

DESIGNING ENVIRONMENTAL TAXES AND USER CHARGING REGIMES: THEORY AND PRACTICE

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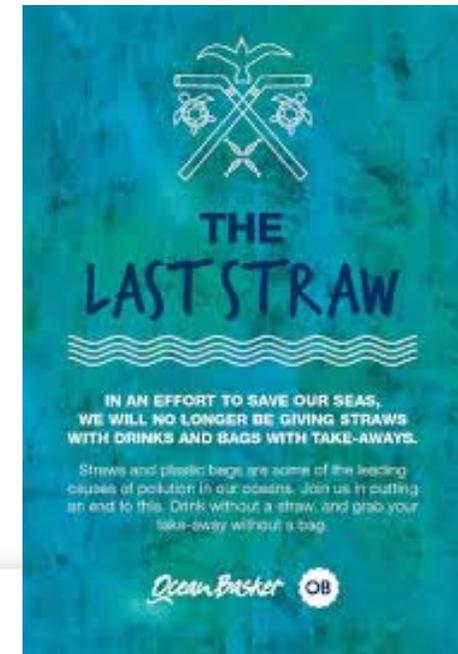
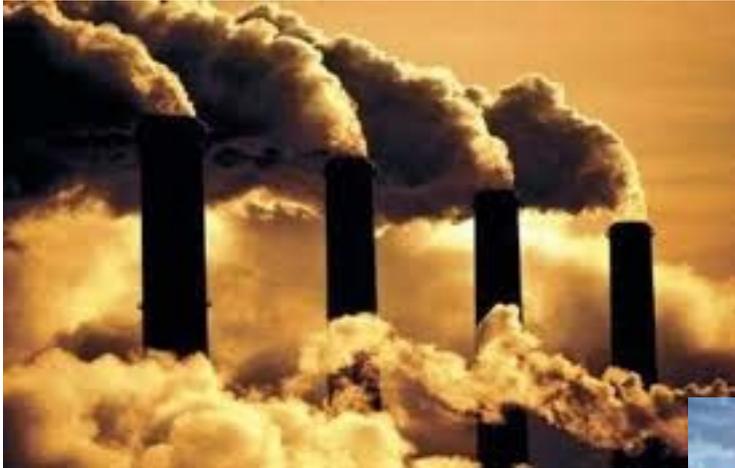
GTAC WINTER SCHOOL
11 JULY 2019



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Environmental challenges – future generations?



Environmental problems facing South Africa...

- **Climate change** – high ghg emissions in absolute terms and per capita – Commitments under the Paris Agreement
- **Local air pollution** – emissions of Soxs, Noxs, particulate matter etc
- **Water and waste water** – water scarce country and inappropriate disposal of effluent into water resources
- **Waste (solid waste and hazardous)** – priority waste streams plastic pollution, electronic waste, lighting, tyres.
- **Land degradation and biodiversity loss** – rehabilitation, management and conservation

Rio + 20 The future we want

- Rio +20 conference recognised that fundamental changes in the way societies consume and produce are indispensable for achieving global sustainable development. The manner in which we use our natural resources such as air, water, biodiversity and land, is an equally important consideration when combined with our social and economic resources. If we do not protect the environment and its natural resources, this economic growth could grind to a halt because we will have destroyed or permanently damaged water and mineral resources, ecosystem diversity and other natural foundations on which our well-being relies. (Source: OECD, Rio 2012)
- The role for environmental taxes, and incentives, complementary to other regulatory measures will be crucial to help promote sustainable consumption and production and address these environmental challenges in an economically efficient, cost-effective manner. This should take into account the specific needs and conditions of developing countries, with the aim of minimizing the possible adverse impacts on their development and in a manner that protects the poor and the affected communities. (Source: Rio+20 (2012) The Future We Want, Resolution adopted by the UN General Assembly)

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

- -Brundtland Commission, 1987

Environmentally related market failures

- **Provision of public goods:** Non rival and non-excludable in consumption.
- **Negative externalities:** Occurs when an individual's action has an impact on others and the costs of these impacts are not reflected in the price of a good or service. Can result in resource under-pricing and therefore overconsumption.
- **Information asymmetry:** Occurs when during a transaction, one party has better information than the other or information is costly to obtain. In new, rapidly changing markets, such as for green technologies, some participants will lag behind current information.
- **Research, development and technology innovation:** may not be possible for a firm to capture the full benefits of an innovation as the information can be readily passed on at a minimal cost.

