REDUCING FOSSIL-FUEL SUBSIDIES AND THE IMPLICATION ON INEQUALITY AND POVERTY IN KAZAKHSTAN: A FIRST ESTIMATE

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Overview

In this study we attempt to investigate the possibility of coal-heated households in Kazakhstan both weatherizing and switching heating technology as the result of full removal of fossil fuel subsidies. According to the International Energy Agency (IEA Energy Subsidy Database, 2013), the coal subsidization rate for Kazakhstan in 2011 was approximately 60% and comprised 3.09% of GDP . Explicit incorporation of both weatherization and equipment technologies is important because removal of fossil fuel subsidies requires the evaluation of traditional coal and new heating technologies.

Methods

We use financial analysis to determine whether a household at time zero, when the government begins to remove a 60% subsidy on coal, if the household will: i) continue to heat with the existing home-made coal stove with the present-level of insulation, ii) heat with the existing home-made coal stove with upgraded insulation, or iii) upgrade insulation and purchase an electric boiler system that can replace an existing home-made coal stove. We use technical specifications from upgrading the insulation characteristics of the house to find annual cost saving from weatherizing. Furthermore, we use additional technical specifications to examine the economics of technology switching.

Results

The results show that those households which have low discount rates – the rich – will weatherize while those households which have high discount rates – the poor – will not weatherize due to the removal of coal subsidies. With respect to switching heating technologies to an electric boiler system, the results indicate that again only the rich would consider this option viable. However, on purely a financial basis, the 'heating with the existing home-made coal stove with weatherization renovations' option is the best.

Conclusions

Our analysis show that if the Government of Kazakhstan removes the 60% subsidies from coal prices, rich households will weatherize but will not switch heating technologies to an electric boiler system. The poor will neither weatherize nor switch technologies. Offering an unconditional cash grant system to persuade all pre-2000 built households to convert to electric boilers, assuming a 5% discount rate, is not feasible because of the excessive cost. Even with a means-tested grant system for switching heating technologies, there is most likely very little probability of success as the poor do not have the incentives to weatherize, which is a pre-requisite of switching heating technologies.

One limitation of our analysis is that it does not include the non-market economic costs of heating a house with coal. These costs can be considerable as is evident in an analysis of coal use in Fairbanks, Alaska (McDowell Group, 2013). Even though the annual fuel cost to heat an average home in 2011 with coal was approximately 35% ($US 1907) of the cost to heat the same house with fuel oil ($US 5268), more than 78% of homes used heating oil as their

space-heating fuel compared to less than 2% that used coal (US Census Bureau, 2015) . For those households that continue to use heating oil, the premium is the willingness-to-pay for convenience and healthier living environment.

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