policies to Better Reduce Absolute Energy Consumption: A Case Study of Refrigerators” (Alyssa Go, MEdSc);  
“Tree Water: Case Study on Green Entrepreneurship” Casey Pickett, (MEM/MBA)
- 2009-2010 Recycling in Singapore’s construction industry (Huijia Phua MEM);  
Industrial symbiosis in Chile’s mining industry (Aislinn Affinito MEM);  
Carbon free desalination of water (JF Thye MEM/MBA);  
State of waste-to-energy technologies (Adrian Horotan MEM);  
Linking industrial symbiosis with landscape ecology (Mona Yang MEM);  
Historical trends and forecasting of energy efficiency (Alyssa Go MEM);  
Material recovery opportunities in Hawaii (Francisco Espinoza MEM);  
Analysis of Point of Use/Point of Entry water treatment market (Catherine Manzo MEM/MBA)
- 2008-2009 Quantification of by-product reuse and industrial symbiosis in India (Ariana Bain MEM);  
International best practices in eco-industrial development (Fengyuan Wang MEM);  
Improving industrial waste reuse and recycling in Pennsylvania (Tara Parthasarathy MEM)
- 2007-2008 Industrial symbiosis database research (Michael Davies MEM);  
Energy service companies (Eric Roberts MEM/MBA);  
Responsible purchasing guide for carpet sector (Colleen Sullivan MEM);  
Uncovering industrial symbiosis in Pennsylvania (Jamie Spivey MEM);  
Uncovering industrial symbiosis in Delaware (Korinti Recalde MEM);  
Performance data for water company operations (Tingting Quan MEM);  
Valuing environmental amenities in large scale development (Christopher Clement MEM/MBA); Policy analysis of micro grid options in Hawaii (Dan Leistra MEM/MBA);  
Are green purchases a complement or substitute to charity? (Duncan Cheung 5-Year Program);

- Environmental impacts of surface coal mining (Edan Rotenberg MEM/ JD YLS);  
 Long-term investments in wastewater treatment (Koichi Kurisu MBA);  
 Lifecycle assessment of ceramic vs. biodegradable plates (Mita Broca TERI)
- 2006-2007 Commercialization strategies for rural cookstoves (Amanda Cowan MEM);  
 Opportunities for the use of biofuel pellets in India (Dawn Lippert MEM);  
 Power generation and pollution scenarios in Hong Kong (Matt Malone MEM);  
 Lifecycle assessment of recycling vs. disposal of plastics (Sarah Percy MEM)
- 2005-2006 Quantifying the benefits of industrial symbiosis in Hawaii (Yuko Miyata MEM);  
 Development of the aquaculture industry in New Haven (Konstantine Drakonakis MEM)
- 2004-2005 Voluntary PC recycling in Thailand (Chikako Fujita MEM)
- 2003-2004 Quantification of industrial symbiosis benefits in the rum industry (Suzette Carty, MEM);  
 Climate change and the insurance industry (Elizabeth Martin MEM);  
 Industrial parks in Tongzhou District, Beijing (Xue Wang MEM) Also YC Senior Thesis -  
 Kalundborg,, Denmark Industrial Ecosystem (Alanya Schofield)
- 2002-2003 Elements of corporate environmental strategy (Andrew Winston MEM);  
 Dataset of former US military properties with residual risk (Martha Walters MEM);  
 Corporate practices and urban development (Veda Truesdale MEM);  
 Aral Sea environmental and political history (Alexander Gritsinin MEM);  
 Participation in eco-industrial networks in pharmaceutical manufacturing (Weslyne Ashton MEd) Also – YC Senior Thesis – Waste-to-Energy (Miriam Seifter)
- 2001-2002 Study of the development of fuel cells (Marni Rapoport MEM/SOM); Climate change  
 action plan for City of New Haven (Madeleine Weil MEM); Industrial ecology of  
 packaging foam (Kensuke Fuse MEM)
- 2000-2001 Industrial ecology and public policy (Curtis Robinhold MEM/SOM);  
 Business plan for a new national park (Heather Cabrera MEM);  
 Solid waste management in Bhutan (Karma Kunzang Chhimi MEM);  
 Redefining the environmental industry (Mari Morikawa MEM);  
 On-site study of BP's emissions trading program (Michael Terrell MEM)

## **UNIVERSITY SERVICE**

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### **YSE Committees**

Masters Admissions Committee; Doctoral Admissions Committee; Doctoral Program Committee;  
 Centennial Capital Campaign Committee; Gender Committee; Student Affairs Committee; Faculty  
 Development Committee; Facility Siting and Design Committee; Environmental Stewardship Committee  
 (Chair for 2 years); Diversity Committee; Strategic Planning Committees, Masters Program Committee.