Options for Intervention

- **Command-and-control measures:**
 - Use of legislative or administrative regulations that prescribe certain outcomes;
 - Usually target outputs or quantity, e.g. minimum ambient air quality standards, within which business must operate.
- **Market-based instruments:**
 - Policy instruments that attempt to internalise environmental externalities through the market by altering relative prices that consumers and firms face;
 - Utilise the price mechanism and complement command-and-control measures. Under certain circumstances MBIs are considered more efficient than command-and-control measures

Policy Instruments to Support Sustainable Development – Sustainable production and consumption patterns

Regulatory Instruments	Economic / Market Based Instruments	Research and education instruments	Cooperation instruments	Information instruments
Norms and standards	Environmental taxes	Research and development	Technology transfer	Consumer advice services
Environmental liability	Fees and user charges	Education and training	Voluntary agreements	Sustainability reporting
Environmental control and enforcement	Removing environmentally harmful subsidies (perverse incentives)			Environmental quality targets and environmental monitoring
	Environmental financing			Eco labelling
	Subsidies			Information centres
	Tradable certificates / permits			

Externalities

- “Externalities refers to situations when the effect of production (and) or consumption of goods and services imposes costs or benefits on others which are not reflected in the prices charged for the goods and services being provided”.
- “A Pigovian tax is a tax imposed that is equal to the negative externality. The result is that the market outcome would be reduced to the efficient amount. A side effect is that revenue is raised for the government, reducing the amount of distortionary taxes that the government must / should impose elsewhere”.

Increasing use of environmental taxes...(Fullerton et al 2008)

- Use of environmental taxes..partly driven by recognition of limitations of conventional environmental regulation
- Environmental policy cannot be approached purely as a technical issue, to be resolved merely by requiring the use of specific abatement technologies and setting emissions limits....
- Extensive changes to existing patterns of production and consumption will be needed...will entail substantial economic costs..
- **Search for instruments capable of minimising these costs and achieving behavioural changes across all sectors has let policy makers to pay closer attention to potential for incentive based environmental regulation ie through economic instruments..**

Choice of instrument – advantages and disadvantages of environmental taxes and other economic instruments (Fullerton et al 2008)

- The case for using environmental taxes and other economic instruments ...primarily a matter of efficiency
- **Static efficiency gains through reallocation of abatement.** Where costs of pollution abatement vary across firms and individuals, environmental taxes have the potential to minimise costs.
 - 1) other policy instruments cannot fully differentiate between polluters with different marginal costs of abatement, and thus may require some to undertake abatement with high economic costs. Econ instruments provide each polluter with an incentive to abate in all of the least expensive ways, thereby achieving a given level of abatement at lower total abatement cost
 - 2) can sidestep the need for the regulatory authority to acquire detailed information on individual sources abatement costs, which lowers the authority's administrative costs
 - **Studies find that cost of abatement using command and control regulation can be several times the minimum cost achieved by using an emissions tax**

Choice of instrument – advantages and disadvantages of environmental taxes and other economic instruments (Fullerton et al 2008)

- **Dynamic innovation incentive**
 - Regulatory policies which stipulate that polluters must use particular technologies maintain emissions below a specified limit may achieve compliance but do not encourage polluters to make reductions below the specified limit.
 - Where regulations are negotiated..polluters may fear that any willingness to exceed requirements may simply lead the regulator imposing a tougher limit on the firm in future..
 - **Environmental taxes provide an on-going incentive for polluters to reduce emissions**, even below the current cost-effective level as the tax applies to each unit of residual emissions, creating an incentive to develop new technologies that have a marginal cost below the tax rate.
- **Robustness to negotiation erosion (regulatory capture)**
 - Effective implementation of regulations requires firm by firm negotiation of individual abatement or technology requirements. Regulatory is dependent on regulated firms for information about their abatement costs and is likely to be drawn into dialogue and negotiation with the firm. Regulated firms therefore control key element in the process for setting regulatory policies, and may be able to extract a price from the regulator from the regulator for their cooperation in the form of less stringent abatement targets..
 - **Environmental taxes can achieve a cost-effective distributive of abatement Risk of eroding the environmental effectiveness of the policy through a negotiation process is substantially reduced**



