# Table of Contents

**Valerie M. Thomas**
**Anderson Interface Professor**
**Industrial and Systems Engineering, and Public Policy**

# I. Earned Degrees

| | |
|---|---|
| 9/81-9/86 | Cornell University, Ithaca, NY: Ph.D. in Theoretical High Energy Physics. Advisor Tung-Mow Yan |
| 9/77-5/81 | Swarthmore College, Swarthmore, PA: B.A. in Physics, Mathematics minor. |

# II. Employment History

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|---|---|
| 8/05 - present | School of Industrial and Systems Engineering and School of Public Policy, Georgia Institute of Technology. Anderson Interface Associate Professor 2005-2015; Anderson Interface Professor 2015 – present. |
| 9/04 – 8/05 | Congressional Science Fellow, funded by the American Physical Society. Science Fellow in Legislative Office of Representative Rush Holt. |
| 6/88 – 8/04 | Princeton University. Research Scientist (from 12/97), Princeton Environmental Institute. Lecturer, Woodrow Wilson School of Public and International Affairs. Member of the Research Staff (7/91 to 12/97); Research Associate (5/88 to 6/91). Advisors: Frank von Hippel and Robert Socolow. |
| 10/86-5/88 | Research Fellow, Dept. Engineering and Public Policy, Carnegie Mellon Univ. Advisor: Granger Morgan. |
| 9/81-9/86 | Research Assistant, Theoretical High Energy Physics; Teaching Assistant (TA), graduate and undergraduate physics, Cornell University. |
| 6/79-8/79 | Bell Laboratories, Murray Hill, NJ. Summer research program for women and minorities. |

# III. Honors and Awards

## A. International or National Awards

MIT Climate Co-Lab: Judges Choice Award, Aviation, 2016, with Suriya Arulselvan.

MSOM Society Best Operations Management Paper in Management Science: V. Agrawal, M. Ferguson, B. Toktay, and V. Thomas, "Is Leasing Greener than Selling?" *Management Science*, **58**(3): 523-533, 2012.

Fellow of the American Association for the Advancement of Science, elected 2010.

Fellow of the American Physical Society, elected 1999.

AT&T Industrial Ecology Fellow, 1997-99, 1993-95.

Excellence in Review Award, *Environmental Science and Technology*, 2005.

Phi Beta Kappa, 1981.

Sigma Xi, 1981.

### B. Institute or School Awards

Class of 1934 Outstanding Interdisciplinary Award, Georgia Tech, April 2018.

Swarthmore College, High Honors, 1981.

## IV. Research, Scholarship, and Creative Activities

### A. Published Books, Book Chapters, and Edited Volumes

**A1. Books**

*Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout and V. Thomas, eds. Cambridge Univ. Press, 1994. Paperback edition 1996.
http://www.amazon.com/Industrial-Ecology-Global-Change-Socolow/dp/0521577837

**A2. Refereed Book Chapters**

1. *Thomas, V. M. "Industrial Ecology: Quantitative Methods for Exploring a Lower Carbon Future," in *Physics of Sustainable Energy III*, Rob Knapp, editor. AIP Press, 2015. AIP Conf. Proc. **1652**, 90 (2015); http://dx.doi.org/10.1063/1.4916172
2. *Thomas, V. M., **Choi, D. G., Luo, D**. "Biofuel Lifecycle Energy and Environmental Impacts: The Challenges of Co-Product Allocation," in *Handbook of Bioenergy*. S. D. Eksloglu, S. Rebennack, P. M. Pardalos, editors. Springer Briefs in Information Systems, 2015.
3. *Thomas, V. M. Efficient Use of Materials and Energy, *Encyclopedia of Operations Research and Management*, J. J. Cochran, ed. 2011. http://onlinelibrary.wiley.com/book/10.1002/9780470400531
4. Thomas, V. and T. Spiro. "Emissions and Exposure to Metals: Cadmium and Lead," pp. 297-318 in *Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout and V. Thomas, eds. Cambridge Univ. Press, 1994.
5. Andrews, C., F. Berkhout and V. Thomas, "The Industrial Ecology Agenda," pp. 469-477 in *Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout and V. Thomas, eds. Cambridge Univ. Press, 1994.
6. Schnoor, J. and V. Thomas. "Soil as a Vulnerable Environmental System," pp. 233-244 in *Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout and V. Thomas, eds. Cambridge Univ. Press, 1994.
7. France, W. and V. Thomas. "Industrial Ecology in the Manufacturing of Consumer Products," pp. 339-348 in *Industrial Ecology and Global Change*, R. Socolow, C. Andrews, F. Berkhout and V. Thomas, eds. Cambridge Univ. Press, 1994.
8. Thomas, V. Verification of Limits on Sea-Launched Cruise Missiles, pp. 149-180 in *Reversing the Arms Race: How to Achieve and Verify Deep Reductions in the Nuclear Arsenals*, edited by Frank von Hippel and Roald Sagdeev. Montreux, Switzerland: Gordon and Breach Science Publishers, 1990.

9. Thomas, V., Nuclear Warhead Detection: The Black Sea Experiment, in *Verification Report 1991*, edited by J. B. Poole, New York: Apex Press, 1991.
10. Thomas, V. Reducing Tactical Nuclear Weapons, in *Science and International Security*, edited by Eric H. Arnett. Washington: American Association for the Advancement of Science, 1990.
11. Thomas, V. Verification of Sea-Launched Cruise Missiles, pp. 38-46 in *Verification of Arms Reductions: Nuclear, Chemical and Conventional*, J. Altmann, J. Rotblat, eds. [Berlin: Springer-Verlag, 1989]
12. Levi, B. Hafemeister, D., and Thomas, V. Verification of Limitations on Land-Based Missiles, in *The Future of Land-Based Strategic Missiles*, B. G. Levi, M. Sakitt, A. Hobson, eds. AIP, 1989.

### A3. Other Parts of Books

1. V. M. Thomas, "Life-Cycle Analysis," *Pollution A to Z*, Vol. 2, 2003. Stapleton, R. M., ed. New York: Macmillan.
2. Silbergeld, E. K., and V. M. Thomas, Fuel Additives, *Encyclopedia of Public Health*, Macmillan, 2000.
3. Silbergeld, E. K. and V. M. Thomas, Dioxin and Related Compounds, pp. 1185-1198 in *Environmental and Occupational Medicine*, W. Rom, ed., 3rd ed., Lippincott-Raven, 1998.
4. Thomas, V. and T. Spiro, Dioxin Emissions Inventories, pp. 1359 - 1365 in *Encyclopedia of Environmental Analysis and Remediation*, R. A. Meyers, ed. Wiley Publishers, 1998.

## B. Refereed Publications and Submitted Articles

### B1. Published and Accepted Journal Articles

1. ***Musselman, A.**, Thomas, V. M., Nazzal, D., Papageorgiou, D. J., Venkatesh, A., Mallapragada, D. S. The Impact of Development Priorities on Power System Expansion Planning in Sub-Saharan Africa. *Energy Systems*, online April 13, 2021. https://doi.org/10.1007/s12667-021-00433-z
2. ***Imasiku**, K. and Thomas, V. M. The Mining and Technology Industries as Catalysts for Sustainable Energy Development. *Sustainability* **24** (12) 10410, 2020. https://doi.org/10.3390/su122410410
3. *Ragauskas, A. J., Li, M. Pu, Y., Thomas, V. M., Yoo, C. G., Ozcan S., Deng, Y., Nelson K., Recent Advancements of Plant-based Natural Fiber-Reinforced Composites and Their Applications. *Composites Part B* **200** (1): 108254, 2020. https://doi.org/10.1016/j.compositesb.2020.108254
4. *Arora, Pratham; Chance, Ronald; Fishbeck, Teresa; Hendrix, Howard; Realff, Matthew; Thomas, Valerie M.; Yuan, Yanhui. Lifecycle Greenhouse Gas Emissions for an Ethanol Production Process Based on Genetically Modified Cyanobacteria: $CO_2$ Sourcing Options. *Biofuels, Bioproducts & Bioprocesses* **14**: 1323-1334, 2020. http://doi.org/10.1002/bbb.2132
5. ***Tricker**, Andrew W.; Michael J. **Stellato**; Thomas T. Kwok; Nicholas S. Kruyer; Zhongzhen Wang; Sankar Nair; Valerie M. Thomas; Matthew J. Realff; Andreas S. Bommarius; Carsten Sievers. Similarities in Recalcitrant Structures of Industrial Non-kraft and Kraft Lignin. *ChemSusChem* **13**: 4624-4632, 2020. http://doi.org/10.1002/cssc.202001219
6. *Arora, Pratham; Chance, Ronald; Hendrix, Howard; Realff, Matthew; Thomas, Valerie M.; Yuan, Yanhui. Life Cycle Greenhouse Gas Emissions of Different $CO_2$ Supply Options for an

Algal Biorefinery. *J. $CO_2$ Utilization* **40**: 101213-101223, 2020. https://doi.org/10.1016/j.jcou.2020.101213

