Outline

- Introduction
- Policy context for the carbon tax and policy synergy
- SA emissions profile, climate change impacts and mitigation options
- Economics of climate change and rationale for carbon tax
- Design considerations for carbon tax
- Budget 2012: Carbon tax proposals
- Concluding remarks and next steps
Introduction

• A high(er) level of economic growth is a necessary but not sufficient requirement to ensure significant reductions in the levels of unemployment, poverty and income inequality AND improvement in the economic welfare of all South Africans.
• It’s not just the quantity of growth that matters, but also the quality.
• **Sustainable development** requires that not only profitability and efficiency considerations are important but human development and the needs of future generations should increasingly be taken into account in today’s policy decisions.
• Market prices do not always reflect the full economic costs of production or consumption / use.
Carbon Tax: Policy synergy and context

- Long Term Mitigation Scenarios (2007 - 2008)
- ANC Resolution on Climate Change, 2007
- **Carbon Tax Discussion Paper (2010)**
- National Climate Change Response White Paper (2011)
- National Development Plan: Vision for 2030
Policy Context for the Development of Market Based Instruments to Address Climate Change in South Africa

- **2006** – Environmental Fiscal Reform Policy Paper entitled “A Framework for considering market-based instruments to support Environmental Fiscal Reform in South Africa”
  - Role of carbon taxes as a policy measure to price carbon emissions stimulate behavioural change towards less energy intensive, low carbon emitting alternatives
- **2011** – National Climate Change Response White Paper recognises that:
  - A mix of economic instruments including market-based instruments such as carbon taxes and emissions trading schemes and incentives complemented by appropriate regulatory policy measures are essential to driving and facilitating mitigation efforts and creating incentives for mitigation actions across a wide range of key economic sectors.
# Sectoral GHG emissions for SA – DEA GHG Inventory Report (2009)

<table>
<thead>
<tr>
<th>Sector</th>
<th>GHG emissions CO$_2$e (Gg – gigagrams)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
</tr>
<tr>
<td>Energy</td>
<td>260 886</td>
</tr>
<tr>
<td>Industrial processes and produce use</td>
<td>30 792</td>
</tr>
<tr>
<td>Agriculture</td>
<td>40 474</td>
</tr>
<tr>
<td>Waste</td>
<td>15 194</td>
</tr>
<tr>
<td>Total (without LULUCF)</td>
<td>347 346</td>
</tr>
</tbody>
</table>
### GHG emission trends for SA – DEA GHG Inventory Report (2009)

<table>
<thead>
<tr>
<th>GHG emissions CO₂e (Gg)</th>
<th>1990</th>
<th>% of total</th>
<th>1994</th>
<th>% of total</th>
<th>2000</th>
<th>% of total</th>
<th>2000 % change from 1994</th>
<th>2000 % change from 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>280 932</td>
<td>80.9</td>
<td>315 957</td>
<td>83.2</td>
<td>353 643</td>
<td>81.1</td>
<td>11.9</td>
<td>18.6</td>
</tr>
<tr>
<td>CH₄</td>
<td>2 053</td>
<td>12.4</td>
<td>2 057</td>
<td>11.4</td>
<td>3 624</td>
<td>17.2</td>
<td>76.2</td>
<td>76.5</td>
</tr>
<tr>
<td>N₂O</td>
<td>75</td>
<td>6.7</td>
<td>67</td>
<td>5.4</td>
<td>76.7</td>
<td>1.3</td>
<td>14.5</td>
<td>2.7</td>
</tr>
<tr>
<td>CF₄</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.303</td>
<td>0.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C₂F₆</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.027</td>
<td>0.06</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total CO₂eqGg (without LULUCF)</td>
<td>347 346</td>
<td>379 842</td>
<td>436 257</td>
<td>14.8</td>
<td>25.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*GHG emissions CO₂e (Gg)*

* 1990: 280 932
* 1994: 315 957
* 2000: 353 643

*Percentage of total:

* 1990: 80.9%
* 1994: 83.2%
* 2000: 81.1%

*2000 % change from 1994:

* CO₂: 11.9%
* CH₄: 76.2%
* N₂O: 14.5%

*2000 % change from 1990:

* CO₂: 18.6%
* CH₄: 76.5%
* N₂O: 2.7%
Over the last century, the world has seen a sustained decline in the proportion of people living in poverty. However, there is a growing concern that climate change could slow or possibly even reverse progress on poverty reduction.