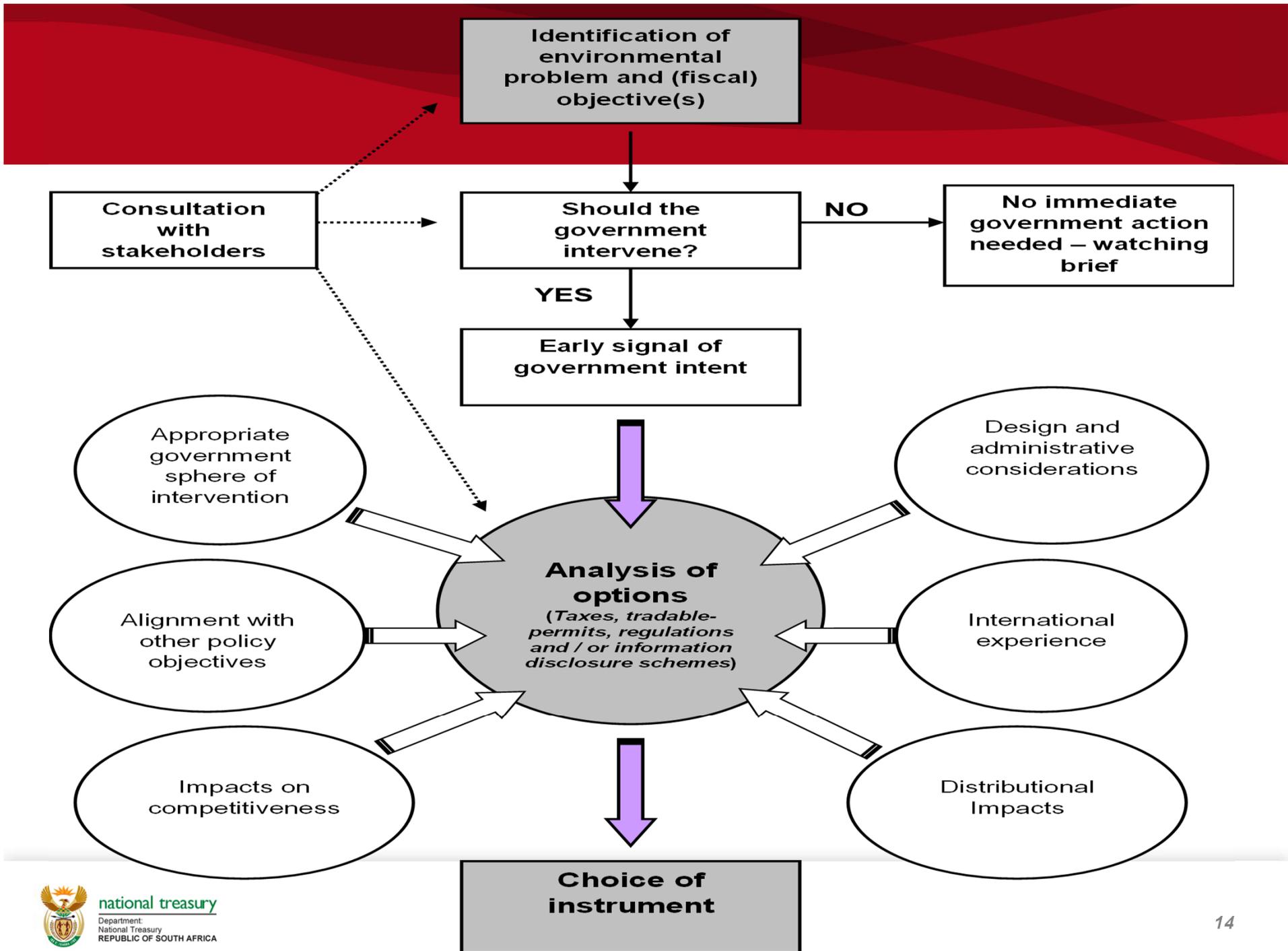
Choice of instrument – considerations for the design of environmental taxes (Fullerton et al 2008)

- **Incompatibility with firm decision making structures.** Business decisions may be decentralised. For environmental taxes to induce efficient responses, firms must draw information on both technology choice and tax payments – firms considering whether to undertake more pollution abatement need to balance the marginal tax savings against the marginal costs of abatement
- **Damaging avoidance activities.** Those subject to a tax may respond in a way that causes more environmental damage eg. A tax on toxic waste may provide a powerful incentive to reduce waste, but it may also result in illegal dumping or burning
- **Distributional effects:** refer to later slide
- **Concerns about international competitiveness:** refer to later slide

Market based and regulatory reinforce each other and have a critical role to play in ensuring markets function as efficiently and effectively as possible.

