Comments on Discussion Paper "Reducing Greenhouse Gas Emissions: The Carbon Tax Option"

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1. General comments

ERC welcomes the publication of the Discussion Paper on a Carbon Tax Option (National Treasury 2010),[1] and express our appreciation to National Treasury for the opportunity to comment.

1.1 Level of a carbon tax

1. Conceptually, the tax level should be set in order to achieve the desired outcome, in this case an environmental goal of limiting GHG emissions, or reducing them relative to a growth trajectory. The tax level should give effect to the 'peak, plateau and decline' trajectory agreed by Cabinet in 2008 and included as the basis of SA's international commitment to act, as submitted to the UNFCCC in January 2010 (RSA 2010).
    a. The discussion document concludes (p. 59): "It would appear that a tax of R75 per ton of CO2, with an increase to about R200 per ton CO2 (at 2005 prices) would be both feasible and appropriate to achieve the desired behavioural changes and emissions-reduction targets".
    b. The timing of the increase in tax rate should be specified, to provide a clear price path and therefore a longer signal.
    c. The relationship to the emissions level needs to be monitored, hence we suggest an adjustment mechanism (next section of these comments).
    d. Based on various analyses of carbon taxes (Kearney 2008; Pauw 2007; Winkler 2007; Winkler & Marquard 2009), we are not convinced that these tax levels are consistent with a trajectory that would see our country's GHG emissions "peak, plateau and decline". See point 3 below for a more detailed discussion.
2. The rationale of relating the tax level to marginal external damage costs (p. 6) does emerge from the literature (Goldblatt 2010; Pearce 1991). This approach is commonly applied to other environmental externalities, such as local forms of air pollution, but is more difficult to apply to GHGs, since these are global pollutants. Calculation of damage costs thus needs to be done globally, and the uncertainties are significant. In addition, the marginal damage cost also rises with the concentration of GHGs in the atmosphere. Thus:
    a. the derivation of a range of marginal external costs "in the region of $5-30 per ton of CO_2" is not clear. The overview refers to Table 4 on p 23, but that table contains a much wider range, from less than $1 to $ 85.
    b. If this approach were followed, a carbon tax policy might then refer more extensively (than in para 31) to the social cost of carbon, social impacts from localised environmental pollution, impacts on health, potential livelihood shifts due to climate variability.
3. Given the methodological difficulty of determining marginal damage costs, methodologically, would a better approach not be to set the carbon tax at the marginal cost of mitigation, given a specific set of national goals? This would be based on the least-cost estimate for achieving a specific set of economy-wide mitigation goals, thereby also providing a basis to engage multi-laterally the issue of fair sharing of mitigation burden and costs. A more practical approach is suggested, setting the tax rate in relation to a desired emissions level, i.e. the one politically agreed as above. The question of the tax level then becomes one

[1] http://www.treasury.gov.za/public%20comments/Discussion%20Paper%20Carbon%20Taxes%2081210.pdf

of incentives – at what level would firms and consumers switch to lower-carbon options? This should be considered from two points of view – from an economy-wide point of view (which captures complex economic interactions), and from a technology investment point of view. There are also some sectors of the economy, which are expected to be unresponsive to a tax, and this needs to be factored in. Evidence from energy modeling for the LTMS suggests that there is a significant response from the energy system at a tax level of around R150-R200 (Hughes et al. 2007; Winkler 2007). Using the recent cost estimates for new power plants from the IRP suggests that the difference between new coal plants and low-carbon technologies is around 20-40 c/kWh, which equates to a tax of R200-R400 per ton of CO2.

1.2 Adjustment mechanism

4. The discussion paper makes a very important point on phasing on p. 6: "Although a carbon tax would not set a fixed quantitative limit for carbon emissions over the short term, a tax set at an appropriate level and phased in over time would provide a strong price signal to both producers and consumers to change their behaviour over the medium to long term."
5. Treasury and government should consider an adjustment mechanism (Winkler & Marquard 2009) that would induce a response from the economy that conforms to the 'peak, pleateau and decline' trajectory as specified by South Africa (RSA 2010)
    a. "Price discovery", or more precisely the discovery of a tax rate consistent with emissions leveling off at 550 Mt CO_2-eq per year between 2020 and 2025; and
    b. Adjusting the tax level (up or down) over time, if emissions exceed a set percentage (say 5%) below or above the 'peak, plateau and decline' trajectory of SA's GHG emissions, respectively (Winkler & Marquard in press).

