

# Dr. Andrew W. Thompson

## ENERGY ASSOCIATE

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Dr. Thompson is an energy economist with a background in electrical engineering and expertise in wholesale electricity market design, regulatory economics, and policy analysis of network industries, particularly in the energy sector.

His work focuses on:

- Wholesale electricity market design and reform
- Capacity market/auction design and resource adequacy
- Integration of emerging energy technologies
- Energy finance, cost of new entry (CONE) studies, and cost of capital estimation
- Energy litigation, asset valuation, and economic damages assessments
- Energy market regulation and regulatory filings

Dr. Thompson has supported clients and diverse stakeholder groups – including electricity system operators, energy regulators, governments, clean energy advocacy groups, market participants, institutional investors, and utilities – in several international jurisdictions. This includes PJM, ERCOT, NYISO, ISO New England, CAISO, the Non-ISO/RTO United States, Ontario, Alberta, the United Kingdom, Spain, Colombia, Saudi Arabia, Australia, and New Zealand.

He has published thought leadership on resource adequacy mechanism design, energy policy, and market reforms to integrate emerging resources (renewables, battery storage, long-duration energy storage, distributed energy resources, and flexible load); regulation of the energy sector; and the economic implications of lithium-ion battery degradation for energy storage and electric vehicle technologies.

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### AREAS OF EXPERTISE

- Electricity Wholesale Markets & Planning
- Regulatory Economics, Finance & Rates

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## EDUCATION

- **Université Paris-Saclay (Paris, France)**  
PhD in Economics
- **Universidad Pontificia Comillas (Madrid, Spain)**  
MS in Energy Economics
- **Delft University of Technology (Delft, The Netherlands)**  
MSc in Engineering and Policy Analysis
- **Rowan University (New Jersey, USA)**  
BSc in Electrical and Computer Engineering

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## PROFESSIONAL EXPERIENCE

- **The Brattle Group (2020–Present)**  
Energy Associate
- **University of California Berkeley/Lawrence Berkeley National Laboratory (2017–2019)**  
Visiting Researcher
- **US Department of Energy: ARPE-E (2018)**  
Technology-to-Market Scholar
- **Institut Vedecom (2016–2018)**  
Electric Vehicle and Battery Storage Researcher
- **Spanish and Portuguese Energy Market Operator (OMIE) (2014–2015)**  
Energy Analyst

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## SELECTED CONSULTING EXPERIENCE

### WHOLESALE ELECTRICITY MARKET DESIGN AND REFORM

- **Energy Storage Wholesale Market Reforms Roadmap:** For the American Clean Power Association (ACP) analyzed and developed a comprehensive roadmap for near-term wholesale market reforms needed to better integrate and enable energy storage resources, with a particular focus on implementing reform efforts in PJM, MISO, and NYISO.
- **IESO Future Market Reforms Initiatives:** For the Ontario Independent Electricity System Operator (IESO) conducted a benefits assessment of near-term, mid-term, and long-term market reform initiatives.
- **AESO Market Pathways Initiative:** For the Alberta Electric System Operator (AESO) and the Executive Working Group (EWG), provided support for various inquiries into energy market enhancements as part of the Market Pathways initiative that aims to inform the future evolution of Alberta's electricity market design.

- **South Carolina Wholesale Energy Market Reforms Study:** For the South Carolina State Legislature, conducted a comprehensive assessment of potential benefits and risks from competitive reforms to the state's electricity sector and regulatory model. Examined potential reforms to join or integrate with a regional transmission organization, introduce competition into resource planning, and pursue partial or full retail choice.
- **US Bulk System Reliability for Tomorrow's Grid:** For the Center for Applied Environmental Law and Policy (CAELP), co-authored a report submitted to the US EPA as public comments of the New Source Performance Standards for greenhouse gas emissions. The report outlines current and emerging reliability impacts on the bulk power system due to recent and projected changes in the energy sector and explains the suite of solutions grid operators have at their disposal to ensure reliability is maintained throughout the ongoing energy transition.
- **Generation Interconnection Reform:** For Hydro Quebec, provided a summary of ongoing generation interconnection reform processes and identified best practices in North America.
- **IESO Wholesale Market Participation Model Design for DERs:** Provided expert support to IESO staff for proposed changes to wholesale market participation models and rules to better enable DER and hybrid resource integration.
- **Costs of Decarbonizing the US Electricity Sector:** For the American Council on Renewable Energy (ACORE), a renewable energy advocacy group, evaluated costs to decarbonize the US electricity sector under alternative proposals to extend and expand renewable energy tax credits in 2021. Simulated investment, costs, prices, and emissions nationally to 2050 using gridSIM, Brattle's capacity expansion model. Informed client's policy position.