Environmental Fiscal Reform

- An **Environmental Fiscal Reform Policy Paper** (published in April 2006) provides a foundation to build on and support environmentally related initiatives in South Africa.
 - Maintenance of a coherent tax policy framework;
 - Development of a coherent process and framework to consider and evaluate environmental taxes; and
 - Consider both environmental and revenue outcomes and the “double-dividend” hypothesis.



CRITERIA / DESIGN CONSIDERATIONS

- **Environmental effectiveness** – linked to the environmental externality and aim for best design possible;
- **Tax rate & revenue** – tax rate to be phased-in, revenue use in terms of government priorities;
- **Support for the tax** – public support and acceptance is important (e.g. tax payer morality);
- **Legal, technical & administrative feasibility:**
 - *Define taxable commodity - tax base; or nature of incentive;*
 - *Setting the tax rate;*
 - *Tax avoidance and evasion;*
 - *Collection costs; and*
 - *Compliance costs.*
- **Competitiveness impacts** – may require phased in approach to allow adequate time for adjustments;
- **Distributional impacts** – compensating measures may need to be considered; and
- **Adjoining policy areas** – is the instrument capable of contributing to other social and economic objectives?

Environmental effectiveness

- The **tax must be well targeted to an environmental objective**. Ideally, there should be a direct link between the environmental issue and the tax.
 - incentives to change taxpayer behaviour are likely to be stronger and unintended side effects minimised.
- Where a direct link is not possible, the closest link should ideally be used instead,
 - for example, to reduce emissions into the atmosphere, a tax per unit of emissions would be one of the closest links to the environmental externality. If this is not technically or administratively feasible, taxing the consumption of the fuel input such as coal, petrol / diesel and / or vehicle use may be used as a proxy for air emissions
- To ensure that the tax is as effective as possible, the *best design* should be aimed for. In some cases, concessions may be necessary to avoid creating perverse incentives that undermine the environmental effectiveness of the tax.

Internalisation of Externalities – Competitiveness Issues

- Internalising negative externalities comes at a price.
- Aims to **internalise externalities to a socially optimal level cannot always be achieved immediately.**
- There are “**win-win**” cases where more environmentally informed business practices could lead to corresponding improvements in competitiveness.
- Improved environmental performance may also improve access to certain markets – notably in the export sectors.
- However, these benefits are not immediately possible in all cases.
 - **A phased approach taking account of potential impacts on competitiveness must be adopted to give specific sectors time to adjust.**

Distributional Issues – Impact on the Poor

- The **poor and low-income groups are often hardest hit** by negative environmental externalities.
- Important for environmentally-related fiscal policy to ensure that **environmental instruments are pro-poor** where possible, or at least **do not place a disproportionate burden on low-income groups**.
- A sustainable growth path should provide protection and support to the poor.
- Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- Tradeoffs need to be well managed.

Potential for achieving the double dividend and tax shifting

- Taxes on labour (income and pay-roll taxes) are necessary to raise revenue for public spending programmes.
- Argued that if additional revenues can be generated through environmentally-related taxes, taxes on labour and the associated distortions this brings with it can be reduced.
- This **concept of *taxing bads*** (such as environmental pollution) and ***reducing taxes on goods*** (e.g. labour) has been termed the ***double-dividend hypothesis***.
 - asserts that a win-win situation could be achieved in that not only is an **improvement in environmental quality secured** (the first dividend), but gains in **economic efficiency and employment** could also be realised (the second dividend).
 - **Tax shifting** can effectively minimise the overall tax burden on affected sectors and still create required behavioural incentives.

OPTIONS FOR REVENUE USE

- How the revenues are used could be an important issue where revenue-raising potentials are significant. There are essentially **four different uses** (although not necessarily mutually exclusive) to which the revenues could be put:
 - Revenues accrue to the fiscus and are **allocated to priority spending needs through the normal budgetary process**;
 - Revenues accrue to the fiscus and are **used as part of a tax-shifting exercise** to reduce the marginal tax rates of other distortionary taxes such as taxes on labour;
 - Revenues are **earmarked or ring-fenced for spending on specific environmental programmes** (*explicit / hard* earmarking); and/or
 - Revenues accrue to the fiscus but **there is some form of agreement that spending on environmental programmes will be increased through on-budget channels** (*implicit / soft* earmarking).

