REPUBLIC OF SOUTH AFRICA

EXPLANATORY MEMORANDUM

FOR

THE CARBON TAX BILL, 2017

[December 2017]

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BACKGROUND

Climate Change Policy in South Africa

Reducing the impacts of climate change through facilitating a viable and fair transition to a low-carbon economy is essential to ensure an environmentally sustainable economic growth path for South Africa. The carbon tax will play a role in achieving the objectives set out in the National Climate Change Response Policy of 2011 (NCCRP) and contribute towards meeting South Africa's commitments to reduce greenhouse gas (GHG) emissions.

The NCCRP provides an overarching policy framework for facilitating a just transition to a low carbon, climate resilient economy. The policy provides for the use of incentives and disincentives, including regulatory, economic and fiscal measures to provide appropriate price signals to nudge the economy towards a more sustainable growth path. The appropriate measures must be developed in line with the "Polluter Pays Principle"; i.e. "Those responsible for harming the environment must pay the costs of remedying pollution and environmental degradation and supporting any consequent adaptive response that may be required" (NCCRP). The development of the carbon tax policy and framework for the use of carbon offsets has been developed along the polluter pays principle.

The Revised Carbon Tax Bill includes the detailed and revised carbon tax design features as per the Carbon Tax Policy Paper of 2013 and the Carbon Offsets Paper of 2014 and takes into account public comments received following extensive stakeholder consultation since 2011. The Revised Carbon Tax Bill provides for the introduction of the carbon tax in a phased manner. This gradual approach takes cognizance of the developmental challenges facing South Africa and international climate policy developments. This will also help encourage investments in and the uptake of more energy efficient and low carbon technologies.

Carbon pricing options

Environmental challenges, such as climate change, air and water pollution, occur when the assimilative capacity of a particular environmental resource is exceeded. Society is affected by the resulting excessive pollution, and the polluter often does not pay for the costs of such pollution. This is defined as negative externalities and is the result of market failures with the costs of pollution not reflected in the

final prices of goods and services. In order to address such market failures, governments intervene by way of regulations and / or market-based instruments (such as taxes and / or emissions trading schemes) to influence the investment, production and consumption decision-making processes of producers and consumers.

There are two approaches to price carbon directly:

- A carbon tax; and
- An emission trading scheme or cap and trade mechanism.

Many jurisdictions have implemented carbon pricing using both approaches, but covering different sectors. In some instances regulations prescribe a limit on emissions and companies are required to adhere to that limit, if not they are subject to significant penalties. Establishing such regulatory limits can be quite challenging. The costs incurred to adhere to such limits (without regard to the individual circumstances) could be seen as an indirect form of carbon pricing. In terms of market dynamics this is not always the most cost effective way to reduce GHG emissions.

A hybrid system is also possible under which the price mechanism is utilized to complement command-and-control measures such as the envisaged alignment with the carbon budgeting approach.

For South Africa, an emissions trading system (ETS) is currently unsuitable due to the dominance of GHG emissions by only a few companies, the result of the oligopolistic market structure of the energy industry. Under such circumstances it is unlikely to create a robust market resulting in credible carbon prices and might result in a very volatile carbon price. In addition, an ETS is relatively complex and will require significant institutional infrastructure and capacity building efforts. A carbon tax is easier to administer and will provide the necessary price certainty to drive behaviour change. The inclusion of a carbon offset mechanism within the carbon tax design serves as a market mechanism and provides additional flexibility for companies to reduce their carbon tax liabilities whilst at the same time invest in GHG emission reduction projects. It might be possible, at a later stage over the medium to longer term to link up with an international emissions trading scheme.

Carbon tax design in South Africa

The design of the carbon tax is informed by the administrative feasibility and practicality to cover most GHG emissions. It also takes into account the need for a long and smooth transition to a low carbon economy in a sustainable manner. The significantly high level of tax-free allowances and phased-in approach will ensure that South Africa's competitiveness is not being compromised. Measures are also taken to protect vulnerable households. The carbon tax will be revenue-neutral during the first phase and revenues will be recycled by way of reducing the current electricity generation levy, credit rebate for

the renewable energy premium, and a tax incentive for energy efficiency savings. Efforts will also be made to prioritise and enhance allocations for free basic electricity (or alternative energy) and funding for public transport and initiatives to move some freight from road to rail.

1. Tax base

The tax is based on fossil fuel inputs (e.g. coal, oil & gas) and the use of approved methods stipulated in the National Greenhouse Gas Emission Reporting Regulations (NGERs) developed by the Department of Environmental Affairs (DEA). Approved procedures and / or emission factors are available to quantify carbon dioxide equivalent (CO_2-eq) emissions with a relatively high level of accuracy for different processes and sectors. To the extent that tier 2 country specific emission factors and tier 3 company specific emission methodologies are unavailable for a particular activity, stakeholders should use the default emission factors (tier 1) as provided in Schedule 1 of the carbon tax bill as the bare minimum requirement.

