

Residential Electricity Rate Design: Canadian fundamentals and trends for innovation

Research question

The student will:

- 1) Undertake a literature review of electricity rate design to uncover the underlying economic theory behind rate design, to explain the advantages and disadvantages of common rate designs, and to identify trends in rate design innovation.
- 2) Perform a jurisdictional scan of rate design and rate design trends across Canadian electricity markets to inform their discussion and identify potential paths to rate design innovation.
- 3) Perform a case study of the [proposed income-based fixed electricity charges in California](#), discussing the advantages and disadvantages of this proposed design with respect to financing electric grid investments while promoting affordability, equity, and fairness for electricity rate payers and encouraging efficiency in electricity systems. The case study should also discuss the applicability of such a model in the Canadian context.

Scope of work

Electricity rate design around the globe has traditionally been dictated by Bonbright's principles for utility ratemaking. These principles ensure that public utilities earn sufficient revenue to finance their investments while offering rates that are fair to consumers and encourage efficiency in utility systems.

In the context of the energy transition and the electrification of energy systems in Canada, electric utilities will have to make historic investments in electricity systems to continue to provide safe and reliable electricity services to their customers. Due to the scale of investments required to meet Canada's future electricity needs, affordability for residential electricity rate payers, is top-of-mind for electric utilities, regulators, and policy makers across all levels of government. Electricity rate design is a key consideration in addressing this affordability issue.

The candidate will use publicly available research (grey literature, white papers, and peer-reviewed studies) to learn about and discuss the fundamentals of electricity rate design from the standpoint of economic and social efficiency, with an emphasis on affordability and equity. The candidate will also perform a scan of rate designs across Canadian electricity markets, discussing the advantages and disadvantages of various rate designs and the potential for innovation in Canada. Finally, the candidate will discuss the proposed income-based fixed electricity charges in California.

Policy analysis

The student will gain knowledge of the electricity system and electricity rate design and will use this knowledge to discuss the advantages and disadvantages of different rate designs in the context of balancing the financial needs of the energy transition with promoting affordability and equity for residential electricity rate payers. Policy discussions will focus on the trade-offs between tax-based and rate-based funding for electricity investments and the potential consequences of contravening Bonbright's principles in electricity rate design, as seen through the California case study.

Economic analysis

The student will learn about the economic theory surrounding electricity rate design and will explore this topic through the lens of economic and social efficiency. Economics discussions will be focused on consumption incentives inherent within rate design and how to promote affordability while keeping these incentives in mind.

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