7. ***Toroghi**, S. S. H., Thomas, V. M. A Framework for the Resilience Analysis of Electric Infrastructure Systems Including Temporary Generation Systems. *Reliability Engineering and System Safety* **202**: 107013-107028, 2020. https://doi.org/10.1016/j.ress.2020.107013
8. *Imasiku, K., Thomas, V. M., Ntagwirumugara, E. Unpacking Ecological Stress from Economic Activities for Sustainability and Resource Optimization in Sub-Saharan Africa. *Sustainability* **12** (9): 3538-3549, 2020, http://doi.org/10.3390/su12093538
9. ***Choi, D.-G**., Lim, M. K., Murali, K., Thomas, V. M. Why have voluntary time-of-use tariffs fallen short in the residential sector? *Production and Operations Management* **29** (3): 617-642, 2020. http://doi.org/10.1111/poms.13126
10. *Favero, A., Luettgen, C. O., Thomas, V. M. Life cycle analysis of alternative fibers for paper. *J. Advanced Manufacturing and Processing* **1** (3): 1-10, 2019. https://doi.org/10.1002/amp2.10023
11. ***Imasiku**, K., Thomas V., Ntagwirumugara, E. Unravelling Green Information Technology Systems as a Global Greenhouse Gas Emission Game-Changer, *Administrative Sciences* **9** (2): 43, 2019. https://doi.org/10.3390/admsci9020043
12. *Brown, M. A., Favero A., Thomas V. M., **Banboukian** A. The Economic and Environmental Performance of Biomass as an Intermediate Resource for Power Production. *Utilities Policy* **58**: 52-62, 2019. https://doi.org/10.1016/j.jup.2019.04.002
13. ***Moellmann**, J., Thomas V. M. Social enterprise factory location and allocation model: Small scale manufacturing for East Africa. *Socio-Economic Planning Sciences* **68**: 100694-704, 2019. https://doi.org/10.1016/j.seps.2019.02.009
14. ***Musselman** A., Thomas V. M., Boland N., Nazzal D. Optimizing Wind Farm Siting to Reduce Power System Impacts of Wind Variability. *Wind Energy* **22** (7): 894-907, 2019. https://doi.org/10.1002/we.2328
15. *Pandit, A., B. Bras, E. A. Minné, E. Dunham-Jones, G. Augenbroe, H. Jeong, J.-A. C. James, J. P. Newell, M. Weissburg, M. A. Brown, M. E. Chang, M. Xu, M. M. Begovic, P. Yang, R. M. Fujimoto, S. P. French, V. M. Thomas, X. Yu, Y. Chen, Z. Lu, J. C. Crittenden. Infrastructure Ecology: An Evolving Paradigm for Sustainable Urban Development. *Journal of Cleaner Production* **163**: S19-S27, 2017. http://dx.doi.org/10.1016/j.jclepro.2015.09.010
16. ***Lee, D.-Y**., and Thomas, V. M. Parametric Modeling Approach for Economic and Environmental Life Cycle Assessment of Medium-Duty Trucks. *J. Cleaner Production,* 142 (4): 3300-3321, 2017. http://dx.doi.org/10.1016/j.jclepro.2016.10.139
17. ***James, J.-A**., Thomas, V. M., Pandit, A., Li, D., Crittenden, J. Water, air emissions, and cost impacts of air-cooled microturbines for combined cooling, heating and power (CCHP) systems: A case study of in the Atlanta region. *Engineering* **2**: 470-480, 2016. http://dx.doi.org/10.1016/J.ENG.2016.04.008
18. ***Levin, T**., Thomas, V. M. Can developing countries leapfrog the centralized electrification paradigm? *Energy for Sustainable Development* **31**: 97-107, April 2016. http://dx.doi.org/10.1016/j.esd.2015.12.005
19. ***Xu, L**., Deng, S.-J., Thomas, V. M. Carbon emission permit price volatility reduction through financial options. *Energy Economics* **53**: 248-260, 2016. http://dx.doi.org/10.1016/j.eneco.2014.06.001
20. ***Golin, C**., Cox, M., Brown M., and Thomas, V. The Water Efficiency Gap. *Sustainable Water Resources Management* 1(4): 315-324, 2015. http://dx.doi.org/10.1007/s40899-015-0025-4
21. ***Kerl, P.,** Zhang, W., Moreno-Cruz, J., Nenes, A., Realff, M. Russell, A., Sokol, J., Thomas, V. M. New Approach for Optimal Electricity Planning and Dispatching with Hourly Time-Scale Air Quality and Health Considerations. *PNAS* **112** (35): 10884-10889, 2015. www.pnas.org/cgi/doi/10.1073/pnas.1413143112
22. ***Shayegh, S**., Thomas, V. M. Adaptive Stochastic Integrated Assessment Modeling of Optimal

Greenhouse Gas Emission Reductions. *Climatic Change* **128** (1/2): 1-15, 2015. http://dx.doi.org/10.1007/s10584-014-1300-3

23. *Lively, R. P., Sharma, P., **Luo, D**., McCool, B. A., Beaudry-Losique, J., Thomas, V. M., Realff, M., Chance, R. R. Anthropogenic $CO_2$ as a Feedstock for the Production of Algal-based Biofuels. *Biofuels Bioproducts & Biorefining* 9(1): 72-81, 2015. http://dx.doi.org/10.1002/bbb.1505
24. ***Luo, D**., Realff, M. J., Thomas, V. M. Bioreactor-based Fuel Systems I: Optimal production capacity considering start-up dynamics. *Computers and Chemical Engineering* **71**: 141-153, 2014. http://dx.doi.org/10.1016/j.compchemeng.2014.07.006
25. ***Levin, T**. and Thomas, V. M. Utility-maximizing Financial Contracts for Distributed Rural Electrification. *Energy* **69**: 613-621, 2014. http://dx.doi.org/10.1016/j.energy.2014.03.057
26. ***Levin, T**., Thomas, V. M. Modeling the Impact of Stochastic Outages for Electricity Infrastructure Development. *Energy Systems* **5**(3): 519-550, 2014. http://dx.doi.org/10.1007/s12667-013-0102-4
27. ***Okwo, A**., Thomas, V. M. Biomass Feedstock Contracts: Role of Land Quality and Yield Variability in Near Term Feasibility. *Energy Economics* **42** (March): 67-80, 2014. http://dx.doi.org/10.1016/j.eneco.2013.11.004
28. ***Lee, D. Y**., Thomas, V. M., Brown, M. A. Electric Urban Delivery Trucks: Energy Use, Greenhouse Gas Emissions, and Cost Effectiveness. *Environmental Science and Technology* **47** (14): 8022–8030, 2013. http://dx.doi.org/10.1021/es400179w
29. ***Choi, D.-G**., **Kreikebaum, F**., Thomas, V. M., Divan, D. Coordinated EV adoption: double digit reductions in emissions and fuel use for $40/vehicle-year. *Environmental Science and Technology* **47**(18): 10703-7, 2013. http://dx.doi.org/10.1021/es4016926
30. ***Mashoko, L**., Mbohwa, C., Thomas, V. M. Life cycle inventory of electricity cogeneration from bagasse in the South African sugar industry. *Journal of Cleaner Production* **39**: 42-49, 2013. http://dx.doi.org/10.1016/j.jclepro.2012.08.034
31. ***Levin, T.**, Thomas, V. M. A Mixed Integer Optimization Model for Electricity Infrastructure Development. *Energy Systems* 4(1): 79-98, 2013. http://dx.doi.org/10.1007/s12667-012-0067-8
32. ***Agrawal, V.**, M. Ferguson, L. B. Toktay, V. M. Thomas. Is Leasing Greener than Selling? *Management Science* **58** (3): 523-533, 2012. http://dx.doi.org/10.1287/mnsc.1110.1428
33. ***Choi, D. G**., Thomas, V. M., An Electricity Generation Planning Model Incorporating Demand Response, *Energy Policy* **42**: 429-441, 2012. http://dx.doi.org/10.1016/j.enpol.2011.12.008
34. ***Levin, T**., Thomas, V. M., Least-Cost Network Evaluation of Centralized and Decentralized Contributions to Global Electrification, *Energy Policy* **41**: 286–302, 2012. http://dx.doi.org/10.1016/j.enpol.2011.10.048
35. *Hldy, G. M., Alcorn, W., Clarke, R., Smith, D., Thomas, V. Environmental Issues and Management Strategies for Waste Electronic and Electrical Equipment. *J. Air and Waste Manage. Assoc.* **61**(10): 990-995, 2011. http://dx.doi.org/10.1080/10473289.2011.615267
36. *Abayomi, K., **Luo, D**. and Thomas, V. M. Statistical Evaluation of the Effect of Ethanol in US Corn Production: A Flexible Test for Independence on a Constrained Sum. *International Journal of Ecological Economics and Statistics* **22**(S11): 105-126, 2011. http://www.ceser.in/ceserp/index.php/ijees/article/view/1060
37. *Thomas, V. M., Meier, A. K., Gunda, S. G., Wenzel, T. P. Cars are Buildings: The Building-like Energy Use of Automobiles. *Transportation Research Part D: Transport and Environment* **16** (4): 341-345, 2011. http://dx.doi.org/10.1016/j.trd.2011.01.010
38. ***Levin, T**., Thomas, V. M., Lee, A. J. State-Scale Evaluation of Renewable Electricity Options: The Role of Renewable Electricity Credits and Carbon Taxes, *Energy Policy* **39**(2): 950-960, 2011. http://dx.doi.org/10.1016/j.enpol.2010.11.020
39. *Thomas, V. M. The Environmental Potential of Reuse: An Application to Used Books. *Sustainability Science* **6**(1): 109-118, 2011. http://dx.doi.org/10.1007/s11625-010-0115-z
40. ***Luo, D**., Z. Hu, **D. G. Choi**, V. M. Thomas, M. J. Realff, R. R. Chance. Lifecycle Energy and Greenhouse Gas Emissions for an Ethanol Production Process Based on Blue-green Algae,

*Environmental Science and Technology* **44**(22): 8670-8677, 2010. http://dx.doi.org/10.1021/es1007577
41. ***Mashoko, L.**, C. Mbohwa, V. M. Thomas. LCA of the South African Sugar Industry, *Journal of Environmental Planning and Management* **53**(6): 793-807, 2010. http://dx.doi.org/10.1080/09640568.2010.488120
42. ***Xu, M.**, J.C. Crittenden, Y. Chen, V. M. Thomas, D.S. Noonan, R. DesRoches, M.A. Brown. Gigaton Problems Need Gigaton Solutions, *Environmental Science and Technology* **44** (11) 4037-4041, 2010. http://dx.doi.org/10.1021/es903306e
43. *Thomas, V. M., **D. Choi**, **D. Luo**, **A. Okwo**, **J. H. Wang**. Relation of Biofuel to Bioelectricity and Agriculture: Food Security, Fuel Security, and Reducing Greenhouse Emissions, *Chemical Engineering Research and Design* **87**, 1140-1146, 2009. http://dx.doi.org/10.1016/j.cherd.2009.06.017
44. *Thomas, V. M. A Universal Code for Environmental Management of Products. *Resources, Conservation and Recycling* **53**: 400-408, 2009. http://dx.doi.org/10.1016/j.resconrec.2009.03.004
45. Thomas, V. M., **C. M. McCreight**. Relation of Chlorine, Copper, and Sulfur to Dioxin Emission Factors, *Journal of Hazardous Materials* **151**, 164-170, 2008. http://dx.doi.org/10.1016/j.jhazmat.2007.05.062
46. Davis, J. Michael, Valerie M. Thomas. Systematic Approach to Evaluating Tradeoffs among Fuel Options: The Lessons of MTBE. *Annals of the New York Academy of Sciences* **1076**:498-515, 2006. http://dx.doi.org/10.1196/annals.1371.068
47. **Saar, S.**, M. Stutz, V. M. Thomas. Toward Intelligent Recycling: A Proposal to Link Bar Codes to Recycling Information. *Resources, Conservation, and Recycling* **41**(1):15-21, 2004. http://dx.doi.org/10.1016/j.resconrec.2003.08.006
48. Thomas, V. M., T. E. Graedel. Research Issues in Sustainable Consumption: Toward an Analytical Framework for Materials and the Environment, *Environmental Science and Technology* **37**(23): 5383-5388, 2003. http://dx.doi.org/10.1021/es034475c
49. Thomas, V. M. Product Self-Management: Evolution in Recycling and Reuse. *Environmental Science and Technology* **37** (23) 5297-5302, 2003. http://dx.doi.org/10.1021/es0345120
50. Thomas, V. M. Demand and Dematerialization Impacts of Second-Hand Markets: Reuse or More Use? *Journal of Industrial Ecology* **7**(2), 65-78, 2003. http://dx.doi.org/10.1162/108819803322564352
51. Thomas, V. M. Theoretical Calculation of Product Contents: Battery and Cathode-Ray Tube Examples, *Environmental Science and Technology,* **37**, 2016-2019, 2003. http://dx.doi.org/10.1021/es0210300
52. **Saar, S.**, V. Thomas. Toward Trash That Thinks: Product Tags for Environmental Management, *Journal of Industrial Ecology*, **6**(2):133-146, 2002. http://dx.doi.org/10.1162/108819802763471834
53. Thomas, V., T. Theis, R. Lifset, D. Grasso, B. Kim, C. Koshland, R. Pfahl. Industrial Ecology: Policy Potential and Research Needs." *Environ. Engineering Science* **20**(1):1-9, 2003. http://dx.doi.org/10.1089/109287503762457536
54. **Mackie, D.**, **J. Liu**, **Y.-S. Loh**, V. Thomas. No Evidence of Dioxin Cancer Threshold, *Environmental Health Perspectives* **111** (9):1145-1147, 2003. http://www.ncbi.nlm.nih.gov/pubmed/12842764
55. Thomas, V. M., **A. Kwong**, Ethanol as a Lead Replacement: Phasing Out Leaded Gasoline in Africa," *Energy Policy* **29**:1133-1143, 2001. http://dx.doi.org/10.1016/S0301-4215(01)00041-6
56. **Riley, D. M.**, C. A. Newby, T. O. Leal-Almeraz, V. M. Thomas. Assessing Elemental Mercury Vapor Exposure from Cultural and Religious Practices, *Environmental Health Perspectives* **109**(8): 779-784, 2001. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240404/

