Massimo Tavoni

Professor of Climate Change Economics, Politecnico di Milano
Director, RFF-CMCC European Institute on Economics and the Environment
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EMPLOYMENT

Politecnico di Milano, School of Management

- Full Professor 2019-present
- Associate Professor 2014-2019

RFF-CMCC European Institute on Economics and the Environment

- Director 2018-present

Fondazione Eni Enrico Mattei (FEEM)

- Coordinator, 'Climate and Sustainable Innovation' research programme 2015-2018
- Deputy Director, Climate Change and Sustainable Development research programme 2012-2014
- Senior Researcher 2010-2012

Princeton University

- Post-doctoral Research Associate 2008-2010

VISITING POSITIONS

Scripps Institute of Oceanography, UC San Diego

- Visiting Professor summer 2019

Stanford University

- Fellow, Center for the Advanced Studies in the Behavioural Sciences (CASBS) 2014-15

EDUCATION

Catholic University of Milan

- PhD Political Economics (European Doctoral Program (EDP)) 2005-2008

London School of Economics

- M.Sc.Econometrics and Mathematical Economics 1999-2001

University of Bologna

- Laurea cum Laude in Engineering 1993-1998

GRANTS AND RECOGNITION

2019: Finalist, Decision Analysis Society Publication Award
2018: Lead Author for the IPCC 6th assessment report, WGIII
2018: Selection Committee, CASBS fellowships, Stanford University, US
2016: Scientific Evaluation, Agence Nationale de la Recherche, France
2016: School coordinator, EAERE-FEEM-VIU European Summer School
2013: European Research Council (ERC) starting grant
2012-2018: Deputy Editor of the journal "Climatic Change"
2012: Member of the scientific committee of the Integrated Assessment Modeling Consortium
2011: Coordinator the EU FP7 project 'LIMITS'
2011: Member of the steering committee of the Energy Modelling Forum 27
2010: Lead Author for the IPCC 5th assessment report, WGIII
2010: Best post-doctoral paper award of the Carbon Mitigation Initiative at Princeton University
2009: Coordinator the EU FP7 project PLANETS'
2009: Paper included in "Time" magazine's list of "The 50 Best Inventions of 2009"
2009-: Co-director of the International Energy Workshop
2007: Second prize for best paper at the 20th World Energy Congress, Rome
2000: Scholarship from the London School of Economics for post-graduate studies
1999: Scholarship from the University of Bologna for postgraduate studies

PUBLICATIONS

1. Galliera, A., G. d'Adda and M. Tavoni "Urgency and engagement: Empirical evidence from a large-scale intervention on energy use awareness " *Journal of Economic Psychology*

2. Gambhir, Ajay, and Massimo Tavoni. "Direct Air Carbon Capture and Sequestration: How It Works and How It Could Contribute to Climate-Change Mitigation." *One Earth* 1, no. 4 (December 20, 2019): 405–9. https://doi.org/10.1016/j.oneear.2019.11.006.

3. Lamperti, F., V. Bosetti, A. Roventini, and M. Tavoni. "The Public Costs of Climate-Induced Financial Instability." *Nature Climate Change* 9, no. 11 (November 2019): 829–33. https://doi.org/10.1038/s41558-019-0607-5.

4. Emmerling, J., L. Drouet, Kaj-Ivar van der Wijst, D. van Vuuren, V. Bosetti, and M. Tavoni. "The Role of the Discount Rate for Emission Pathways and Negative Emissions." *Environmental Research Letters* 14, no. 10 (October 2019): 104008. https://doi.org/10.1088/1748-9326/ab3cc9.