1.3 Use of tax revenues

6. We concur that good public finance practice does not "support the full earmarking of specific revenue streams" (p. 8). Treasury is taking due care not to complicate the budgetary process. On-budget allocation of revenues might be a better option, with funds being channeled towards projects focused on climate change mitigation. However, clarity would need to be provided on how tax revenues would be apportioned between tax shifting, limited earmarking and revenues flowing to the government's coffers.
7. More information needs to be provided in section 8 regarding the recycling of revenues through tax shifting. Details of where tax reductions will be pursued should be made available, but not necessarily the magnitude of the reductions. Some areas have been addressed (p.7 on free services, see also section 1.4 below)

1.4 Protecting the poor

8. The approach of designing the tax to include "compensating measures to minimise adverse impacts on low income households" (p. 4) is strongly supported. The revenue streams from a carbon tax should be allocated to on-budget programmes, including the ideas for "developmental programmes –

from reducing distortionary taxes such as payroll taxes, to targeted rollout of free basic services such as electricity and water to poor households, to higher transfers to low- and middle-income households" (p. 8). This is sound design for mitigation in the context of poverty and development. The support programmes should seek to achieve the developmental goals in the most locally sustainable manner possible.

9. Both protection of the poor from increased costs and promoting environmental outcomes should be done in accordance with sound public finance practice. We support the notion advanced in the paper of "partial 'on-budget' earmarking of some revenue for specific (e.g. environmental or social) purposes" (p. 8-9). Conflict between the commitment to the ppor and resistnace to earmarking of money (p. 50)
10. The final policy might further specify *how* government will off-set the implications of the tax on the poor. What developmental programmes (p. 7-8) might to considered. One option that emerges from our work on energy poverty would be an increased and extended poverty tariff: from 50 kWh to 100 kWh; other fuels as well LPG (DME 2003; Gaunt 2005; Howells et al. 2006; Mapako & Prasad 2005; Mavhungu 2000; UCT 2002). This supports the notion identified on page 7 of the discussion document. Further analysis is needed of household expenditure patterns and the potential impact of increases of carbon or energy prices (but see the note on IRP2010 showing increases due to non-carbon factors, in the next section). Section 8 of the discussion document might then comprehensively cover all the potential areas where carbon tax revenues could be channeled.

1.5 Competitiveness for industries

11. A range of policy options should be explored. The tax rate should be set in relation to the environmental outcome, as argued above. The particular situation of energy-intensive industries should have specific solutions (Winkler, Jooste & Marquard 2010a), rather than starting at a low tax rate to accommodate. The latter approach would be contrary to the purpose of the tax, to reduce GHG emissions.
12. The increase in the average electricity prices which the country is currently undergoing, and which will continue for around a decade, will not primarily be due to a shift to more expensive low-carbon generation options, but because the electricity price is currently below long-run marginal cost for historical reasons. IRP2010 (DoE 2010) shows that the electricity price will more than double under any scenario, including a coal-intensive scenario utilizing the cheapest supply options, from around 40 c / kWh to over 100 c / kWh. The difference between various policy cases (with the exception of EM3.0) is small. The policy cases are similar to the reference case, even when they include significant limitation on GHG emissions in the electricity supply sector.
13. Sectoral exemptions are a possibility, but as the paper states, may lead to inefficiencies in abatement (p. 8). It may be the case that specific sectors are relatively inflexible in the short to medium term. This could have various reasons, including lack of technology options to switch to and greater levels of sunk investments. While such sectors may warrant approaches structured to their circumstances, any exemptions or special dispensations should only be introduced if a mitigation plan, benchmarked against international best practice, is in place for the specific sector. No new installations should have any kind of exemption, since this would undermine the rationale for the tax, which

is at least partially to incentivise investment in low-carbon technology (Winkler et al. 2010a).

14. One possible complication as regards the point of imposition of the tax is the regulatory system which set prices in the energy sector. The regulatory system that prices liquid fuels would currently prevent some refineries from passing on the tax to consumers, but not others. This is a complex and particular problem that should be addressed as part of a) an overall mitigation plan with specific sectoral components, and b) as part of a review of liquid fuel regulation as a whole.
15. Revenues from the general carbon tax should support programmes that promote efficiency and diversification in energy- and emissions-intensive sectors, towards a low-carbon and climate-resilient economy and society. Any funding of such programmes through a tax should also take into account the support that some sectors have received from government in the past, and the real impact that such measures are likely to have on the profitability of the sectors concerned.
16. Rather than supporting energy-intensive industries (e.g. through the Developmental Electricity Pricing Programme), incentives provided by government should consistently be in favour of climate-friendly technologies, systems and programmes. One example would be to fund DSM / energy efficiency activities , another would be funding the Renewable Energy Feed-in Tariff (REFiT) .

1.6 Border tax adjustments

17. The issue of border tax adjustments (BTAs) is dealt with together with competitiveness. The two are clearly related, but we suggest treating them distinctly, as BTAs are fundamentally an international trade issue. South Africa's position in the climate negotiations has been unambiguously opposed to the imposition of border adjustment measures (taxes or otherwise) by the US or EU.

