

Pablo Busch

Ph.D. Candidate Energy Systems, M.Sc. Statistics & Public Policy, Industrial & Environmental Engineer
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EDUCATION

University of California, Davis

Davis, CA

Ph.D. Energy Systems

2023 – June 2025

- Quantitative modeling of Demand and Supply for Energy Transition Minerals

M.Sc. Statistics - Data Science

2021 – 2022

- Outstanding Master's Student Award. GPA: 4.0

M.Sc. Environmental Policy and Management

2020 – 2022

- Environmental & Resource Economics
- Spatial Information Science

Pontificia Universidad Católica de Chile

Santiago, Chile

Civil Engineer of Industry, Diploma in Environmental Engineering

2011 – 2016

- Title conferred with maximum distinction
- Award for Best Student of the Hydraulic and Environmental Engineering Department
- Honor award, Highest GPA of the class (2014 and 2015)

PROFESSIONAL EXPERIENCE

Researcher

Apr. 2021 – Present

University of California, Davis

Davis, CA

- **Institute of Transportation Studies & Energy and Efficiency Institute**

- * Developed a global critical mineral demand and supply model to evaluate supply risks associated with lithium-ion batteries decarbonization technologies
- * Developed a global trade supply chain model for electric vehicle production and policy scenarios
- * Analyzed lifecycle emissions assessment of hydrogen pathways to zero-carbon emission vehicles in California
- * Evaluated decarbonization strategies and policies for the cement & concrete sector

Policy Analyst

Sep. 2021 – Jun. 2022

Chile Lagos Limpios

Davis, CA - Valdivia, Chile

- Summarized policy lessons and impact metrics from Lake Tahoe conservation experience to protect North-Patagonian lakes

Senior Project Engineer

Aug. 2018 – Nov. 2020

GreenLab, Dictuc S.A.

Santiago, Chile

- **Air Quality**

- * Conducted an ecological study to analyze the relationship between air pollution (PM_{2.5}), derived mainly by wood combustion, and COVID-19 mortality rates in Chile
- * Designed the methodological guide for estimating atmospheric emissions from point sources in Chile
- * Executed a technical and economic analysis to implement an environmental policy instrument to improve air quality in the inner zone of the Valparaíso region

- **Life Cycle Assessment**

- * Designed and directed the development of a web tool of life cycle assessment in the packaging sector, using local data from the industry

- **Health & Risk Assessment**

- * Developed an automated model to calculate the national base incidence rates of mortality and morbidity for air pollution in Chile
- * Summarized the main risk perception challenges of hydrogen combustion technologies in the mining sector

Project Engineer

GreenLab, Dictuc S.A.

Sep. 2016 – Jul. 2018

Santiago, Chile

- **Climate Change & Air Quality**

- * Calculated the first national emissions inventory of short lived climate pollutants in Chile
- * Designed a handbook for the elaboration of emissions inventory in Chile
- * Improved the methodology for the estimation of health benefits derived from atmospheric pollution reductions

- **Environmental Economics**

- * Executed an econometric analysis for a contingent valuation study to estimate environmental benefits associated with adequate disposal of car waste, such as tires, motor oils and batteries
- * Conducted a specialized technical assistance in matters of information analysis of environmental inspection activities

- **Life Cycle Assessment**

- * Analyzed the social and economic impacts of a return and refund system on returnable containers for soft drinks

Research Internship

Technische Universität Berlin

Jan. 2016

Berlin, Germany

- Analyzed methodologies for life cycle assessment

SKILLS

Languages: Spanish Native, English Proficient, German Intermediate

Programming: Advanced in R, julia, Python, SQL, JavaScript D3, Git, L^AT_EX, VBA

Software: Advanced in R Studio, Visual Studio Code, MS Office, ArcGIS, QGIS, Tableau, MS SQL Server, Stata, Analytica

SCIENTIFIC ARTICLES

Busch, P., Chen, Y., Ogbonna, P., Kendall, A. (2025). Effects of Demand and Recycling on the When and Where of Lithium Extraction. *Nature Sustainability*. [Accepted]

Busch, P., Kim, A., Miller, S.A., Murphy, C.W. (2025). Policy mechanisms to decarbonize cement production: through the lens of California. *Environmental Research: Infrastructure and Sustainability*.

Pares, F., **Busch, P.**, Chandra, M., Tal, G. (2024). Shifting Manufacturing: Electric Vehicle Supply Strategy using the Model for International EV Trade. *Journal of Cleaner Production*, 144357.

Busch, P., Rocha, P., Lee, K., Cifuentes, L., Tai, X. (2024). Short-term exposure to fine particulate pollution and elderly mortality in Chile. *Communications Earth Environment*. 5:469

Busch, P., Pares, F., Chandra, M., Kendall, A., Tal, G. (2024). Future of Global Electric Vehicle Supply Chain: Exploring the Impact of Global Trade on Electric Vehicle Production and Battery Requirements. *Transportation Research Record*.

Brandao, M., **Busch, P.**, Kendall, A. (2024). Life cycle assessment, quo vadis? Supporting or deterring greenwashing? A survey of practitioners. *Environmental Science: Advances*. 3(2), 266-273

Busch, P.; Kendall, A., Lipman, T. (2023). A systematic review of life cycle greenhouse gas intensity values for hydrogen production pathways. *Renewable and Sustainable Energy Reviews*. 184.

Busch, P.; Cifuentes, L.A., Cabrera, C. (2023). Chronic exposure to fine particles (PM_{2.5}) and mortality: Evidence from Chile. *Environmental Epidemiology*. e253.

Busch, P.; Kendall, A., Murphy, C.W., Miller, S.A. (2022). Literature review on policies to mitigate GHG emissions for cement and concrete. *Resources, Conservation and Recycling*. 182.

ACADEMIC EXPERIENCE

Scholar | *Resources for the Future*

Sep. 2024 – Present

- Research scholar at the Critical Minerals Research Lab, an interdisciplinary collaboration to ensure a reliable and equitable supply chain for critical minerals

Committee Member | *ENAMI, Chile*

May – July 2024

- Participation as expert on the Chilean Committee for new Technologies for Lithium Extraction

Consultant | *Inter American Development Bank*

March – June 2024

- Report on emerging energy supply chain opportunities for Latin America and the Caribbean

Conference Presentation | *TRB, Washington DC*

Jan. 2024

- Future of Global Electric Vehicle Supply Chain: Exploring the Impact of Global Trade on Electric Vehicle Production and Battery Requirements

February 2025 Pablo Busch 2/2