5. Realmonte G. et. al 2019 'An inter-model assessment of the role of direct air capture in deep mitigation pathways', *Nature Communications, 10(1)*

6. M. Fontana, S. Vantini and M. Tavoni 2019 'Functional Data Analysis of high-frequency load curves reveals drivers of residential electricity consumption', *Plos One, https://doi.org/10.1371/journal.pone.0218702*

7. Nerini, F.F, et. al 2019 'Connecting climate action with other Sustainable Development Goals', *Nature Sustainability, 2, pages 674–680 (2019)*

8. Gao, Y., G. d'Adda and M. Tavoni "Adopting LEDs changes attitudes towards climate change: experimental evidence from China", *Environmental Research Letters, https://doi.org/10.1088/1748-9326/ab1499*

9. Fanghella, V., G. d'Adda, and M. Tavoni. "On the Use of Nudges to Affect Spillovers in Environmental Behaviors." *Frontiers in Psychology* 10 (2019). https://doi.org/10.3389/fpsyg.2019.00061.

10. Emmerling, Johannes, and Massimo Tavoni. "Exploration of the Interactions between Mitigation and Solar Radiation Management in Cooperative and Non-Cooperative International Governance Settings." *Global Environmental Change* 53 (November 1, 2018): 244–51. https://doi.org/10.1016/j.gloenvcha.2018.10.006.

11. Vinca, Adriano, Marianna Rottoli, Giacomo Marangoni, and Massimo Tavoni. “The Role of Carbon Capture and Storage Electricity in Attaining 1.5 and 2 Â°C.” *International Journal of Greenhouse Gas Control* 78 (November 1, 2018): 148–59. https://doi.org/10.1016/j.ijggc.2018.07.020.

12. Ricke, Katharine, Laurent Drouet, Ken Caldeira, and Massimo Tavoni. “Country-Level Social Cost of Carbon.” *Nature Climate Change*, September 24, 2018, 1. https://doi.org/10.1038/s41558-018-0282-y

13. Luderer G. et. al “Residual fossil CO 2 emissions in 1.5–2 Â°C pathways”, *Nature Climate Change, 2018,* 8:626-633

14. Vinca, A., J. Emmerling and M. Tavoni “Bearing the Cost of Stored Carbon Leakage” May 2018, *Frontiers in Energy Research* 6(40):1-11

15. Jewell et al. “Limited Emission Reductions from Fuel Subsidy Removal except in Energy-Exporting Regions.” *Nature* 554, no. 7691 (February 2018): 229–33. https://doi.org/10.1038/nature25467.

16. Rogelj, J. et al. “Scenarios towards Limiting Global Mean Temperature Increase below 1.5 Â°C.” *Nature Climate Change*, March 5, 2018, 1. https://doi.org/10.1038/s41558-018-0091-3.

17. R B Jackson, Canadell J, Fuss S.,Milne J, Nakicenovic N. and M Tavoni 2017 ’Focus on negative emissions’, *Environmental Research Letters*, Volume 12, Number 11

18. Witajewski-Baltvilks, J., Verdolini, E. & Tavoni, M 2017 ’Induced Technological Change and Energy Efficiency Improvements’, *Energy Economics* (2017). doi:10.1016/j.eneco.2017.10.032

19. Nicolini and Tavoni 2017 ’Are renewable energy subsidies effective? Evidence from Europe’, *Renewable and Sustainable Energy Reviews* 74:412-423

20. Bonan, Pareglio and Tavoni 2017 ’Access to modern energy: a review of barriers, drivers and impacts’, *Environment and Development Economics*, 1-26

21. van Soest et. al. 2017 ’Low-emission pathways in 11 major economies: comparison of cost-optimal pathways and Paris climate proposals’ *Climatic Change* 142(3):491-504 Â · April 2017

22. d’Adda, Capraro and Tavoni 2017 ’Push, don’t nudge: Behavioral spillovers and policy instruments’, *Economics Letters*, 154, 92–95

23. Bosetti et. al. 2017 ’COP21 climate negotiators’ responses to climate model forecasts’, *Nature Climate Change*, 7 (2017) doi:10.1038/nclimate3208

24. Marangoni, Tavoni et. al. 2017 ’Sensitivity of projected long-term CO2 emissions across the Shared Socioeconomic Pathways’, *Nature Climate Change*, doi:10.1038/nclimate3199

25. Emmerling and Tavoni, 2017 ’Climate Engineering and Abatement: A ‘flat’ Relationship Under Uncertainty’, *Environmental and Resource Economics,* doi:10.1007/s10640-016-0104-5