## CAPACITY MARKET/AUCTION DESIGN AND RESOURCE ADEQUACY

- **PJM Quadrennial Review of Capacity Market Design and Demand Curve Parameters (2022, 2025):** For PJM, conducted periodic reviews of PJM's capacity market, the Reliability Pricing Model. Analyzed market design and functioning for resource adequacy standards, including uncertainty and volatility of prices, net cost of new entry (CONE) parameters, impacts of administrative parameters and regulatory uncertainties, locational mechanisms, demand curve shape, incremental auction procedures, and other market mechanisms. Developed a probabilistic simulation model evaluating the price volatility and reliability implications of alternative demand curve shapes and recommended a revised demand curve shape. expert support to stakeholder proceedings and testimony submitted before the Federal Energy Regulatory Commission.
- **Clean Security of Supply in Europe, Models for Market-Aligned Contracting and Procurement:** For the Clean Air Task Force, developed a whitepaper outlining enhanced market designs for European policymakers to better align resource adequacy mechanisms and clean energy policy to create mutually supportive incentives for meeting both reliability needs and long-term decarbonization goals. With Europe's energy mix shifting rapidly toward variable renewables, the report shows how enhanced and coordinated approaches to security of supply and clean energy procurement can reduce costs, enable cross-border trade, and accelerate the transition to carbon-free energy.

- **Ontario Capacity Auction Design:** Provided expert support to IESO staff in support of a new capacity auction design and enhancements. Delivered detailed reports describing options, tradeoffs, and lessons learned on every aspect of capacity auction design. Developed analysis and design proposals for the capacity market demand curve, capacity accreditation methodologies, and penalty mechanism design. Supported IESO stakeholder engagement efforts and presented analyses of design alternatives in public forums.
- **Assessment of Resource Adequacy Alternatives:** For a North American market operator, assessed potential alternative resource adequacy options including a centralized capacity market with single and bi-furcated pricing, a residual market, a bilateral market, and alternative capacity hedging strategies that could be pursued for end-customers.
- **Capacity Market Overview Study:** For a major renewable investment company, presented an overview of US and international capacity markets and resource adequacy mechanisms.
- **Capacity Accreditation Approaches for Hybrid Resources:** For a major renewable investment company, presented an assessment of current approaches to capacity accreditation using Effective Load Carrying Capability (ELCC) methods for evaluating hybrid resources.

## INTEGRATION OF EMERGING ENERGY TECHNOLOGIES

- **Clean Flexibility Opportunities and Benefits in Europe:** For Beyond Fossil Fuels, authored a report assessing the benefits and opportunities of clean flexibility in different European regions with an in-depth look at the UK, Germany, Poland, Italy, Greece, Bulgaria, and Türkiye. Clean flexibility includes technologies such as batteries and pumped hydro storage, as well as emerging solutions like smart EV charging, demand response, long-duration energy storage, interconnectors, and digital grid management tools. These solutions operate across generation, transmission, and distribution levels to ensure the system remains stable and reliable. Clean flexibility is associated with substantial cost savings. In the UK alone, flexibility solutions reduced electricity bills by £300 million in 2024. Across Europe, demand-side flexibility could save up to €300 billion per year by 2030.
- **Long-Duration Energy Storage (LDES) Technology Landscape:** For the Center for Climate and Energy Solutions (C2ES) provided expert support and research to an industry working group on the Long-duration Energy Storage (LDES) technology landscape. Assessed costs, technology readiness, and value proposition of Inter-day LDES (10-36 hrs) and Multi-day LDES (36+ hrs) technologies to address emerging system needs under deep decarbonization. Provided support on developing policy reforms to encourage greater LDES deployment at state and federal levels.
- **EPRI Long-Duration Energy Storage Working (LDES) Working Group:** For the Electric Power Research Institute (EPRI) presented to an industry working group on the challenges associated with modeling LDES in capacity expansion models.
- **Ontario Long-term Contract Design for Renewable, Storage, and Hybrid Resources:** Provided expert support to Ontario Independent Electricity System Operator (IESO) staff for long/mid-term RFP contract design to procure energy, capacity, and environmental attributes

