

Energy Affordability in Competitive Retail Electricity Markets: Evidence on Prices, Contract Design, and Consumer Outcomes

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INTRODUCTION

Theory:

Efficient markets → lower prices → consumers benefit

Reality (OH & PA):

Price dispersion | Disparate household impacts | Widening cost burdens

This Project Examines:

- Market efficiency
- Consumer cost burdens
- Who benefits, and who pays more

DATA

• Retail market data

Over 2 million daily residential electricity supply offers (2014–2023), from public utility shopping portals

• Market fundamentals

Wholesale electricity prices (PJM) | Utility default service rates | Renewable Energy Credits (REC) prices

• Household-level data

Verified residential electricity bills | Semi-structured household interviews | Choice experiment

• Community partnerships

Ohio Consumers' Counsel | Regional food banks and community organizations

METHODS

We combine **econometric analysis**, **explainable machine learning** and **consumer choice modeling** to identify mechanisms shaping household electricity costs in deregulated retail markets.

Market-Level Analysis: Pricing and Market Design

• Data mining and descriptive analysis

- To compare competitive retail electric service (CRES) prices with utility default service (SSO) prices and wholesale prices over time.

• Explainable machine learning

- To estimate renewable energy price premiums.
- Quantify how contract features contribute to observed price differences.

Household-Level Analysis: Preferences and Consumer Choice

We use **conjoint choice experiments** and **household survey data** to estimate consumer preferences and decision-making under complex retail contracts.

- To estimate willingness-to-pay for: Price, Contract length, Renewable content, Fees and promotional features
- To identify heterogeneity in preferences and information constraints across income and vulnerability groups.

FINDINGS

- **Finding 1: Most competitive retail offers are not welfare-improving.**

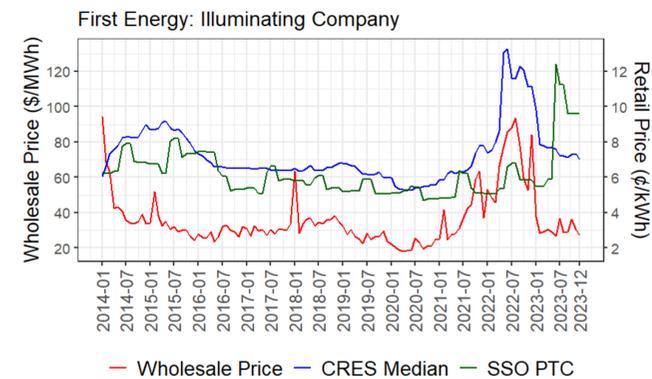


Figure 1. Wholesale and Retail Electricity Price in the Territory of The Illuminating Company. (2014–2023)

- **Finding 2: Retail renewable electricity pricing is shaped by strategic contract design, not just underlying energy and REC costs.**

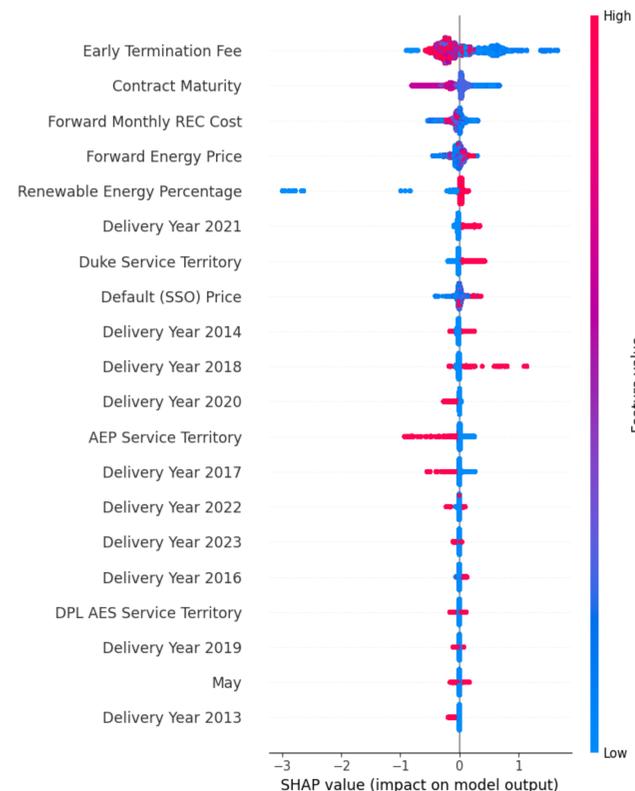


Figure 3. Contract design features explain more variation in renewable retail price premiums than wholesale energy or REC costs.

