Research Statement — Anil Gogebakan

My research lies at the intersection of international trade, environmental economics, and energy policy. I use applied microeconometrics, spatial data, and quantitative general equilibrium models to study how environmental and energy policies interact with trade flows, firm behavior, and inequality across regions and income groups. A central question guides my work: *How do environmental regulations and energy transitions affect the global economy, and how can trade policy be designed to complement rather than hinder environmental goals?*

Current Research

1. Published Work:

My solo-authored paper, *Revisiting Trade and Income in the New Era of Globalisation—Distance, Big Boats and Natural Barriers to Trade*, in *The World Economy* develops a novel instrumental variable to estimate the causal effect of trade on income, exploiting the asymmetries in the effective maritime distance generated by the Panama Canal's capacity constraints and the growth of shipping vessels. By creating quasi-random variation in shipping costs and market access, this study contributes to the literature on geography and trade by offering a novel instrumental variable for identifying the gains from trade.

2. Job Market Paper:

My job market paper, *The Role of Energy Efficiency in Productivity: Evidence from Canada*, provides the first comprehensive economy-wide estimates of how energy misallocation, in addition to capital and labor misallocation, reduces aggregate productivity at the province–sector level. Using annual provincial input-output tables from 2014-2020 and a Hsieh-Klenow style framework extended to include energy, I show that misallocation depresses Canada's productivity by 5 to 8%. Interestingly, while energy accounts for only 8% of input costs, its inefficient allocation explains up to 1.5% of this gap, comparable to capital and far greater than the contribution of labor. Moreover, I decompose misallocation into interprovincial (within-sector) and intersectoral (within-province) components and find that the bulk of the losses stem from interprovincial barriers and regulatory fragmentation in energy markets.

This finding highlights energy as a uniquely distortionary input: its limited mobility, persistent provincial price gaps, and heavy regulation make it far more consequential for productivity than its cost share suggests. The results imply that improving the integration of interprovincial energy could yield a 'double dividend' of higher productivity and lower emissions, easing the trade-off between growth and climate policy. The paper

thus positions energy misallocation, long ignored in productivity analysis, as a central factor for both productivity and environmental policy design.

3. Environmental Justice and Cap-and-Trade:

In a joint work, I study the distributional impacts of the Regional Greenhouse Gas Initiative (RGGI), the first U.S. cap-and-trade program targeting carbon emissions. We combine power-plant level emissions data (2000–2019) with a heterogeneous difference-in-differences design to estimate how RGGI affected co-pollutants (SO2 and NOx). Feeding these results into the high-resolution InMAP air quality model, we link emissions changes to fine-grained demographic data at the census tract level. The analysis shows that while RGGI achieved substantial aggregate reductions in co-pollutants, the health benefits were unevenly distributed, with avoided mortality varying by region and community characteristics. By incorporating causal identification and spatial exposure modeling, this study contributes to the environmental justice literature, which has often relied on descriptive or highly aggregated approaches. Beyond its substantive findings, this project highlights my ability to work collaboratively on data-intensive, interdisciplinary research with policy relevance.

Research Agenda

Building on these foundations, my future research seeks to deepen and connect three strands: (1) the trade–environment nexus, (2) energy markets and air pollution, and (3) environmental justice and regulation.

1. Trade and Environment

I plan to study how global trade flows mediate the effects of environmental policies. For example, I am interested in analyzing how carbon border adjustment mechanisms, pollution taxes, tariffs, or renewable energy subsidies in one country affect production patterns, emissions, and welfare worldwide. I also aim to investigate how unilateral carbon pricing regimes or cap-and-trade programs shift comparative advantage, sectoral allocation, and the emissions intensity of exports.

2. Energy Markets and Air Pollution

Energy production and trade are critical drivers of environmental outcomes. My long-term agenda will examine international markets for electricity and fossil fuels under tightening climate policies, with a particular focus on how cross-border energy trade shapes local air quality and public health. I plan to combine atmospheric chemical transport models with demographic data to quantify differential exposure across socio-economic

groups. This work will provide evidence on who benefits most from cleaner energy transitions, and how policy can ensure that these benefits are shared fairly.

3. Environmental Justice and Regulation

Environmental and energy policies often generate uneven regional effects. Using high-resolution spatial data, I will study how shocks—such as plant closures, carbon taxes, or electrification mandates—reshape regional economic activity, pollution exposure, and firm networks. These projects will integrate spatial econometrics, GIS tools, and general equilibrium modeling to trace how local disruptions propagate across space and sectors, scaling up to national and even global outcomes.

Methodological Approach

My research integrates empirical and computational approaches to address questions at the intersection of trade, energy, and the environment. On the empirical side, I use quasi-experimental designs—such as difference-in-differences and instrumental variables—together with spatial and administrative microdata to identify causal effects. On the structural side, I develop and calibrate quantitative models grounded in international trade and energy economics to interpret mechanisms and explore counterfactual scenarios. I work extensively with Stata, Python, GIS tools, and InMAP, and I have substantial experience with large-scale microdata and emissions inventories. This combination allows me to connect fine-grained data with economic models in ways that capture both local detail and broader general equilibrium dynamics.

Broader Impact

The goal of my research is to contribute to the design of effective and equitable environmental and trade policies. I study how policies such as carbon border adjustments, renewable subsidies, or emissions regulations shape production, emissions, and welfare across regions and sectors. My current work emphasizes the policy relevance of energy misallocation and environmental justice, highlighting who bears the costs and who reaps the benefits of various policy interventions. Through this lens, I seek to produce research that is not only analytically rigorous but also actionable for policymakers, international organizations, and stakeholders engaged in climate and trade governance.