The emissions reporting will be in line with mandatory reporting requirements for GHG emissions designed by the DEA and stipulated in the NGERs. The National Inventory Unit within the DEA will approve the appropriate methods and emission factors (if necessary), in line with the 2006 Intergovernmental Panel on Climate Change (IPCC) default emission factors.

Thresholds for mandatory reporting are provided in the NGERs based mainly on energy production, energy consumption and greenhouse gas emissions. For stationary emissions, reporting thresholds will be determined by source category as stipulated in Schedule 2 of the Bill. Only entities with total installed capacity for an activity that is equal to or above the indicated threshold (mostly a total installed thermal capacity of around 10MW) shall report their emissions and will be subject to the tax in the first phase. These thresholds are in line with the stipulated thresholds in Annexure 1 of the NGERs of the DEA and the Department of Energy (DoE) energy management plan reporting.

For blended fuels or biomass, the fossil component of their fuels should be reported to the DEA hence is taxable even though there is no need to report the carbon dioxide component which is depicted as zero in Table 1 of Schedule 1. Also energy recovery from waste is considered as energy emissions and hence should be reported to the DEA.

For non-stationary / mobile emissions (e.g. liquid fuel - transport), the carbon tax will be included in the fuel tax regime.

2. Tax-free allowances

Based on extensive stakeholder engagements and in order to ensure a smooth transition to a low carbon economy, a number of transitional tax-free allowances are provided which include:

- A basic tax-free allowance of 60 per cent;
- An additional tax-free allowance of 10 per cent for process emissions;
- An additional tax-free allowance of 10 per cent for fugitive emissions;
- A variable tax-free allowance for trade-exposed sectors (up to a maximum of 10 per cent);
- A maximum tax-free allowance of 5 per cent for above average performance;
- A 5 per cent tax-free allowance for companies with a Carbon Budget;
- A carbon offset allowance of either 5 or 10 per cent; and
- The total tax-free allowances during the first phase (up to 2022) can be as high as 95 per cent.

Over time, these percentage based tax free allowances could be replaced with an absolute tax-free threshold which could be in line with the proposed carbon budgets. A study on the options for alignment and integration of the carbon tax and carbon budget policy instruments post 2020 has been completed. The mandatory carbon budgets regime will be introduced in a way that is fully-aligned with the carbon tax, and resulting in no double penalty. An integrated review process to assess both instruments will be done, which will inform any significant changes in the tax rate and the implementation of the carbon budgets.

3. Tax rate and tax liability

The proposed headline carbon tax is R120 per ton of CO_2e for emissions above the tax-free thresholds. Given the above tax-free allowances this would imply an initial effective carbon tax rate range as low as R6 to R48 per ton CO_2e.

Section 5 of the bill specifies the annual increase to the nominal carbon tax rate by the rate of consumer price inflation plus 2 per cent up to 31st December 2022, and adjustments in line with inflation thereafter. This will help to provide certainty to firms and provide a clear long-term price signal and is in line with the Carbon Tax Policy Paper of 2013 which "*proposed that the tax rate of a R120 per tCO2-eq be increased at a rate of 10 per cent per annum until the end of 2019, followed by a review during 2019, with the intention to announce a revised annual rate of increase in the 2020 Budget"*.

The carbon tax liability is calculated as the tax base (total quantity of GHG emissions from combustion, fugitive and industrial processes proportionately reduced by the tax-free allowances) multiplied by the rate of the carbon tax.

4. Carbon tax administration (institutional arrangements)

Implementation of the carbon tax requires an accurate system for monitoring, reporting and verification (MRV) of emissions. The South African Revenue Service (SARS) will be the main implementing administrative authority on tax liability assessment and will have access to the DEA emissions database. In order to audit the self-reported tax liability by entities, SARS will be assisted by the DEA to verify the reported emissions. Alignment between the reporting entity as registered with the DEA and the taxable entity registered with SARS has commenced to enable the companies to use their DEA registration details for the SARS process.

The DEA will lead the MRV process, collecting the GHG emissions data which will form the tax base, hence incorporating the carbon tax within the South African National Atmospheric Emissions Inventory System (NAEIS) – part of the South African Air Quality Information System (SAAQIS). The DEA will work closely with the DoE, as a joint implementation partner on the carbon tax MRV work. DEA will directly collect the GHG emissions information and the DoE, which is developing the Central Energy Database, will supply energy combustion data to the NAEIS. It is envisaged that this will be implemented through the NGERs of the DEA and the Energy Reporting Regulations of the DoE. The DoE currently hosts the Designated National Authority (DNA) who will be responsible for administering the carbon offsets.

