

## Juan B. Moreno-Cruz

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EDUCATION	Ph.D. Economics, University of Calgary, 2010. M.Sc. Electrical Engineering, Universidad de Los Andes, 2004. B.Sc. Electrical Engineering, Universidad de Los Andes, 2003.	
RESEARCH INTERESTS	Energy, Environmental and Natural Resources Economics. Technological Change, Economic Growth and Institutions. Climate Change Economics and Climate Engineering.	
CURRENT AFFILIATIONS	Associate Professor School of Environment Enterprise and Development University of Waterloo. Since July 2018  Canada Research Chair in Energy Transitions. Since October 2018  Research Network Affiliate CESifo. Since March 2018	
OTHER ACADEMIC APPOINTMENTS	Faculty Advisor Carnegie Energy Innovation Center— Carnegie Institution for Science, Stanford. Since March 2017  Visiting Researcher in the Department of Global Ecology — Carnegie Institution for Science, Stanford. Since October 2014  Researcher at the Center for Climate and Energy Decision Making — Engineering and Public Policy, CMU. Since August 2011	
PREVIOUS POSITIONS	Associate Professor School of Economics — Georgia Institute of Technology. August 2017-July 2018  Assistant Professor School of Economics — Georgia Institute of Technology. August 2011-July 2017	
GRANTS	PI: Canada Research Chair in Energy Transitions, NSF, 2018-2023 ( <u>\$ 500,000</u> )  PI: Regional Industrial Structure, Economic Resilience and Energy Consumption: Comparative Evaluation, Historical Analysis and Pathway towards a More Sustainable Economy, NSF, 2015-2018 ( <u>\$ 300,000</u> ) (John Crittenden, Co-PI)  Energy in an Information Age, Strategic Energy Institute, 2017 ( <u>\$40,000</u> )  GT-FIRE “Prosumers and the disruption of the economic system.” ( <u>\$31,840</u> )  Small Research Grants, Ivan Allen College, 2016 ( <u>\$13,000</u> )	

Brook Bryers Fellowship 2015-2018 (\$1500 per year, for three years)  
Small Research Grants, Ivan Allen College, 2014 (\$18,000)  
Small Research Grants, Ivan Allen College, 2013 (\$12,000)

HONORS AND  
AWARDS

Kavli Frontiers of Science Fellow, National Academy of Sciences, 2016.  
Class of 1969 Teaching Fellows, 2011.  
Young Scientist Summer Program, Institute for Applied Systems Analysis,  
Laxenburg, Austria. 2003.

PEER-REVIEWED  
PUBLICATIONS

Lei Duan, Juan Moreno-Cruz and Ken Caldeira, Balancing climate and development goals (2020), *Environmental Research Letters*, vol 15, 124057

Patrick Brown, Juan Moreno-Cruz and Ken Caldeira, Break-even year: a concept for understanding intergenerational trade-offs in climate change mitigation policy (2020) *Environmental Research Communications*, Vol 2, no 9

Wilfried Rickels, Martin Quaas, Juan Moreno-Cruz, Kate Ricke, Johannes Quaas and Sjak Smulders, Who Turns the Global Thermostat and by How Much? (2020) *Energy Economics* Vol 91, September 2020, 104852

Juan Moreno-Cruz and M. Scott Taylor, Food, Fuel and the Domesday Economy (2020), *European Economic Review*, Vol 128, September 2020, 103501

Christopher J. Blackburn Mallory E. Flowers, Daniel C. Matisoff and Juan Moreno-Cruz, Do Pilot and Demonstration Projects Work? Evidence from a Green Building Program (2020) *Journal of Policy Analysis and Management*

Caleb Robinson, Bistra Dilkina, Juan Moreno-Cruz, Modeling migration patterns in the USA under sea level rise (2020) *PlosONE* 15(1): e0227436

Anthony R. Harding, Katharine Ricke, Daniel Heyen, Douglas G. MacMartin, Juan Moreno-Cruz, Climate econometric models indicate solar geoengineering would reduce inter-country income inequality (2020) *Nature Communications* 11, 227

Juan Moreno-Cruz Understanding the industrial contribution to pollution offers opportunities to further improve air quality in the United States (2019) *Proceedings of the National Academy of Sciences* Vol 116 no6, 19768–19770

Jane A Flegal, Anna-Maria Hubert, David R Morrow, Juan Moreno-Cruz, Solar Geoengineering: Social Sciences, Legal, Ethical and Economic Frameworks. (2019) *Annual Review of Environment and Resources* Vol 44.