### **Other YSE Service**

Coordinator of the Memorandum of Understanding (MOU) and programs with the National University of  
 Singapore since 2001, Faculty Search Committees; Manager for Moore Foundation Grant for final two  
 years 2014-2016; Managed grant from Ellen MacArthur Foundation, U.K. to support a student fellowship

– 5 years, Coordinator, co-ordinator of Yale/Rwanda program; Co-lead Specialization on Business and Environment with Bradford Gentry.

### **Service to Other Professional Schools and Programs at Yale**

**School of Management:** Secondary faculty appointment at SOM. Active involvement with the jointly sponsored Center for Business and Environment at Yale since its start-up in 2007. Taught in Executive MBA in Sustainability from 2014 – 2019 teaching E-MBA course Corporate Environmental Management and Strategy.

**Law School:** From 1995-1999, Director of a joint program between the Law School and YSE titled “Environmental Reform: the Next Generation Project” with Professor Dan Esty. Involved convening multiple sessions with policy experts at Yale, production of a book, and a 10-city tour to present findings to academic, civic and business groups. For 2015, 2017 appointed YLS Professor (Adjunct).

**Yale Institute for Biospheric Studies (YIBS) and Yale Climate and Energy Institute (YCEI):** Presenter and participant. Accompanied faculty from YIBS for environmental conference in Djibouti, Africa 2015.

**Institution for Social and Policy Studies:** Social Science Workshop on Contemporary China.

**MacMillan Center:** Council on Africa – appointed 2018

**Office of Sustainability:** From 2017-2019 I served on a university-wide committee through the Office of Sustainability on the implementation of a Pay-as-You-Throw waste management program within Yale including the pilot study.

### **Other Service to Yale**

Faculty Standards Review Committee – appointed 2018

**Office of International Affairs:** Contributed to committees within the Secretary’s Office concerning Framework 2.0 for the Internationalization of Yale and to several meetings on Singapore and China initiatives. Attended sessions with Presidents of Chinese universities, Indian Parliamentarians, and the Indian Minister of Education.

**President’s Council on International Activities:** Presentation on industrial ecology; group discussion with India section on future direction.

Yale-NUS – Served on a successful search committee at Yale-NUS; hiring completed in March, 2021  
Also served on two promotional reviews at other universities

### **Selected Presentations for Yale**

The MacMillan Report: *Marian Chertow talks about industrial ecology and symbiosis in the developing world* – Yale Podcasts –1/22/20;

Yale Alumni Association Webinar – Climate Change Conversations - *Increasing Business Efficiency and Community through Industrial Symbiosis*;

Industrial Ecology and Industrial Symbiosis: Closing the Loops -Yale Young Global Scholars 7/1/20, 6/30/21  
Faculty leader for AYA trips 2008, 2010, 2015, 2016, 2017. 2018. 2019.

## **SELECTED MEDIA**

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- 2021 Feature - *Economic Times of India* - Industrial symbiosis saves the environment and India is a world leader in such sustainability (June 2021)
- 2021 Featured in *Forbes* - The Round Trip: Innovation and Circular Economic Thinking (March)
- 2020 *Axios* – The fraught future of recycling (Feb 2020)
- 2019 *Mother Jones* (Aug 2019), *EnergyWire* (October 2019), *Honolulu Civil Beat* (October 2019), *Dow- University of Michigan Podcast* (April 2019), *New Haven Business* (Nov 2019), *Connecticut Magazine* (Dec 2019)
- 2018 *National Public Radio Takeaway; NBC News, Voice of America, Sage Press, The Weather Channel, Waterbury Republican* – the Chinese import ban on waste.
- 2017 *Corporate Knights* – “Industrial Symbiosis” by L. Childress, Fall Issue.
- 2017 *The Hill* – “Trump has a great opportunity to save our environment”–multiple authors. Jan 23
- 2016 *The Hartford Courant*–“State, Hartford Pondering Future of Trash-To-Energy Plant” April 25
- 2013 *FuturArc* –The Voice of Green Architecture in Asia. Interview with Marian Chertow. July-August 2013/Volume 31.
- 2012 *International Innovation*. Yale Center for Industrial Ecology and Int’l Society for Industrial Ecology – Four Presidents.
- 2010 *SWE* – Magazine of the Society of Women Engineers, “Industrial Ecology: Moving beyond Traditional Engineering Borders.”
- 2009 New Hampshire Public Radio Interview. Available from: <http://www.nhpr.org/node/26421>
- 2007 YSE Podcast: Why Waste Waste? (20,000 downloads).
- 2005 *Environmental Science and Technology* news section– “Quantifying Industrial Symbiosis”
- 1999 *Science*: “Turning Engineers into Resource Accountants”
- 1998 On-line Forum leader for the *American Scientist* “Is Combustion of Plastics Desirable?”

