NCPC
NATIONAL CLEANER PRODUCTION CENTRE
SOUTH AFRICA

Carbon Tax in South Africa

Implications for the Industrial Sector

Pretoria – 19 June 2019

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the dti
Department:
Trade and Industry
REPUBLIC OF SOUTH AFRICA

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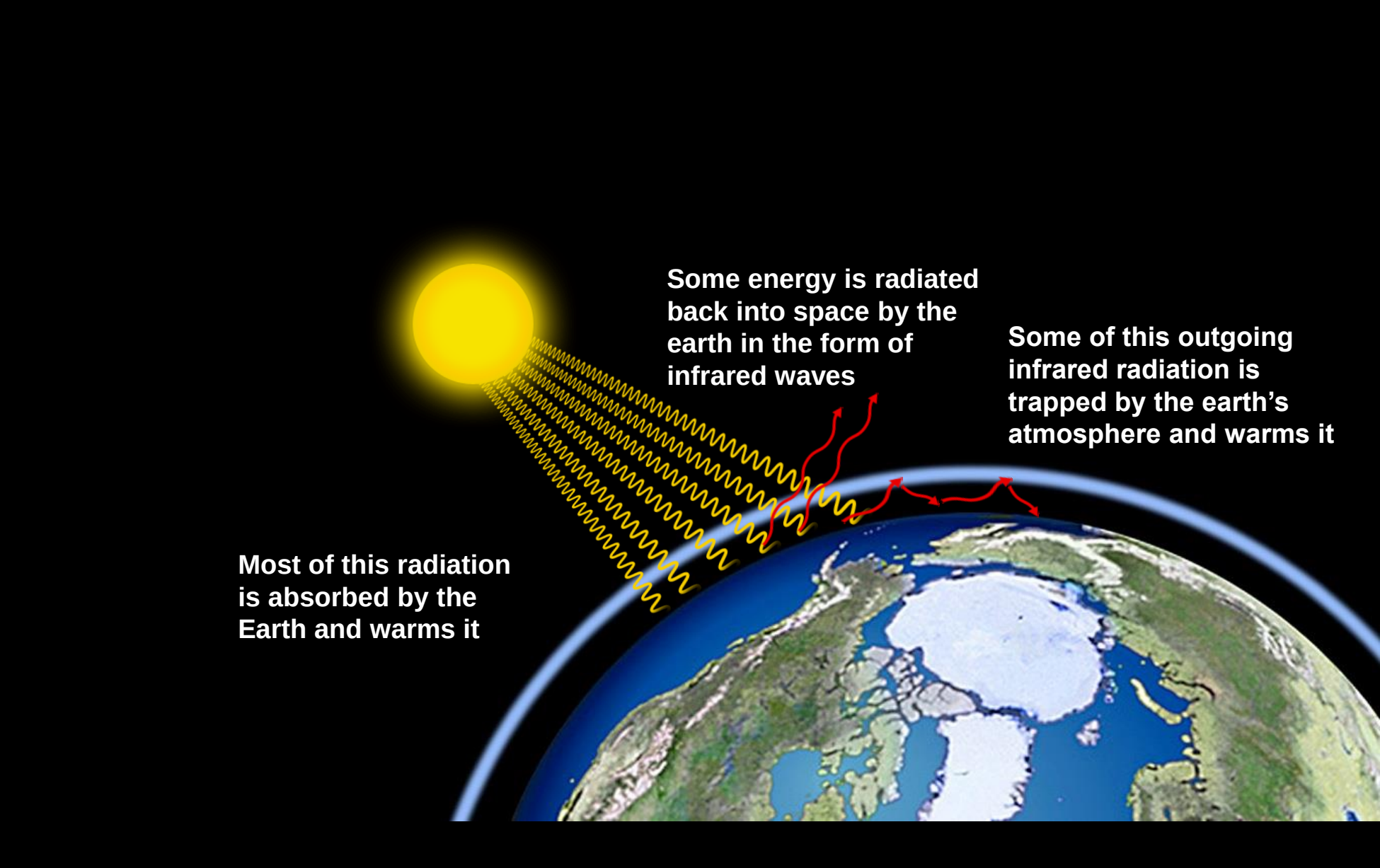
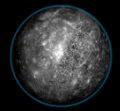
Context


Some energy is radiated back into space by the earth in the form of infrared waves
Some of this outgoing infrared radiation is trapped by the earth's atmosphere and warms it
Most of this radiation is absorbed by the Earth and warms it