This concern is rooted in the fact than most developing countries are more dependent on agriculture and other climate-sensitive natural resources for income and wellbeing, and that they also lack sufficient financial and technical capacities to manage increasing climate risk.

Climate change is likely to lead not only to changes in the mean levels of temperatures and rainfall, but also to a significant increase in the variability of climate and in the frequency of extreme weather-related shocks.

...much of the poverty impact is expected to be concentrated in Africa and South Asia, both of which would see more substantial increases in poverty relative to a baseline without climate change.
As a signatory to the UN Framework Convention on Climate Change (UNFCCC), South Africa has no current obligations to reduce its greenhouse gas emissions although this situation may change post 2012.

However, partly due to the fact that the South African economy has one of the highest energy intensities in the world (i.e. energy consumption per unit of output), improvements in energy efficiency and the promotion of renewable energy sources have been highlighted as an important component of the Department of Minerals and Energy (DME) future energy policy. The DMEs proposed Energy Bill would allow the Minister of Minerals and Energy to establish a National Energy Efficiency Program to regulate energy efficiency matters.

With respect to climate change adaptation, a National Climate Change Response Strategy was adopted in 2004 that highlights potential areas for government intervention to both mitigate and adapt to the effects of climate change.
Long Term Mitigation Scenarios (Wedges) – rank emission reductions

- Limit use of SUVs (36)
- Passenger modal shift (16)
- Improved vehicle efficiency (14)
- SWH subsidy (25)
- Industrial, Commercial, Residential energy efficiency (5, 22, 21)
- Renewables with learning extended (subsidy) (6, 7)
- Nuclear (12, 8)
- Cleaner coal (28)
- Land use: afforestation (27)
- Escalating CO$_2$ tax (1)
- Nuclear and renewables extended (2)
- CCS (2 Mt & 20 Mt) (26, 19)
- Electric vehicles with nuclear, renewables (3)
- Biofuel subsidy (29, 15)
- Hybrids (23)
- Synfuel CCS (2Mt) (32)
Economics of Climate Change

• Economic theory suggests that well functioning markets tends to ensure an optimal allocation of scarce resources.

• Through the price mechanism, incentives are created for all participants in the economy to optimise resource use.

• However, the market often fails to put an adequate price on the use of environmental resources.

• Why:
  – environmental resources such as air; climate and biodiversity are non-rival and non-excludable in consumption (“public goods”).
In general, markets provide an efficient (although not necessarily the most equitable) means of allocating scarce resources.

However, some markets are subject to failures, particularly with respect to environmental goods and services due to the public good nature of these goods.

This can lead to insufficient consideration of environmental issues in production and consumption decisions.

Government intervention necessary – regulations, standards, taxes, etc.
Externalities & Pigovian Tax

• “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”.

• OECD definition of environmentally related taxes:
  – Tax on an environmentally harmful tax base.
Polluter Pay Principle - Application

• “The PPP is normally implemented through two different policy approaches: command-and-control and market-based. Command-and-control approaches include performance and technology standards. Market-based instruments include pollution taxes and tradable pollution permits. The elimination of subsidies is also an important part of the application of the PPP.

• At the international level the Kyoto Protocol is an example of application of the PPP: parties that have obligations to reduce their greenhouse gas emissions must bear the costs of reducing (prevention and control) such polluting emissions”.

Rationale for a carbon tax

• The external costs of GHG emissions are not reflected in the market prices of certain goods and services, e.g. energy.

• A carbon tax is a means by which government can intervene by way of a market based instrument to appropriately take into account the social costs resulting from carbon emissions.