Rong Wang, Harry Saunders, Juan Moreno-Cruz, Ken Caldeira Induced Energy-Saving Efficiency Improvements Amplify Effectiveness of Climate Change Mitigation. (2019) *Joule* Volume 3, no 9, 2103-2119

Xi Liu, Huibin Du, Zengkai Zhang, John C Crittenden, Michael L Lahr, Dabo Guan, Zhifu Mi, Jian Zuo, Juan Moreno-Cruz Can virtual water trade save water resources? (2019) *Water Research* Vol 163, 114848.

Gregory Casey, Soheil Shayegh, Juan Moreno-Cruz, Martin Bunzl, Oded Galor and Ken Caldeira, The impact of climate change on fertility. (2019) *Environmental Research Letters* Vol 14, no 5.

- Daniel Heyen, Joshua Horton and Juan Moreno-Cruz, Strategic implications of counter-geoengineering: Clash or cooperation? (2019) *Journal of Environmental Economics and Management* Vol95, 153-177.
- Eve Tsybina, Alexey Tereshin and Juan Moreno-Cruz, Liberalisation lowers primary energy efficiency: Evidence from twin power systems. (2019) *Energy* Vol 173, 423-435.
- Jevan Cherniwchan and Juan Moreno-Cruz, “Maize and Precolonial Africa.” (2018). *Journal of Development Economics* Vol 136, 137-150.
- Garth Heutel, Juan Moreno-Cruz and Soheil Shayegh, “Solar Geoengineering, Uncertainty, and the Price of Carbon.” (2018). *Journal of Environmental Economics and Management* Vol 87, Pages 24-41
- Chris Blackburn, Tony Harding and Juan Moreno-Cruz, “Toward Deep-Decarbonization: An energy-service system framework.” (2017). *Curr Sustainable Renewable Energy Rep.* DOI 10.1007/s40518-017-0088-y.
- Rong Wang, Juan Moreno-Cruz, and Ken Caldeira, “Will the use of a carbon tax for revenue generation produce an incentive to continue carbon emissions?” (2017). *Environmental Research Letters* Vol 12, no 6.
- Yuan Wang, Nan Lai, Jian Zuo, Juan Moreno-Cruz, John Crittenden, and Yi Jin, “Air pollutants emission from economic sectors in China: A linkage analysis” (2017). *Ecological Indicators* Vol 77, pp 250-260
- Juan Moreno-Cruz and Scott Taylor, “An Energy-centric Theory of Agglomeration.” (2017). *Journal of Environmental Economics and Management* Vol 84, pp 153-172
- Juan Moreno-Cruz and Sjak Smulders, “Revisiting the economics of climate change: the role of geoengineering.” (2017). *Research in Economics* 71 (2), pp 212-224
- Tony Harding and Juan Moreno-Cruz, “Solar geoengineering economics: from incredible to inevitable and half-way back.” (2016). *Earth’s Future* Vol 4(12), pp 2328-4277
- Soheil Shayegh, Juan Moreno-Cruz and Ken Caldeira, “Adapting to rates versus amounts of climate change: A case of adaptation to sea-level rise” (2016). *Environmental Research Letters* vol 11, No 10.
- Garth Heutel, Juan Moreno-Cruz and Soheil Shayegh, “Climate Tipping Points and Solar Geoengineering.” (2016). *Journal of Economic Behavior and Organization.* Volume 132, Part B, pp 19-45
- M. Burke, M. Craxton, C. D. Kolstad, C. Onda, H. Allcott, E. Baker, L. Barrage, R. Carson, K. Gillingham, J. Graff-Zivin, M. Greenstone, S. Hallegatte, W. M. Hanemann, G. Heal, S. Hsiang, B. Jones, D. L. Kelly, R. Kopp, M. Kotchen, R. Mendelsohn, K. Meng, G. Metcalf, J. Moreno-Cruz, R. Pindyck, S. Rose, I. Rudik, J. Stock, R. S. J. Tol, “Opportunities for advances in climate change economics” (2016). *Science* Vol 352, pp. 292-293
- Garth Heutel, Juan Moreno-Cruz and Kate Ricke, “Climate Engineering Economics.” (2016). *Annual Review of Resource Economics.* Vol. 8, pp 99-118
- Kate Ricke, Juan Moreno-Cruz, Jacob Schewe, Anders Levermann and Ken Caldeira, “Policy Thresholds in Mitigation” (2016). *Nature Geosciences* Vol 9 (5-6)