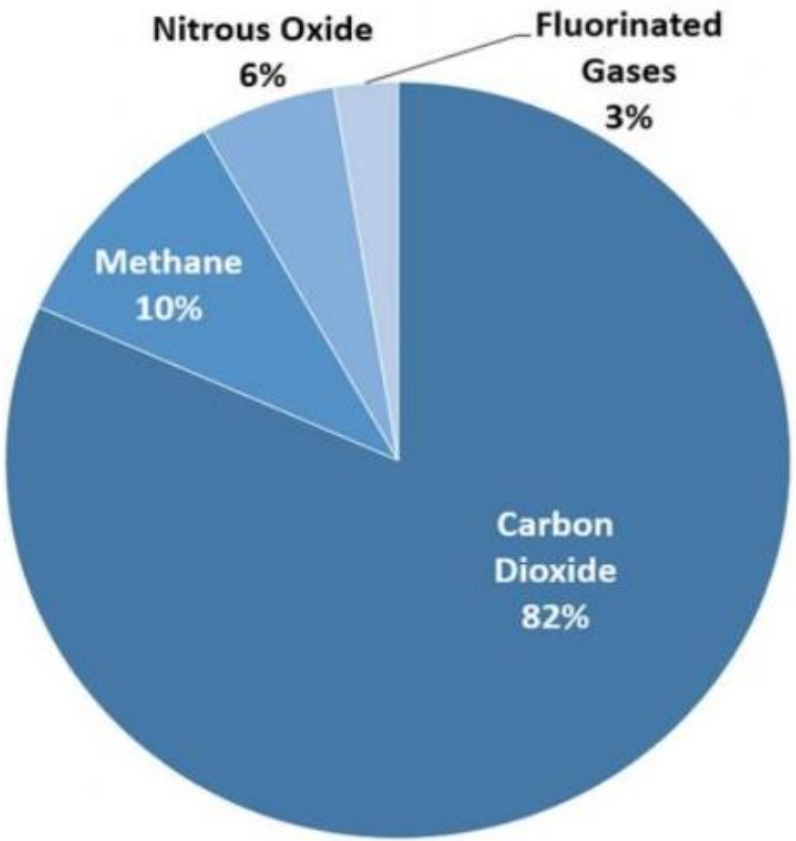
Mercury
167° C



Venus
+457° C

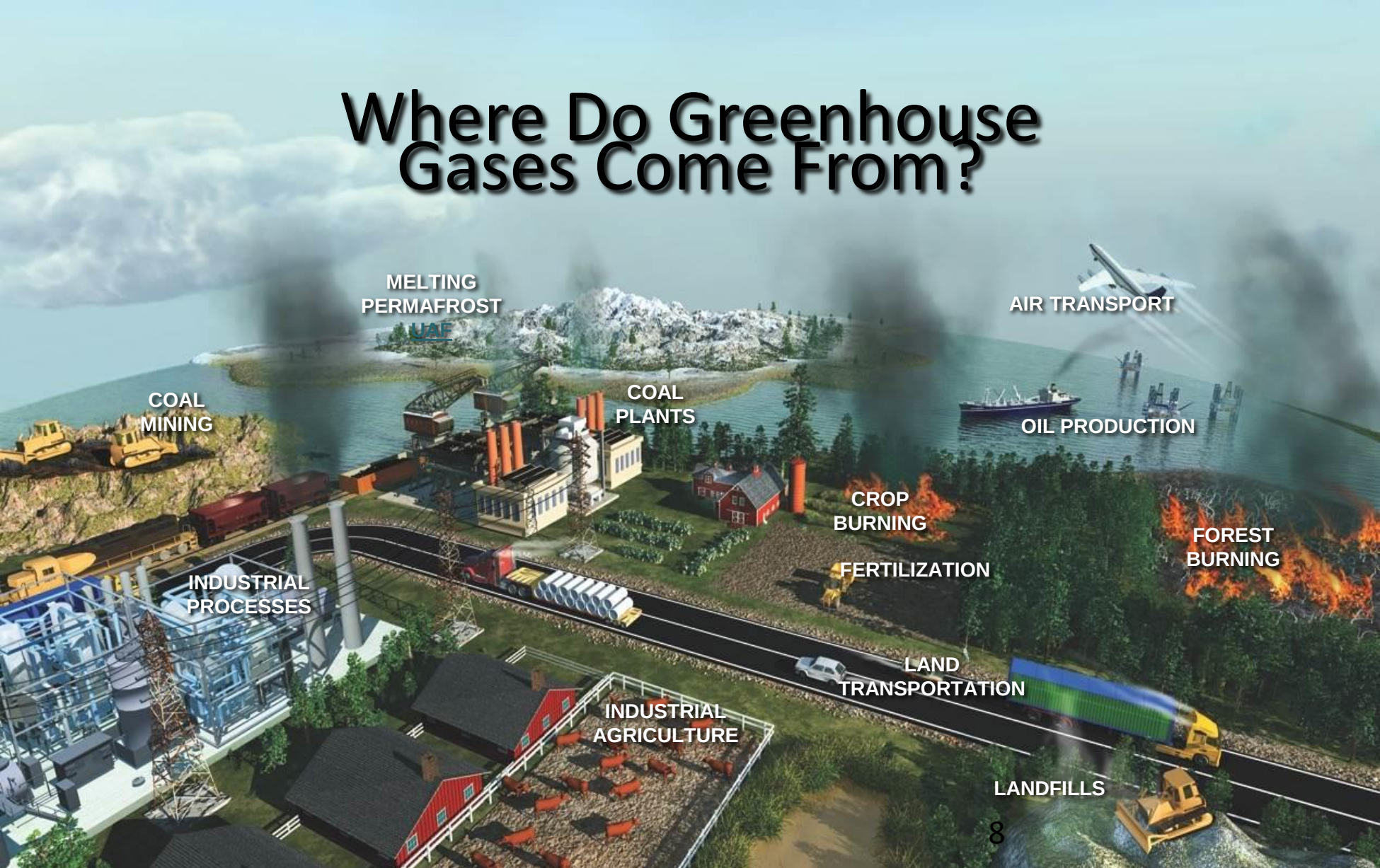
Earth
15° C

Green Houses Gasses & Global Warming Potential

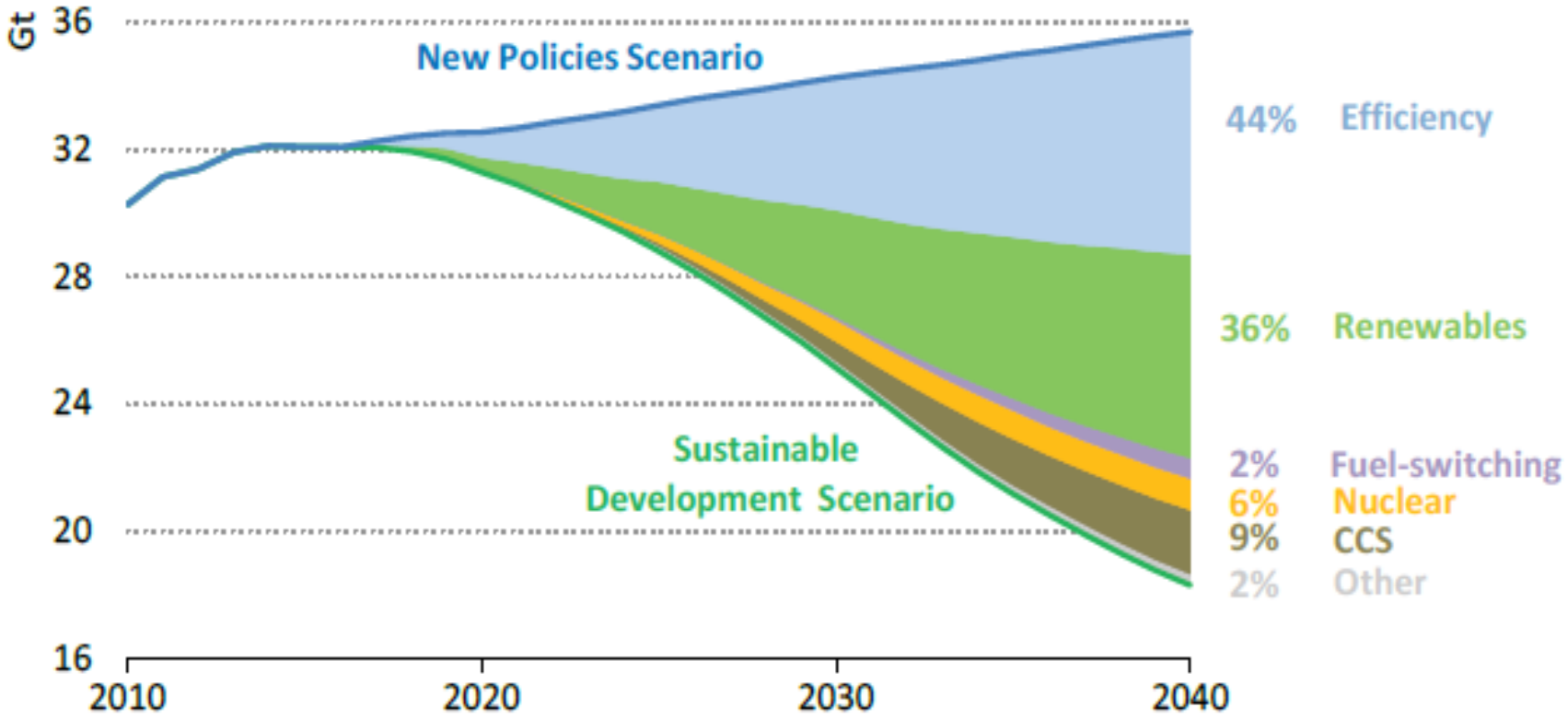


- **Carbon Dioxide (CO_2)** has a GWP of 1 and remains in the climate system for thousands of years.
- **Methane (CH_4)** is estimated to have a GWP of 28–36 times that of CO_2 over 100 years and absorbs much more energy than CO_2.
- **Nitrous Oxide (N_2O)** has a GWP 265–298 times that of CO_2 for a 100-year timescale. N_2O emitted today remains in the atmosphere for more than 100 years, on average.
- **Fluorinated Gases (CFCs, HFCs, HCFCs, PFCs, SF_6)** trap substantially more heat than CO_2. The GWPs for these gases can be in the thousands or tens of thousands.)