from emerging resources including renewables, energy storage, and hybrid storage assets in Ontario.

- **NEOM Saudi Arabia Load Flexibility Integration Study:** Developed supporting analysis and a load flexibility roadmap to assist the public utility (ENOWA) in developing their load flexibility integration plan for various sources of large-scale electricity demand within NEOM.
- **Future of Hydrogen in the Power Sector:** For the Environmental Defense Fund (EDF), developed an assessment of the potential role of hydrogen in a decarbonized power sector. Explained the nature of reliability needs in renewable power systems and assessed hydrogen technologies' ability to address system reliability, resiliency, and resource adequacy challenges.

## ENERGY FINANCE, CONE STUDIES, AND COST OF CAPITAL ESTIMATION

- **PJM CONE Study 2025:** For PJM, assessed CONE for new reference resource types and developed updated Brattle CONE model. Report presents: (1) our analysis and selection of relevant resource types; (2) estimates of the CONE for a CC, CT, and 4-hour BESS resource for the 2028/2029 commitment period including escalation methods for subsequent years through 2031/2032; (3) recommendations regarding the methodology for calculating the net energy and ancillary service (E&AS) revenue offset (E&AS Offset); and (4) our recommendations for the reference prices that will be used as an input to setting pricing parameters on the Variable Resource Requirement (VRR) curves.
- **ERCOT CONE Study 2022:** For the Electric Reliability Council of Texas (ERCOT) developed an updated estimate of the Cost of New Entry (CONE) for use in setting the Peaker Net Margin (PNM) threshold, evaluating the cost of proposed reliability standards, analyzing the Market Equilibrium Reserve Margin (MERM) and Economically Optimal Reserve Margin (EORM), and potentially setting demand curves for a Performance Credit Mechanism (PCM). Developed updated model to calculate CONE accounting for fixed and variable costs, lifetime estimates, financial parameters, and levelization of future net revenue requirements.
- **PJM Gross Avoidable Cost Rates:** For PJM, developed Avoidable Cost Rates (ACRs) for existing resource types for use in the Minimum Offer Price Rule (MOPR) and in Market Seller Offer Cap (MSOC). Contributed to submitted testimonies before FERC.
- **Alberta Utilities Commission Generic Cost of Capital (GCOC) Estimation:** Supported Dr. Bente Villadsen's expert testimony on the cost of equity and appropriate capital structure presented before the Alberta Utilities Commission (AUC).
- **Cost of Capital Estimation for North American Regulated Electric Utilities:** For several major North American regulated electric utilities, conducted financial and economic analyses to support expert testimony estimating allowed Return on Equity to inform upcoming rate case hearings before state utility commissions and the FERC.
- **Cost of Capital Estimation for North American Regulated Gas Utilities:** For several major North American regulated gas utilities, conducted financial and economic analyses to support

expert testimony estimating allowed Return on Equity to inform upcoming rate case hearings before state utility commissions and the FERC.