Additional mentions in: *Fortune, Wall Street Journal, New York Times, Big Island Chronicle, Puerto Rico Business, Huffington Post* and *New Haven Register*.

Articles or reviews about *Thinking Ecologically: The Next Generation of Environmental Policy* appeared in more than 30 journals and media including *Issues in Science and Technology, Ecology, The Environmental Forum, The Economist, The Futurist, Fordham Environmental Law Journal, Journal of Environment and Development* and *the Journal of Economic Literature*.

## **PROFESSIONAL SERVICE**

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### **Professional and Advisory Boards and Committees**

- 2021-Present World Bank Group Global Influencer Barometer Panel
- 2018-2019 Scientific Advisory Board, Int’l Society of Industrial Ecology Biennial Conference – Beijing, China

2018-Present Council on Africa at the Yale MacMillan Center for International and Area Studies.  
 2015-2016 Co-Chair and Advisor to first ISIE Americas Meeting – Bogota, Colombia  
 2015-2016 Immediate Past President, The International Society for Industrial Ecology  
 2012-2013 Advisory Board, Governor’s Task Force on Recycling Modernization, Connecticut  
 2012-Present International Science Board for MAB Reserve in Samothraki, Greece  
 2011-Present Alliance for Research on Corporate Sustainability (ARCS) Board of Directors  
 2010-Present Ingersoll Rand\* External Advisory Council for the Center for Energy Efficiency and Sustainability (\* renamed as Trane Technologies, Inc. as of March 2020)  
 2010-2012 Advisory Board Member, Int’l Society of Industrial Ecology Asia-Pacific Meeting  
 2009-2012 Duke Energy, Energy and Environment Thought Leaders Council (appointed by Chairman and CEO)  
 2008-2011 Senior Scientific Advisor, Iron Ventures  
 Council of the International Society for Industrial Ecology  
 2007-2013 Advisory Board, Soltage, Inc.- solar energy  
 2007 International Society of Industrial Ecology Conference  
 2005-2007 Co-Chair of the Nominating Committee, International Society of Industrial Ecology  
 Chair, Awards Committee and Member, Technical Committee  
 2003-2009 Board of Directors, Chair, Research Committee, Eco-Industrial Development Council  
 2002 Organizing Committee, Gordon Research Conference on Frontiers of US Science and Technology Policy – New London, Connecticut  
 2000-2006 Advisory Board, Clearwater Technologies, Inc.  
 2000 Connecticut’s Distinguished Environmental Fellow, Briarwood College  
 1996-present Editorial Board, *Journal of Industrial Ecology*  
 1995-2003 Advisory Council, Alliance for Environmental Innovation, A Project of the Pew Memorial Trust and Environmental Defense  
 1993-2000 Member, Connecticut Council for Environmental Quality (appointed by Governor)  
 1989-2011 Board of Directors, Tax-Exempt Proceeds Fund  
 1989-2011 Editorial Board, *BioCycle* Magazine

**Other Professional Service/Affiliations**

Chair of 3<sup>rd</sup> Annual Meeting of the Alliance for Research in Corporate Sustainability: 120 participants at YSE - New Haven, Connecticut

Special Issue Editor – *Diverse Dynamics of Industrial Symbiosis: Emergence and Development* with Frank Boons – *Sustainability* 2016-2017

Affiliations: Academy of Management, Sigma Xi, International Society for Industrial Ecology

October 10, 2021 with some updates to December 1, 2021