



Natural Capital Accounting in Action

Energy accounts inform decisions about carbon tax in South Africa

South Africa's economy relies heavily on coal and the country is a big emitter of carbon dioxide. As part of a strategy to reduce emissions, the government considered introducing a carbon tax but needed reliable information to assess the social and economic impacts. Data from the South African energy accounts informed both the assessment of which economic sectors would be most affected and the economic modeling to establish the tax level needed to reach the emissions targets. The energy accounts helped to show that the economic impact of the tax would be relatively small. A carbon tax was outlined in the budget in 2012 and is likely to be introduced in 2016.

South Africa is the 13th largest carbon dioxide (CO₂) emitter in the world, a statistic that has prompted the government to reduce the economy's reliance on coal. In 2009 it committed to cut greenhouse gas emissions 42 per cent by 2025.

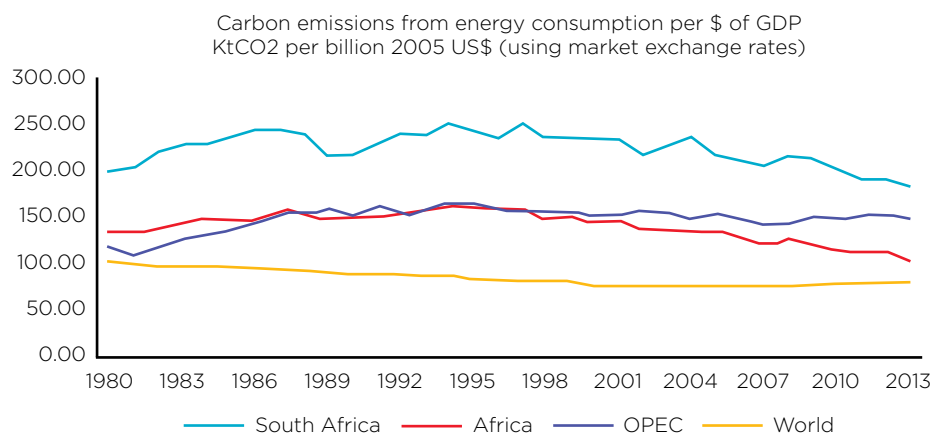
A carbon tax on goods and services based on their emissions intensity (the average carbon content per produced unit) could contribute to achieving this goal by altering their price, driving consumers and producers towards low-carbon alternatives and encouraging introduction of low-carbon technologies.

There have been concerns, however, that such a carbon

pricing mechanism could hit low-income households harder than higher earners and exacerbate the poverty, inequality and high unemployment already prevalent in South Africa's economy.

In brief

- South Africa wants to transform its economy to one that is less carbon intensive and contributes to reducing greenhouse gas emissions.
- A carbon tax could drive this change, but there have been concerns it might push parts of society further into poverty.
- Data from energy accounts helped assess the effectiveness of such a tax and its economic impact.



The South African energy satellite accounts were important in measuring the carbon intensity of the economy.

Data source: The Shift Project Data Portal (2015).

Accounts enable carbon intensity measurement

The first step in assessing the economic impact of a carbon tax was to measure carbon emissions across the economy.

A study commissioned by the South African National Treasury¹ used the South African energy accounts and emission factors for different fuels to measure the carbon intensity of the country's economy. The resulting tables (carbon accounts) showed carbon supply and use across different products and sectors.

This identified the areas of the economy which would be most affected by a carbon tax. This level of detail on carbon use had not been captured before.

Greater accuracy

The energy accounts also allowed for measurement of both direct and indirect embodiment of CO₂. Some sectors and products can appear to be less carbon intensive when only direct carbon use is measured. Vehicles in the transport sector, for example, use highly carbon-intensive metal and rubber products, but this is classed as indirect carbon use and is not captured. The accounts enabled a more accurate picture of carbon intensity across the economy and therefore a more nuanced carbon pricing policy.

Clear results

This information revealed that the impact of a carbon tax would go beyond the energy and heavy industrial sectors to affect other sectors, such as traditionally less carbon-intensive sectors that use carbon indirectly — mainly as electricity. The study found that carbon pricing would hit South African exporters — particularly of metals and mined products — harder than other sectors. But there was no strong evidence that a tax would have a significant adverse effect on national employment or wages, since the most

important employers in the economy are within the least carbon-intensive sectors, even when indirect use is taken into account. In addition, the study showed that carbon pricing is not likely to have a higher impact on low-income than high-income households, as middle-income households are the most carbon-intensive consumers. It also showed that the highest 4 per cent of earners account for more than a third of total household emissions.

The energy accounts were also used to assess how effective a carbon tax would be in reducing emissions. Economic modeling using accounts data helped measure the impact of implementing a tax in three different scenarios: a tax on carbon production, on carbon consumption, and a tax imposed by trading partners on exported carbon.

The results showed that a phased-in tax, starting at US\$3 per ton of CO₂ in 2012 and reaching US\$30 per ton in 2022, would achieve the national emissions targets set for 2025 while reducing GDP and employment by only 1 per cent and 0.6 per cent, respectively.

Reliable data vs political challenges

In 2012, an emissions-based carbon tax was outlined in the national budget. Discussion followed, involving stakeholders from many sectors including labor unions and energy-intensive industries. Introducing the tax is delayed as, despite the acknowledged value of the energy accounts in providing detailed and accurate carbon use data, the political and development implications of implementing the tax remain a challenge.

¹Arndt C, Davies R, Makrelov K and Thurlow J (2013). Measuring the Carbon Intensity of the South African Economy, Economic Society of South Africa – South African Journal of Economics Vol 81:3 September 2013

i What is natural capital accounting?

A set of objective data showing how natural resources contribute to the economy and how the economy affects natural resources. The accounts are an extension of the System of National Accounts. Natural capital accounting integrates natural resources and economic analysis, providing a broader picture of development progress than standard measures such as GDP.



Further resources can be found at www.wavespartnership.org

Facilitated by the World Bank, **Wealth Accounting and the Valuation of Ecosystem Services** is a global partnership that aims to promote sustainable development by ensuring that the national accounts used to measure and plan for economic growth include the value of natural resources



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