Overview of Environmentally Related Taxes

- **Proposed Carbon Tax** – aim of the carbon tax is to put a price on the environmental and economic damages caused by excessive emissions of greenhouse gases
- **Electricity generation levy** – applies to non-renewable based electricity generation including fossil and nuclear based generation
- **Fuel taxes** – raise general revenue, fund compensation for road accidents, and help to address pollution and congestion
- **Incandescent globe tax** – to encourage the use of more efficient compact fluorescent bulbs and reduce electricity demand
- **Motor vehicle CO₂ emissions tax** – aims to encourage consumers to use more fuel-efficient, low-carbon-emitting vehicles, and manufacturers to improve fuel efficiency
- **Plastic bag levy** – aims to counter the dispersion of plastic bags that end up as wind-blown litter or in waste facilities
- **Tyre Levy** – intended to reduce waste, while encouraging reuse, recycling and recovery, and discouraging disposal into landfills (R2,30/kg tyre)

Direct and indirect tax instruments

- **Direct Taxes** (income)
 - **Personal Income Tax / Individuals**
 - **Corporate Income Tax**
 - Dividend withholding tax (Previously Secondary Tax on Companies)
 - Estate Duty
 - Donations Tax
 - Payroll Taxes
 - Skills Development Levy
 - Unemployment Insurance Fund Contributions
- **Indirect Taxes** (“consumption”)
 - **Value Added Tax (VAT)**
 - Excise Duties (Specific and Ad Valorem)
 - Custom Duties
 - Transfer Duties (Properties)
 - Securities Transfer Tax (Financial transactions - shares)
 - **Environmentally-related taxes**
 - Fuel Levy
 - Electricity levy – non-renewable generation
 - Plastic Bag Levy
 - Tax on incandescent light bulbs
 - Motor vehicle CO₂ emissions tax
 - Tyre levy
 - Air passenger departure tax

Revenues from Environmental Taxes (2004/05 – 2017/18)

Year R'000	Fuel Levy	Air passenger departure tax	Plastic bag levy	Electricity generation levy	CO2 tax motor vehicle emissions	Incandescent light bulb levy	Tyre levy	Environmental Tax Revenues (total)
2004/05	19 190 431	412 176	41 214	-	-	-	-	19 643 821
2005/06	20 506 666	458 158	61 385	-	-	-	-	21 026 209
2006/07	21 844 641	484 823	75 128	-	-	-	-	22 404 592
2007/08	23 740 511	540 635	86 314	-	-	-	-	24 367 460
2008/09	24 883 776	549 365	78 563	-	-	-	-	25 511 704
2009/10	28 832 536	580 326	110 510	3 341 691	-	63 880	-	32 928 944
2010/11	34 417 577	647 810	258 222	4 996 366	625 891	151 083	-	41 096 948
2011/12	36 602 263	762 416	53 832	6 429 721	1 617 353	143 787	-	45 609 373
2012/13	40 410 389	873 060	150 817	7 983 940	1 567 382	136 792	-	51 122 380
2013/14	43 684 654	878 697	169 243	8 818 930	1 711 179	71 802	-	55 334 505
2014/15	48 466 532	906 575	174 298	8 648 170	1 483 337	90 877	-	59 769 790
2015/16	55 607 288	941 226	183 358	8 471 774	1 276 880	51 801	-	66 532 326
2016/17	62 778 834	1 003 904	231 875	8 457 668	1 208 521	70 206	77 242	73 828 251
2017/18	70 948 576	1 086 040	241 295	8 500 970	1 336 817	55 354	715 912	82 884 963