57. Thomas, V. M., A. O. Orlova. Soviet and Post-Soviet Environmental Management: Lessons from a Case Study of Lead Pollution, *Ambio* **30**(2): 104-111, 2001. http://dx.doi.org/10.1579/0044-7447-30.2.104
58. Thomas, V. M., R. H. Socolow, **J. J. Fanelli**, T. G. Spiro. Effects of Reducing Lead in Gasoline: An Analysis of the International Experience, *Environ. Science and Technol.*, **33**(22): 3942-3947, 1999. http://dx.doi.org/10.1021/es990231+
59. Thomas, V. M., J. A. Bedford, R. J. Cicerone. Bromine Emissions from Leaded Gasoline, *Geophysical Research Letters* **24** (11): 1371-1374, 1997. http://dx.doi.org/10.1029/97GL01243
60. Socolow, R. H., V. M. Thomas. The Industrial Ecology of Lead and Electric Vehicles, *Journal of Industrial Ecology* 1(1): 13-36, 1997. Re-published in *Managing a Material World: Perspectives in Industrial Ecology*. P. Vellinga, F. Berkhout, J. Gupta, eds., Kluwer Academic, Dordrecht, 1998. Also republished in *The Future of the Electric Vehicle*, H. A. Kukcuk, ed., Informationen zur Elekrizitat, Frankfurt, 1997, pp. 230 - 241. http://dx.doi.org/10.1162/jiec.1997.1.1.13
61. Thomas, V. M. and T.G. Spiro. The US Dioxin Inventory: Are There Missing Sources? *Environmental Science and Technology* 30(2):82A-85A, 1996.
62. Orlova, A. O., D. I. Bannon, M. R. Farfel, V. M. Thomas, L. V. Aleschukin, V. V. Kudashov, J. P. Shine, G. I. Kruchkov. Pilot Study of Sources of Lead Exposure in Moscow Russia, *Environmental Geochemistry and Health* **17**:200-210, 1995. http://dx.doi.org/10.1007/BF00661332
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64. Thomas, V. M., T.G. Spiro. An Estimation of Dioxin Emissions in the United States, *Toxicological and Environmental Chemistry* **50**(1/2):1-37, 1995. http://dx.doi.org/10.1080/02772249509358202
65. Thomas, V. M., Verification of Limits on Long-Range Nuclear SLCMs, *Science and Global Security*, 1(1/2): 27-56, 1989. http://www.princeton.edu/sgs/publications/sgs/pdf/1_1-2Thomas.pdf
66. Edelson, D. and V. Thomas. Sensitivity of Oscillating Chemical Reactions 1. The Period of the Oregonator," *The Journal of Physical Chemistry*, 85:1555, 1981. http://dx.doi.org/10.1021/j150611a019

### B2. Conference Presentation with Proceedings (Refereed)

1. Imasiku, K. and Thomas, V. M. Bioenergy efficiency evaluation for sustainable optimization in sub-Saharan Africa. *Proceedings of the 2nd African International Conference on Industrial Engineering and Operations Management*. Harare, Zimbabwe, December 7-10, 2020. http://www.ieomsociety.org/harare2020/papers/401.pdf
2. **Chen**, Y. and Thomas, V. M. Electricity Infrastructure Planning with Uncertain Demand Using Stochastic Optimization. *Proceedings of the 2019 IISE Annual Conference*. H. E. Romeijn, A. Schaefer, R. Thomas, eds. July 2019.
3. Choi, D. G., Murathi, K., Lim, M., Thomas, V. M. Why Voluntary Time-of-Use Tariffs Struggle to Penetrate the Residential Electricity Sector. Production and Operations Management Society (POMS) Conference, May 2019.
4. *Momin, A.-M. E., Thomas, V. M. Role of Artificial Roughness in Solar Air Heaters. *Proceedings of the International Symposium on Sustainable Systems and Technology*, **3** 2015. http://dx.doi.org/10.6084/m9.figshare.1507571
5. ***Musselman, A.**, Nazzal, D., Thomas, V. M. Analyzing Wind Location Options for the Southwest Power Pool. *Proceedings of the 2015 Industrial and Systems Engineering. Research Conference.* S. Cetinkaya and J. K. Ryan, eds.

6. ***Kreikebaum, F.**, **Choi, D. G.**, Lambert, F., Thomas, V. and Divan, D. Increasing the Likelihood of Large-Scale Grid-Enabled Vehicle (GEV) Penetration through Appropriate Design Choices, *2011 Vehicle Power and Propulsion Conference*, September 2011. http://dx.doi.org/10.1109/VPPC.2011.6043157
7. *Molloy, S.; Alidadi, M.; Thomas, V. M.; Seto, M. Design and Testing of a Tidal Current Power Extraction Device. Second International Symposium on Marine Propulsors, Hamburg, Germany June 15-17, 2011. http://www.marinepropulsors.com/smp/files/downloads/smp11/Paper/FA1-4_Molloy.pdf
8. ***Xu, L.**, S. Deng, V. M. Thomas. An Alternative Mechanism for Carbon Emission Permit Price Volatility Mitigation, *IEEE Energy Conversion Congress and Exposition*, 4583 - 4587, 2010.
9. ***Levin, T. J.**, V. M. Thomas, A. J. Lee. Lowest Cost Path to Meeting Electricity Demand at the State Level: Implications of Carbon Cap-and-Trade, *IEEE Energy Conversion Congress and Exposition*, 126-131, 2010.
10. ***Borin, S.**, **T.J. Levin**, V. M. Thomas. Estimates of the Cost of New Electricity Generation in the South, *IEEE Energy Conversion Congress and Exposition*, 406-413, 2010.
11. *V. Thomas, A. Meier, T. P. Wenzel, Siva G. Gunda. Appliance Energy Use in America's Second Home – The Automobile. *ACEEE 2008 Summer Study on Energy Efficiency in Buildings*, August 2008.

### B3. Other Refereed Material

1. *Thomas, Valerie M.; **Moellmann, Jan**, "Data for: Local Manufacturing for Sustainable Development: Decision Support for Small Enterprises," Mendeley Data, v1, 2019. http://dx.doi.org/10.17632/kt26m9ts2s.1
2. *Thomas, V. M., **Liu, W**. Assessment of Alternative Fibers for Pulp Production. February 11, 2013. http://www.cms.kimberly-clark.com/UmbracoImages/UmbracoFileMedia/Alternative_Fiber_LCA_Public_Report_FINAL_01-14_umbracoFile.pdf
3. *Allen, D. T., C. Allport, K. Atkins, **D. G. Choi**, J. C. Cooper, R. M. Dilmore, L. C. Draucker, K. E. Eichmann, J. C. Gillen, W. Gillette, W. M. Griffin, W. E. Harrison, J. Hileman, J. R. Ingham, F. A. Kimler, A. Levy, J. Miller, C. F. Murphy, M. J. O'Donnell, D. Pamplin, K. Rosselot, G. Schivley, T. K. Skone, S. M. Strank, R. W. Stratton, P. H. Taylor, V. M. Thomas, M. Q. Wang, T. Zidow. *Lifecycle Greenhouse Gas Analysis of Advanced Jet Propulsion Fuels: Fischer-Tropsch Based SPK-1 Case Study*, U. S. Air Force AFRL-RZ-WP-TR-2011-2138, September 2011. https://www.netl.doe.gov/energy-analysis/details?id=586
4. *Allen, D. T., C. Allport, K. Atkins, J. C. Cooper, R. M. Dilmore, L. C. Draucker, K. E. Eichmann, J. C. Gillen, W. Gillette, W. M. Griffin, W. E. Harrison, J. Hileman, J. R. Ingham, F. A. Kimler, A. Levy, C. F. Murphy, M. J. O'Donnell, D. Pamplin, G. Schivley, T. K. Skone, S. M. Strank, R. W. Stratton, P. H. Taylor, V. M. Thomas, M. Wang, T. Zidow. *Framework and Guidance for Estimating Greenhouse Gas Footprints of Aviation Fuels*, U. S. Air Force AFRL-RZ-WP-TR-2009-2206, April 2009. http://www2.isye.gatech.edu/~vthomas/Aviation_GHG_Framework.pdf

### B4. Submitted Journal Articles

1. Broesicke, O.; Yan, J.; Thomas, V.; Grubert, E. A.; Derrible, S.; Crittenden, J. Natural Gas Combined Cycle Power Plants Have Lower Environmental Impact than Conventional Combined Heat and Power for Commercial Buildings. Submitted to ES&T, February 11, 2021. In Revise and Resubmit.

2. Can Şener, S.; Thomas, Valerie; Hogan, D.; Maier, R.; Carbajales-Dale, M.; Barton, M.; Karanfil, T.; Crittenden, J.; Amy, G.. Recovery Potential of Critical Minerals and Metals from Aqueous Sources. *ACS Sustainable Chemistry & Engineering*. Submitted February 12, 2021.

## C. Other Publications and Creative Products

### C1. Provisional Patents, Applications, and Invention Disclosures

Intellectual Property Disclosure: "Electric Tag for Product Life Cycle Management," V. Thomas, S. Saar, M. Stutz. 8/13/2003. *IP.com Prior Art Database*. http://ip.com/pubView/IPCOM000018813D