1.7 Carbon tax and cap-and-trade

18. This document deals with carbon taxes, whereas another will outline emissions trading. The are the two major options in the literature (Anderson 2008) and have also been compared for the South African context (G:enesis 2010; Goldblatt 2010; Winkler & Marquard 2010). We held an international conference at UCT on the broad concept of 'putting a price on carbon' (Winkler, Marquard & Jooste 2010b) and papers on these issues have been published in *Climate Policy.*
19. Based on our analysis and reading of the literature, our view is that the instruments are not mutually exclusive. We know of no emissions trading scheme that covers an entire economy, many cover large installations – and a carbon tax might cover the rest. Certainly the option in the current discussion document, a carbon tax, has a great advantage in ease of administration. Yet a carbon tax will tend to be passed on, where that is possible, so that the burden may not rest with large emitters within our economy. There may be a case for regulation of some of the trace gases with high global warming potentials, e.g. HCFCs and other species. Emissions trading retains a key advantage – that the cap gives greater certainty of the quantity of GHG emissions, a non-trivial consideration in this context.

20. From an international perspective, it seems at this point that the EU-ETS will continue and that other countries may adopt emissions trading (Australia, maybe China and others). Emissions trading is likely to continue regardless of when a new climate treaty is agreed. One scenario for reducing fragmentation in the climate regime is that carbon trading systems will be increasingly linked. Other things being equal, it would be simpler to join a South African ETS to other ETS'es than a tax. Such linkages would also address one of the most compelling critiques of trading, namely that SA has too few large players for a liquid market. One option requiring further exploration is a regional approach, within SADC or the Southern African Power Pool.
21. We look forward to reading the option document on emissions trading, to be released in 2011, including "the economics, design and practicality of an emissions trading scheme" (p.10).
22. All things considered, our view is that Treasury should proceed with implementing a carbon tax, while not foreclosing the option of emissions trading. The carbon tax should build on initial measures (e.g. the 2 c/kWh levy on non-renewable energy for electricity generation). This would allow the process of price discovery to begin, adjusting over time in line with the objective –reducing GHG emissions.

2. Comments on detailed issues

p. 4 "0.2 °C per decade" for the last 50 years would be 1 °C from 1960 to 2010; IPCC estimates about 0.7 °C (±0.2 °C) for the 20th century

p. 4 "2-5 °C" – whose estimate? IPCC AR4 did work on probability distribution functions for climate sensitivity, i.e. the temperature response to a doubling of atmospheric CO_2, with a range but best estimate of 3°C.

p. 6 It is true that the EU ETS "experienced significant price volatility" in its first phase. The reasons were not only free allowances and relatively lax targets, however, but also lack of information. A major downward adjustment in carbon price occurred when verified information became available, and the market expectations had been higher. The information problem is not unique to emissions trading; good information is essential for a carbon tax (and indeed regulatory approaches) as well.

p. 16 – SA is the 12th largest co2 emitter – this is not accurate. In 2005, SA is the 19th largest emitter of co2 without LULUCF emissions, the 42nd largest emitter per capita. With all GHGs considered, including LULUCF emissions and other gases, in 2005, SA ranks 23rd in terms of total co2-eq emissions, and 61st in terms of emissions per capita. By comparison to a world average of 6.7 tons/cap, SA's emissions were 9 tons/cap in 2005. SA's emissions are high compared to other middle-income countries.

P. 20 on section 4.1 and 4.2 on externalities – as the paper points out, the external cost of carbon emissions is a difficult basis on which to set a carbon price. First, this is an international price, second, the price would vary considerably according to the methodology (both for damage assessment /cost of adaptation, the discount rate and the period), and thirdly, the cost of a marginal ton of carbon would increase significantly at different levels of concentration since damage is not linear to concentration. Therefore, the basis for policy should probably be a specific emissions pathway, and the price should be set according to a marginal abatement cost, with an adustment mechanism of some kind to correct errors in the setting of the price.

p.32 – paragraphs 73 and 74 – this is likely to be very complex esp given Sasol. This is easily simplified: 1) tax the carbon going into the plant, including refinery furnace fuel. 2) exempt carbon going out as non-energy products (e.g. petrochemicals). This would capture all the carbon from the original feedstock, as well as the carbon which is going to be burned downstream – e.g. petrol. The implication for the petrol price will be that the carbon content of the petrol will have effectively been taxed. The carbon tax on refinery fuel combustion will have been paid by the refinery, regardless of whether it comes from the feedstock or from outside. The only tricky point to address is the price regulation of liquid fuels in South Africa. A mechanism would have to be introduced to allow liquid fuels producers to recover the tax from consumers. If this was not passed on, then there would be no incentive to change consumer behaviour. This poses the problem of allocating the refinery emissions to each unit of fuel, and also the problem of the difference between Sasol and refineries. Sasol's emissions are strikingly higher than those of conventional refineries per unit of output, but the liquid fuels systems does not allow for differentiation. This is not a trivial question and the solution would involve strong lobbying from the industry, which would likely result in a significant liquid fuels price increase, if the current system of regulation was used as a basis for this.

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