Where Do Greenhouse Gases Come From?



Global CO_2 Emissions Reduction Scenarios



Source: IEA Energy Efficiency 2018

“Africa is one of most vulnerable continents to climate change and climate variability.”

Intergovernmental Panel on Climate Change

IPCC Fourth Assessment, 2007

South African Constitutional Guarantee

The Constitution of the Republic of South Africa, Chapter 2, Bill of Rights, paragraph 24 deals with environment:

Everyone has a right to:

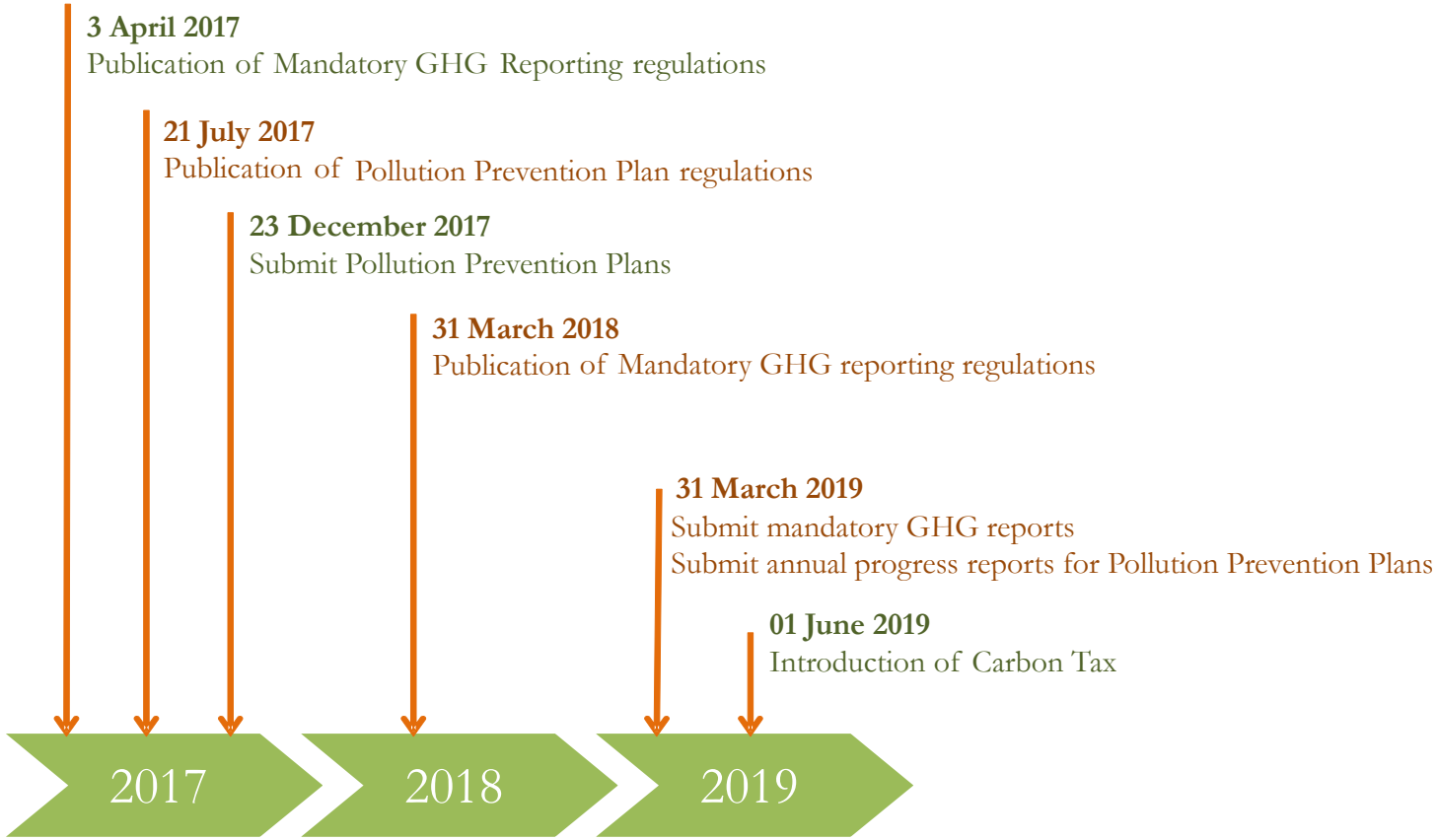
- an environment that is not harmful to their health or well-being and
- to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
  - prevent pollution and ecological degradation;
  - promote conservation; and
  - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Committing to the Constitutional Guarantee