### C2. Other Creative Products

1. Thomas, V. M., Kurtis K., Santiago I., Chang M., Crittenden J., Davidson C., Lepech M., Velez-Reyes M., **Broesicke O**., Lolli F., **Johnston J**. Sustainable Urban Infrastructure: Report of a Workshop Sponsored by the U.S. National Science Foundation. January 2020.
2. Brown, Marilyn A., Alice Favero, Valerie Thomas, and **Aline Banboukian**. 2018. "The Economics of Four Virginia Biomass Plants." School of Public Policy, Georgia Institute of Technology, Working Paper 93, https://cepl.gatech.edu/sites/default/files/attachments/Biomass Economics-Working Paper %2393.pdf
3. J. Lo Min, Jean-Daniel Saphores, Valerie M. Thomas, Introduction: Special Issue on Engineering Economics and Sustainable Systems. *The Engineering Economist* **61**(3): 161-162, 2016
4. *Thomas, V. M., **Kerl, P**. Moreno-Cruz, J., Nenes, A., Realff, M., Russell, A., Sokol, J., **Zhang W**., Commentary: Reduce Ozone When and Where it Matters Most. *Power* **159** (11), 2015. http://www.powermag.com/reduce-ozone-when-and-where-it-matters-most/
5. ***Liu, W**., Thomas, V. M. See the Trees for the Forest: Looking into bundles of resource rights and gross forest change in the developing world. Scaling Up Responsible Land Governance, Annual World societal Conference on Land and Poverty, March 2016.
6. ***Golin, C**., Cox, M., Brown M., and Thomas, V. The Water Efficiency Gap. Working Paper #85. School of Public Policy, Georgia Institute of Technology, 2015. http://www.spp.gatech.edu/publications/working-papers/water-efficiency-gap
7. ***Liu, W**., **Tindall, N. W. III**, Thomas, V. M. The Impacts of Strong and Weak Community Private Property Rights on Forest Resilience. Linking Land Tenure and Use for Shared Prosperity, Annual World Bank Conference on Land and Poverty, March 2015.
8. *Brown, M., Begovic, M., Crittenden, J., Graham, S., Johnson, E., Thomas, V. The State of Electric Power in the South. Working Paper #80. School of Public Policy, Georgia Institute of Technology, 2014. http://cepl.gatech.edu/drupal/node/75
9. *Thomas, V. M., Mlade, J., **Borin, S**., **Tindall, N**., **Okwo, A**. Dhamodharan, A. Reducing Greenhouse Gas Emissions in Atlanta. February 2014.
10. *Thomas, V. M. Reflections on Science Advice. *Physics and Society* **42** (3): 11-13, 2013. http://www.aps.org/units/fps/newsletters/201307/reflections.cfm
11. ***Levin, T. J**., V. M. Thomas, A. J. Lee. A MARKAL Model of State Electricity Generation," *IEEE International Symposium on Sustainable Systems and Technology*, May 2010. http://dx.doi.org/10.1109/ISSST.2010.5507755
12. ***Borin, S**., **T. Levin**, and V. M. Thomas. "Estimates of the Cost of New Electricity Generation in the South, School of Public Policy Working Paper 54, Georgia Institute of Technology, March 2010. http://www.spp.gatech.edu/faculty/workingpapers/wp54.pdf
13. *Thomas, V. M., **S. Borin**, **J. Wang**. City of Atlanta Greenhouse Gas Emissions Inventory. March 2009.

14. ***Pyasi, A.**, S. Deng, V. M. Thomas. Biomass Forwards and Futures Market to Support Bioenergy Development," IEEE Energy 2030. August 2008. http://dx.doi.org/10.1109/ENERGY.2008.4781052
15. *Thomas, V. M. Radio-Frequency Identification: Environmental Applications, White Paper, Foresight in Governance Project. *Woodrow Wilson International Center for Scholars,* 2008. http://wilsoncenter.org/article/improving-the-environment-advanced-id-tags
16. *Thomas, V. M. Environmental Implications of RFID, *Proc. IEEE International Symposium on Electronics and the Environment*, 2008.
17. *Thomas, V. M., A Universal Code for Lifecycle Management of Products, *Proc. IEEE International Symposium on Electronics and the Environment*, 2007.
18. **Lee, J. A**., V. M. Thomas, GPS and Radio Tracking of End-of-Life Products, *Proc. IEEE International Symposium on Electronics and the Environment*, 2004, pp. 309-312.
19. Stutz, M., V. M. Thomas, **S. Saar**, Linking Bar Codes to Recycling Information, *Proc. IEEE International Symposium on Electronics and the Environment*, 2004, pp. 313-316.
20. Guidance: Environmentally Sound Management of End-of-Life Mobile Phones. Project 4.1A. Awareness Raising and Training. Design. Mobile Phone Partnership Initiative, The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. UNEP. 2004.
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33. **Al-Okush, H**., R. J. Caudill, V. Thomas, Understanding the Real Impact of DFE Guidelines: A Case Study of Four Generations of Telephones, *Proc. IEEE Int'l. Symp. Electronics and Environment* 1999.

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35. Thomas, V., R. Caudill and **D. Badwe**. Marginal Emissions and Variation Across Models: Life-Cycle Analysis of a Television, *Proc. IEEE Int'l. Symp. Electronics and Environment* 1998, pp. 48-53.
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40. Thomas, V. Review of "The Greening of Industrial Ecosystems" (by B. R. Allenby and D. J. Richards), *Society and Natural Resources* **9**(4): 440-442, 1996.
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44. Thomas, V. Nuclear Weapon, *Academic American Encyclopedia*, Danbury: Grolier, 1990.
45. Thomas, V. Reductions in Tactical Naval Nuclear Weapons," *FAS Public Int. Rep.*, May 1990.
46. Thomas, V. Monitoring of Solid-Fueled Missile Production, *Physics & Society*, Jan. 1988.

## D. Presentations

### D1. Keynote Addresses and Plenary Lectures

1. "Measuring and Reducing Air Pollution Health Impacts," Informal Technical Expert Meeting on Tools and Methodologies for Assessing the Impacts of the Implementation of Response Measures. UN Framework Convention on Climate Change. May 18, 2021. https://unfccc.int/event/TEM-SBSTA-chair-assessing-impacts-RM
2. Seminar: GT/PNNL Virtual Biofuels Seminar. December 2, 2020. Co-organizer.
3. Workshop: Sustainable Production of Fuels and Chemicals from Biomass.
4. Seminar: "Sustainability and Manufacturing: The Strategy and Approach of International Manufacturers toward Implementing Sustainability Goals," September 16, 2020. Moderated by Valerie Thomas. With representatives from YKK, Solvay, Okabashi, and Boehringer-Ingelheim. Sponsored by The French, German, Belgian, Netherlands and Swedish American Chambers of Commerce, the British-American Business Council, the Japan-America Society of Georgia, the Women's Series, the Global Change Program and the Ray C. Anderson Center for Sustainable Business at Georgia Institute of Technology, Next Generation Manufacturing, Society of Plastic Engineers, and Global Atlanta. September 16, 2020.
5. "Electricity Production Planning Methods for Sustainable Development Studies" IEEE PES CAMS webinar. July 8, 2020.
6. "Industrial Ecology Frameworks for Sustainable Aviation Fuel Development" CAAFI Seminar on Alternatives to Petroleum (SOAP)-Jet. Webinar, June 16 2017.

7. "Smart Trash," US Embassy, Wellington, New Zealand, via video-conference. US Department of State Public Diplomacy Program, April 14/15 2011.
8. "Energy Alternatives: Capacity, Benefits, Impacts," Department of Science and Technology, South Africa. Pretoria, South Africa, May 4 2009.
9. "Electronics Recycling Research Needs," Testimony to the Committee on Science and Technology, U.S. House of Representatives, February 11 2009.
10. "Toward Trash That Thinks," EPA Millennium Lecture, January 5 2005, US EPA Headquarters, Washington DC.
11. "Health Benefits of Reducing Lead in Gasoline," Member of U.S. EPA Delegation, World Bank meeting on Phasing Out Leaded Gasoline. Dakar, Senegal, 2002.
12. "Implementing Industrial Ecology at the US EPA," US EPA Industrial Ecology Workshop, November 1999.
13. "Sources and Risks of Exposure to Lead," National Security Council of the Russian Federation, Interagency Commission on Ecological Security, The Kremlin, Moscow, Russia. May 22, 1995.
14. "World Use of Lead in Gasoline, and the Barriers to Lead Phase-Out," United Nations Commission on Sustainable Development, United Nations, New York. April 12 1995.

### D2. Invited Conference and Workshop Presentations

1. "Real Time Electric Grid to Reduce Health Impacts," May 17, 2021. Energy and Public Health Workshop - Energy Transitions: Clean Energy, Healthy Energy, Prosperity for All, Georgia Institute of Technology.
2. "Cleaner Cooking in Developing Countries," May 17, 2021. Energy and Public Health Workshop - Energy Transitions: Clean Energy, Healthy Energy, Prosperity for All, Georgia Institute of Technology.
3. "Optimal Electricity Dispatching with Hourly Health Considerations," Georgia Tech Energy Modeling Workshop, Atlanta, November 14 2019.
4. "Structure of Electricity Production Planning Models," INFORMS, Seattle WA, October 21, 2019.
5. "Infrastructure Impacts of Fairness in Electricity Policy," INFORMS, Seattle WA, October 21 2019.
6. "Fairness in Energy Access Initiatives: Reformulating the Optimization Problem for Energy in Developing Countries," INFORMS, Seattle WA October 20 2019.
7. "Resilience of Combined Centralized and Decentralized Infrastructure," International Society for Industrial Ecology, Tsinghua University, Beijing China, July 7-11, 2019.
8. "Centralized and Decentralized Electricity Development in Sub-Saharan Africa." International Energy Workshop, June 19 2019, Paris.
9. "Emergent Properties in Parametric Life Cycle Assessment," NSF CRISP Workshop, George Mason University, December 5 2018.
10. "A Mixed Integer Optimization Model for Electricity Infrastructure Planning," Workshop on Energy Systems and Optimization, Georgia Tech, November 16, 2018.
11. "A Mixed Integer Optimization Model for Electricity Infrastructure Development," International Energy Workshop 2018, Chalmers University Sweden, June 20 2018.
12. "Sustainable Food Production," Energy Expo, Georgia Tech, April 13, 2018.
13. "The Science of Science Advice," Princeton Citizen Scientists, Princeton University, February 16, 2018.
14. "Innovative approaches for developing sustainable industrial ecologies," Multi-National Enterprise and Sustainable Development V, Georgia Tech, December 8, 2017.
15. "What to Do About Nuclear Waste", American Nuclear Society, December 6, 2017, Georgia Tech
16. "Potential for Low Cost Reduction in Health Impacts of Air Pollution." Operations Research and Industrial Engineering Seminar, University of Michigan, November 17, 2017.