## ENERGY LITIGATION, ASSET VALUATION, AND ECONOMIC DAMAGES ASSESSMENTS

- **ISO New England Gas Power Plant Arbitration:** On behalf of a major energy developer, supported an expert report in an arbitration proceeding. Assessed the financial outlook of a natural gas power plant asset with particular focus on its participation in the ISO New England capacity market.
- **HVDC Transmission Asset Valuation:** For several major transmission companies, assessed the energy, capacity, and additional resource adequacy value of proposed inter-regional high-voltage DC (HVDC) transmission projects under various carbon price and future resource mix scenarios for due diligence processes.
- **PJM Battery Storage Asset Valuation and Damages:** For a major renewable energy developer, developed an economic damages estimation due to an alleged breach in contractual performance warranties of a battery storage asset in PJM Interconnection LLC.
- **Spanish Wind Asset Regulatory Impacts:** For a major renewable energy developer, contributed to expert report on the financial impact on wind assets of a mid-stream switch in the regulatory regime for Spanish renewables.
- **Spanish Solar PV Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Spanish Wind Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Spanish Concentrated Solar Power (CSP) Asset Valuation and Damages:** For a major renewable energy developer, contributed to litigation support and damages estimation of an international arbitration concerning the financial impact of a mid-stream switch in the regulatory regime for Spanish renewables. The damages estimate considers the valuation of both the reduction in remuneration and financial instruments related to the project financing.
- **Colombia Energy Investors Dispute:** For a group of investors in electricity companies, contributed to analysis for expert testimony regarding a dispute over dividend payments before the Bogotá Chamber of Commerce Arbitration Centre.

## ENERGY MARKET REGULATION AND REGULATORY FILINGS

- **Testimony in Alberta Supply Surplus Rule Proceeding:** On behalf of the Alberta Electric System Operator (AESO), supported expert testimony before the Alberta Utilities Commission regarding alleged complaints that ISO Rule 202.5 (the “Supply Surplus” rule) is discriminatory. Testimony assessed whether ISO Rule 202.5 creates unduly discriminatory outcomes or market inefficiencies and how AESO’s practices compare to those in other organized wholesale electricity markets. The Testimony also considered ongoing market design developments in the Restructured Energy Market (“REM”).
- **Testimony Assessing Reliability Value of Inter-state Transmission:** On behalf of PacifiCorp, supported expert testimony before the Wyoming Public Service Commission regarding the reliability value of inter-state transmission, the risks and costs of operating the Bulk Electricity System (BES) in non-compliance with NERC standards, the economic impact of reliability events particularly to large industrial customers, and transmission cost allocation approaches in multi-state jurisdictions.
- **Recent Developments in International Rate of Return Methods:** For Energy Networks Australia (ENA), developed an updated overview of international rate of return methods for regulators in the US, Great Britain, New Zealand, Italy, and The Netherlands. This paper also provided a review of the Australian Energy Regulator’s draft 2022 Rate of Return Instrument and recommend improvements as well as a comparison on a like-for-like basis of recent rate of return decision from each regulator.
- **International Approaches to Regulated Rates of Return:** For the Australian Energy Regulator (AER), researched international approaches to rate of return and WACC estimations across six countries: Australia, Italy, the Netherlands, New Zealand, the US, and the UK. This report reviewed and summarized international regulators’ approaches to utility regulation and compared the rate of return approach of each regulator to that of the AER as part of the 2022 Rate of Return Instrument.

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## TESTIMONY AND REGULATORY FILINGS

- Before the FERC, Docket No. ER26-455-000, Answering Affidavit of Dr. Samuel A. Newell, Dr. Andrew W. Thompson, Dr. Bin Zhou, and Joshua C. Junge, Regarding Protest of the Independent Market Monitor for PJM on Updates to PJM’s CONE and Net Energy and Ancillary Service Offset Parameters for Delivery Years 2028/29 through 2031/32 on Behalf of PJM Interconnection L.L.C., December 19, 2025
- Before the FERC, Docket No. ER26-455-000, Affidavit of Dr. Samuel A. Newell, Dr. Andrew W. Thompson, Dr. Bin Zhou, and Joshua C. Junge, Regarding Updates to PJM’s CONE and Net Energy and Ancillary Service Offset Parameters for Delivery Years 2028/29 Through 2031/32 on Behalf of PJM Interconnection L.L.C., November 7, 2025
- Before the FERC, Docket No. ER26-455-000, Affidavit of Dr. Kathleen Spees, Dr. Samuel A. Newell, and Dr. Andrew W. Thompson, Regarding the Sixth Review of PJM’s Variable Resource Requirement Curve on Behalf of PJM Interconnection L.L.C., November 7, 2025

