Hybrid models: Modelling Development aspirations and mitigation in South Africa

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ABSTRACT

South Africa currently faces several challenges relating to economic and social development. SA is considered to be an upper middle income country, with a per capita GNI in purchasing power parity terms of 12240$US (World Bank, 2015). However, society in South Africa remains very unequal. The GINI coefficient is 0.69 (StatsSA 2014) and the MDG poverty line of $1.25 (2005ppp) shows that 7.4% of South Africans are currently living in extreme poverty, using a poverty line at $2.5 (2005 ppp) per day, this number increases to 29.2% (StatsSA 2013). Lower income households also experience a large degree of energy poverty, for example the Department of Energy found that over a third of South African households are energy poor (DOE 2013). Poverty is largely due to high levels of unemployment, using a broad definition of unemployment which includes all those currently without work that would like to work, 34.6% of South Africans are currently unemployed (StatsSA 2015).

Despite high levels of poverty and unemployment, South Africa is ranked amongst the top 20 emitters in terms of global GHG emissions. This is largely due to the use of coal to supply thermal fuel needs in energy intensive industrial sectors, as well as electricity and liquid fuels. Given the commitment to eradicate poverty and reduce green house gas emissions, a challenge for South Africa therefore lies in growing energy services and the economy whilst at the same time reducing the dependence on coal and reducing emissions.

In order to test the impact of alternative energy development pathways on the economy, ERC began the development of a linked bottom up energy model (the South African TIMES model (SATIM)) and an economy wide CGE model (E-SAGE). Although only the electricity sector of SATIM is linked to E- SAGE at this point (Arndt 2014), an initial exploration of two possible economic futures with the linked model has revealed that there are opportunities for low carbon growth in South Africa.

The focus of this presentation is on the methodology followed in the linking of E-SAGE and SATIM and the use of the linked model to test the cost and development impacts of a decarbonized electricity sector in two alternative economic futures, one in which the growth of low carbon sectors is prioritized and another in which the development of skills is prioritized. This work forms part of the Deep Decarbonization Pathways Project (DDPP).

References

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