17. "Potential for Low Cost Reductions in Health Impacts of Air Pollution," Joint Global Change Research Institute, Pacific Northwest National Laboratory and University of Maryland, College Park MD. August 2 2017.
18. "Challenges in Public Understanding of Biofuel LCA," International Society of Industrial Ecology and ISSST Joint Conference, June 26 2017, Chicago Illinois.
19. "Environmental Impacts of Biofuels and Bio-electricity: System Policy and Planning" German American Bioenergy Conference, Atlanta GA, November 1 2016.
20. "The Internet of Things, Energy Efficiency Style," Southeast Energy Efficiency Alliance, October 25, 2016.
21. "Strategic Investment to Scale Up Aviation Biofuels," Climate CoLab Aviation Contest, Judges Choice Award, September 29 2016, MIT
22. "Environmental Assessment of Aviation Biofuel: Gasification with Fischer Tropsch using Forest Biomass from the US Southeast." A. Favero, M. J. Realff, V. M. Thomas. TAPPI IBBC conference, Atlanta GA, October 29 2015.
23. "Evaluating and Reducing Environmental Impacts of Manufacturing," V. M. Thomas. Friendly Environmental and Social Factory, Focused Workshop for France-Atlanta Symposium, Georgia Tech Manufacturing Institute, October 28, 2015.
24. "A New Approach for Optimal Electricity Planning and Dispatching with Hourly Time-Scale Air Quality and Health Considerations," Nenes, A., Kerl, P., Zhang, W., Moreno-Cruz, J., Realff, M., Russell, A., Sokol, S., Thomas, V. M. Environmental Vision Conference, Electric Power Research Institute, May 14 2015 Crystal City VA.
25. Lee, D.-Y., Thomas, V. M., & McCarthy, P. S. (2015). Fuel for Next-Generation Garbage Trucks in Atlanta: Natural Gas or Electricity? Career, Research, and Innovation Development Conference. Georgia Institute of Technology, Atlanta, GA, USA. March 5, 2015.
26. Lee, D.-Y., Thomas, V. M., & McCarthy, P. S. (2015). Fuel for Next-Generation Garbage Trucks in Atlanta: Natural Gas or Electricity? Transportation Research Forum. Georgia Institute of Technology, Atlanta, GA, USA. March 12 - 14, 2015.
27. "Natural Gas as a Bridge Fuel," Dong-Yeon Lee and V. M. Thomas, International Society for Industrial Ecology Conference, University of Surrey, United Kingdom, July 7, 2015.
28. "Environmental Management at a Global Firm," N. W. Tindall and V. M. Thomas, International Society for Industrial Ecology Conference, University of Surrey, United Kingdom, July 9, 2015.
29. "Addressing Supply- and Demand-side Heterogeneity and Uncertainty Factors in Transportation Life-Cycle Assessment: The Case of Refuse Truck Electrification," Dong-Yeon Lee, V. M. Thomas, P. S. McCarthy, ISSST (International Symposium on Sustainable Systems and Technology) Conference, Dearborn, MI, May 18, 2015.
30. "Solar Air Heaters," A. M. Momin and V. M. Thomas, ISSST (International Symposium on Sustainable Systems and Technology) Conference, Dearborn, MI, May 20, 2015.
31. "Linking Air Quality Health Impacts and Electricity Capacity Planning," Kerl, P., W. Zhang, J. Moreno-Cruz, A. Nenes, M. Realff, A. Russell, J. Sokol, V. Thomas, AAAR (American Association for Aerosol Research) 33rd Annual Conference, Orlando FL, October 22-24, 2014.
32. "Learning in Optimization: Integrated Assessment Modeling of Climate Change under Uncertainty," Stream: Stochastic Optimization in Energy. International Federation of Operations Research Societies (IFORS) Conference, Barcelona, Spain, July 13-18 2014.
33. "Grid Integration of Wind and Electric Vehicles," Stream: Stochastic Optimization in Energy. International Federation of Operations Research Societies (IFORS) Conference, Barcelona, Spain, July 13-18 2014.
34. "Planning for Cascading Infrastructure Transformations," Invited talk, American Planning Association Annual Conference, Atlanta GA. April 26 2014.

35. "Lifecycle of an iPhone," Keynote Speaker, GT Student Government Association's 4th Campus-Wide Sustainability Forum, Georgia Tech, April 9 2014.
36. "Experiences as a Science Advisor for the U.S. Environmental Protection Agency (EPA) and as a Congressional Science Fellow in Congress," Policy@Tech Series, March 26 2014.
37. "Industrial Ecology," Physics of Sustainable Energy Workshop, Sponsored by the American Physical Society, University of California Berkeley, March 9, 2014
38. "Environmental Impacts of Biofuels: Lifecycle Greenhouse Gas Emissions," Mississippi State University, January 28 2014.
39. "Integrated Energy and Environmental Assessments," Korean Institute of Energy Research, Daejeon, South Korea, June 24 2013.
40. "Lifecycle Carbon Emissions from Bioenergy Systems," Bioenergy Systems Research Institute, Annual Retreat, University of Georgia, May 13, 2013.
41. "Contributing to Science and Technology Policy: Physicists as Science Advisors," American Physical Society Annual Meeting, Denver, Colorado, April 13 2013.
42. "Greenhouse Gas Reduction Strategies for the Southeast," Southeast Climate and Energy Network Conference, Atlanta GA, December 6 2012.
43. "Is IT Good: Ethics in an Information Age." George H. and Faye C. Sparks Forum in Ethics and Engineering. Georgia Institute of Technology, September 18 2012.
44. "Integration of Electric Vehicles and Wind Energy," Department of Chemical and Environmental Engineering, Yale University, March 30 2012.
45. "Sustainability Overview," Alpharetta Chamber of Commerce, February 14 2012.
46. "Waste Electronics and Electrical Equipment Recycling," Air and Waste Management Association, Annual Meeting, Orlando, June 22 2011.
47. "Evaluating the Environmental Impact of Bioenergy Supply Chains," IIE IERC, Reno, NV May 2011.
48. "Emission Allocation in Supply Chains," NSF Symposium on the Low Carbon Footprint Supply Chain, Washington DC, October 14-15 2010. www.ie.umn.edu/NSFsymposium/
49. "Biomass Energy in the Southeast," Clean Energy Speakers Series, Georgia Tech, February 24 2010. http://www.secleanenergy.org/
50. "E-waste Legislation and E-waste Approaches," Electronics Recycling Symposium, Georgia Institute of Technology, October 23 2009.
51. "Technology for Electronics Recycling," Keep American Beautiful National Conference, Atlanta, October 21 2009.
52. "The Potential to Reduce Dioxin Emissions by Product Environmental Management" 11th Int'l Congress on Combustion By-Products, Research Triangle Park, NC, June 1 2009.
53. "Creating a Future for Sustainable Cellulosic Biofuel Production," Atlanta, 2009 BIO International Convention, May 20 2009.
54. "Life Cycle Assessment," Sugar Milling Research Institute, University of KwaZulu-Natal, Durban, South Africa, May 7 2009.
55. "Energy Alternatives: Capacity, Benefits, Impacts," University of Johannesburg, Johannesburg, South Africa, May 5 2009.
56. "How We Get Rid of Things: Product Self-Management and the Economics of Second-Hand Markets," School of Natural Resources and Environment, University of Michigan, November 2002.
57. "A Theoretical Foundation for Industrial Ecology," Gordon Conference on Industrial Ecology, June 2002.
58. "Why Resources Aren't Scarce and Emissions Aren't a Problem," Gordon Conference on Industrial Ecology, June 1998.
59. "Industrial Ecology of Lead," Workshop on Materials Flows, National Research Council, January 26 1998.

60. "Elimination of Leaded Gasoline in Russia," Workshop Sponsored by the Center for Russian Environmental Policy, the Natural Resources Defense Council (NRDC), and the Russian Ministry of Fuels and Energy. Moscow, Russia. December 14 1995.

### D3. Conference and Workshop Presentations

### D4. Invited Seminar Presentations

61. "Industry Comparison Tools for Sustainable Communities," #SmarterTogether Webinar, October 15, 2020. https://smartcities.ipat.gatech.edu/smarter-together
62. "Electricity Production Planning Methods for Sustainable Development Studies" IEEE PES CAMS Webinar, July 8, 2020. https://cmte.ieee.org/pes-cams/
63. "Plastics: The Immense, Eternal Footprint Humanity Leaves on Earth," Society of Plastics Engineers, Baylor University, November 16, 2017.
64. "New Optimization Models and Algorithms for Power Grid Optimization," GT Sandia Strategic Collaboration Meeting, Sandia National Laboratories, February 22, 2017.
65. "Optimal Electricity Planning and Dispatching Incorporating Health Impacts," Emerging Topics in Sustainable Electric Power Systems (EE, IOE, SNRE), U. Michigan, Feb. 9 2017.
66. "Careers in Physics and Society," V. M. Thomas, Cornell University Physics Department, Ithaca NY, October 24, 2015.
67. "Wind Energy and Electric Vehicles," Vaasa University, Finland, June 9 2014.
68. "Petroleum Independence," Clean Energy Speaker Series, Georgia Tech, October 31 2012.

## E. Grants and Contracts

### E1. As Principal Investigator

Rwanda Sustainable Development: Georgia Tech Engagement. Denning Seed Fund for Global Engagement, Georgia Tech. PI: Valerie Thomas. Co-PIs: Jonathan Colton, Anthony Giarrusso, Chen Zhou. $15,000. April 2019 – June 2020.

Lifecycle Assessment of Packaging Materials. Estée Lauder. PI: Valerie Thomas. Co-PI: Matthew Realff. $95,000. May 2019-July 2021.

Conference: Research Network for Sustainable Urban Infrastructure. NSF 1929920. PI: Valerie Thomas. Co-PI: Kimberly Kurtis. Amount: $50,000. Award date: May 28, 2019. End date: May 31, 2020.

Creating the Next in Logistics: Economic Development and Sustainability in the US Southeast. PI: Valerie Thomas, Co-PIs: Tim Brown, Alan Erera, Benoit Montrieul, Martin Savelsburgh, Chip White. Georgia Tech Strategic Energy Institute. $85,600. August 2018-July 2019.

Risk of Combined Physical-Cyberattacks Against Electricity Infrastructure. PI: V. Thomas. Co-PI: M. Kosal. GT Strategic Energy Institute. January –May 2018 $41,000

Electricity Development in Africa. PI: V. Thomas. Co-PI: D. Nazzal. ExxonMobil Research and Engineering, July 15, 2015-August 15 2016; NCE to August 2017. $103,000

Study of Alternative Fiber Papers. PI: V. Thomas. Co-PI: A. Favero. Green Seal. February – June 2016. $16,000

Lifecycle Fossil Fuel and Greenhouse Gas Assessment. Algenol. PI: V. Thomas. Co-PI: M. Realff. January – December 2015. $43,058.92

The American Jobs Project. The JPB Foundation, subcontract from UC Berkeley. PI: V. Thomas. April 2015 – February 2016. $20,000

Developing a New Type of Energy/Air Quality Modeling Capacity: Changing the

Electricity System to Reduce Health Impacts. Strategic Energy Institute,

Georgia Tech. Jan 2014 – Dec 2014. PI: V. Thomas. Co-PIs: M. Realff, A. Nenes, J.Moreno-Cruz. Thomas' share: ~ 50% ($20,000) $39,927

Utilization of Natural Gas: Potential, Choices, and Implications. Strategic Energy Institute, Georgia Tech. Feb 2013 – Dec 2013 PI: V. Thomas. Co-PIs: M. Realff,

A. Nenes, J. Moreno-Cruz. ($35,500 to Thomas) $74,000

Assessment of Progress Toward Sustainability Goals. Coca-Cola: July –December 2012. PI: V. Thomas $51,500

Paper Sector Sustainability. Sustainability Consortium (Arizona State University)

July 2011 – September 2011. PI: V. Thomas $40,000

Lifecycle Assessment of Ethanol Production from Algae. Algenol, Inc.

