



Rural migrant workers' intentions to permanently reside in cities and future energy consumption preference in the changing context of urban China

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ABSTRACT

Focusing on China, which has a special household registration system (called *hukou*), this study examines the likely effects of the China's National New-type Urbanization Plan (2014–2020) on rural migrant workers' intentions to reside permanently in cities and their future energy consumption preference. Questionnaire surveys were conducted in 2014 and 2015 among rural migrant workers and residents with a *hukou* in three cities (985 migrants and 671 residents with a *hukou*). Analysis results show that 39% of migrant workers intended to reside permanently in cities under the aforementioned plan, and the current energy consumption of residents with a *hukou* is 1.2–4.0 times higher than that of rural migrant workers. Further analyses based on structural equation models confirm that migrants' current less-satisfied life experience and lower level of viability in cities hinder them to become a permanent urban resident. Unexpectedly, migrants' permanent residence intentions do not affect their future energy consumption preference, which is however mostly affected by their confidence and barriers to become a permanent resident, especially future concerns about health and lack of social security in their current daily life. Finally, it is argued that studies on rural migrants should pay more attention to capability-concerned and life-oriented aspects, which are useful to derive important insights into cross-sectoral energy policymaking.

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1. Introduction

Urbanization, a global trend with a profound impact on urban development (Zhang, 2016), can be driven by natural population growth, rural-to-urban migration, changes in economic development structures, and investments in cities (Pannel, 2002). This trend is especially remarkable in developing countries (Zhang, 2016). Rafiq et al. (2016) examined the impacts

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of urbanization on emissions and energy intensity in more than 20 rapidly urbanizing economies (e.g., Bangladesh, China, Ghana, India, Indonesia, Tanzania, Vietnam) from 1980 to 2010 and confirmed that urbanization significantly increases energy intensity, but its impacts on increasing emissions are not significant. However, using data from the BRICS countries (Brazil, Russia, India, China and South Africa) in the period 1985–2014, Wang et al. (2016a) revealed that urbanization could markedly induce more carbon emission. Zhang et al. (2016) also confirmed similar increase in carbon emission based on data collected in China in 2010. Using data from the ASEAN countries spanning the period 1980–2009, Wang et al. (2016b) confirmed that energy use and carbon emissions in the long run are positively related, and the effect of energy use on carbon emissions is greater than that of urbanization on carbon emissions. Thus, empirical evidence on the impacts of urbanization on energy consumption and the resulting emissions have been mixed and remain ambiguous.

In China, the target country of this study, a large percentage of urban population growth is due to rural–urban migration (Chen and Song, 2014). China has a special household registration system (called *hukou*). The traditional *hukou* system means that a city resident's right to public services depends on whether or not they have a *hukou*, i.e., a legal household registration. As most rural migrants do not have an urban *hukou*, they have unequal access to urban public services. Under China's National New-type Urbanization Plan (2014–2020)¹ (hereafter, abbreviated as China New Plan), the traditional *hukou* system will be gradually abolished, so that rural migrant workers in cities will be provided with equal access to a common standard of public services, comparable to that received already by residents with a *hukou*. Under the China New Plan, 100 million people, mostly migrants, will be granted an urban *hukou* until the year 2020 (Chan, 2014). Considering that the resources (e.g., land, water, and energy) available to support urban development are limited, it is necessary to control the speed of urbanization.

Various relevant studies can be found in the literature with respect to the reform of the *hukou* system; however, little scientific evidence can be found with regard to the impact of migrant workers' transformation into residents with an urban *hukou* on energy consumption in the urban context (in particular, resulting from increased ownership and usage of vehicles and in-home appliances). This study therefore attempts to fill this gap. To this end, we conducted the surveys in Dalian in November 2014 and May 2015, Guiyang in June 2015, and Chongqing in August 2015 and collected valid questionnaire sheets from 985 migrant workers, and 671 urban residents with a *hukou*.

In this research, we raise the following two research questions.

- (1) *Question 1*: What kinds of factors affect migrant workers' intentions to reside permanently in cities under the China New Plan?
- (2) *Question 2*: How will migrant workers' intentions of permanent residence in cities be associated with their future energy consumption preference?

The theory of planned behavior suggests that the stronger the intention to engage in a behavior, the more likely should be its performance, and intention (i.e., trying to perform a given behavior) accounts for considerable variance in actual behavior (Ajzen, 1988, 1991). Thus, it is logical to understand rural migrant workers' future energy consumption via their intentions.

The above questions contains major decision variables, such as migration behavior and energy consumption behavior, which may be further affected by other factors. There are probably complicated association structures related to these behaviors and factors. However, due to the lack of behavioral studies dealing with rural migrant workers in China, and especially the lack of studies on their energy consumption, insights into treating the complicated decision-making issues involved in this study are very limited. This makes the application of advanced choice modeling techniques with behavioral interdependencies difficult. Therefore, to answer the above questions, we will focus on preferences behind actual behaviors, rather than the behaviors themselves directly. Such preference-based analysis could provide useful insights because preference is a key to predict actual behavior (McFadden, 2000a,b).

Question 1 is a relatively straightforward question, given our research motivations mentioned above. Our assumption is that the China New Plan will encourage more rural migrant workers to reside permanently in cities via having an urban *hukou*. Having an urban *hukou* indicates that the rural migrant worker may intend to live in cities forever. Hereafter, residing permanently in cities and having an urban *hukou* are used interchangeably. However, testing this assumption is not straightforward because there are some difficulties faced in these workers' daily life and other concerns about their future life, which may hinder some workers' decisions on permanent residence in cities. We expect that residents with a *hukou* will consume more energy than rural migrant workers. Accordingly, we raise *Question 2* for answering how the China New Plan will eventually affect the future energy consumption consumed by rural migrant workers via their intentions to reside permanently in cities. In answering the above two questions, it is expected that the associations between dependent variables may vary with individual and household attributes.

The analysis unit in this study is individual rural migrant worker. Essentially, decisions about workers' migration into cities and energy consumption should be a household decision, where both married couples and their family members (especially parents) left in villages may play an important role. However, it is not practically possible to ask migrant workers to provide a full set of group decision information because they are often living separately from some of their family members. Furthermore, it is not clear, either, how to obtain their intended joint future decisions in a reliable way and how to reflect members' heterogeneous influences in joint decisions. With the above considerations, we treat individual rural

¹ http://www.gov.cn/zhengce/2014-03/16/content_2640075.htm (in Chinese; Accessed April 26, 2016).

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