Andrew Igdal

Curriculum Vitae

Austin, TX
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Education

2023–Present **Ph.D. in Energy Policy**
LBJ School of Public Affairs, *The University of Texas at Austin*, Expected 2028
GPA: 3.9/4.0

2019–2023 **B.S. in Economics; B.A. in Physics**, *North Carolina State University*
GPA: 3.6/4.0

Experience

Feb 2024–Present **Graduate Researcher**, *Dr. Michael Webber, Webber Energy Group*, UT Austin
- Developing a cost benefit methodology for electric transmission infrastructure.
- Developing a web interface to support general use of the methodology.
- Researching grid and economic impacts of residential electrification and efficiency measures.
- Researching a general equilibrium model of Asian energy economies.

June 2022–Nov 2025 **Research Analyst**, *Post Road Foundation*, Remote
- Studied beneficial electrification upgrades for residential housing in South-Central Alabama using NREL's ResStock.
- Authored a white paper summarizing study results and policy implications.

June 2024–August 2024 **Long Term Studies Intern**, *ERCOT*, Taylor, TX
- Studied planned and extended planned outages on the ERCOT network.
- Improved modeling inputs of outages in ERCOT's long term studies simulations.
- Created tool for understanding the impact of outages on the ERCOT network.

Feb 2022–May 2023 **Undergraduate Research Assistant**, *Dr. Daniel Dougherty, Condensed Matter Physics Laboratory*, North Carolina State University, Raleigh, NC
- Investigated doping effects in the Mott insulators $RuCl_3$ and $CrCl_3$ via tetramethylammonium bromide intercalation in transition metal trihalide systems.
- Grew and characterized thin films via congruent sublimation, atomic force microscopy, and diffuse reflectance spectroscopy.
- Investigated Schottky barrier effects and the high ideality factors governing memristive behavior of semiconductors.

Mar 2020–Feb 2022 **Undergraduate Research Assistant**, *Dr. John Blondin, Computational Astrophysics*, North Carolina State University, Raleigh, NC
- Modeled stellar gas flow in binary star systems using FORTRAN and Vh-1 hydrodynamics code.

Research

2024–Present **Cost-Benefit Methodology for Transmission Infrastructure**, Manuscript in preparation, targeting *Energy Policy*

- Developed original cost-benefit methodology covering capital, operational, energy losses, emissions, wildfire risk, outage risk, permitting delay, and congestion/curtailment benefits as viewed through multiple BCR perspectives.

2025–Present **Causal Inference Study on CA Heat Pump Adoption**, Paper in development

- Designing panel event study to identify HVAC heat pump adoption response to California's TECH Clean California incentive launch.

2026 **Advanced Reconductoring to Accelerate U.S. Grid Capacity**, *Policy Memo for White House National Energy Dominance Council*, with Joshua D. Rhodes, PhD and Michael E. Webber, PhD

- Co-authored policy memo briefing Peter Lake, then-Senior Director of Power at the White House National Energy Dominance Council, on grid-enhancing technologies.
- Compared advanced conductor technologies (ACSS, ACCR, ACCC, TS, C7) and high-emissivity coatings against standard ACSR, synthesizing peer-reviewed and national-lab literature on capacity uplift, cost, and deployment tradeoffs.
- Produced illustrative cost/schedule comparison between reconductoring and greenfield transmission builds using the FORGE cost calculator.

2025–Present **ERCOT Building Stock Profiling**, In progress

- Replicating and improving ERCOT/Texas residential building stock electric demand profiles from Skiles et al. (2025, 2026) using NREL ResStock.