- National Environmental Management Act 56 of 2002 & Amendments
- Mineral and Petroleum Resources Development Act 28 of 2002 & Amendments
- National Water Act, Act No. 36, 1998.
- National Environmental Management: Air Quality Notice 275 of 2017
- Atmospheric Pollution Prevention Act. Act 21 of 1981.
- Atmospheric Pollution Prevention Amendment Act, No. 15 of 1985
- Waste Act, 200 Act No. 59 of 2008
- Hazardous Substances Act plus Regulations
- Regulations for Transportation of dangerous Goods and Substances by Road (Chapter VIII of Regulations in terms of National Road Traffic Act)
- National Health Act. Act 61 of 2003.
- National Heritage Resources Act. Act No. 25 of 1999 plus Regulations
- Mineral and Petroleum Resources Development Amendment Act 49 of 2008
- Carbon Tax Act No. 15 of 2019

Carbon Tax Act

Journey to the Carbon Tax Act



Carbon Tax Act No 15 of 2019

- South Africa's commitment to the Paris Agreement on Climate Change signed in April 2016.
- In terms of that agreement, SA made commitments - one of which is to reduce greenhouse gas emissions up to 42% by 2025.
- A critical tool in the fight against climate change – the greatest existential threat of our time: many South Africans in rural areas and cities from Limpopo to the Western Cape are already affected.
- The 2018 IPCC Special Report on Global Warming states that we have 11 years to radically reduce our heat-trapping emissions if we want to have the slightest chance of keeping global warming below a 2°C increase.
- South Africa - a confirmed climate hotspot - will warm at twice as much as the global average. A frightening reality for our country: "There is no certainty that adaptation to a +4°C world is possible," warns the World Bank. This is why an effective and just carbon tax is so important.

IPAP Motivation for Carbon Tax

- **Can support diversification** of the economy through growing the green industry.
- Pricing of carbon into the economy will **change the competitiveness of new, clean industry** in favour of old, legacy industry.
- Use of offsets to **spur economic development in underdeveloped zones** can introduce a new model for social inclusion.
- Tool to support SA industries to **move towards a low carbon and climate resilient economy** through innovation, offsets, renewable energy and industrial energy efficiency.

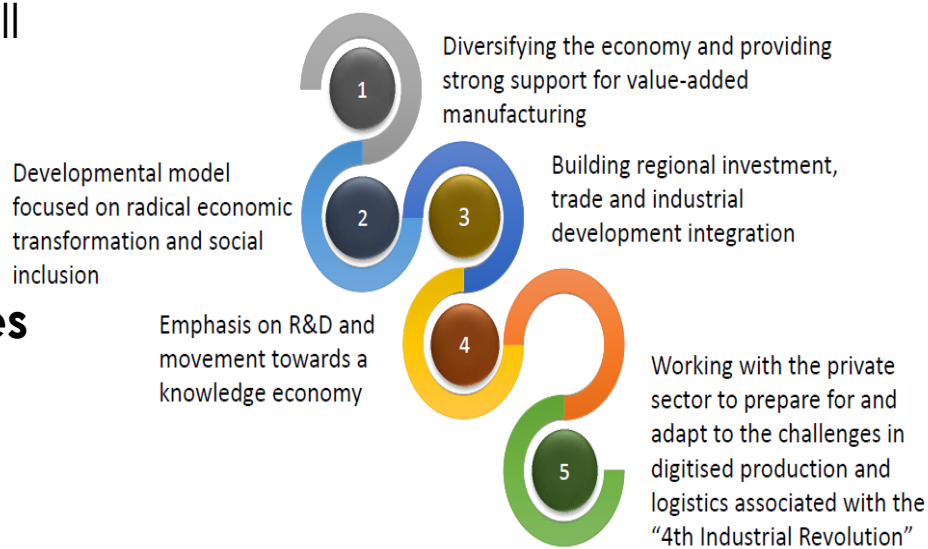


Figure 1: Industrial Policy Action Plan

Carbon Tax: High Level Summary

- **Phase 1**: Jun 2019 – Dec 2022: R120/tonne CO_{2e} + annual escalation equivalent to inflation rate + 2.0%.
- **Phase 2**: Post Jan 2023 (consumer price inflation annual escalation)
- Total allowances capped at 95%
- Effective tax rate: R6.00 – R48.00 / tonne CO_{2e}
- Tax based on input fuel emission levels
- Revenue Recycling – carbon tax to fund environmental incentives.

Definitions relating to Carbon Tax

- **"emissions intensity"** means an indicator of the result of the measurement of the quantity of GHG emissions in relation to an activity.
- **"emissions intensity benchmark"** means the result of the measurement in respect of an activity that creates GHG.
- **"fugitive emissions"** are those emissions that occur from the release of GHG during the extraction, processing and delivery of fossil fuels.
- **"industrial process"** means a manufacturing process that chemically or physically transforms materials.
- **"process emissions"** means GHG emissions other than combustion emissions occurring as a result of reactions between substances.
- **"product use"** means GHGs used in products and product applications.

Definitions relating to Carbon Tax

- **"allowance"** means any amount allowed to be taken into account for the purposes of determining the amount of carbon tax payable
- **"carbon budget"** means a limit on total GHG emissions from a specific company, within a specific time period
- **"CO_2 equivalent (CO_2e)"** means the concentration of CO_2 that would cause the same radioactive forcing as a given mixture of CO_2 and other GHGs.
- **"combustion"** means the exothermic reaction of a fuel with oxygen
- **"emissions"** means the release of GHG or their precursors and aerosols into the atmosphere over a specified period of time.
- **"emission factor"** means the average emission rate of a given GHG for a given source.