SECTION-BY-SECTION EXPLANATION

Preamble

Part I: Definitions and general provisions relating to imposition of carbon tax

Definitions: Section 1

"allowance" means any amount allowed to be taken into account in terms of Part II, subject to section 13, for the purposes of determining the amount of carbon tax payable;

"carbon tax" means a tax on the carbon dioxide (CO_2) equivalent of greenhouse gas emissions imposed in terms of section 2;

"carbon dioxide (CO_2) equivalent" means the concentration of carbon dioxide that would cause the same amount of radiative forcing (the difference of sunlight absorbed by the Earth and energy radiated back to space) as a given mixture of carbon dioxide and other greenhouse gases;

"combustion" means the exothermic reaction of a fuel with oxygen;

"Commissioner" means the Commissioner for the South African Revenue Service;

"emissions" means the release of greenhouse gases and / or their precursors into the atmosphere over a specified area and period of time;

"emission factor" means the average emission rate of a given greenhouse gas for a given source, relative to the activity data of a source stream assuming complete oxidation for combustion and complete conversion for all other chemical reactions;

"fugitive emissions" means emissions that occur from the release of greenhouse gases during the extraction, processing and delivery of fossil fuels including leaks from industrial plants and pipelines;

"greenhouse gas" means gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation, and includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6);

"industrial process" means a manufacturing process that chemically or physically transforms

materials;

“IPCC” means the Intergovernmental Panel on Climate Change established for the purposes of providing internationally co-ordinated scientific assessments of the magnitude, timing and potential environmental and socio-economic impact of climate change by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) and endorsed by the United Nations by General Assembly Resolution 43/53 made at the 70th plenary meeting on 6 December 1988;

“IPCC code” means the source code of an activity that results in the emission of a greenhouse gas as specified in the “Guidelines for National Greenhouse Gas Inventories” (2006) issued by the IPCC;

“Minister” means the Minister of Finance;

“person” includes a partnership and a trust;

"process emissions" means greenhouse gas emissions other than combustion emissions occurring as a result of intentional or unintentional reactions between substances or their transformation, including the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock;

"Republic" means the Republic of South Africa;

"taxpayer" means a person liable for the carbon tax in terms of section 3;

"tax period" means a period in respect of which tax is payable as prescribed under section 14.

Imposition of carbon tax: Section 2

This section specifies that the carbon tax will be collected from taxpayers and deposited into the National Revenue Fund.

Persons subject to tax: Section 3

This section specifies which persons/entities are liable for the tax. Liability for the tax arises for every entity that conducts an activity and emits GHG emissions above the threshold which is listed in Schedule 2 of the Bill.

These thresholds are in line with the stipulated thresholds in Annexure 1 of the NGERs of the DEA which is based mainly on energy production, energy consumption and greenhouse gas emissions. The NGER requires only entities engaged in activities within the indicated IPCC source categories and

above the threshold (total installed capacity for this activity is equal or above the threshold) to be data providers. A description of the main thresholds is provided below:

- **10MW(th)** – means a combined boiler capacity equal to or above 10MW(th) net heat input. For example, the combined boiler design capacity for six (6) 2MW(th) equal 12MW(th) which is above the reporting threshold of 10MW(th). Therefore, the data provider has to report GHG emissions associated with stationary combustion in this case.
- **none** – means that the data provider has to report activity data and GHG emissions irrespective of the size of GHG emissions and the scale of operation of the activity.
- **NA (Not Applicable)** - means that data providers do not need to report emissions associated with such activities.

Tax Base: Section 4

The carbon tax covers all direct stationary and non-stationary GHG emissions. These emissions relate to production and use of energy (i.e. fuel combustion and gasification) and non-energy industrial processes.

The carbon tax will apply to direct emissions in the following categories as specified in the NGERs:

- Fuel combustion, which deals with emissions released from fuel combustion activities;
- Fugitive emissions from fuels, which deals with emissions mainly released from the extraction, production, processing and distribution of fossil fuels;
- Industrial processes emissions, which deals with emissions released from the consumption of carbonates and the use of fuels as feedstocks or as carbon reductants, and the emission of synthetic gases in particular cases; and

The carbon tax applies to all the sectors and activities except the Agriculture Forestry and Other Land Use (AFOLU) and waste sectors, which will be exempt during the first implementation phase (up to 2022), due to measurement difficulties. Also, land based emissions covered by the UNFCCC categories 'Agriculture' and 'Land Use, Land Use Change and Forestry' are not covered under the scope of activities listed for mandatory reporting in the NGER. However, emissions from fuel combustion or any other emission source listed in the above direct emission categories and which occurs from a facility operating within a land-based industry are, nonetheless, covered by the NGER Determination.

Complementary measures and incentives (such as the energy efficiency savings tax incentive) have been introduced to encourage businesses to reduce their indirect emissions i.e. emissions resulting from a firm's use of purchased electricity, heat or steam.

The carbon tax is based on fuel inputs with an approved transparent and verified monitoring procedure and / or approved company or country specific as well as IPCC default emission factors (Schedule 1 to the Bill). The carbon tax covers GHG emissions according to the IPCC guidelines (carbon dioxide, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride).