12-month CRES Offers in FECEI

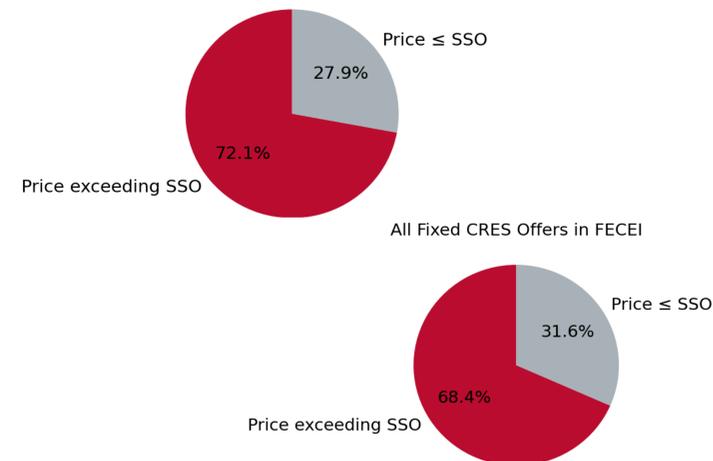


Figure 2. Most Competitive Retail Electricity Offers Exceed Utility Default Prices. FECEI: The Illuminating Company, one of the territories in Ohio.

- **Finding 3: Consumer preferences are highly heterogeneous.**

○ Responses: 320 (OH: 259, PA: 61)

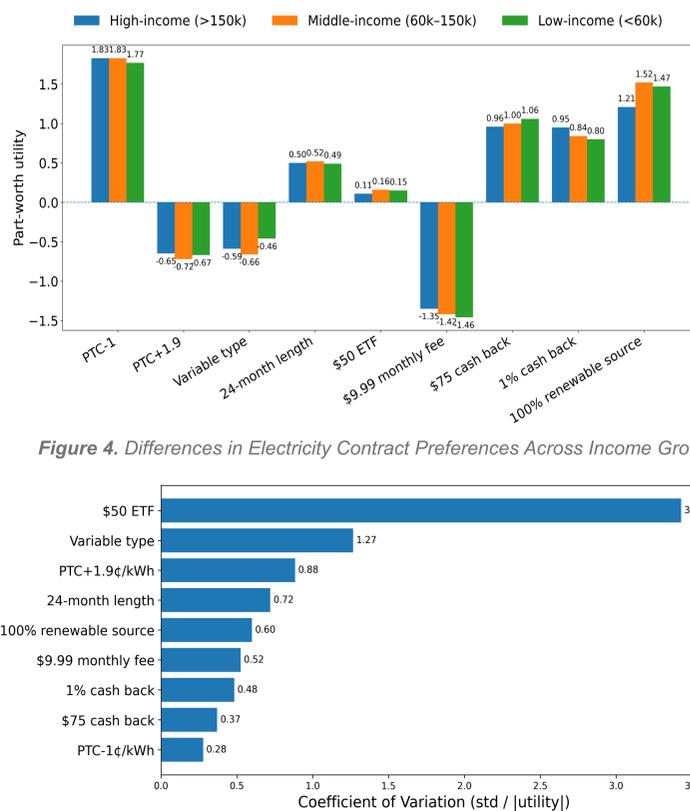


Figure 5. Variability of Part-Worth Utilities by Attribute.

- **Finding 4: Energy burden is shaped by market design and consumer protections — not only fuel and infrastructure costs.**

Cost-side factors	Market & Policy Drivers
Wholesale fuel costs	Retail market design
Infrastructure investment	Contract complexity
	Behavioral frictions
	Consumer protection regimes

→ Policy Recommendations:

- Establish a statewide Office of the Independent Market Monitor.
- Establish a CRES supplier scorecard accessible on consumer utility bills and online.

IMPACTS AND NEWS STORIES

- Our research has informed **Ohio House Bill 15**, whose passage marks a **landmark reform** of Ohio's energy policy.
- News Media Covering This Research: NPR | Ohio Capital Journal | Columbus Business First | iHeart Radio AM 620 | Cleveland plain dealer | Columbus' Morning News | 2025-10TV | etc.

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