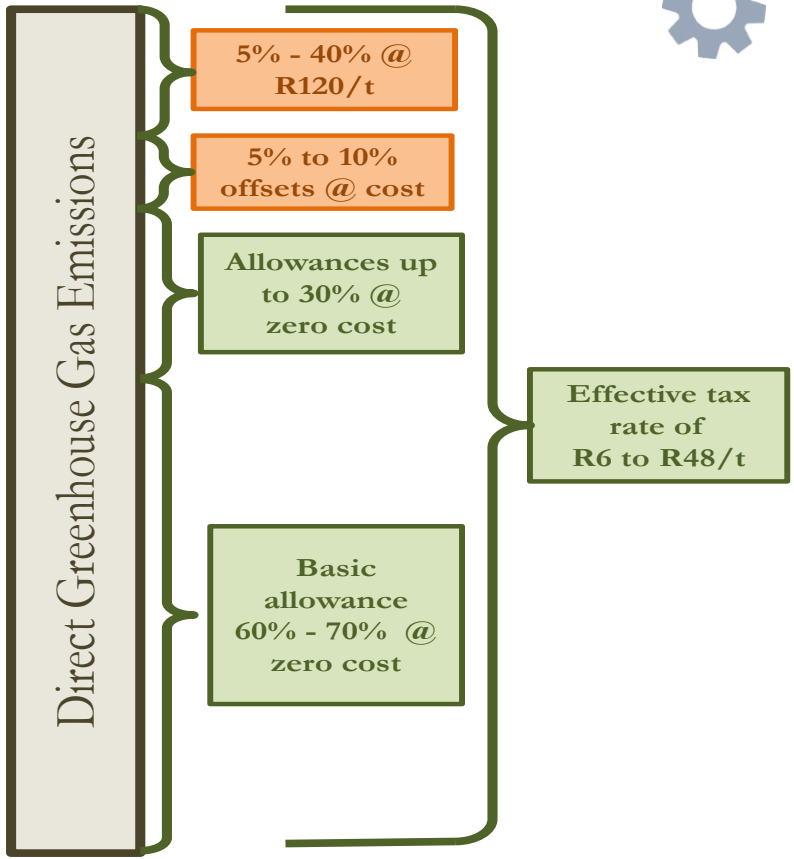
Carbon Tax Base

There are thresholds for specific sectors and activities. Taxpayers conducting activities **above these thresholds will be liable for carbon tax,** eg.

- Stationary Fuel Combustion Activities – **10 MW Thermal**
- Civil Aviation, Railways and Water Borne Navigation – **100 000 litres pa**
- Coal Mining and Handling, Underground and Surface Mines, Iron and Steel, Aluminium, Cement, Lime and Glass Production – **No Thresholds**

Carbon Tax Structure

- The carbon tax level will start at R120 per tonne $CO_{2equivalent}$ of greenhouse gas emissions over which a company has control.
- The tax level will be annually adjusted, linked to inflation.
- Liquid fuels will be taxed at the point of sale and would impact all companies, irrespective of size and activities.



Activities and Sectors Exempt from Carbon Tax

- Residential
- Uncontrolled combustion and burning coal dumps
- Agriculture, Forestry and Other Land Use (AFOLU)
- Aggregate and non-CO2 emission sources on land
- Solid Waste Disposal
- Biological Treatment of Solid Waste
- Waste Water Treatment Plants

Thresholds, Allowances and Offsets

Activity / Sector Emission Thresholds

- Energy Industries – 10 MW
- Manufacturing and Construction – 10 MW
- Commercial, Institutional emissions – 10 MW
- Non-specified stationary emissions – 10 MW
- Transport – 100 000 litres pa
- Residential emissions – 10 MW
- Agriculture, Forestry, Fishing emissions – 10 MW
- Transport of CO_2 – 10 000 tons CO_2 pa
- Injection and Storage – 100 000 tons CO_2 pa
- Forest Land – 100 hectares of plantation
- Solid Waste Disposal – 25 000 tons pa
- Waste Pyrolysis – 100 kg/ hour
- Waste Incineration - 1ton / hour
- Domestic WWT and Discharge – 2 million litres / day
- Industrial WWT and Discharge – 1 000 m3 / day