1. Carbon Tax Base Calculation

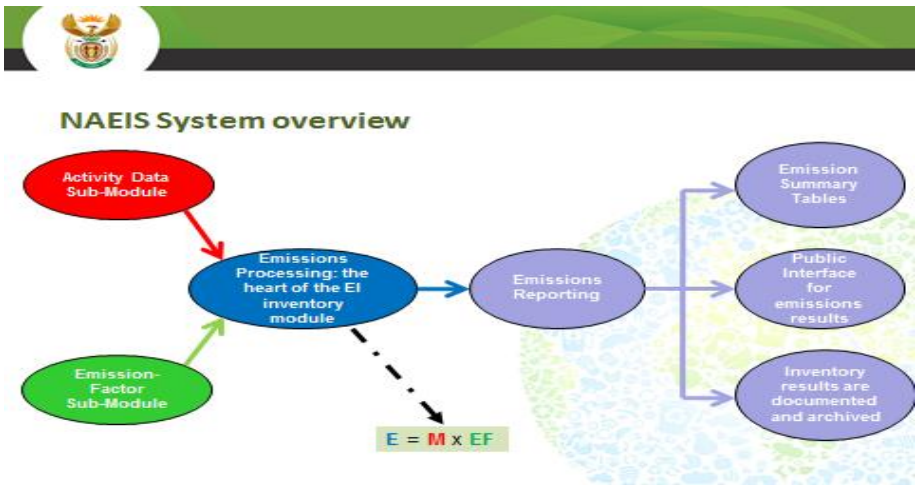
Emissions reporting under NAEIS

Entities that engage in activities that produce direct GHG emissions will be liable for the tax and will need to submit their tax returns based on their own assessment of emissions to SARS.

To calculate the company's tax liability, the amount of GHG emissions is determined based on the fuel combusted or product processed which is determined by an approved methodology. An approved methodology entails a DEA-approved transparent and verified monitoring procedure and or use of approved emission factors as prescribed in Schedule 1 to the Bill. Schedule 1 provides country specific and default IPCC emission factors for energy combustion, process emissions and fugitive emissions which will be used for mandatory reporting requirements under the NAEIS developed by the DEA.

The calculation of the tax base is closely linked to the DEA mandatory reporting requirements of emissions for all economic sectors in South Africa as per the NGERs which were gazetted during the first quarter of 2017. The NAEIS will play a major role in the emissions verification process for the carbon tax liability. The DEA will collect information on emissions which will be aggregated to company level in order to verify that companies are complying with their tax liability. Figure 1 below depicts the way that the GHG emissions will be reported under NAEIS.

Figure 1: GHG emissions reporting under NAEIS



Source: DEA

The scheme also represents the basis upon which emissions to be used as the tax base for individual taxpayers will be calculated. The activity data component will contain fuel use data inputted by entities. The data will be composed of different types of fuels. The emission factors sub module contains factors to quantify CO_2-equivalent emissions with a relatively high level of accuracy for different processes and sectors.

Box 1 below provides a detailed explanation of the IPCC approaches and recommended methodologies for the measurement of GHG emissions.

Box 1: IPCC recommended emissions measurement methodologies

An emission factor is a value that quantifies emissions associated with an activity (e.g. fuel consumption). The IPCC provides 'default emission factors' for different fuels and activities. These default emission factors are considered to be less accurate than country-specific factors and even less accurate than company-specific factors. In the case of reporting under the IPCC Guidelines, it is recommended to use country or plant specific emissions factors for key categories to improve the accuracy of reporting. In instances where country or plant specific emission factors are not available, then it is recommended that IPCC default factors are used in line with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (henceforth IPCC Guidelines).

The IPCC Guidelines uses a tiered approach to describe different methods of calculating GHG emissions i.e. for various categories of emission activities, several options for calculating the emissions described as tiers are provided. There are three levels of tiers: tier 1, tier 2, and tier 3. Each tier has an associated increasing level of detail and accuracy, with the tier 3 method requiring the most detail and consequently also the most accurate approach. There are various methodologies, which could be followed to quantify emissions:

- Activity data should be multiplied with a specific and relevant emission factor which can either be a default (Tier 1) emission factor or country specific emission factor (Tier 2).
- A company could carry out continuous emissions monitoring to measure the quantity of GHG emissions produced (Tier 3).

Companies will have to use the same methodology to report their emissions to both DEA and SARS and using default emission factors should be the barest minimum as these default emission factors are expected to change as South African specific emission factors are developed.

The general methodology which is relevant for all reporting entities combines activity data (the extent to which a human activity takes places) with the emission factor (coefficients which quantify the emissions or removals per unit activity). The basic equation is therefore:

Emissions = Activity Data × Emission Factor

Since the IPCC Guidelines require that GHG emissions are reported separately but the carbon tax applies to a carbon dioxide equivalent (CO_2e) unit, there is need for non-CO_2 GHGs to use an emissions factor that converts data into a carbon dioxide equivalent (CO_2e). Although the IPCC Guidelines recommend that when calculating non-CO_2 GHG emissions, the most recent Global Warming Potentials (GWP) are used, under NGERs, which stipulates national reporting requirements, data providers are required to use GWP values provided by the IPCC Third Assessment Report (TAR) or 2001 IPCC GWP values.

