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Are South African consumers arm-chair environmentalists? Implications for renewable energy

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In terms of global warming, coal is the worst offender, as it is a dirty energy source. There are various damaging environmental impacts associated with coal during its mining, transportation, combustion and disposal. Our focus is on the impact that is associated with combustion. Air pollution from coal-fired power stations includes carbon dioxide emissions, which are cited as the primary cause of global warming.

South Africa is the biggest polluter in Africa and among the biggest in the world – mainly due to emissions from its coal-fired power plants. The abundance of cheap coal in emerging economies like South Africa has provided little incentive for significant investment in other energy sources, such as renewable energy. The need for electricity generation to be clean and safe has never been more obvious. South Africa has traditionally made up the shortfall from coal-fired power stations with nuclear power. According to the International Energy Agency (2015), the conclusion reached after Fukushima is that renewable energy is now favoured over nuclear power around the world. In 2014, 128GW of new renewable energy capacity was installed worldwide.

In light of mounting power outages in South Africa, a balanced energy mix towards renewables is seen as the best strategy to safeguard energy supply. Discussions between policymakers about renewable energy have gained momentum in recent years, amid growing recognition of the need for more investment in green energy sources; hence, we consider the factors that affect the public's support for renewable energy.

It is recognised that by increasing renewable energy use, significant cuts in global warming emissions can be achieved, as well as a reduction in the heavy reliance on coal and other fossil fuels. However, compared to fossil fuels, most renewable energy sources require significantly large capital investment, which is scarce in developing countries. A move towards this cleaner, healthier energy source may come at an additional cost to households.

According to Zografakis et al., (2010) and Walwyn and Brent (2015), the costs of some renewable-energy-generating sources (e.g. wind and solar photovoltaic, or PV) have decreased, and there is a possibility that they will continue to decrease in the near future. These recent developments will enable developing countries such as South Africa to invest more in renewable energy. That said, it is important to ascertain households' WTP for renewable energy.

Given this background, the objectives of our study are to assess support for and whether households are WTP a premium towards a renewable energy supply or whether they are simply arm-chair environmentalists. It is vital that households' determinants of the additional cost

burden associated with renewable energy are assessed, in an effort to win public acceptance of the introduction of renewable energy. South Africa and other developing countries also have renewable energy targets, but only a few renewable energy WTP studies have been conducted in Africa (see Abdullah and Jeanty, 2011). The few studies on renewable energy undertaken in South Africa to date generally discuss opportunities, barriers, policies and milestones (Sebitosi and Pillay, 2008; Krupa and Burch, 2011; Walwyn and Brent, 2015). Therefore, this study contributes to this scant literature.

By contrast, there is a growing literature on renewable energy in developed countries. Most of these studies discuss public opinions, preferences and WTP for renewable energy (Dimitropoulos and Kontoleon, 2009; Yoo and Kwak, 2009; Zografakis et al., 2010; Mozumder et al., 2011; Ertor-Akyazi et al., 2012; Zoric and Hvrovantin, 2012; Bigerna and Polinori, 2014; Guo et al., 2014; Stigka et al., 2014, Ribeiro et al., 2014; Park and Ohm, 2014). Overall, our study will aid policymakers by revealing what energy sources are socially acceptable, and the determinants of such choices.

Approximately 47 percent of the respondents were WTP 20 percent more in energy bills as contributions towards large initial capital costs required to setup renewable energy supplies. When the bid was increased to 50 percent, only 10 percent were WTP. Therefore, respondents are WTP a premium to support green electricity sources. Older people did not necessarily support renewable energy. The finding that educated people were not WTP is not in line with expectations.

Households are WTP towards increasing electricity generation in South Africa. WTP studies done in other countries show that many people state that they are WTP for renewable energy investments. However, when asked to contribute voluntarily by buying renewable energy, only a very small percentage do (Zhang and Wu, 2012). This shows that sometimes, talk is cheap. Therefore, an experiment of a similar nature is the next logical step towards actually assessing if real actions would match hypothetical scenarios.

The US\$966 WTP for renewable energy represents a significant premium over generation costs, and signals social acceptance of renewable energy. Most importantly, given the wide degree of heterogeneity in WTP models, a clear message to policymakers and stakeholders is that they need to do more to communicate the economic and environmental benefits associated with renewable energy. The government should make renewable energy sources such as wind and solar power even cheaper, by opening up access to the electricity national grid. Moreover, given the enormous benefits of renewables, government should invest more in renewable energy research and development, and subsidise key renewable technologies such as storage and smart grids. Germany has demonstrated that renewables have huge generation potential. It was reported in the media on Sunday, 8 May 2016 that Germany had set a new record in terms of renewable energy generation. Due to strong wind and sun that weekend, they generated more than they required; so much so that it pushed electricity prices to negative. As a result, users were paid to use excess electricity.