26. Fuss et. al 2016 ’Research priorities for negative emissions’, *Environmental Research Letters,* Volume 11, Number 11

27. SzolgayovÃ¡ et. al 2016 ’The benefits of investing into improved carbon flux monitoring’, *Cogent Economics&Finance* 4:1239672

28. Rao et. al 2016 ’A multi-model assessment of the co-benefits of climate mitigation for global air quality’, *Environmental Research Letters* 11 124013

29. Riahi et. al 2016 ’The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview’, *Global Environmental Change*, http://dx.doi.org/10.1016/j.gloenvcha.2016.05.009

30. Aldy, Pizer, Tavoni et. al 2016 ’Economic tools to promote transparency and comparability in the Paris Agreement’, *Nature Climate Change*, doi:10.1038/nclimate3106

31. Rao et. al 2016 “Future air pollution in the Shared Socio-economic Pathways”, *Global Environmental Change* Â · DOI: 10.1016/j.gloenvcha.2016.05.012

32. van Vuuren et. al 2016 “Carbon budgets and energy transition pathways”, *Environmental Research Letters*, 11(7):075002

33. de Cian et. al 2016 “Alleviating inequality in climate policy costs: an integrated perspective on mitigation, damage and adaptation”, *Environmental Research Letters*, 11(7):074015

34. Jewell et. al. 2016 “Comparison and interactions between the long-term pursuit of energy independence and climate policies”, *Nature Energy*, DOI: 10.1038/NENERGY.2016.73

35. Kriegler et. al, 2016 “Will economic growth and fossil fuel scarcity help or hinder climate stabilization?: Overview of the RoSE multi-model study”, *Climatic Change*, Volume 136, Issue 1, pp 7–22

36. Gennaioli, C., and M. Tavoni. 2016. “Clean or Dirty Energy: Evidence of Corruption in the Renewable Energy Sector.” *Public Choice*, March, 1–30. doi:10.1007/s11127-016-0322-y.

37. Berger, L., J. Emmerling and M. Tavoni, 2016. “Managing Catastrophic Climate Risks under Model Uncertainty Aversion”, *Management Science,* doi:10.1287/mnsc.2015.2365

38. Witajewski-Baltvilks, J., Verdolini, E. & Tavoni, M. Bending the learning curve. *Energy Economics* (2015). doi:10.1016/j.eneco.2015.09.007

39. van Sluisveld, M. A. E. et al. Comparing future patterns of energy system change in 2 Â°C scenarios with historically observed rates of change. *Global Environmental Change* 35, 436–449 (2015).

40. Tavoni, M. et al. Post-2020 climate agreements in the major economies assessed in the light of global models. *Nature Clim. Change* 5, 119–126 (2015).

41. Stechow, C. von et al. Integrating Global Climate Change Mitigation Goals with Other Sustainability Objectives: A Synthesis. *Annual Review of Environment and Resources* 40, 363–394 (2015).

42. Drouet, L., Bosetti, V. & Tavoni, M. Selection of climate policies under the uncertainties in the Fifth Assessment Report of the IPCC. *Nature Clim. Change* 5, 937–940 (2015).

43. McJeon, H. et al. Limited impact on decadal-scale climate change from increased use of natural gas. *Nature* 514, 482–485 (2014).

44. Kriegler, E. et al. The role of technology for achieving climate policy objectives: overview of the EMF 27 study on global technology and climate policy strategies. *Climatic Change* 123, 353–367 (2014).

45. Fuss, S. et al. Betting on negative emissions. *Nature Clim. Change* 4, 850–853 (2014).

46. Bowen, A., Campiglio, E. & Tavoni, M. A macroeconomic perspective on climate change mitigation: meeting the financing challenge. *Clim. Change Econ.* 05, 1440005 (2014).

47. Blanford, G. J., Kriegler, E. & Tavoni, M. Harmonization vs. fragmentation: overview of climate policy scenarios in EMF27. *Climatic Change* 123, 383–396 (2014).