PI: V. Thomas. Co-PI: M. Realff, ChBE. January – May 2012 (Thomas portion $140,000) $278,000

City of Atlanta: Greenhouse Gas Emissions Inventory and Climate Action Plan. June 2010 – January 2012. PI: V. Thomas. $91,000

US Air Force (UTC Corporation). PI: V. Thomas. Environmental Assessment of Alternative Aviation Fuels. August 12, 2009 – November 1, 2010 $165,663

Traditional Industries Program, State of Georgia: Biomass Energy Supply Prioritization for Georgia. $43,432

PI: V. Thomas. Co-PI: M. Realff, S. French. July 1 2009 – June 30 2010

Tides Foundation and Sustainable Atlanta. Atlanta Greenhouse Gas Emissions Study

January – April 2009, PI: V. Thomas $12,000

Chevron: Energy, Greenhouse Gas Emissions, and Environmental Impacts of Biofuels

October 2007 - December 2009. PI: V. Thomas $202,244

Traditional Industries Program, State of Georgia: Biomass Energy Supply Prioritization for Georgia. $68,500. May 2007 – April 2008. PI: V. Thomas

Woodrow Wilson International Center for Scholars: Environmental Implications of RFID

June 2007 – December 2007. PI: V. Thomas $6,000

NSF BES-0632478, Industrial Ecology Gordon Research Conference. July 1 2006-June 30, 2007 (through GRC). PI: V. Thomas $5,000

EPA X3-83314101-0, Industrial Ecology Gordon Research Conference. July 1 2006-June 30, 2007 (through GRC). PI: V. Thomas $23,000

Georgia Tech Strategic Energy Initiative. Globalization and Energy Use. 5/1/2006 – 6/30/2007. PI: V. Thomas $20,000

EPA Contract, "Lessons Learned from MTBE" (2004-05) $21,200

NSF DMI-0414307. Gordon Research Conference on Industrial

Ecology. (2004). Principal Investigator $10,000

EPA/NSF. Electronic Tags for Product Environmental Management

Principal Investigator. (2002-2004) $340,000

NSF DMI - 0120438 Workshop: Reinventing the Use of Materials

(2001-2003). Principal Investigator $96,049

New Jersey Commission on Science and Technology (1998-2002) $200,000

MacArthur Foundation (1998-2001) $200,000

W. Alton Jones Foundation (1998-2001) $83,000

AT&T Foundation (1998) $25,000

**E2. As Co-Principal Investigator**

Convergence Around A World Without Waste. Workshop. NSF OIA (Office of Integrative Activities). PI: Bhavik Bakshi. Co:PIs: T. Gutowski, D. Sekulik, T. Theis, V. Thomas. 09/01/2020 - 08/31/2021. NSF Award Number 2027185. $100,000

Use of Domestic Wastewater for Food Production. USDA NIFA AFRI 1016016, GEOW-2017-08908. PI: Yongsheng Chen. Co-PIs: John Crittenden, Ching-Hua Huang, Kaye Husbands-Fealing, John Koon,

Valerie Thomas, Marc Weissburg, Perry Yang. $4,838,263. January 2019 – December 2022. Thomas portion: $200,000

Direct Air Capture of $CO_2$ and Delivery to Photobioreactors for Algal Biofuel Production. PI: Chris Jones. Co-PIs: Valerie Thomas, Ron Chance (Algenol Biotech), Eric Ping (Global Thermostat), Eric Tan (NREL). January 2019 – October 2021. US DOE EERE BETO award DE-EE0008520, CX-101728. $1,983,452.

Engineered Reversal of the β-Oxidation Cycle in Clostridia for the Synthesis of Fuels and Chemicals. PI: Michael Jewett, Northwestern Univ. Co-PIs: Ramon Gonzalez, Rice Univ., Michael Köpke and Robert Conrado, LanzaTech, V. Thomas. USDA/DOE NIFA BRDI DE-EE0008354 via Northwestern University. September 2018 – August 2021. $1,600,000. Thomas portion: $175,000.

Production of Bio-crude in an Advanced Photobioreactor-Based Biorefinery. PI: Ron Chance (Algenol) GT PI: V. Thomas. US DOE BETO Advancements in Algal Biomass Yield Phase 2 ABY2 (DE-EE0007690) via subcontract with Algenol Biotech LLC. October 2016-March 2020. $6,250,000. GT portion: $483,907

Bridging the Gap Between Idealized and Attainable Infrastructure Sustainability and Resilience (SuRe Gap). Supplement to RIPS: Participatory Modeling of Complex Urban Infrastructure Systems (NSF #1441208). 9/1/2018-6/30/2019 PI: John Crittenden. Co-PIs: Ellen Dunham Jones and Valerie Thomas. Total: $150,000. Thomas portion: $70,253

Southeast Biomass Economics Research. PI: M. Brown. Co-PI: V. Thomas and A. Favero. Natural Resources Defense Council. June – August 2018. VT portion $8000. $25,000

The Future of Electric Power in the South: A Framework and Participatory Process for Evaluating Options. Strategic Energy Institute, Georgia Tech. Jan 2014 – Dec 2015. PI: M. Brown. Co-PIs: M. Begovic, J. Crittenden, S. Graham, E. Johnson, V. Thomas. Thomas' share ~$7,000. $80,000

Curriculum Development for Energy Technology and Policy Graduate Course. University of Tennessee: January 2014 – June 2014. Co-PIs: M. Brown and V. Thomas. Thomas's share 50% ($4207). $8,415

Lifecycle Assessment of Fossil Energy and Greenhouse Gas Emissions for Production of Biofuel from Woody Biomass. Renmatix: April – August 2011. Co-PIs: V. Thomas, M. Realff (ChBE) (ISyE portion: $27,000) $46,000

Georgia Tech Strategic Energy Institute: Web-Based Biomass Resource Identification and Routing System. July 2009-July 2010. PI Tony Giarrusso and Matthew Realff. Co-PI: V. Thomas. $27,644

The Future of Electric Power in the South: A Framework and Participatory Process for Evaluating Options. Strategic Energy Institute, Georgia Tech. Jan 2014 – Dec 2015.

PI: M. Brown. Co-PIs: M. Begovic, J. Crittenden, S. Graham, E. Johnson, V. Thomas. Thomas' share ~$7,000. $80,000

Curriculum Development for Energy Technology and Policy Graduate Course. University of Tennessee: January 2014 – June 2014. Co-PIs: M. Brown and V. Thomas. Thomas's share 50% ($4207).
$8,415

### E3. As Senior Personnel or Contributor

NSF RIPS Type 2: Participatory Modeling of Complex Urban Infrastructure Systems

(Model Urban SysTems). NSF-EFMA-1441208. 9/1/14-8/30/17. PI: J. Crittenden.

Total: $2,500,000. Thomas portion: $160,000

NSF. IGERT: Aug 2011 – Aug 2015. Nanomaterials for Energy Storage and

Conversion. PI: E. Reichmanis.

(~ $174K to V Thomas in PUBP to support 2 PhD students for 2 years each)

Kimberly-Clark: Environmental Assessment of Alternatives to Recycled Pulp.

July 2011 – March 2013. PI: N. Marsolan (IPST).

Investigator: V. Thomas (~90%) $184,000

Turner Foundation, Assessment of Cost and Availability of Supply and Demand Side Electricity Resources in the Southeast, PI: M. Brown, PUBP. June 2009 – June 2010.

Total: $60,000. ISYE portion: $11,428

Power4Georgians, Energy for Georgia: Economic, Environmental, and Social Sustainability

January – December 2009 PI: M. Realff. $74,386, ISyE portion: $20,000

### E4. Pending Proposals

NSF. Title: ECO-CBET Preliminary: Electrode Band Gap Tuning for Electrochemical Advanced Oxidation Processes (EAOPs) and Water Splitting for Wastewater Treatment, Reuse and Energy Production. PI: J. Crittenden. Co-PI: V. M. Thomas and others. Submitted February 11, 2021.

## F. Other Scholarly and Creative Accomplishments

None.

## G. Societal and Policy Impacts

Selected Media coverage:

"How Burning Wood, Once a Viable Power Source, Fell Out of Favor in the U.S.", *Bloomberg Green*, Will Wade, April 7, 2020.

"Qatar's Outdoor Air Conditioning is Not the Real Villain," *Slate*, Jane C. Hu, November 4 2019.

"Reducing Ozone When and Where it Matters Most, *Power Magazine*, V. Thomas, P. Kerl, J. Moreno-Cruz, A. Nenes, M. Realff, A. Russell, J. Sokol, W. Zhang. November 2015.

How Bad is Power Plant Pollution? Depends on the Weather. *National Geographic*, August 2015.

Diesel or Electric? Valerie Thomas discusses choice for vehicle propulsion, Money Radio, October 4 2013.

Waste Tracking - *New York Times Magazine*, December 13, 2009.

Will Trash Cans Get Smart? - *Wall Street Journal*, October 14, 2009.

See also section, Invited Government and International Agency Presentations and Testimony

### H. Other Professional Activities

Provost's Emerging Leaders Program, 3rd cohort. 2018-2019.

## V. Education

### A. Courses Taught

| Semester, Year | Course Number | Course Title | Number of Students |
|---|---|---|---|
| Spring 2020 | ISYE 6701 | Energy, Technology, and Policy | 43 |
| Spring 2020 | ISYE 4501 | Energy, Efficiency, and Sustainability | 19 |
| Fall 2019 | ISYE 3025 | Engineering Economics | 130 |
| Spring 2019 | ISYE 8803 | Life Cycle Assessment | 6 |
| Spring 2019 | ISYE/PUBP 6701 | Energy, Technology and Policy | 39 |

| | | | |
|---|---|---|---|
| Fall 2018 | ISYE 4501 | Energy, Efficiency, and Sustainability | 40 |
| Spring 2018 | ISYE 3025 | Engineering Economics | 117 |
| Spring 2018 | ISYE/PUBP 6701 | Energy, Technology and Policy | 27 |
| Fall 2017 | ISYE 4803 | Energy and Environmental Analysis | 60 |
| Spring 2017 | ISYE 3025 | Engineering Economics | 127 |
| Spring 2017 | ISYE/PUBP 6701 | Energy, Technology and Policy | 29 |
| Fall 2016 | ISYE 4803 | Energy and Environmental Analysis | 63 |
| Fall 2016 | ISYE 4106 | Senior Design | 8 |
| Fall 2016 | GT 2803 SLS | Introduction to Sustainable Systems and Communities | 14 |
| Summer 2016 | PHIL 6000 | Responsible Conduct of Research | 116 |
| Spring 2016 | ISYE 3025 | Engineering Economics | 126 |
| Spring 2016 | ISYE/PUBP 6701 | Energy, Technology and Policy | 34 |
| Fall 2015 | ISYE 4803 | Energy and Environmental Analysis | 49 |
| Spring 2015 | ISYE 3025 | Engineering Economics | 90 |
| Spring 2015 | ISYE/PUBP 6701 | Energy, Technology and Policy | 41 |
| Fall 2014 | ISYE 4803 | Energy and Environmental Analysis | 38 |
| Spring 2014 | ISYE/PUBP 6701 | Energy, Technology and Policy | 31 |

## B. Individual Student Guidance

### B1. Ph.D. Students

#### B1.a. Graduated Ph.D. Students

• Sean Shahahboddin Hashemi Toroghi, Building Construction. Title: Sustainable Energy Technology, Adoption, Rebound, and Resilience. Graduated spring 2019.

• Jenna McGrath, PUBP. Supervision began fall 2013. Title: Electricity Infrastructure Threats and Policy Response. Graduated fall 2018. Current position: Cyber Economist, CyberCube.

• Caroline Golin, PUBP. Supervision began fall 2011. Title: Analyses of Innovations in Energy and Water Policy in Georgia. Defended summer 2017. Founder, President, The Greenlink Group, 2014-2017. Regulatory Director, Vote Solar, May 2017 to May 2018. Current position: Senior Regulatory Policy

Lead, Global Energy Policy and Market Development, Google.
https://www.linkedin.com/in/carolineburkhardgolin/

• Amelia Musselman, ISyE. Co-advisor: Dima Nizzal. Thesis Title: Planning and Protecting Critical Infrastructure: Three Applications of Optimization Under Uncertainty or Variability. Defended summer 2017. Current position: Systems and Policy Analyst, Lawrence Livermore National Laboratory.