A GWP is a relative measure of how much heat a GHG traps in the atmosphere (measure of how much a GHG contributes to global warming) relative to CO_2 i.e. it compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide. For example, according to the TAR, GWP over 100 years is 23 for methane, 296 for nitrous oxide and 1 for carbon dioxide. These GWP values are applied in this case because indications from DEA are that these are the values which have been agreed on with the industry. The table below provides a list of 100 year GWP TAR values that data providers must use.

Greenhouse Gas	**TAR 100 Year GWP**
Carbon dioxide (CO_2)	1
Methane (CH_4)	23
Nitrous oxide (N_2O)	296
Sulphur hexafluoride (SF_6)	22 200
Hexafluoroethane (C_2F_6)	11 900
Carbon tetrafluoride (CF_4)	5 700

The CO_2e is a measure used to compare the emissions from various GHGs based upon their GWP. Thus each fuel type's various GHGs are standardized to a CO_2e as follows:

*CO_2e emissions = CO_2 * 1 + CH_4 * 23 + N_2O * 296 + C_2F_6 * 11 900 + CF_4 * 5 700 + SF_6 * 22 200*

The DEA has highlighted the preference for use of higher tier methodologies (Annexure 1 to the NGER) or as a minimum, default emission factors stipulated in Schedule 1 of the Bill in line with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. These higher tier measurement solutions or direct measurement methodologies or modelling techniques can be developed in conjunction with DEA (e.g. mass balance approach in the synthetic fuels production).

During the first five years or transitional phase, entities are allowed to use the default emission factors initially with a plan to develop and use higher tier methods that more accurately reflect the level of emissions. For some key emitting sectors, these transitional arrangements wherein, for a specific IPCC emission source and GHG, higher tier IPCC methodologies have to be used after a five-year period from the date of promulgation of the NGERs. Scope is given for emission factors to be adjusted as new methodologies are developed, verified and certified by DEA.

Entities will be liable for their (1) fuel combustion emissions, (2) fugitive emissions (e.g. fugitive emissions from coal mining) and, (3) process emissions. Calculations of the tax base will be conducted using the formulas specified in the carbon tax Bill, as per the mandatory reporting requirements. The tax base comprises emissions from fuel combustion, industrial processes and fugitive emissions.

Calculating emission factors for energy combustion emissions

Energy combustion emissions are classified according to whether they emanate from a stationary or mobile source category and their emission factors also differ across these categories.

Biomass is commonly used as a fuel, often in combination with fossil fuels, companies would need to ensure that CO_2 emissions from biomass burning are separated from fossil fuel emissions that is, methane (CH_4) and nitrous oxide (N_2O) emissions because these gases are not sequestered during replanting of forests, and regrowth, for example. For ease of identification, the CO_2 emissions from biomass are displayed as zero in Table 1 of Schedule 1 to the Bill to indicate that these emissions will not need to be reported to the DEA. Consequently, these emissions will not be subject to the carbon tax.

For all combustion activities, the carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) GHG emissions as reported by the entities will be converted to a carbon dioxide equivalent (CO_2e) standard. The CO_2e is a measure used to compare the emissions from various GHGs based upon their GWP. Thus each fuel type's various GHGs are standardized to a CO_2e as follows:

CO_2e Emission Factor / tonne = CO_2e emissions / terra joule * default calorific value (terra joule / tonne)

Where

CO_2e emissions / terra joule = $CO_2 * 1 + CH_4 * 23 + N_2O * 296$

The sum of the total carbon dioxide equivalent emissions/ terra joule for each fuel type in the source category is then multiplied by the default calorific value of the fuel type source category to derive the GHG carbon dioxide equivalent emission factor. This emission factor is then multiplied by the mass of fuel type within the source category to derive the amount of CO_2e emissions subject to the carbon tax as shown below.

Fossil fuel combustion emissions

Example 1 – using tier 1 methodology (IPCC default emission factor)

Company 1C produces electricity and heat from sub-bituminous coal mined underground and uses 2000 tonnes of sub-bituminous coal for its processes. Company 1C decides to use the tier 1 methodology and uses the default IPCC emission factors. Its GHG CO_2e combustion emission factor will be derived as follows:

CO_2e *emissions / terra joule* $= CO_2 * 1 + CH_4 * 23 + N_2O * 296$

$= (96100 * 1 + 1 * 23 + 1.5 * 296) / 1000$

$= 96.567$

CO_2e *Emission Factor / tonne (B)* $= 96.567 * 0.0192$

$\boldsymbol{B = 1.8541}$

Thus with an emissions factor of 1.8541 tCO_2e per tonne of coal, its emissions **E** from combusting the coal to produce electricity will be calculated as follows:

$$\boldsymbol{E = A_1 x B_1 + A_2 x B_2 + A_3 x B_3 + \ldots\ldots\ldots\ldots + A_n x B_n}$$

where A_n is the mass of fossil fuel type *n* and B_n is its respective emission factor.

