

Response to Extreme Energy Price Changes: Evidence from Ukraine

By

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Executive Summary

We have used a unique dataset documenting monthly electricity meter readings from Ukrainian households to study the responsiveness to large tariff increases. Residential electricity demand is generally thought to be price inelastic, and one would expect this to be the case at a locale with comparatively smaller homes and fewer appliances than in Western Europe or the US. Yet, the tariff changes were very substantial, and we estimate a short-run price elasticity of -0.2 to -0.5, with values getting stronger as when we allow for some time to elapse since a tariff revision. We use instrumental variable techniques, as is appropriate with increasing block rate schemes.

People were thus willing and able to reduce usage promptly, but the price elasticity of demand is much less than one. Only 15% of our sample uses electricity as their main heating fuel. On examining the information respondents reported about upgrades, changes of heating equipment, etc., we surmise that electricity usage reductions were attained through behaviors and not through technological changes or energy efficiency upgrades.

Our calculations suggest that the price changes entailed meaningful welfare losses for most families. For example, for consumers in the second block—the majority—the rate increase in April 2015 implied that in October of that month the average consumer experienced a loss of consumer surplus of 73.50 UAH—a little over half the average monthly bill, which is 126 UAH. We estimate the same price increase to result in a 17.07% decline in electricity

consumption and 0.260 fewer tons of CO₂ per household per year. The cost of each ton, based on the welfare loss alone, would thus be a high 3341 UAH, or 131 US\$.

The results from our study offer suggestions for the possible response to tariff reforms at other locales—in Ukraine, other transition economies, and middle-income countries. We note however that the response to tariff hikes may be completely different in settings where individual metering is not present. A common problem at many of these locales is that the utilities' revenues are insufficient to cover the cost of generating and delivering electricity or making improvements to the grid. If a sufficiently large share of the population is relatively price-inelastic, and can afford to pay, part of the revenues from these customers could be used to subsidize poorer consumers—or energy efficiency investments.