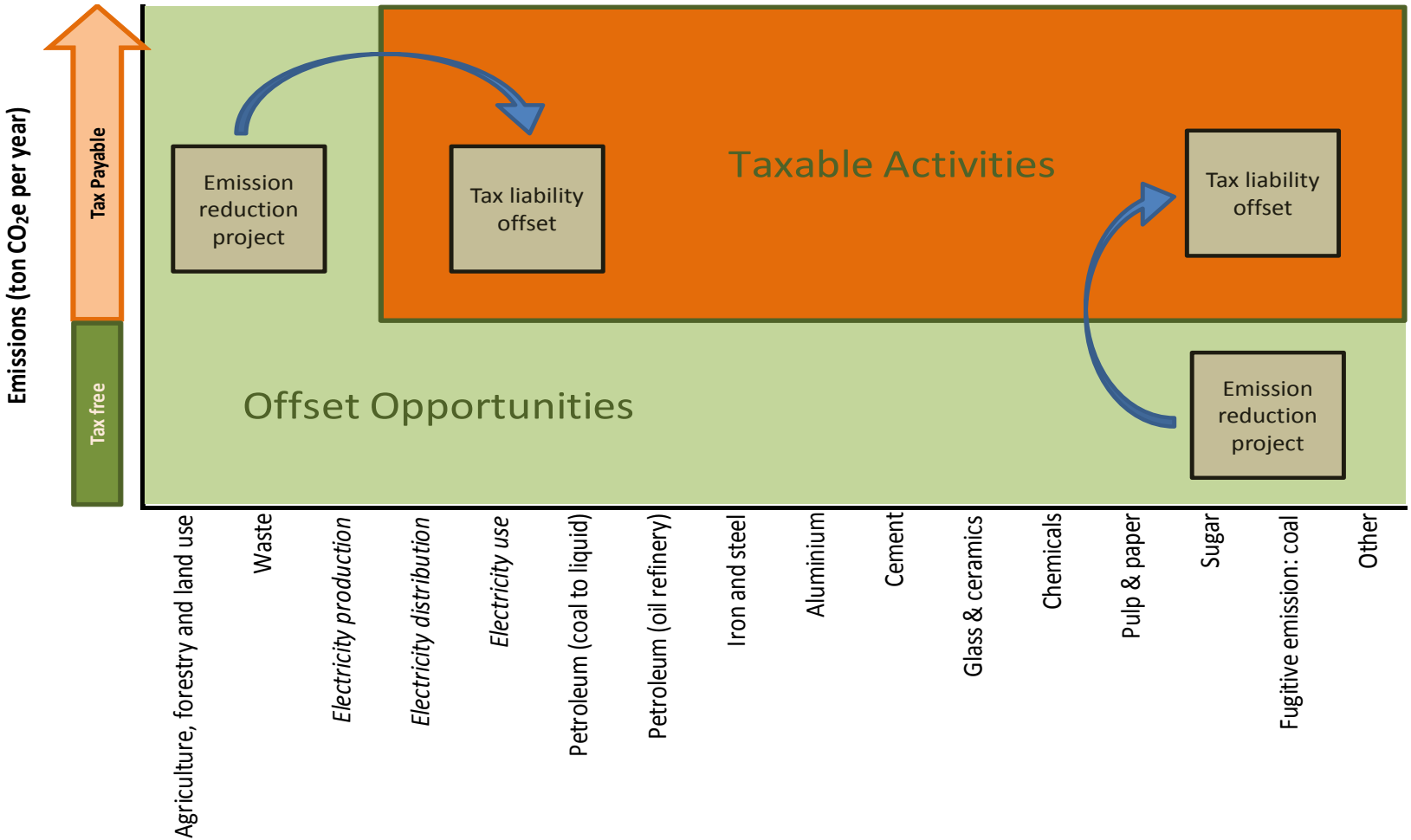
Thresholds for Commonly used Fuels

- **Anthracite** – installed capacity capable of burning 12 260 tonnes pa (1.4 tons/hr)
- **Coal** – installed capacity capable of burning 13 000 tonnes pa (1.5 ton/hr)
- **Diesel** – installed capacity capable of burning 8 300 m3 pa (950 l/hr)
- **Liquefied petroleum gas (LPG)** – installed capacity capable of burning 6 800 tons pa (780 kg/hr)
- **Natural gas** – installed capacity capable of burning 9 400 Nm3 pa (36 GJ/hr)
- Paraffin – installed capacity capable of burning 10 600 litres pa (960 l/hr).
- **Heavy Fuel Oil** – installed capacity capable of burning 7 600 litres pa (0.86 l/hr)

Carbon Tax Allowances

- **Basic tax-free allowances for all tax paying entities**: 60-100% for combustion emissions and 70-100% for process emissions.
- **Fugitive emissions allowance:** up to a maximum of 10%.
- **Trade exposure allowance**: sliding scale allowance, with companies in a sector associated with high trade intensity receiving a 10% tax allowance.
- **Performance allowance**: up to a maximum of 5% available to companies where the sector submitted a sector or sub-sector emissions intensity benchmark to National Treasury.
- **Carbon budget allowance**: an allowance of 5% for participating in the voluntary first phase of the DEA carbon budget initiative.
- **Offset allowance:** ranging from 5-10% of emissions, depending on the sector in which the company falls, for the use of carbon offsets. Carbon offsets can be obtained from validated emission reduction (RECP, IEEP) projects implemented by the NCPC-SA, and others, in South Africa.

Carbon Tax Offsets



Carbon Offset Categories

- **Renewable energy:** Hydro power; wind power; solar thermal; biomass-fired boilers;
- **Low carbon electricity:** natural gas-fired power plant;
- **Energy efficiency:** more efficient steam turbines, efficient refrigerators, efficient lighting, waste heat recovery, recovery and use of waste gas, ESO;
- **Fuel or feedstock switch:** fuel switch (ex. coal to natural gas), switch from fossil sources of CO_2 to renewable sources of CO_2, raw material switch to avoid GHG emissions, refrigerant switch to avoid GHG emissions, blending of cement;
- **GHG destruction**: Combustion of methane (e.g. biogas or landfill gas);
- **GHG emission avoidance:** Avoidance of anaerobic decay of biomass, reduction of fertiliser use; and
- **GHG removal by sinks:** CO_2 from the atmosphere is removed through photosynthesis in plants and stored in form of biomass (sequestration).
- This excludes projects that benefit from Section 12L of the Income Tax Act

Utilising Carbon Offsets

- Companies can access least-cost mitigation options for taxable activities, eg. through energy management systems and energy systems optimisation.
- Both tax paying and non-tax paying companies can fund emission reduction projects of activities that are not liable for carbon tax through selling carbon offsets into the tax net.
- The carbon offset system will rely on existing international carbon offset standards, viz. CDM, Verified Carbon Standard (VCS) and the Gold Standard (GS).