A = 2000

B = 1.8541

*E = A * B = 2000 * 1.8541 = 3 708.20 tonnes* CO_2e

Example 2 - using tier 1 methodology (IPCC default emission factor)

Company 2C produces electricity and heat from charcoal as well as diesel in open cycle gas turbines

(OCGTs) for its processes. The company uses 1000 tonnes of charcoal and 500 000 litres of diesel (equivalent to 418.5 tonnes) for their processes. Company 2C decides to use the tier 1 methodology and uses the default IPCC emission factors. Because Company 2C uses charcoal for combustion, its CO_2 emissions are not included either in the DEA mandatory reporting or calculation of taxable emissions. Its GHG CO_2e combustion emission factors will be derived as follows:

CO_2e emissions / terra joule = *CO_2 * 1 + CH_4 * 23 + N_2O * 296*

a) *Emission factor for charcoal* = (0 * 1 + 200 * 23 + 4 * 296) / 1000

= 5.784

CO_2e Emission Factor / tonne charcoal (B_1) = *5.784 * 0.0295*

B_1 = 0.17063

b) *Emission factor for diesel* = (74100 * 1 + 3 * 23 + 0.6 * 296) / 1000

= 74.3466

CO_2e Emission Factor / tonne diesel (B_2) = *74.3466 * 0.0381*

B_2 = 2.8326

Thus with emission factors of 0.17063 tCO_2e per tonne of charcoal and 2.8326 tCO_2e per tonne of diesel, its emissions **E** from combusting the charcoal and using diesel in the OCGTs will be calculated as follows:

$$E = A_1 x B_1 + A_2 x B_2 + A_3 x B_3 + \ldots\ldots\ldots\ldots + A_n x B_n$$

where A_n is the mass of fossil fuel type *n* and B_n is its respective emission factor.

Its emissions **E** from combusting the charcoal and diesel to produce electricity will be calculated as follows:

$A_1 = 1000$; $A_2 = 418.50$

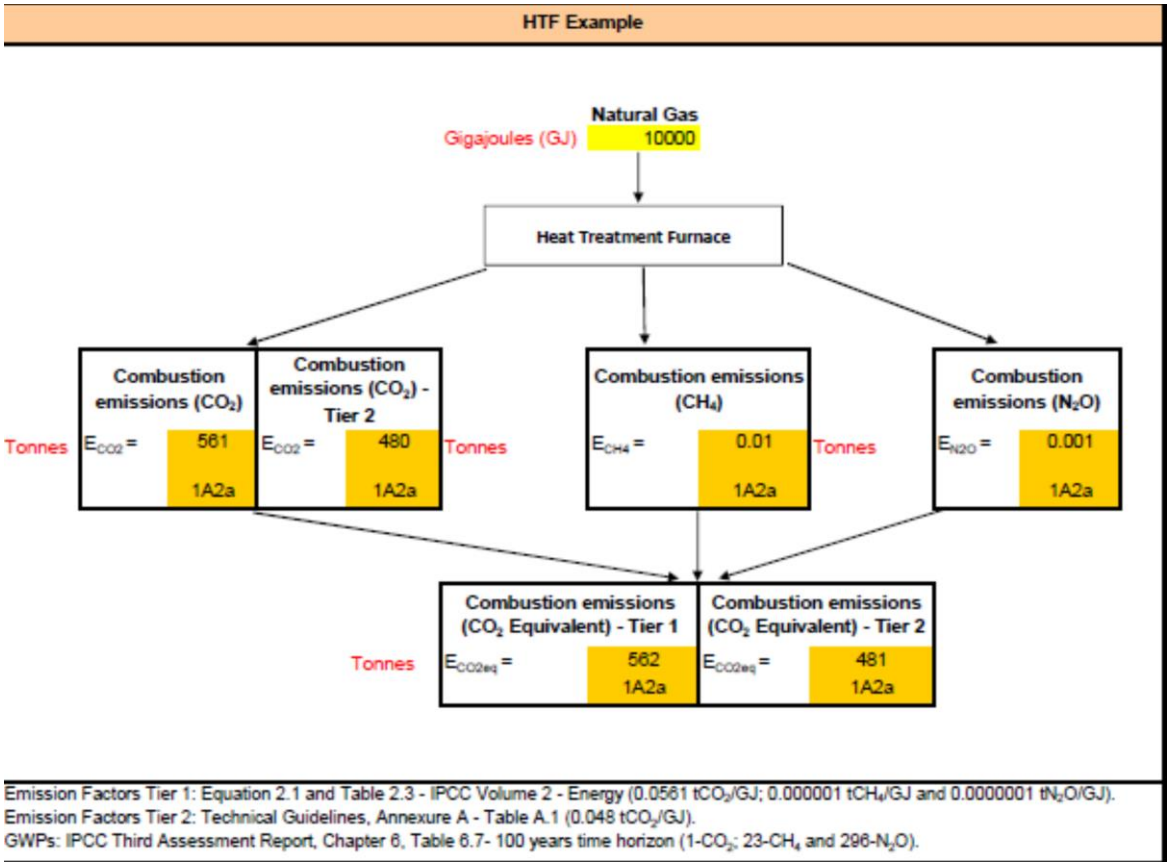
$B_1 = 0.17063$ $B_2 = 2.8326$

$E = A_1 * B_1 + A_2 * B_2 = (1000 * 0.17063) + (418.50 * 2.8326) = 1\ 356.07$ tonnes CO_2e

Example 3 – comparison of tier 1 versus tier 2 methodology

An example from industry using both tier 1 and tier 2 methodologies in the iron and steel sector to determine combustion emissions.