Publications & Presentations

In prep **Room to Maneuver: The Case for a UN Maritime Force Under Article 109**, *1st Place, New Voices 4 Global Solutions Essay Contest*, Forthcoming in *Mondial*; Invited Participant, 42nd Ventotene International Federalist Seminar

In prep. **Cost-Benefit Methodology for Transmission Infrastructure**, *Igdal et al.*, *Energy Policy*

Sept 2026 **Economics-Driven Adoption Pathways for Residential Electrification in ERCOT**, *PowerUp 2026 Poster*, CU Boulder, Forthcoming

June 2026 **C2AI: Multi-Agent LLM System for Electrification Data**, *PyData London 2026, DevBcn 2026*, with C. Clyburn (Red Hat)

April 2026 **Economic Analysis of Heat Pump Upgrades in NC's Residential Stock**, *UT Energy Week 2026 Poster Competition*, Energy Policy, Economics & Sustainability

Selected Projects

2025–2026 **C2AI — Multi-Agent LLM System**

- Built multi-agent microservices system: orchestrator decomposes natural-language questions and dispatches sub-tasks to specialized SQL, statistics, and visualization agents; query agent exposes a Model Context Protocol (MCP) server for database access.
- Docker Compose deployment with streaming SSE responses; integrated OpenTelemetry distributed tracing to Grafana; real-time chart generation (matplotlib over SSE) and Vercel-inspired frontend.
- Co-developed with Cedric Clyburn (Red Hat) using Red Hat LiteLLM infrastructure; demonstrated live at PyData London 2026 and DevBcn 2026.

July 2026 **Room to Maneuver — UN Maritime Force Policy Essay**

- Researched and authored a policy essay proposing a multilateral UN maritime security force under UN Charter Article 109, addressing the free-rider problem in global freedom-of-navigation (FON)provision.
- Synthesized trade-economics literature, NATO burden-shifting literature, and emerging autonomous naval technology to argue global collective provision of FON is now strategically necessary and technically affordable.
- Delivered a complete argument within a 2,000-word contest limit on a same-day research-to-submission turnaround.
- Won 1st Place in the New Voices 4 Global Solutions Essay Contest 2026.

Jan 2024–May 2024 **Team Lead, ML Payback Prediction**, Austin, TX

- Led development of ML models (AdaBoost, XGBoost) to predict payback periods for electrification upgrades, handling data preprocessing, feature engineering, model selection, and evaluation.

Nov 2025 **2nd Place, USAEE Virtual Case Competition**, *WESARDs*

- Data-driven energy economics case analysis applying economic, engineering, and policy frameworks to a real-world utility grid challenge.
- Wrote a 33-page policy analysis on data center load integration and interconnection reform, covering FERC Order 2023, READY Grid screening, and cost allocation frameworks.
- Designed a 36-month PJM implementation roadmap with tiered capacity framework and risk register.

Skills

Programming	Python (5+ yrs), R (2+ yrs), Julia, TypeScript/JavaScript, SQL
Domain Tools	ResStock, GenX, UPlan, pyfixest
Frameworks	FastAPI, Next.js, Docker/Compose, AWS (EC2, S3, RDS, Cognito), Supabase/Postgres
Data Science	scikit-learn, TensorFlow, XGBoost, Matplotlib, OpenTelemetry/Grafana
Methods	Cost-benefit analysis, econometrics, causal inference (DiD, event study), panel data, general equilibrium modeling
Writing & Tools	LaTeX/BibLaTeX, Git, Linux/Unix

Honors & Activities

2026	1st Place, New Voices 4 Global Solutions Essay Contest
2026	Invited Participant, 42nd Ventotene International Federalist Seminar — Altiero Spinelli Institute of Federalist Studies, with the Union of European Federalists and Young European Federalists
2025–2027	Vice President of Communications, Longhorn Energy Club
2025–2027	Awarded Student allocation on National Renewable Energy Laboratory's Kestrel supercomputer for research on residential electrification and efficiency measures.
2024–2026	Teaching Assistant, Microeconomics, LBJ School of Public Affairs
2025	Invited Participant, National Academies Workshop: "Reinventing the Right of Way: Policy, Technical, and Economic Implications of Siting Transmission Lines Along Transportation Corridors"

2025 2nd Place, United States Association for Energy Economics Case Competition

2025 Gulf Coast Power Association emPOWERing Scholarship

References

Dr. Michael E. Webber **Email**
Dr. Seth A. Hoedl **Email**
Dr. Joshua D. Rhodes **Email**