• A carbon tax seeks to level the playing field between carbon intensive (fossil fuel based firms) and low carbon emitting sectors (renewable energy and energy efficient technologies).

• Although this option does not set a fixed quantitative limit to carbon emission over the short term, a carbon tax at an appropriate level and phased in over time to the “correct level” will provide a strong price signal to both producers and consumers to change their behaviour over the medium to long term.
Carbon Taxes and Trading Schemes

• Policy instruments to address climate change:
  – The carbon tax discussion paper acknowledges that carbon taxes and emissions trading schemes are key policy instruments that could be used to price carbon and provide the necessary and credible price signals to stimulate behaviour change.

• Developing an adequate, transparent, credible and competitive emissions trading mechanism to protect the atmosphere could complement the proposed carbon tax.

• An alternative or possibly a complementary mechanism to price carbon by way of an emission trading scheme can be considered over the longer term, however such a mechanism is probably not feasible in South Africa over the medium term
  – In the South African context, the oligopolistic structure of the energy sector is likely to reduce efficiency gains that would result from such a mechanism.
  – The lack of many industry players and appropriate market structure with diverse abatement costs suggests limited opportunities for domestic trade, resulting in inappropriate permit prices.
  – This could result in the lock-in of emission-intensive technologies where permits could be used as a barrier of entry for newcomers.
## Carbon Tax vs. Emissions Trading

### Carbon Tax

- **Price certainty** – fixed price
- **Emission reductions** – *quantity uncertain*
- **Administration** and compliance – piggy back on existing administrative systems
- **Visibility** of tax
- **Design** – tax base, collection point, price level

### Emissions trading

- **Price uncertainty** – volatility
- **Emissions are capped** – *quantity certain*
- **Complexity** – negotiations, high transaction costs, new institutions.
- Some costs (and benefits) are **hidden**
- **Coverage**, point of obligation, cap level
Criteria / Tax Design Considerations

- **Environmental effectiveness** – linked to the environmental externality and aim for best design possible.
- **Tax rate & revenue** – tax rate to be phased-in, consider appropriate revenue recycling options, budget priorities, etc.
- **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 phase 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?
1. **Carbon Emissions Tax**
   Actual measured emissions; or

2. **Proxy tax bases:**
   A. **Fossil Fuel Input (Upstream):**
      where fuels enter the economy based on the carbon content of the fuel.
   B. **Output Tax (Downstream):**
      (i) At point where fuel is combusted.
      (ii) May be based on average emissions of production processes.
Two main concerns of environmental taxes are their impacts on income distribution and international industrial competitiveness.

In the case of carbon taxes that raise the cost of domestic energy, these taxes may have a regressive impact on low income households.

The design of tax instruments and expenditure programmes could incorporate compensating measures that could offset potential regressive impacts. Such measures will ensure access to energy at affordable prices for low income households.
Competitiveness impacts

• Potential adverse impacts on international competitiveness of trade exposed industrial sectors.

• Carbon tax seeks to:
  – Level playing field between carbon intensive (fossil based firms) and low carbon emitting sectors.
  – Result in a contraction in the long run of carbon intensive sectors and contribute to net ghg emissions reductions.

• First mover competitive advantage gains:
  – Early adoption of low carbon intensive growth path can result in competitive advantage in low carbon technologies
  – Incentives created for research, development, innovation etc.

• Measures to mitigate competitiveness impacts could include:
  – Longer period of phasing in of the tax rate
For many stakeholders, there is a link between revenues from environmentally-related taxes and spending on the environment.

In general, “full” earmarking is not in line with sound fiscal management practices.

Need to consider different incentive / revenue use options {revenue recycling such as “soft” earmarking (on budget allocations) or reducing (or not increasing) other taxes}. 
Carbon Tax Policy Process and Stakeholder Engagements in 2011

• Carbon tax workshop held on 16 March 2011
• Consolidation of comments received (79 sets of comments)
• Series of engagements with key sectors / firms:
  – Eskom
  – SASOL
  – BUSA
  – Mining
  – Cement
  – Iron and Steel
  – Manufacturing circle
  – Paper and pulp
  – Liquid fuels (oil)
• Questionnaire circulated to key sectors
Phased approach to the implementation of the carbon tax
- Introductory phase of the carbon tax will be effective from 2013/14 to 2019
- Phase 2 extending from 2020 to 2025

Application of a percentage based exemption threshold on actual emissions, instead of absolute emissions thresholds, below which the tax will not be payable during the first phase.
- Transition period will provide for temporary thresholds below which an exemption from the carbon tax will be granted.