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## REPORTS, ARTICLES, & PUBLICATIONS

- [“Clean Security of Supply in Europe: Models for Market-Aligned Contracting and Procurement”](#), with Kathleen Spees, prepared for the Clean Air Task Force (February 2026)
- [“Clean Flexibility: Opportunities in Europe”](#), with Ryan Hledik, Kailin Graham, Averlie Wang, and Paolo Coghe (Acousmatics), prepared for Beyond Fossil Fuels (February 2026)
- [“Electricity Market Design: Building on strengths, addressing gaps”](#), contributing author to International Energy Agency report (November 2025)
- [“Sixth Review of PJM’s Variable Resource Requirement Curve”](#), with Kathleen Spees and Samuel A. Newell, prepared for PJM Interconnection, LLC (April 2025)
- [“Brattle 2025 CONE Report for PJM”](#), with Samuel A. Newell and Bin Zhou, prepared for PJM Interconnection, LLC (April 2025)
- [“Energy Storage Market Design Roadmap”](#), with Samuel A. Newell, Andrew Levitt, and Serena Patel, prepared for American Clean Power (April 2025)
- [“LDES Scoping Report”](#), with J. Michael Hagerty and Andrew Levitt, prepared for the Center for the Center for Climate and Energy Solutions (C2ES) (March 2024)
- [“ERCOT CONE for 2026,”](#) with Samuel A. Newell, prepared for the Electric Reliability Council of Texas, Inc. (ERCOT) (June 2024)
- [“Bulk System Reliability for Tomorrow’s Grid,”](#) with Metin Celebi, Andrew Levitt, and Ragini Sreenath, prepared for prepared for the Center for Applied Environmental Law and Policy (CAELP) (December 2023)
- [“Ontario’s Experience with the Single Buyer Contracting Model”](#), with Kathleen Spees, Andrew Levitt, and Xander Bartone, prepared for the Alberta Electric System Operator (AESO) and the Executive Working Group (EWG) (November 2023)
- [“Assessment of Potential Market Reforms for South Carolina’s Electricity Sector,”](#) with John H. Tsoukalis, Kathleen Spees, Johannes P. Pfeifenberger, Andrew Levitt, and Oleksandr Kuzura, prepared for the South Carolina General Assembly Electricity Market Reform Measures Committee (April 2023)
- [“Gross Avoidable Costs for Existing Generation,”](#) with Samuel Newell, prepared for PJM Interconnection, L.L.C. (January 2023)
- [“International Rate of Return Methods – Recent Developments,”](#) with Bente Villadsen and Toby Brown, prepared for Energy Networks Australia (September 2022)
- [“Fifth Review of PJM’s Variable Resource Requirement Curve,”](#) with Kathleen Spees and Samuel Newell, prepared for PJM Interconnection (April 2022)
- [“Vehicle-to-Everything \(V2X\) Energy Services, Values Streams, and Regulatory Policy Implications,”](#) with Yannick Perez, *Energy Policy*, 137, Article 111136 (2020)

- [“Economic implications of lithium-ion battery degradation for Vehicle-to-Grid \(V2X\) services,”](#) *The Journal of Power Sources*, 396, pp. 691–709 (2018)
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## PRESENTATIONS & SPEAKING ENGAGEMENTS