Box 2: Comparison of Tier 1 and Tier 2 methodologies



In the above example, Company 2C used 10000 GJ of natural gas in its heat treatment furnace within its iron and steel production process. Using default IPCC emission factors (tier 1 methodology) results in higher emissions reported when compared to use of country specific emission factors (tier 2 methodology). This shows why the DEA encourages development of higher tier methodologies as they are more accurate in estimating emissions.

Fugitive emissions for each source category activity are reported either as a mass per volume or volume per mass. For those emissions reported as a mass per volume, the conversion to a CO_2e is straightforward as the reported mass per volume of each GHG is multiplied by its GWP (as highlighted above) to derive the CO_2e per volume which are then summed per activity to derive the total GHG CO_2e emission factor per volume of emissions. For source category activities reported as a volume per mass

which is the underground coal mining, the volume per mass has to be converted to a mass by using a density factor.

In South Africa, this applies to underground coal mining for which the industry developed its own South African specific emission factor. The density factor for methane for underground coal mining is 0.67 * 10^{-6} and this converts the methane into a mass which is then multiplied by the GWP to get a CO_2e emissions factor which is then used to calculate the carbon tax payable. For South Africa, there is no guidance on the density factor for CO_2 emissions so they are not included in calculating the underground coal mining fugitive emissions. Also, for surface coal mining, the DEA and industry have agreed that fugitive emissions are negligible hence they are treated as zero.

Example 4 – using tier 2 methodology (country specific emissions factor)

Company 1F mines sub-bituminous coal from underground and produces fugitive emissions. In the past year, it extracted 2000 tonnes of sub-bituminous coal. Company 1F decides to use the tier 2 methodology and uses the country specific emission factors. Its GHG CO_2e emission factor for fugitive emissions will be derived as follows:

CO_2e Emission Factor / tonne (Q) = *(CH_4 * density factor * 23) * 1000*

= ((0.77 * (0.67 * 0.00001)) * 23) * 1000

Q = 0.1187

Thus with an emissions factor of 0.1187 tCO_2e per tonne of coal extracted. Its fugitive emissions **F** from underground coal mining will be calculated as follows:

$$F = N_1 \times Q_1 + N_2 \times Q_2 + N_3 \times QB_3 + \ldots\ldots\ldots\ldots + N_n \times Q_n$$

where N_n is the mass or volume of fossil fuel n and Q_n is its respective emission factor

N = 2000

Q = 0.1187

*F = N * Q = 2000 * 0.1187 = 237.31 tonnes CO_2e*

Table 3: Industrial Process and Product Use Emission Factors

Calculating emission factors for process emissions

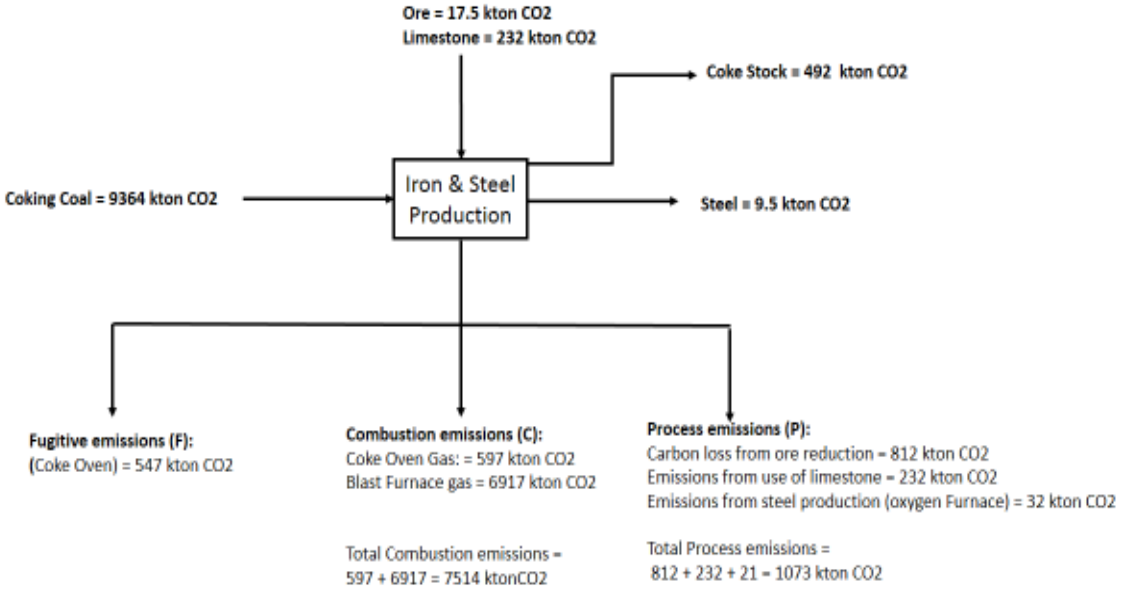
Process emissions for each source category activity are reported in mass hence their conversion into a CO_2e is by multiplying the respective GHG by its GWP from the TAR as follows:

