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Energy Poverty and the Household Heating Energy Transition in Rural China

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The household heating energy transition program in China has led to a sharp increase in household heating costs and has exacerbated energy poverty (high ratios of energy expenditure to income). This program is mandatory, with the goal of alleviating environmental problems and accelerating households’ transition to cleaner fuel. Specifically, it is intended to convert household heating fuel from coal to natural gas (*coal to gas*), electricity (*coal to electricity*), or cleaner coal (*clean coal replacement*), through mandates and subsidies. Although it has effectively decreased air pollution, this program draws many complaints because it increases heating costs. This creates a burden, especially for low-income households. Because of concerns about fairness and people’s well-being, it is important to understand the effects of this program on energy poverty, to depict who is more likely to experience energy poverty, and to identify who is negatively affected to a larger degree.

We use data from household surveys in Beijing and Hebei to calculate three indices of energy poverty. By comparing these three indices, we find that the *coal to electricity* and *coal to gas* programs exacerbated energy poverty, while *clean coal replacement* alleviated energy poverty. Through statistical methods, we find that households with lower income, less education, smaller household size and larger housing area are more likely to have high ratios of energy expenditure to income, and therefore are more likely to experience energy poverty. Furthermore, households with lower income are negatively affected by the program to a larger degree in terms of the increase in the ratio of energy expenditure to income and the likelihood of being pushed into energy poverty.

Our findings call the attention of policy makers to low-income households when designing and implementing policies. Without identifying the likely differing effects of policies on different groups, a mandatory “one policy for all” is likely to hurt low-income households more. Considering the limited financial resources, encouraging technological innovation to improve the efficiency of electricity and gas heating would be the key to achieving affordable, clean heating.

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