• Wenman Liu, PUBP. Supervision began fall 2011. Passed general comprehensive exam May 2013; passed specialty comprehensive fall 2013. Topic: Bioenergy and forest land use management. Defended spring 2017. Current position: Post-doctoral fellow, School for Environment and Sustainability, University of Michigan.

• Seth Borin, ISyE. Supervision began Fall 2007. Thesis topic: Decision-making in climate and energy policy. Defended spring 2017. Manager of Supply Chain Analytics at Dillards.

• Paul Kerl, ISyE. Co-advisor: Joel Sokol. Co-supervision began spring 2013. Thesis topic: Integrated least cost operation of energy systems including pollutant impacts. Defended fall 2016. Current position: Principal Engineer at Verizon.

• Dong Yeon Lee, CEE. Graduated spring 2016. Title: Parametric Approach to Life Cycle Assessment. Current position: Decision Support Analyst, National Renewable Energy Laboratory.

• Nathaniel W. Tindall, III. CEE. Graduated fall 2014. Co-advisor: John Crittenden. Thesis title: Analysis of Sustainability Goals: Applying Statistical Models to Socio-Economic and Environmental Data. Current position: Senior Manager Data Scientist, United Technologies.
https://www.linkedin.com/in/nathanieltindall/

• Soheil Shayegh, ISyE. Graduated fall 2014. Thesis title: An adaptive stochastic integrated model for climate change mitigation. Current position: Researcher, Bocconi University and European Institute on Economy and the Environment (EIEE), Milan, Italy. Previous position: Post-doctoral fellow, Carnegie Institution for Science, Stanford.

• Dong Gu Choi, ISyE. Graduated fall 2012. Thesis title: Energy models for electricity sector with green policies and technologies. Current position: Associate Professor, Industrial and Management Engineering, Pohang University of Science and Technology (POSTECH).
https://scholar.google.com/citations?user=Xs1nItsAAAAJ&hl=en.

• Todd Levin. Graduated spring 2013. Thesis title: Understanding the Centralized-Decentralized Electrification Paradigm. Current position: Computational Engineer and Energy Policy Scientist, Center for Energy, Environmental, and Economic Systems Analysis in the Decision & Information Sciences Division Argonne National Laboratory. https://www.anl.gov/energy-systems/person/todd-levin

• Adaora Okwo Okoro, ISyE. Graduated spring 2012. Thesis title: Next generation biofuels: The supply chain approach to estimating potential land-use change. Current position: Energy Marketing and Trading Financial Analysis Advisor, Southern California Edison. https://www.linkedin.com/in/adaora-okoro-phd-22329011/

• Dexin Luo, ISyE. Graduated fall 2011. Thesis title: Design of highly distributed biofuel production systems. Current position: Senior Business Development Manager, The Linde Group, Munich. https://www.linkedin.com/in/dexin-luo-928820b/?ppe=1

#### B1.b. In Process Ph.D. Students

• Jaden Johnston, ISyE. Supervision began summer 2019.

• Aline Banboukian, PUBP. Supervision began spring 2019.

• Cindy Azuero, ISyE. Supervision began fall 2018.

• Yuang Chen, ISyE. Supervision began fall 2017.

• Camila Apablaza, PUBP. Supervision began fall 2017.

### B2. M.S. Students (Indicate Thesis Option for Each Student)

#### B2.a. Graduated M.S. Students

• Jan Moellmann, ISyE, Fall 2018, Summer 2018. Local Manufacturing for Sustainable Development: Decision Support for Small Enterprises.

• Aline Banboukian, Public Policy, Spring 2017, International Development Funding.

• Rainey Jernigan, Public Policy, Spring 2017, Cross-National Policy Comparison.

• Allie Miller, Industrial Design, Spring 2016, Biogas Digester Design.

• Ankit Agarwal, ISyE. Non-thesis research. Fall 2012. Research topic: Sustainability metrics of multinational corporations.

• Dong-Yeon Lee, PUBP. Non-thesis research. Summer 2012. Research topic: Electric Urban Delivery Trucks: Energy Use, Greenhouse Gas Emissions, and Cost Effectiveness. Published in *Environmental Science and Technology*, 2013.

• Kyle Azevedo, ME. MS Thesis. Advisor: Bert Bras. Thesis title: Modeling Sustainability in Complex Urban Transportation Systems. Graduated summer 2010.

• Aditya Pyasi, ISyE. Non-thesis research. Fall 2007. Co-advisor: Shijie Deng. Topic: Biomass Forwards and Futures Market to Support Bioenergy Development, Published in IEEE Energy 2030, August 2008

#### B2.b. In Process M.S. Students

None.

### B3. Undergraduate Students

• Jennifer Liu, ISyE, Spring 2020. Gender Implications of Electrification.

• Theresa Denniss, ISyE, Fall 2019, $CO_2$ supply chain.

• Alex Reyna, Fall 2019. Electricity in Democratic Republic of Congo and Process Matrix LCA.

• Marie Ozenua, Fall 2019, Gender, Development, and Rural Electrification.

• Cariana Morales, Fall 2019, Gender, Development, and Rural Electrification.

• Aashika Jikaria, ISyE, Fall 2018. Relation of exposure to leaded gasoline and population blood lead concentrations.

• Suraj Sehgal, ISyE, Spring 2017, Cell phone adoption in Africa.

• Ma Sichao, ISyE, Spring 2016, Natural Gas versus Gasoline Vehicles.

• Luyi Chen, ISyE, Spring 2016, Utilization Options for Natural Gas.

• Kyle Denis, ISyE, Spring 2015, Electric versus gasoline vehicles.

• Anika Dhamo, Spring 2014. Cost benefit analysis of commercial building greenhouse gas emission reductions.

• Diana Lim, Spring 2012. Statistical analysis of corporate environmental performance.

### B4. Service on Thesis or Dissertation Committees

#### B4.a. Internal

• Michael Stellator, ChBE. Advisor: Andrew Bommarius. Gradation Expected Spring 2021.

• Andrew Tricker, ChBE. Advisor: Carsten Sievers. Graduation expected summer 2021.

• Osvaldo Broesicke, CEE. Advisor: John Crittenden. Graduation expected spring 2021.

• Yuan Kong, ECE. Advisor: Sakis Meliopolous. Topic: Instrumentation Channel Error Correction and its Effects on Protective Relays. Defended August 2019.

• Cal Abel, ME. Advisor: Bojan Petrovic. Topic: Integrating Thermal Energy Storage and Nuclear Reactors: A Technical and Policy Study. Graduated spring 2018.

• Joy Wang, PUBP. Advisor: Marilyn Brown. Topic: Real-Time Information Impacts on Residential Energy Use: An Analysis of U.S. Smart Grid Projects & Policy Projection. Passed proposal fall 2013. Graduated winter 2016.

• Shan Zhou, PUBP. Advisor: Marilyn Brown. Topic: Smart Grid Technologies and Policies. Graduated winter 2016.

• Alyse Taylor, ECE. Advisor: Santiago Grijalva. Topic: Smart Grid. Defended fall 2015.

• Jean-Ann James, CEE. Advisor: John Crittenden. Topic: The ‘physiology’ of urban systems:

understanding the flows and inefficiencies in an urban body. Passed pre-proposal Jan. 2014. Thesis defended July 2015.

• Xuewei Yu, CEE. Advisor: John Crittenden. Topic: Interconnections between regional industrial structure and energy consumption patterns. Passed defense Spring 2015.

• Korin Reid, ChBE. Advisor: Matthew Realff. Topic: Biofuel production supply chain. Completed spring 2015.

• Alison Riggieri, PUBP. Advisor: Juan Rogers. Thesis title: The Impact of Hybrid Electric Vehicle Incentives on Demand and the Determinants of Hybrid-Vehicle Adoption. Graduated Spring 2011.

• Jess Chandler, PUBP. Advisor: Marilyn Brown. Thesis title: Sustainable Metropolitan Development: A Look at Planning and Development in Atlanta, Georgia. Graduated Spring 2011.

• Ben Jordan, PUBP. Advisor: Doug Noonan. Thesis title: Sustainability at Multiple Scales: Interactions between Environment, Economic, and Social Indicators at the Country, City, and Production Facility Scale. Graduated spring 2012.

• Diran Soumonni, PUBP. Advisor: Susan Cozzens. Thesis title: Electricity Planning in West Africa: Which Way Forward? An Adaptive Management Perspective on Energy Policy. Graduated spring 2013.

• Hyunju Jeong, CEE. Advisor: John Crittenden. Thesis title: Feasibiity and Lifecycle Assessment of Decentralized Water, Wastewater, and Stormwater Alternatives for Communities with a Variety of Population Densities. Graduated fall 2013.

• Frank Kreikebaum, CEE. Advisor: Deepak Divan. Thesis title: Control of Transmission System Power Flows. Graduated fall 2013.

• Chuljin Park, ISyE. Advisor: Seeong-hee Kim. Thesis title: Discrete Optimization via Simulation with Stochastic Constraints. Graduated fall 2013.

• Xu, Li, ISyE. Advisor: Shijie Deng. Thesis title: Financial and Computational Models in Electricity Markets. Graduated spring 2014.

• Ben Deitchman, PUBP. Advisor: Marilyn Brown. Thesis title: Why U.S. States Became Leaders in Climate and Energy Policy: Innovation Through Competition in Federalism. Graduated spring 2014.

### B4.b. External

• Olivia Muza, PhD student, African Center of Excellence in Energy for Sustainable Development, University of Rwanda. Supervision began May 2018.

• Katundu Imasiku, PhD student, African Center of Excellence in Energy for Sustainable Development, University of Rwanda. Supervision began May 2018.

• Desire Sekanabo, PhD student, African Center of Excellence in Energy for Sustainable Development, University of Rwanda. Supervision began May 2018.

### B5. Mentorship of Postdoctoral Fellows or Visiting Scholars

#### B5.a. Postdoctoral Fellows

• Ankush Karemore, PhD. Biofuel Production Improvement. September 2017-November 2019. Previously post-doctoral research at University of Nebraska Lincoln. PhD 2016: Biotechnology and Bioprocessing, Department of Biotechnology, Indian Institute of Technology (IIT), Kharagpur, India.
• Pratham Arora, PhD. Biofuel LCA and Techno-Economic Assessment. July 2018-July 2019. Previously Associate Fellow at TERI (The Energy and Resources Institute) New Delhi. PhD from IIT Bombay and Monash University, 2017. Position as of July 26, 2019: Assistant Professor, Department of Hydro and Renewable Energy, Indian Institute of Technology Roorkee.
• James Belanger, PhD. NSF SEES Fellow, 2014-2017. Research Scientist II, EAS. Host mentor: V. Thomas. Partner Mentor: Greg Holland, UCAR. Topic: Improved prediction of landfalling impacts of tropical cyclones: applications for establishing more resilient electricity infrastructure systems. Position as of June 2019: Senior Meteorological Scientist, The Weather Company.
• Donna Riley, PhD. Princeton Environmental Institute. 1999-2000. Current Position: Professor, Department of Engineering Education, Virginia Polytechnic and State University.

#### B5.b. Visiting Scholars

• Seongwhan Kang, KAIST, Republic of Korea, May-November 2019.

