

EFFICIENCY VS. EQUITY: THE DISTRIBUTIONAL CONSEQUENCES OF REFORMING PROGRESSIVE ELECTRICITY FIXED CHARGES

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Extended Abstract

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Abstract Summary

As the electricity sector shifts toward capital-intensive decarbonization and electrification, utility cost structures are increasingly dominated by fixed costs. This study examines the urgent need for tariff reform in South Korea, focusing on its unique residential progressive fixed charge—an anomalous structure where fixed fees increase up to 8-fold based on consumption volume.

Using microdata from the 13th Household Energy Panel Survey ($n=6,355$), we design and evaluate six revenue-neutral reform scenarios that vary the progressivity and level of the fixed charge. We assess these reforms against four key criteria: cost-reflectivity, bill stability, equity, and distributional impacts across income quartiles.

Our results reveal that the current progressive fixed charge is non-monotonic and generates significant cross-subsidization that cannot be justified on efficiency grounds. Moving toward a flat, cost-reflective fee consistently improves bill stability and reduces the Electric Gini coefficient, indicating enhanced inter-consumer equity. However, we identify a critical efficiency and equity trade-off: since income and consumption are imperfectly correlated, some low-income, low-consumption households—who currently benefit from the cross-subsidized tier structure—face bill increases.

We conclude that the phased elimination of the progressive multiplier is a technically feasible and welfare-improving reform path. To mitigate the impact on vulnerable households, we recommend pairing tariff modernization with targeted social support, such as energy vouchers or income-graduated models. This study provides a vital roadmap for aligning residential tariffs with the economic realities of a decarbonized and electrified grid, offering a preview for markets facing similar structural shifts.

Presenting Author Biography

Yunji Her is an assistant professor in the Department of Economics at Dankook University. Her research lies at the intersection of environmental economics, energy policy, and microeconomic theory. She studies how households adapt to climate change through investment in energy-efficient capital, with a focus on the role of income inequality, information, and liquidity constraints. Her current work examines cooling adaptation patterns in South Korea using household panel data, contributing to the literature on climate adaptation equity and the design of targeted energy efficiency policies.