Due consideration will be given to sectors where the emission reduction potential is limited for technical or structural reasons.
- Initial consideration suggests that this will include the cement, iron and steel, aluminium and glass sectors.

Carbon leakage and competitiveness concerns will also be addressed in the long term. Additional tax free allowance for trade exposed sectors.

Offsets could be used by firms to reduce their carbon tax liability up to a limit; variable offset limits are proposed based on the mitigation potential of the sector.
## Proposed Sector Emissions Thresholds

<table>
<thead>
<tr>
<th>Sector</th>
<th>Basic tax free threshold (%) below which no carbon tax will be payable during the first phase (2013/14 to 2019)</th>
<th>Maximum Additional allowance for Trade Exposure</th>
<th>Additional allowance for “process” emissions</th>
<th>Total</th>
<th>Maximum Offset percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>60%</td>
<td></td>
<td></td>
<td>60%</td>
<td>10%</td>
</tr>
<tr>
<td>Petroleum (Coal to Liquid)</td>
<td>60%</td>
<td>10%</td>
<td></td>
<td>70%</td>
<td>10%</td>
</tr>
<tr>
<td>Petroleum – Oil refinery</td>
<td>60%</td>
<td>10%</td>
<td></td>
<td>70%</td>
<td>10%</td>
</tr>
<tr>
<td>Iron and Steel</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Cement</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Glass &amp; Ceramics</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Pulp &amp; Paper</td>
<td>60%</td>
<td>10%</td>
<td></td>
<td>70%</td>
<td>10%</td>
</tr>
<tr>
<td>Sugar</td>
<td>60%</td>
<td>10%</td>
<td></td>
<td>70%</td>
<td>10%</td>
</tr>
<tr>
<td>Agriculture, Forestry and Land Use</td>
<td>60%</td>
<td></td>
<td>40%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Waste</td>
<td>60%</td>
<td></td>
<td>40%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Fugitive emissions: Coal mining</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>80%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>60%</td>
<td>10%</td>
<td></td>
<td>70%</td>
<td>10%</td>
</tr>
</tbody>
</table>
Additional Emissions Intensity Based Allowance

- A formula is proposed to adjust the **basic percentage tax free threshold** to take into account efforts already made by firms to reduce their emissions as well as to encourage firms to invest in low carbon alternatives.
- The **basic percentage** threshold below which the tax will not be payable may be adjusted using a carbon emissions intensity factor for output compared to an agreed sector benchmark.
- A formula is proposed to calculate a factor $Z$ which will then be used to adjust, either increase or decrease, the basic percentage tax free threshold as described below:

$$Z = Y / X$$

Where,

- $X$ is the **average measured and verified carbon intensity of the output** of a firm
- $Y$ is the **agreed benchmark carbon intensity for the sector**.

The adjustment to the tax free threshold is then determined by multiplying the original percentage threshold by $Z$. 
Carbon Tax Proposals (cont.)

- The proposed carbon tax seeks to
  - internalise these external costs that already exist in the economy
  - contribute to shifting resources to their most efficient use through adjustments in the relative prices of competing goods and services.

- An efficient tax requires that the tax base should be as broad as possible, that is covering all ghgs and sectors that are practically feasible to allow for cost effective emissions reductions and create the necessary price signals to influence medium to long term investment decisions.

- The carbon tax will apply to scope 1 emissions and the GHGs that will be covered are CO₂, methane, nitrous oxide and perfluorocarbons.