## C. Educational Innovations and Other Contributions

New Courses Developed:

• Energy Technology and Policy ISyE 6701/PUBP 6701. Co-taught each spring, with Prof. Marilyn Brown of PUBP. This cross-listed course attracts students from across the Institute and has a strong Distance Learning section.

• Energy, Efficiency, and Sustainability ISyE 4501. This is the first ISyE undergraduate course in the energy, environment, and sustainability area. Its quantitative and industrial engineering focus sets it apart from energy and environmental courses offered elsewhere at GT or at other universities.

• Life Cycle Assessment, ISyE 8803. Taught spring 2019.

New Program Developed:

• Rwanda Study Abroad: Sustainable Development. Program for undergraduate and graduate students in ISYE 6701, ISYE 4501, and CP 4510. First cohort will travel spring 2020.

# VI. Service

## A. Professional Contributions

### A1. Editorial Board Memberships

Associate Editor, *Journal of Industrial Ecology*, 2010-2019.

Member of the Editorial Board, *Resources, Conservation and Recycling*, 2009-present

Member of the Editorial Board, *Sustainability Analytics and Modeling*, 2021-present.

### A2. Society Offices, Activities, and Membership

Institute of Industrial and Systems Engineers (IISE). Sustainable Development Division.
Conference Track Co-Chair 2020.

American Physical Society:
Nominating Committee: Group on Energy Research and Applications (GERA), 2014; appointed by APS Executive Director.
Chair, Forum on Physics and Society (FPS). 6000 members. April 2013-March 2014. (elected). Past-chair April 2014-2015. Chair-elect April 2012-Mach 2013, Vice-chair, April 2011-March 2012.
Member, APS Physics Policy Committee, 2006.
Member, APS Panel on Public Affairs, 2007.
Vice-chair, Forum on Physics and Society awards committee, 2007 and chair, 2008.
Member, APS Congressional Science Fellow Selection Committee, 2008.

International Society for Industrial Ecology, Elected: Treasurer, 2019-2021. Councilor, 2006-2009, 2011-2014.

### A3. Organization and Chairmanship of Technical Sessions, Workshops, and Conferences

Session Organizer, INFORMS 2016, 2018, 2019.

Track co-chair, IISE 2019, Sustainable Development

Workshop Organizer, "Reducing the Greenhouse Gas Impacts of Aviation," International Society of Industrial Ecology Conference, June 25 2017, University of Illinois Chicago.

Workshop Organizer, Southeast Bioeconomy Workshop, ATIP Foundation, September 16 2016, Georgia Tech.

Workshop Organizer, Georgia Farm to Fly. Jointly sponsored by the Georgia Tech Strategic Energy Institute, George Department of Economic Development, and the Commercial Aviation Alternative Fuels Initiative. Georgia Institute of Technology, December 3 2015. http://pwp.gatech.edu/farm2fly2/

Session Organizer, APS April Meeting 2015, Baltimore MD. Carbon Capture and Sequestration; Research at ARPA-E.

Session Organizer, INFORMS Annual Meeting, November 3 2015. Electricity System Resilience.

Session Organizer, APS April Meeting 2014, Savannah GA. Extreme Energy Efficiency. Hyperloops and Other Transportation Ideas.

Session Organizer, ACS Green Chemistry and Engineering Conference, Bethesda MD. Lifecycle assessment of biofuels. June 2013.

Program Chair, Forum on Physics and Society, American Physical Society. March Meeting Baltimore MD and April Meeting Denver CO, 2013.

Session Organizer, "Energy, Environment, and Sustainability," INFORMS Annual Meeting, San Diego, October 2009.

Conference co-chair, IEEE International Symposium on Electronics and the Environment, May 2008.

Chair, 2006, Gordon Research Conference on Industrial Ecology. The Queens' College, Oxford, UK. Vice-Chair, 2004. http://www.grc.org/programs.aspx?year=2006&program=indust (elected by conference participants in 2002).

Co-organizer (with T. Graedel of Yale) of "Reinventing the Use of Materials," a workshop to

develop a research agenda for the National Science Foundation. February 2002.

Co-Organizer (with R. Socolow and C. Andrews). NSF-sponsored Workshop on Industrial Ecology and Policy, White House Conference Center, April 1998.

### A4. Technical Journal or Conference Referee Activities

Reviewer for Journal of Industrial Ecology, Environmental Science and Technology, Energy Policy, Resources Conservation and Recycling, and other journals.

### A5. Proposal Panels and Reviews

Institute Review Committee, Institute of Environmental Science and Policy, University of Illinois Chicago, January 22-24, 2019.

Program Review Committee, Masters in Environmental Management, Nicholas School of the Environment, Duke University, 2017.

USDA NIFA Biomass Center of Excellence, review panel member, January 2017

Selection Committee, AAAS Marion Milligan Mason Award for Women in the Chemical Sciences, 2015, 2016, 2017, 2018.

Reviewer, Critical Materials Institute, US DOE Energy Hub. April 23-24 2014.

Reviewer, Ford Foundation Fellowship Program, National Academy of Sciences, March 2013 2015, 2016. http://sites.nationalacademies.org/pga/fordfellowships/

NSF Review Panel Member, Spring 2007, Spring 2009.

### A6. Other Involvement

US Director, Russian Lead Project. Measurement of environmental lead in Russia. Participants from a range of Russian NGO, scientific, industry, and governmental organizations. 1997-2000.

Organizing Committee, International Summer Symposia on Science and World Affairs, 1991: Moscow; 1992: Shanghai; 1993: Boston. Co-Organizer, 1990 International Summer School on Science and World Affairs, Princeton University, August 6-16, 1990. http://www.ucsusa.org/nuclear-weapons/summer-symposium/past-symposiums.html#.Wc5iJUyZPBI

Observer, NRDC/Soviet Academy of Sciences "Black Sea Experiment," on nuclear SLCM warhead detection, Yalta, USSR, July 1989.

Task Force Member, Basel Convention Mobile Phone Partnership Initiative (MPPI) (Mobile Phone manufacturers' voluntary initiative under the Basel Convention, United Nations Environment Program). Member, Working Group 4.1A. 2003-04.

## B. Public and Community Service

Member, US DOE and USDA Biomass R&D Technical Advisory Committee. Appointed. 2014-2019.

Congressional Science Fellow, Legislative Office of Representative Rush Holt, 2004-2005. Funded by the American Physical Society. Managed R&D Caucus and Biomedical Research Caucus for Holt. Supported legislative activities related to U.S. Office of Technology Assessment, 2005 Energy Bill, NSF appropriations, and energy research.

US EPA Science Advisory Board: http://www.epa.gov/sab/

Chartered Board Member 2003-2009.

Environmental Engineering Committee Member, 2000-2003.

Panel on Valuing Protection of Ecological Systems and Services, 2003-2004.

Chair, Metals Action Plan Review Panel, 2002.

Subcommittee on Industrial Ecology. Co-chair, 2001.

Dioxin Reassessment Panel, 2000.

Review of Residual Risk Case Study (for Clean Air Act residual risk assessments), 2000.

Integrated Risk Project. Human Exposure and Health, and Steering Committee, 1996-99.

Review of EPA's Report to Congress on Mercury. Chair, sources working group, 1997.

Review of EPA Dioxin Reassessment: Exposure Panel, 1995.

Chair of US EPA Dioxin Inventory External Peer Review. May 1998.

Technical Expert to US Delegation, OECD Workshop on Lead Products, Toronto, Sept. 1994. Invited by US EPA.

New Jersey Comparative Risk Project, NJ Department of Environmental Protection (DEP):

Ecosystem Technical Working Group, and Project Team. 1999-2001.

Member of New Jersey Task Force on Mercury, NJ DEP, 1998-00. Invited by Governor of NJ.

Board Member, Southeast Energy Efficiency Alliance, 2013-2018.

Member, Board of Scientific Experts, 2016-2019. Member, Board of Directors, 2011-2015. Federation of American Scientists.

Consultant, US Postal Service, for review of *The Environmental Impacts of the U.S. Mail*, 2008.

Consultant to Environmental Defense, on vehicle emissions, 2000.

Council Member, Federation of American Scientists, 1990-93.

## C. Institute Contributions

### C1. Institute Committee Service

Research Faculty Promotion Review Task Force, 2020.

Faculty Executive Board, August 2020 – August 2023. FEB Liaison to Student Honor Committee.

Institute Research Faculty Promotions Committee, College of Engineering Representative, 2020-21.

BBISS (Brook Byers Institute for Sustainable Systems) Faculty Advisory Committee, 2015-2018.

Strategic Energy Institute Faculty Advisory Committee Co-Chair, 2015-2019.

Georgia Tech Energy Club Faculty Advisory Committee, 2014-2016.

BBISS Review Committee, 2012-2013.

Search Committee, Director, Brook Byers Institute for Sustainable Systems, FY 2008-09.

Member, Strategic Partners Office Internal Advisory Committee, FY 2008.

### C2. College Committee Service

CoE Dean Search Committee, 2020.

IAC Diversity and Inclusion Committee, 2019-2020.

Chair of 5-year review committee for School of Public Policy Chair Kaye Husbands Fealing, reporting to Ivan Allen College Dean Royster, 2018-2019.

COE Diversity and Inclusion Council, co-chair 2019-2020; member 2021-2021.

College of Engineering Strategic Plan Implementation: Strategy Team Member: Recruitment, retention, recognition and development to ensure the best and most diverse faculty and staff. March – April, 2019.

Search Committee, GT NRE (Nuclear and Radiological Engineering) Program Director, 2016.

College of Engineering Assistant-to-Associate RPT Committee, 2014-2016.

Search Committee, Tellepson Chair, Civil and Environmental Engineering, 2009-2011.

### C3. School Committee Service

ISyE RPT Committee, 2020-2021.

Search Committee, Energy Policy Faculty Position, School of Public Policy, 2005-06.

ISyE Diversity and Inclusion Committee – March 2019-June 30 2021.

ISyE representative to General Faculty Assembly and Faculty Senate, FY 2017-2019; FY 2008-2010.

ISyE Awards Committee, 2012-2016. Developed and submitted nominations for ISyE faculty for Sigma Xi Sustained Research award, GT Ector Teaching Award, GT Service Award, GT CETL/BP Junior Teaching Award, Sigma Xi Best Thesis Award, and others.

Development of Strategy for Energy, Environment and Sustainability for ISyE. Presentations to ISyE Advisory Board April 2010, April 2009, etc. Worked with Ed Rogers of UPS to develop ISyE strategy. Developed new ISyE course, Energy and Environmental Analysis 4803.

Search Committee, Nash Junior Professorship and Mello Professorship, ISyE, 2008-09.

### C4. Program Development: Research

Workshop to develop a Research Network for Sustainable Urban Infrastructure. August 15-16 2019. Key participants from Georgia Tech, Stanford, Syracuse University of University of Texas El Paso. https://suiconf.sustainable.gatech.edu

### C5. Program Development: Academic

Rwanda Study Abroad: Sustainable Development. Program for undergraduate and graduate students in ISYE 6701, ISYE 4501, and CP 4510. First cohort planned to travel spring 2020; Covid-19 delay.

Energy and Environmental Leadership. One-week CEISMC summer program for high school students. Established in 2016, ran it again in 2017 and 2018, and passed it on to Rich Simmons at GT Strategic Energy Institute in 2019 as Energy Unplugged.