48. Tavoni, M. & Socolow, R. Modeling meets science and technology: an introduction to a special issue on negative emissions. *Climatic Change* 118, 1–14 (2013).

49. Tavoni, M. et al. The distribution of the major economies' effort in the durban platform scenarios. *Clim. Change Econ.* 04, 1340009 (2013).

50. Mastrandrea, M. & Tavoni, M. Foreword to the special issue: climate change, extremes, and energy systems. *Climatic Change* 121, 1–2 (2013).

51. Kriegler, E. et al. What does the 2Â°c target imply for a global climate agreement in 2020? the limits study on durban platform scenarios. *Clim. Change Econ.* 04, 1340008 (2013).

52. Emmerling, J. & Tavoni, M. Geoengineering and Abatement: A 'Flat' Relationship Under Uncertainty. (Social Science Research Network, 2013).

53. Cian, E. D., Sferra, F. & Tavoni, M. The influence of economic growth, population, and fossil fuel scarcity on energy investments. *Climatic Change* 1–17 (2013). doi:10.1007/s10584-013-0902-5

54. Cian, E. D., Carrara, S. & Tavoni, M. Innovation benefits from nuclear phase-out: can they compensate the costs? *Climatic Change* 123, 637–650 (2013).

55. Chen, C. & Tavoni, M. Direct air capture of CO2 and climate stabilization: A model based assessment. *Climatic Change* 118, 59–72 (2013).

56. Chakravarty, S. & Tavoni, M. Energy poverty alleviation and climate change mitigation: Is there a trade off? *Energy Economics* 40, Supplement 1, S67–S73 (2013).

57. Carraro, C., Cian, E. D. & Tavoni, M. Human Capital, Innovation, and Climate Policy: an Integrated Assessment. *Environ Model Assess* 19, 85–98 (2013).

58. Calvin, K. et al. A multi-model analysis of the regional and sectoral roles of bioenergy in near- and long-term co2 emissions reduction. *Clim. Change Econ.* 04, 1340014 (2013).

59. Bosetti, V., Carraro, C., De Cian, E., Massetti, E. & Tavoni, M. Incentives and stability of international climate coalitions: An integrated assessment. *Energy Policy* 55, 44–56 (2013).

60. Tavoni, M., Chakravarty, S. & Socolow, R. Safe vs. Fair: A Formidable Trade-off in Tackling Climate Change. *Sustainability* 4, 210–226 (2012).

61. Tavoni, M., De Cian, E., Luderer, G., Steckel, J. C. & Waisman, H. The value of technology and of its evolution towards a low carbon economy. *Climatic Change* 1–19 (2012).

62. Massetti, E. & Tavoni, M. A developing Asia emission trading scheme (Asia ETS). *Energy Economics* 34, Supplement 3, S436–S443 (2012).

63. Jakob, M., Luderer, G., Steckel, J., Tavoni, M. & Monjon, S. Time to act now? Assessing the costs of delaying climate measures and benefits of early action. *Climatic Change* 1–21 (2012).

64. De Cian, E. & Tavoni, M. Do technology externalities justify restrictions on emission permit trading? *Resource and Energy Economics* 34, 624–646 (2012).

65. De Cian, E. & Massimo, T. Mitigation portfolio and policy instruments when hedging against climate policy and technology uncertainty. *Environmental Modeling and Assessment* 17, 123–136 (2012).

66. De Cian, E., Bosetti, V. & Tavoni, M. Technology innovation and diffusion in 'less than ideal' climate policies: An assessment with the WITCH model. *Climatic Change* 1–23 (2012).

67. Bosetti, V., Carraro, C. & Tavoni, M. Timing of Mitigation and Technology Availability in Achieving a Low-Carbon World. *Environmental and Resource Economics* 51, 353–369 (2012).

68. Blanford, G. J., Rose, S. K. & Tavoni, M. Baseline projections of energy and emissions in Asia. *Energy Economics* 34, Supplement 3, S284–S292 (2012).