Xuwei Yu, Juan Moreno-Cruz, and John C. Crittenden, “Regional energy rebound effect: the impact of economy-wide and sector level energy efficiency improvement in Georgia, USA.” (2015). *Energy Policy* Vol 87, pp 250-259.

Paul Y Kerl, Wenxian Zhang, Juan Moreno-Cruz, Thanos Nenes, Matthew J Reallf, Armistead G Russell, Joel Sokol and Valerie M. Thomas, “A New Approach for Optimal Electricity Planning and Dispatching with Hourly Time-Scale Air Quality and Health Considerations,” (2015). *Proceedings of the National Academy of Sciences* Vol 112 (35), pp 10884-10889

Juan Moreno-Cruz, “Mitigation and the Geoengineering Threat,” (2015). *Resource and Energy Economics* Vol 41, pp 248-263

Gregory Macfarlane, Laurie Garrow and Juan Moreno-Cruz, “Does Atlanta Value MARTA? Selecting an autoregressive model to recover willingness to pay.” (2015). *Transportation Research Part A: Policy and Practice* Vol 78, pp 214-230

Kate Ricke, Juan Moreno-Cruz and Ken Caldeira, “Strategic incentives for climate geoengineering coalitions to exclude broad participation.” (2013). *Environmental Research Letters* 8 (1), 014021

Timo Goeschl, Daniel Heyen and Juan Moreno-Cruz, “The Intergenerational Transfer of Solar Radiation Management Capabilities and Atmospheric Carbon Stocks.” (2013). *Environmental and Resource Economics* Vol 56, Issue 1, pp 85-104

Juan Moreno-Cruz and David Keith, “Climate Policy under Uncertainty: A Case for Solar Geoengineering.” (2013). *Climatic Change* Vol 121, Issue 3, pp 431-444

Juan Moreno-Cruz, Kate Ricke and David Keith. “A simple model to account for regional inequalities in the effectiveness of solar radiation management.” (2012). *Climatic Change* Vol 110, Issue 3-4, pp 649-668

BOOK  
CHAPTERS

Kate Ricke and Juan Moreno-Cruz, “Geo-Wedges: A Portfolio Approach to Geoengineering the Climate” (2020) in *Volume 9 Renewable Energy and the Environment* Trevor Letcher, ed. Elsevier.

Tony Harding and Juan Moreno-Cruz, “Economics of Geoengineering” (2018) in *Managing Global Warming: an interface of technology and human issues* Trevor Letcher, Ed. Elsevier

Juan Moreno-Cruz, Kate Ricke and Gernot Wagner, “The Economics of Climate Engineering.” (2015) in *Geoengineering Our Climate: Science, Ethics and Governance*. EarthScan.

Scott Barrett and Juan Moreno-Cruz, “The alternatives to unconstrained climate change: Emission reductions versus carbon and solar geoengineering.” (2015). *Towards a Workable and Effective Climate Regime* ed. Scott Barrett, Carlo Carraro, Jaime de Melo

LETTERS AND  
REPORTS

David Keith, Gernot Wagner and Juan Moreno-Cruz, “Modelling the effects of climate engineering” (2106). *Science* 352, 1526-1527

David Keith and Juan Moreno-Cruz, “Is the Photovoltaic Learning Curve Flattening?” (2011). NearZero.