Carbon Offset Project Eligibility Criteria

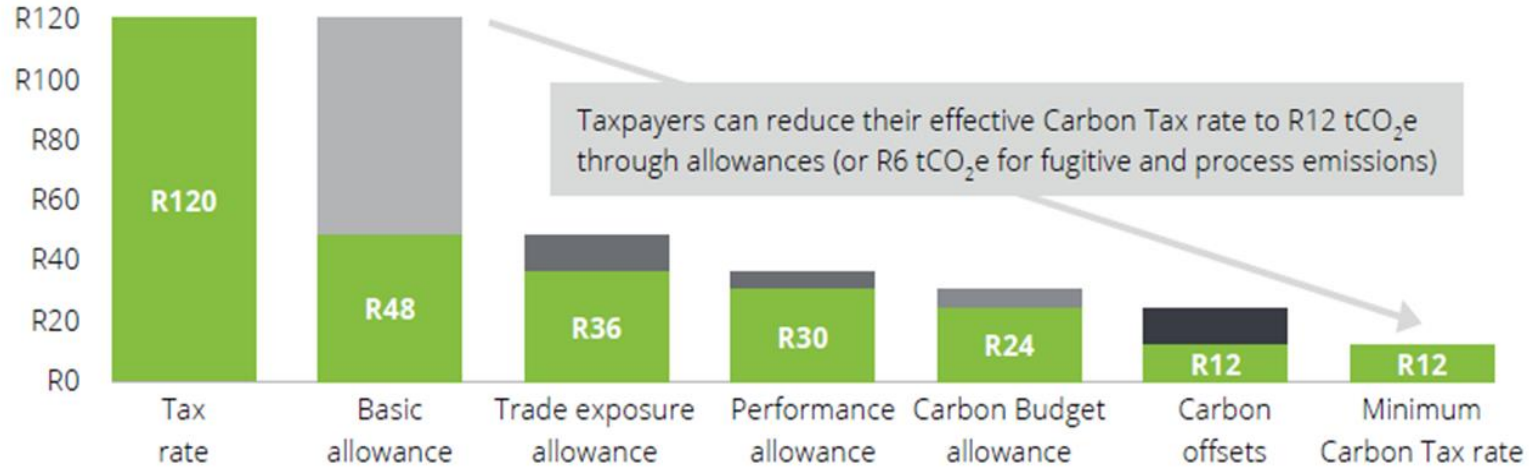
- Only projects implemented on or after 01 June 2019 and located in South Africa will be eligible.

- Projects should occur outside the scope of activities that are subject to the carbon tax to prevent double counting of the carbon emission reduction benefit.

- The carbon offset system will focus on activities that are not included in the carbon tax net, which includes the transport, waste and AFOLU sector activities.

Combustion Emission Allowance Example

Example of allowances for combustion emissions



Emission Calculations

Calculation of Emissions

- The carbon tax legislation will rely on the reporting of greenhouse gas emissions by companies in terms of the mandatory reporting regulations.
- These regulations require companies that are over a set threshold of either activity or installed capacity to report their greenhouse gas emissions to DEA.
- The first round of mandatory greenhouse gas reports were due for submission in March 2018.
- Non-compliance with these reporting regulations, false or misleading greenhouse gas inventory reports carry a steep fine or jail term.

Emissions Calculation – Combustion Emissions

$$E = Fuel\ (tons) \times (CO_2 + 23CH_4 + 296N_2O) \times 1000 \times Fuel_{cv}$$

Schedule 1

Table 1

Fuel Combustion Emission Factors

STATIONARY SOURCE CATEGORY

FUEL TYPE	CO_2 ($KGCO_2$/ TJ)	CH_4 ($KGCH_4$/ TJ)	N_2O (KGN_2O/ TJ)	DEFAULT CALORIFIC VALUE (TJ/TONNE)
ANTHRACITE	98 300	1	1.5	0.0267
AVIATION GASOLINE	70 000	3	0.6	0.0443
BIODIESEL	0	3	0.6	0.027
BIOGASOLINE	0	3	0.6	0.027
BITUMEN	80 700	3	0.6	0.0402
BLAST FURNACE GAS	260 000	1	0.1	0.00247
DIESEL	74 100	3	0.6	0.043

Emissions Calculation – Fugitive Emissions

$$E = \text{Fuel (tons or } m^3) \times (CO_2 + 23CH_4 + 296N_2O)$$

Schedule 1

Table 2

Fugitive Emission Factors

IPCC Code	SOURCE CATEGORY ACTIVITY	CO_2	CH_4	N_2O
1B1	SOLID FUELS (M^3 /TONNE)			
1B1a	COAL MINING AND HANDLING			
1B1ai	UNDERGROUND COAL MINING	0.077	0.77	
	UNDERGROUND POST-MINING (HANDLING & TRANSPORT)	0.018	0.18	
1B1aii	SURFACE COAL MINING	N/A	0	
	SURFACE POST-MINING (STORAGE AND TRANSPORT)	N/A	0	
1B1c2	Charcoal production (Fuel wood input) ($kgCH_4/TJ$)	N/A	300	
	Charcoal production (Charcoal produced) ($kgCH_4/TJ$)	N/A	1000	

Emissions Calculation – Industrial Process

$$E = \text{Product or Raw Mat tons} \times (CO_2 + 23CH_4 + 296N_2O + C_2F_6 + CF_4 + SF_6)$$

Table 3

INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU) Emission Factors

IPCC Code	SOURCE CATEGORY ACTIVITY / RAW MATERIAL / PRODUCT	TONNE CO_2/ tonne product	TONNE CH_4/ tonne product	TONNE N_2O/ tonne product	TONNE C_2F_6/ tonne product	TONNE CF_4/ tonne product	TONNE SF_6/ tonne product
2A1	*CEMENT PRODUCTION (PER TONNE OF CLINKER)*						
	CEMENT	0.52					
2A2	*LIME PRODUCTION (PER TONNE OF LIME)*						
	QUICKLIME/HIGH CALCIUM LIME	0.75					
	DOLOMITIC LIME	0.77					
	HYDRATED LIME	0.59					
2A3	*GLASS PRODUCTION (PER TONNE GLASS)*						
	GLASS PRODUCTION	0.2					

Registration, Licensing and Payment of Carbon Tax

Carbon Tax Registration and Licensing

- The Customs Amendment Act and the Rules provide that any person who operates an emissions generation facility equal to or above the carbon tax threshold to license that facility as a customs and excise manufacturing warehouse.
- The Rules provide that in order to apply for the licence, the applicant must:
  - submit forms DA 185, DA 185.4A17 and DA 185.4B2;
  - submit the appropriate annexures thereto;
  - comply with the requirements specified in the Rules;
  - comply with any additional requirements that may be determined by the Commissioner;
  - submit a completed agreement in accordance with the *pro forma* agreement specified in the Rules; and
  - furnish the security required.
- If the emissions generating facility's capacity operates below the threshold, a taxpayer will only need to register and will not be required to furnish security.

Payment of Carbon Tax

- Section 17(1) of the Carbon Tax Act provides that a taxpayer must submit an environmental levy account and make payments in accordance with the Rules every six months for each tax period.
- A tax period is defined as a period commencing on 1 June 2019 and ending on 31 December 2019); and subsequent to this period, the period commencing on 1 January of each year and ending on 31 December of that year.
- The Carbon Tax Act, draft Rule 54FD.04 provides that every licensee must, in the month of July following the tax period, but not later than the penultimate working day of that month:
  - submit a separate annual account on the prescribed DA 180 form in respect of each licensed emissions generation facility registered to that licensee;
  - make payment of the environmental levy as calculated on prescribed DA 180 form in accordance with draft Rule 54FD.03; and
  - any other supporting documents the Commissioner may require.