69. Tavoni, M. & Zwaan, B. van der. Nuclear Versus Coal plus CCS: a Comparison of Two Competitive Base-Load Climate Control Options. *Environ Model Assess* 16, 431–440 (2011).

70. Tavoni, M., Cian, E. D., Luderer, G., Steckel, J. C. & Waisman, H. The value of technology and of its evolution towards a low carbon economy. *Climatic Change* 114, 39–57 (2011).

71. Massetti, E. & Tavoni, M. THE COST OF CLIMATE CHANGE MITIGATION POLICY IN EASTERN EUROPE AND FORMER SOVIET UNION. *Climate Change Economics* 02, 341–370 (2011).

72. Haurie, A., Tavoni, M. & Zwaan, B. C. C. van der. Modeling Uncertainty and the Economics of Climate Change: Recommendations for Robust Energy Policy. *Environ Model Assess* 17, 1–5 (2011).

73. Bosetti, V., Carraro, C., Duval, R. & Tavoni, M. What should we expect from innovation? A model-based assessment of the environmental and mitigation cost implications of climate-related R&D. *Energy Economics* (2011).

74. Tavoni, M. & Tol, R. S. J. Counting only the hits? The risk of underestimating the costs of stringent climate policy. *Climatic change* 100, 769–778 (2010).

75. Clarke, L. et al. International climate policy architectures: Overview of the EMF 22 International Scenarios. *Energy Economics* 31, S64–S81 (2009).

76. Chakravarty, S. et al. Sharing global CO2 emission reductions among one billion high emitters. *Proceedings of the National Academy of Sciences* 106, 11884–11888 (2009).

77. Bosetti, V., Carraro, C. & Tavoni, M. Climate change mitigation strategies in fast-growing countries: The benefits of early action. *Energy Economics* 31, Supplement 2, S144–S151 (2009).

78. Bosetti, V., Carraro, C. & Tavoni, M. A Chinese commitment to commit: can it break the negotiation stall? *Climatic Change* 97, 297–303 (2009).

79. Bosetti, V., Carraro, C., Sgobbi, A. & Tavoni, M. Delayed action and uncertain stabilisation targets. How much will the delay cost? *Climatic Change* 96, 299–312 (2009).

80. Bosetti, V. & Tavoni, M. Uncertain R&D, backstop technology and GHGs stabilization. Energy Economics 31, S18–S26 (2009).

81. Bosetti, V., Carraro, C., Massetti, E., Sgobbi, A. & Tavoni, M. Optimal energy investment and R&D strategies to stabilize atmospheric greenhouse gas concentrations. *Resource and Energy Economics* 31, 123–137 (2009).

82. Bosetti, V., Carraro, C., Massetti, E. & Tavoni, M. International energy R&D spillovers and the economics of greenhouse gas atmospheric stabilization. *Energy Economics* 30, 2912–2929 (2008).

83. Tavoni, M., Sohngen, B. & Bosetti, V. Forestry and the carbon market response to stabilize climate. *Energy Policy* 35, 5346–5353 (2007).

84. Marschinski, R., Rossi, P., Tavoni, M. & Cocco, F. Portfolio selection with probabilistic utility. *Annals of Operations Research* 151, 223–239 (2007).

85. Bosetti, V., Carraro, C., Galeotti, M., Massetti, E. & Tavoni, M. WITCH A World Induced Technical Change Hybrid Model. *The Energy Journal* 27, 13–37 (2006).

INVITED PRESENTATIONS AND LECTURES

2017: OECD; Michigan University
2015: Yale University
2014: Stanford University, Yale University
2013: Bruegel Institute, UniversitÃ della Svizzera Italiana
2012: University of Vigo, Renmin University
2011: Princeton University, Pompeu Fabra University, Economics for Energy Foundation
2010: Bocconi University, ETH Zurich, Bruegel Institute, Tsinghua University, European Bank of Reconstruction and Development (EBRD), Environmental Defense Fund (EDF), Princeton University
2009: Economic and Financial Committee of the United Nations General Assembly, International Energy Workshop
2008: Catholic University of Milan
2007: Princeton University, University of Padua