Environmental tax revenues as percentage of total tax revenue

Year	Fuel Levy	Air passenger departure tax	Plastic bag levy	Electricity generation levy	CO2 tax motor vehicle emissions	Incandescent light bulb levy	Tyre levy	% of total tax revenues
2004/05	5.5%	0.1%	0.0%	0.0%	0.0%	0.0%		5.6%
2005/06	5.0%	0.1%	0.0%	0.0%	0.0%	0.0%		5.1%
2006/07	4.5%	0.1%	0.0%	0.0%	0.0%	0.0%		4.7%
2007/08	4.2%	0.1%	0.0%	0.0%	0.0%	0.0%		4.4%
2008/09	4.1%	0.1%	0.0%	0.0%	0.0%	0.0%		4.2%
2009/10	5.0%	0.1%	0.0%	0.6%	0.0%	0.0%		5.7%
2010/11	5.1%	0.1%	0.0%	0.7%	0.1%	0.0%		6.1%
2011/12	4.9%	0.1%	0.0%	0.9%	0.2%	0.0%		6.2%
2012/13	5.1%	0.1%	0.0%	1.0%	0.2%	0.0%		6.5%
2013/14	5.0%	0.1%	0.0%	1.0%	0.2%	0.0%		6.3%
2014/15	5.1%	0.1%	0.0%	0.9%	0.2%	0.0%		6.2%
2015/16	5.2%	0.1%	0.0%	0.8%	0.1%	0.0%		6.2%
2016/17	5.5%	0.1%	0.0%	0.7%	0.1%	0.0%	0.0%	6.5%
2017/18	5.9%	0.1%	0.0%	0.7%	0.1%	0.0%	0.1%	6.9%
Average	5.0%	0.1%	0.0%	0.5%	0.1%	0.0%	0.0%	5.6%

SOUTH AFRICA'S CARBON TAX - TAX DESIGN IN PRACTICE – CONCESSIONS!

Revenue

Carbon tax at R120 per ton of CO₂e

60% basic tax-free threshold

Max of 10% tax-free allowance for trade exposure

10% tax-free allowance for process and fugitive emissions

Up to 5% performance allowance

5% tax-free allowance for complying with carbon budgets information requirements

5 or 10% allowance for Carbon Offsets – to reduce the carbon tax liability

- Tax-free allowances of **60-95%** - effective tax rate of

R6 - R48 t/CO₂e

- No impact on electricity prices in the first phase

Revenue Recycling

Energy Efficiency Savings tax incentive

Credit against Eskom's carbon tax liability for the renewable energy premium built into the electricity tariffs

Credit for the electricity levy

Support for the installation of solar water geysers

Enhanced free basic electricity / energy for low income households

Improved public passenger transport & support for shift of freight from road to rail



Carbon tax policy framework for SA

- **Tax Base**
 - Electricity generation and fuel combustion
 - Industrial processes – cement, iron and steel, glass, ceramics,
 - Fugitive emissions – e.g. methane emissions from mining
 - Direct (Scope 1) stationary emissions
 - Direct (Scope 1) non- stationary emissions – as an add on to the fuel tax regime.
- **Marginal tax rate**
 - R120/tonCO_{2e}
- **Recycling measures**
 - Reducing other taxes and providing tax incentives
 - If revenues left over, on budget support for pro poor programmes in energy, transport sectors
- **Phased approach**
 - Phase 1: 2019 to 2022
 - Starting off the tax at a relatively modest rate, coupled with generous tax-free allowances, adjusted over time to facilitate a structural transition to a low carbon, climate resilient economy in a cost effective manner.

Conclusions (1)

- Taxation is a powerful tool to price negative externalities and drive behaviour change – the threat to polluters, both producers and consumers, of being required to pay sends an important price signal to
 - Either pay a tax or reduce their tax liability by investing in cleaner, pollution abatement, low emission technologies;
 - Invest in research development and technology innovation;
 - For sunset industries, provide an important incentive for diversification of business processes, and shifting to cleaner industries; and
 - Helps with creating and changing mindsets.
- Taxation gives effect to key environmental and economic principles – polluter pays, intergenerational equity and precautionary principles.

Conclusions (2)

- In designing environmental taxes, two important considerations are impacts on industry competitiveness and poor and low income households.
 - Compensating measures will need to be considered in the short term to mitigate potential adverse impacts and to enhance the political acceptability of the tax
- Key condition for driving behaviour change, not just in the short but over the medium to longer term, is price certainty and gradually shifting towards fully internalising externality costs – adopting a phased rather than “big bang” approach
- Environmental taxation is an important part of environmental policy packages to address environmental issues – provides flexibility to industries in transitioning their processes whilst providing incentives for reducing pollution.
- Combining environmental taxation with appropriate regulatory measures such as standards and effective enforcement of these measures, information, education and awareness campaigns, and support for research development and technology innovation can be very effective in achieving stricter environmental goals in a cost effective manner.

Thank you.

