ERSA Research Brief

How an electricity tax will affect the South African economy

R. Seymore, P.D. Adams, M. Mabugu, J.H. van Heerden and J. Blignaut.

An electricity tax imposed at the point of production in South Africa would reduce carbon dioxide emissions, albeit at the expense of a slight pullback in overall economic output, consumption and investment.

According to researchers R. Seymore, P.D. Adams, M. Mabugu, J.H. van Heerden and J. Blignaut, an electricity tax pegged at 2c/kWh the tax would shave a marginal 0,28% off South Africa's GDP. The good news is that the abatement in carbon dioxide emissions in the electricity sector, as well as in the economy in general, would translate into a broader financial benefit of nearly R2bn.

The research, prompted by Treasury's proposals in the 2008 National Budget to tax electricity generated from non-renewable resources, is published as ERSA Working Paper no. 139, "The impact of an electricity generation tax on the South African economy".

Taxes work better than permits

In evaluating the impact of an electricity tax in South Africa, the authors assess the benefits of such a policy instrument compared with a permit system – the tradeable emission schemes in the process of being implemented globally.

They dismiss a permit system on the grounds that the monopolistic nature of the South African energy system would render this a senseless command-and-control arrangement, equivalent to giving Eskom a direct quota. They also point to findings that taxes on emissions tend to be more efficient that a permit system, particularly when uncertainty prevails.

The benefit of an environmental tax is that it creates distortions that prompt a change in producer and consumer behaviour over the long term, with the ultimate advantage of encouraging energy-efficient technologies.

But *what* to tax?

If the objective is to change behaviour, the most effective approach is to tax the undesirable activity directly. In this way the incentives to change behaviour are likely to be stronger and the unintended effects will be minimised.

But, the authors point out, there is no example globally of a direct tax on emissions *per se*, probably because of the high administration cost that it would entail. The nearest proxy is an input tax on fossil fuels that discriminates according to the carbon content of the fuel used in the production process. Even though demand for electricity is relatively price-inelastic in South Africa, such a tax has the potential to reduce emissions.

Simulating the effects of a 2c tax

In simulating the effects on the economy of a 2c/kWh tax on electricity generation, the authors find that the price of electricity rises by about 10%, thereby pushing up production costs and suppressing economic activity and spurring job losses.

The modelling process shows that the resultant decline in domestic demand will outweigh the pull-back in domestic production, so that the overall price level will fall.

Reduced levels of economic output would create a drop in carbon emissions. The decline in emissions – in the electricity generation industry and in the broader economy – has a projected value of just under R2bn.

Ultimately, such an electricity generation tax would have the advantage of reducing carbon emissions, at the expense of a slight reduction in output.