Payment of Carbon Tax

- The first provisional Carbon payment is due in July 2020.
- The Carbon Tax Act provides for an adjustment period from 1 January to 30 June 2020 similar to that of provisional tax, where a taxpayer's income tax liability is paid in advance to ensure that taxpayer does not remain with a large tax debt on assessment.
- The payment of carbon tax will be spread over the relevant year and will be paid in two amounts. The first "*provisional payment*" will be off-set against the liability for carbon tax for the applicable tax period.

Managing the Impact of Carbon Tax on your Business

GHG Reporting Obligations

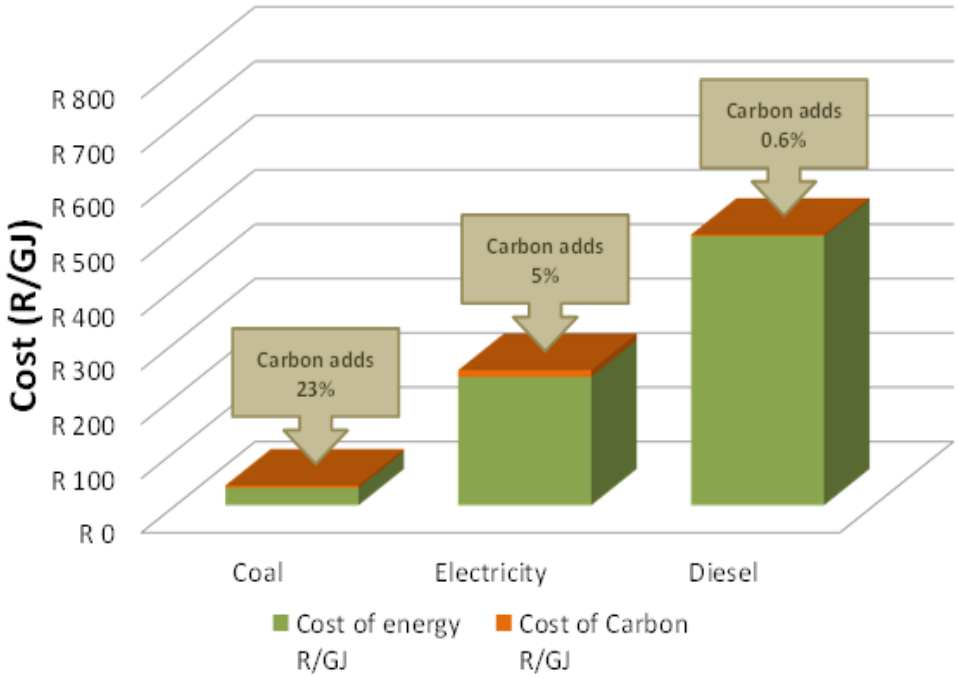
- To facilitate the carbon tax, the DEA implemented a mandatory GHG reporting system.
- The National Greenhouse Gas Emission Reporting Regulations, 2016 introduce a single national reporting system for the transparent reporting of GHG emissions.
- The GHG Reporting Regulations are one of the implementation tools which will be used to regulate the reporting of data and information to the National Air Emission Inventory System (NAEIS) with a view to compiling atmospheric emission inventories to inform the carbon tax.
- Section 54AA of the Customs Amendment Act provides that the allowances prescribed in the Carbon Tax Act must be administered as rebates, refunds or drawbacks, as prescribed in section 75 of the Customs Act.

Carbon Tax Compliance and Oversight

- Although SARS will be responsible for the collection of the carbon tax, the Department of Environmental Affairs (DEA) will be inextricably linked to this process.
- The carbon tax base will be determined from the emission data that is collected by the DEA.
- SARS will be privy to the database that is recorded by the DEA.
- The rationale for this is formulated on the basis that this "*checks and balances*" system will increase taxpayer compliance in respect of the carbon tax.

Impact of Carbon Pricing on Companies

- The pricing of carbon into the economy will lead to increases in the cost of production of goods and services.
- The cost is however not evenly distributed as different energy sources have different emission intensities.
- Carbon pricing will have the biggest impact on the cost of burning coal, with the least impact on the use of liquid fuels.



Reduction of Carbon Tax Liability

- The purpose of the carbon tax is to get emitters of greenhouse gasses to change their behaviour. The object of the tax is, therefore, to encourage companies to reduce their costs by reducing emissions.
- A reduction of the carbon tax liability can be achieved in two ways:
  - The first is that reduced emissions will lead to a reduced carbon tax liability.
  - Secondly, a reduction in emissions could translate into a reduction in the carbon intensity of the product of the company.
- If the company operates in an industry that has an approved benchmark for the performance allowance, then the company can get a reduction of up to 5% of its total emissions.
- The importance of the carbon tax cost saving resulting from the NCPC-SA's RECP and IEE projects is that it will enhance the economics of the projects by increasing the value of the savings.
- Projects that save electricity can add a revenue stream equivalent to R 45 per MWh saved, and coal projects in the order of R 100 per ton of coal saved. These values are based on an estimated market price of R 48 per ton of CO_2e for the offset credits.

Next Steps and Conclusions

Next Steps

It is vitally important that, as a business, you quantify your tax liability based on the design of the carbon tax and that you understand whether or not you will be required to submit a carbon budget. This will enable you to determine the impact of the carbon tax and its interaction with the carbon budget on your business and whether to register and licence accordingly.

Conclusions

- The carbon tax will increase the cost of production of goods and services in the economy.
- It will however also introduce an incentive structure for resource efficiency and cleaner production projects.
- The economic benefit that is attributed to emission reduction is different for projects that are implemented inside the boundary of a taxable activity and a project that falls outside the boundary of a taxable activity.
- Companies that have assessed projects in the past, but found the business case lacking are advised to revisit these projects in the light of both the cost of carbon and the benefit of reducing greenhouse gas emissions.

Thank you for your attention

Any Questions?

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