David Keith and Juan Moreno-Cruz, "Pitfalls of coal peak prediction" (2011).  
*Nature* 469, 472

Juan Moreno-Cruz, "A Sustainable Policy Making - Energy System for Colombia,"  
IIASA IR 009, 2004.

WORKING  
PAPERS

David L. Kelly, Garth Heutel, Juan B. Moreno-Cruz and Soheil Shayegh, "Solar  
Geoengineering, Learning, and Experimentation" (2021)

Erik Johnson and Juan Moreno-Cruz, "Air-quality and Health Impacts of Electricity  
Congestion." (2020).

Christopher J. Blackburn and Juan Moreno-Cruz, "Energy Efficiency in General  
Equilibrium with Input-Output Linkages" (2020).

Juan Moreno-Cruz, Gernot Wagner and David Keith, "An Economic Anatomy of  
Optimal Climate Policy" (2017). Harvard Kennedy School Working Paper  
RWP17-028.

Tibor Besedeš, Juan Moreno-Cruz and Volker Nitsch. "Trade Integration and the  
Fragility of Trade Relationships: Theory and Empirics" (2018).

Tavoni, M., Bosetti, V., Shayegh, S., Drouet, L., Emmerling, J., Fuss, S., Goeschl,  
T., Guivarch, C., Lontzek, T.S., Manoussi, V. and Moreno-Cruz, J, "Challenges and  
opportunities for integrated modeling of climate engineering" (2017).

Juan Moreno-Cruz and M. Scott Taylor, "Back to the Future of Green-Powered  
Economies," (2012). NBER Working Paper WP 18236

PROFESSIONAL  
SERVICE AND  
OTHER  
ACTIVITIES

**Current Students:** Laura Blanco-Murcia, David Benjamin Billedeau, Isra Saeed,  
Zixing (Lisa) Shen

**Past PhD Students:** Tony Harding (Harvard, Postdoc) Mao Xi (PhD. UT Rio  
Grande Valley, Assistant Professor), Chris Blackburn (Bureau of Economic Analysis,  
Researcher)

**Co-Editor: Contemporary Economic Policy**

**Referee for:**

*JAERE, JEEM, Nature Communications, Proceedings of the National Academy of  
Sciences, Journal of Economic Behavior and Organization, Anthropocene Review,  
Canadian Journal of Economics, Climate Policy, Climatic Change Journal,  
Contemporary Economic Policy, Ecological Economics, Energy Journal, Energy  
Policy, Energy and Environmental Economics, Environment and Development  
Economics, Environmental Science and Technology, Journal of Environmental  
Economics and Management, Nature Climate Change, Socio-economic Planning  
Sciences.*

TEACHING  
EXPERIENCE

**University of Waterloo, SEED** Susm 702: Research Methods, Susm 603: Methods,  
Indev 606: Energy and Sustainability

**Georgia Institute of Technology, School of Economics**

Econ 6160, Econometric Analysis, Econ 4321: Tech and Entrepreneurship/Econ 6440: Economics of Technology, Econ 4813, Sports Economics, Econ 6106, Microeconomic Analysis, Econ 6380, Environmental Economics, Econ 7032, Macro of Innovation, Econ 7102, Environmental Economics

NON-ACADEMIC  
EXPERIENCE

**Energy and Natural Gas Regulatory Commission: Advisor, 2004-2005**

Responsibilities: Development of the regulatory framework to bring electricity to rural areas in Colombia.

Development of the regulatory framework for distributed generation in Colombia.

Study of the retail electricity system in Colombia.

**Consultoria Colombiana S.A.: Engineering Assistant, 2002**

Responsibilities: Power systems designer and database manager.

CITIZENSHIP

Colombian.

Last updated: February 18, 2021