

Madalsa Singh

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APPOINTMENTS

University of California Santa Barbara

Aug 2024 - Present

Postdoctoral Research Fellow

Bren School of Environmental Science & Management

EDUCATION

Stanford University

Sep 2019 - May 2024

Ph.D.

Energy Science and Engineering

Thesis: Rapid and Equitable Transport Decarbonization in the Age of Electrification

Advisor: Prof. Inês Azevedo

Committee members: Prof. Bruce Cain, Prof. Sally Benson, Prof. Julian Marshall

Carnegie Mellon University

Aug 2018 - May 2019

Master of Science

Energy Science and Mechanical Engineering

Indian Institute of Technology Bombay

Aug 2011 - Aug 2015

Bachelor of Technology

Materials Science and Metallurgical Engineering

PUBLICATIONS

First Author Publications & Working Papers

1. Ensuring greenhouse gas reductions from electric vehicles compared to hybrid gasoline vehicles requires a cleaner U.S. electricity grid. (with Tugce Yuksel, Jeremy Michalek, Inês Azevedo). *Nature Scientific Reports*, 2024.
2. Distributional impacts of fleet-wide changes in light-duty transportation: mortality risks of PM_{2.5} emissions from electric vehicles and Tier 3 conventional vehicles. (with Chris Tessum, Julian Marshall, Inês Azevedo). *Environmental Research Letters*, 2024.
3. How differential privacy will affect our understanding of air pollution exposure and disparities in the United States? *Findings*, 2023.
4. Microhybrid electricity system for energy access, livelihoods, and empowerment. (with P. Balachandra). *Proceedings of the IEEE*, 2019
5. Equitable retail rates for a decarbonized and resilient electricity system. (with Bruce Cain and Inês Azevedo). *In revision, Progress in Energy* [Draft]
6. Trends and drivers of utility costs in California. (with Alison Ong, Rayan Sud). *In revision, The Electricity Journal* [Draft]

7. Policies to retire old light-duty vehicles will help achieve California's zero-emissions targets and provide substantial air-pollution co-benefits. (with Eleanor Hennessy, Sarah Saltzer, Andrew Berson, Inês Azevedo). *In submission* [Draft]

Contributing Author Publications

1. Pathways to zero emissions in California's heavy-duty transportation sector.(with Nora Hennessy, Sarah Saltzer, Inês Azevedo). *Environmental Research: Infrastructure and Sustainability*, 2024.
2. Performance metrics required of next-generation batteries to electrify commercial aircraft. (with Alexander Bills, Shashank Sripad, Venkat Vishwanathan). *ACS Energy Letters*, 2020.

PRESENTATIONS

1. Maximizing climate, air quality, and exposure equity benefits from vehicle electrification. *Rochester Institute of Technology* 2024. [Invited talk]
2. Targeted power sector decarbonization to improve climate and health benefits of electrification. (with Inês Azevedo). *INFORMS* 2024. [Invited talk]
3. Ensuring greenhouse gas reductions from electric vehicles compared to hybrid gasoline vehicles requires a cleaner U.S. electricity grid. (with Tugce Yuksel, Jeremy Michalek, Inês Azevedo). *SAE Energy and Propulsion* 2024. [Invited talk]
4. Rapid and equitable transport decarbonization in the age of electrification. *Special Jones Seminar, Dartmouth College* 2024. [Invited talk]
5. Designing efficient and equitable electricity retail rates for distributed energy resources. (with Bruce Cain, Inês Azevedo). *INFORMS* 2023.
6. How clean does the U.S. electricity grid need to be to ensure electric vehicles reduce emissions? (with Tugce Yuksel, Jeremy Michalek, Inês Azevedo). *Transportation Research Board Annual Meeting* 2023.
7. EVs or tier 3 gasoline vehicles? PM_{2.5} mortality impacts of fleet-wide change in light duty transportation. (with Chris Tessum, Julian Marshall, Inês Azevedo). *American Geophysics Unions Fall Meeting* 2022.
8. At-margin or not? Persistently high marginal emissions factors and their impact on electric vehicle emissions. (with Tugce Yuksel, Jeremy Michalek, Inês Azevedo). *United States Association of Energy Economics Annual Meeting* 2022.
9. Accelerated retirements of fossil vehicles to achieve sustainable mobility goals of California (with Nora Hennessy, Sarah Saltzer, Inês Azevedo). *United States Association for Energy Economics Annual Meeting* 2022.
10. Utility in a box: Feasibility of hybrid micro-grids for productive energy in India. *Women in Clean Energy Symposium*, Stanford University, 2019.
11. Techno-economic feasibility of hybrid micro-grids in Western Ghats (with P. Balachandra). *International Conference of Indian Society of Ecological Economics* 2017.

REPORTS

1. Pathways to Carbon Neutrality in California: Decarbonizing the Transportation Sector. (with Eleanor Hennessy, Sarah Saltzer, Andrew Berson, Inês Azevedo) *Stanford Center for Carbon storage and Stanford Carbon Removal Initiative* 2022.

POLICY WORKSHOPS

1. Energy Justice Workshop & Policy Dialogue, Howard University 2024
2. Open Energy Modeling Initiative (Openmod) workshop, Stanford University 2023
3. Energy justice in the energy transition. Southern Methodist University 2023
4. Stanford-IIT Bombay workshop on climate change and energy transition. IIT Bombay 2023
5. International Workshop on Sustainable Development. Columbia University 2023, 2022
6. Green energy in the Appalachia: Trans-tech workshop 2018
7. India Energy Access Summit 2018

AWARDS

The William H. Bourne Fellowship 2023
Columbia University travel grant 2023
American Geophysics Union travel grant 2022
Fellow, Inaugural Aspen Climate Cohort 2022
Shultz Energy Fellow, Stanford University 2021
Winner, United States Energy Economics Case Competition, 2020
Alumni Award, Carnegie Mellon University, 2018
EST&P travel grant, Carnegie Mellon University, 2018
Science Fellowship, Department of Science and Technology, Government of India, 2011

SERVICE

Moderator: Behavior, Energy, and Climate Change Conference 2023.
Teaching: Quantitative Methods for Energy Decisions 2021. 1 out of 2 teaching assistants responsible for grading, office hours, extra lectures, and problem set conceptualization.
Reviewer: Energy Findings, Joule, IEEE Vehicle Power and Propulsion, Energy Policy, Environmental Research Letters, Nature Reviews: Electrical Engineering, Progress in Energy.
Department Service: Graduate Student Advisory Committee Representative, Department of Energy Science and Engineering, Stanford University (2022-2023)
Graduate Student Panelist, Stanford School of Earth, Energy & Environmental Sciences Faculty Search, 2021
President, Women in Earth Sciences, Stanford University (2021-2023)
Department Mentor, Energy Resources Engineering, Stanford University (2021-2023)

SKILLS

Python, Julia, QGIS, L^AT_EX

PROFESSIONAL EXPERIENCE

Tesla Inc. *Algorithms and Operations Intern*

June 2022 - Sept 2022

California Public Utilities Commission, Office of Commissioner Martha Guzman Aceves

Shultz Energy Fellow

May 2021 - Sept 2021

- Energy systems modeler for commissioner's office on the net energy metering rule-making (NEM3.0 proceeding)

Oorja Development Solutions Ltd., *Technical Consultant*

Oct 2017 - July 2018

MEDIA

Should I Buy an Electric Vehicle in California? All Your Questions Answered. 2024 (research mentioned) [link]

COVID-19: India needs a green economic stimulus (with Aniruddh Mohan). *Hindustan Times*. 2020 [link]