- [“ERCOT CONE Workshop: Trends in Costs, and Sketch of a 2026 ERCOT CONE Study”](#), Presented to ERCOT stakeholders, with Samuel Newell and Joshua Junge (November 2025)
- [“2025 Iberian Blackout”](#), Presented to the Gridwise Alliance Technology Council (November 2025)
- [“Lessons Learned from Two Decades of Capacity Mechanisms in North America”](#), presented at the 8th Annual Capacity Mechanisms Forum (October 2025)
- [“Evolving Resource Adequacy Approaches in North America”](#), Presentation and panel discussions at the International Energy Agency (IEA) Expert Workshop on Power Market Design (May 2025)
- Bank of America, US Power & Utilities Research Expert Presentation on PJM CONE Estimation, with Samuel Newell, Sang Gang, and Joshua Junge (May, 2025)
- Jefferies, US Power, Utilities, & Clean Energy Research Expert Presentation on PJM Parameters, with Samuel Newell and Kathleen Spees (May, 2025)
- UBS, Utilities and Power Equity Research Expert Presentation on PJM Parameters, with Samuel Newell and Kathleen Spees (April, 2025)
- [“Sixth Review of PJM’s RPM VRR Curve Parameters: Final Recommendations,”](#) with Samuel Newell and Kathleen Spees, PJM Market Implementation Committee (April, 2025)
- [“The Need for Mechanisms to Support Flexibility or Capacity”](#) and [“Aligning the Security of Supply and Decarbonization Targets”](#), Panel Discussions at the 7<sup>th</sup> Capacity Mechanisms Forum: Ensuring the European Electricity Supply (October 2024)
- [“Resource Adequacy Trends of the Energy Transition: Experience from North America,”](#) 7<sup>th</sup> Capacity Mechanisms Forum: Ensuring the European Electricity Supply (October 2024)
- [“Modeling Storage Adequacy in Capacity Expansion Models,”](#) with Kate Peters, EPRI Long-Duration Energy Storage Working Group (July 2024)
- [“Long-duration Energy Storage Scoping Report,”](#) with Andrew Levitt and Michael Hagerty, C2ES LDES Working Group (March 2024)
- [“Resource Adequacy Trends of the Energy Transition: Experience from North America,”](#) NTNU Energy Transition Week: Power Markets (March 2024)
- [“Role of Hydrogen in a Decarbonized Future,”](#) with Josh Figueroa and Metin Celebi, Bank of America Global Research US Alternative Energy Hydrogen Conference (December 2023)
- [“Discussion on Demand Curve Review,”](#) IESO Technical Session (October 2022)

- “PJM Market Implementation Committee Special Session: Quadrennial Review,” with Kathleen Spees and Samuel Newell, PJM Interconnection (December 2021)
- “[Vehicle-to-Everything \(V2X\) Energy Services](#),” presented to Smart Charging Webinar hosted by Newcastle University in conjunction with The Alan Turing Institute, CESI and Supergen Energy Networks (October 2020)
- “[Vehicle-to-Everything \(V2X\) Energy Services](#),” presented to the International Smart Grid Action Network (ISGAN) (April 2019)
- “[Economic Feasibility of Wind Energy Participation in Secondary Reserves Markets](#),” *Proceedings of the 1<sup>st</sup> Italian Association of Energy Economists (IAEE) Energy Symposium*, Milan, Italy (2016)
- “[PV by-pass diode performance in landscape and portrait modalities](#),” with Carlos Barreiro, Peter M. Jansson, and John L. Schmalzel, *37th IEEE Photovoltaic Specialists Conference* (2011)

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#### TRADE PRESS & MEDIA COVERAGE

- E&E News, “[Spain’s big blackout: A cautionary tale for US grid managers](#)”, June 2025
- Utility Dive, “[PJM, MISO, NYISO ripe for energy storage market reforms: Brattle/ACP](#)”, April 2025
- RTO Insider, “[ACP Road Map Suggests Market Changes to Increase Storage Participation](#)”, April 2025
- Energy Storage News, “[American Clean Power report recommends energy storage-friendly market reforms to US grid operators](#)”, April 2025
- PV Magazine: Energy Storage, “[US call for better energy storage rules in wholesale markets](#)”, April 2025

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#### PROFESSIONAL ASSOCIATIONS & MEMBERSHIPS

International Association for Energy Economics (IAEE)

Institute of Electrical and Electronics Engineers (IEEE) Power and Energy Society

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#### LANGUAGES

- Spanish (fluent), French (conversational)