- The tax will apply on fuel inputs based on agreed emissions factors or, in the case of certain industrial processes, procedures available to reasonably and accurately quantify CO2e emissions.
• Government proposes a carbon tax at R120 per ton/CO$_2$e above the thresholds to be introduced in 2013 /14 and taking into account the proposed maximum allowable offset opportunities.

• It is further proposed that the tax rate of a R120 per ton/CO$_2$e be increased at a rate of 10 per cent per annum until 2019 /2020. The annual rate of increase in the tax will be reviewed before 31 January 2020.

• Revenues from the tax will not be earmarked but consideration will be given to additional spending to address environmental concerns and to support the low carbon transition.
Pricing energy appropriately is vital to ensure that the external costs of climate change and other environmental damages are explicitly reflected in the price of energy and the relative prices between carbon intensive and low carbon technologies are correctly rebalanced.

Energy sector environmental externalities include GHG emissions and local air pollution damages (emissions of SOx, NOx)

For the electricity sector, it is important that very high emission intensive power stations are phased-out over time and efforts are targeted to support a low carbon transition for the electricity sector.

The dual benefits of both emissions reductions and energy security of supply could be achieved through investments in appropriate retrofitting of these facilities and consideration of off-grid electricity and regional supply options.

Given the regulated nature of the electricity and liquid fuels sectors and therefore electricity and fuel prices, consideration will be given to the pass through of the carbon tax to ensure that incentives are maintained for changes in both production and consumption patterns.
Transitional Support Measures

- Under the **National Climate Change Response White Paper**, several **priority flagship programmes** have been identified in the **energy**, **transport**, **water** and **waste sectors**.

- To complement these initiatives, consideration will be given to support for households and business as detailed below:

  - **Households**
    - enhanced free basic electricity allocation
    - improved public transport

  - **Businesses**
    - tax relief for CER credits
    - Research and development tax incentive
    - Implementation of the energy efficiency savings tax incentive
Concluding remarks and next steps

- **To support our broader sustainable development and climate change objectives, the transformation of our energy sector is vital.**
- Carbon pricing will play an important role, as part of a suite of complementary policy measures, in providing the appropriate price signals to influence producer and consumer behaviour towards low carbon, energy efficient technologies that drive emissions reductions.
- A **carbon tax** at an appropriate level and **phased in over a specific time period to the ‘correct’ level will provide strong price signals and certainty to influence key investment decisions over the medium to long term** in a cost effective manner.
- **New investments should not lock us into an emissions intensive growth path.**
- **Next steps:**
  - Publication of the **second carbon tax discussion paper in May 2012** for public comments followed by stakeholder consultations.
Thank you.

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Existing environmentally related (with some climate change elements) fiscal measures

**Taxes**

- **General fuel levy** applied to petrol, diesel (a component ?)
- **Electricity generation tax** applied to non-renewable based electricity generation (2c/kWh)
- **Motor vehicle emissions tax** – purchase tax of R75 gCO$_2$/km for each emission exceeding 120gCO$_2$/km (passenger vehicles) and double cabs subject to tax of R100 for emissions exceeding 175gCO$_2$/km
- **Incandescent globe tax** of R3 per globe

**Tax Incentives**

- **Tax exemption for revenues earned from CERs** (CDM projects)
- **Accelerated depreciation allowances** for renewable electricity generation and biofuels production
- **R&D tax incentives** (including green technologies) - 150 per cent income tax deduction for R&D expenses
- **Tax incentives for biodiversity conservation**
- **Energy efficiency savings** tax allowance (in process …)
ANC Resolution on Climate Change, 2007

- Recognise that the evidence for climate change is indisputable and that immediate action by all governments and the public as a whole is needed.

- Set a target for the reduction of greenhouse gas emissions as part of our responsibility to protect the environment and promote sustainable development, and to participate in sharing the burden with the global community under a common framework of action.

- Support the meeting of the target through:
  - a) energy efficiency improvements in industry, in households and by setting vehicle fuel efficiency standards;
  - b) diversifying energy sources away from coal, including through nuclear energy and renewables - especially solar power;
  - c) putting a price on the emission of carbon dioxide and other greenhouse gases;