*CO_2e emissions = CO_2 * 1 + CH_4 * 23 + N_2O * 296 + C_2F_6 * 11 900 + CF_4 * 5 700 + SF_6 * 22 200*

With regards to hydroflourocarbons (HFCs) process emissions, a differentiated approach to reporting and measurement has been taken by the DEA because of the wide range of HFCs available. In line with the NGER Technical Guidelines, HFCs are currently not being measured by the DEA (IPCC codes 2D3 and 2F) because they depend on how leakages are managed and are likely to vary per installation. As these emissions are not reportable for phase 1 of the carbon tax, these emissions will not be included in the process emissions calculation until such a time as when DEA can measure and monitor them. However, where available sector specific methodologies are referenced in the sector specific volumes in the Technical Guidelines e.g. magnesium or flourochemical production (IPCC code 2B9), these emissions are reportable and hence will attract a carbon tax.

Example 5 – carbon balance approach

Company CFP is an iron and steel manufacturer. Within its operation, it has a coke oven, blast furnace as well as an Oxygen Furnace for steel production. Company CFP uses a carbon balance approach to quantify GHG emissions from all activities occurring within its iron and steel facility. A simplified version of its carbon balance is provided below for illustration purposes. Note that inputs and outputs from the carbon balance are expressed in kilotonnes of carbon dioxide for ease of comparison between inputs and outputs. The results of the comparison should demonstrate that total carbon contained in all inputs is equal to the sum of carbon outputs (i.e. carbon in product, by-products and all greenhouse gas emission streams). The results from the carbon balance submitted by company CFP shows that it generated 547 ktonCO_2 from fugitive emissions, 7514 kton CO_2 from combustion emissions and 1073 kton CO_2 from process emissions.



The total emissions for CFP from its steel making processes will be calculated as follows:

F = 547 *C = 7514* *P = 1073*

*E = F + C + P = (547 + 7514 + 1073) * 1000 = 9 134 000 tonnes CO_2e*

The total carbon contained in all inputs (ore + limestone + coking coal) is equal to the sum of carbon outputs (fugitive emissions + combustion emissions + process emissions + steel + coke stock).

However, given that this is a simplified example of a carbon balance approach, the following example from industry highlights the complex process of isolating and assigning emissions within the different processes when producing goods (see Box 3 below).

Box 3: Industry simplified example on emissions estimation

NOTE:
Kindly note that the figures in this example are fictitious .

INPUT DATA

Coke Making Emissions should be reported in the Energy Sector

Assumptions:
- All coke made onsite at iron & steel production facilities is used onsite;
- All coke oven by-products are transferred off site;
- All coke oven gas produced is combusted on site for energy recovery.

ENERGY EMISSIONS / FUGITIVE EMISSIONS

TIER 1 METHOD	
Equation 4.1: CO_2 Emissions from Coke Production (Tier 1) :	
Coke Produced (t)	2,800,000.00
Emission Factor (tCO_2/t coke produced):	0.56
Total CO_2 emission from Coke Production (t):	**1,568,000.00**

TIER 1 / 2 METHOD (Natural Gas and LPG consumed Downstream)	GJ	tC/GJ	tCO_2
Downstream Natural Gas consumed	6,050,000.00	0.01309	290,400.00
Downstream LPG consumed	225,000.00	0.01721	14,197.50
Downstream Sasol Gas consumed	5,050,000.00	0.01586	293,674.33
Total CO_2 Emissions from Natural Gas and LPG Downstream consumption (t):			**598,271.83**

Natural Gas Factor - considerations:
48000 $kgCO_2$/TJ (Technical guidelines - Annexure A: Stationary Combustion - Emission Factors)

LPG Factor:
63100 $kgCO_2$/TJ (Technical guidelines - Annexure A: Stationary Combustion - Emission Factors)

Sasol Gas Factor - considerations:
Density = 0.73 kg/Nm^3 (Obtained from the supplier)
LCV = 0.0336 GJ/Nm^3 (Technical guidelines - Annexure D: Net Calorific Values of fuels)
Carbon Content = 0.73 t_c/t (Table 4.3. from IPCC, Chapter: 4)
(factor: 0.015208 t_c/GJ)

PROCESS EMISSIONS

Equation 4.4 : CO_2 from Iron & Steel Production (Tier 1):	
BOF crude steel produced (t):	6,300,000.00
BOF emission factor (tCO_2/t CS BOF produced):	1.46
CO_2 Emissions from BOF (t):	**9,198,000.00**
EAF crude steel produced (t):	250,000.00
EAF emission factor (tCO_2/t CS EAF produced):	0.08
CO_2 Emissions from EAF (t):	**20,000.00**
OHF crude steel produced (t):	-
OHF emission factor (tCO_2/t CS OHF produced):	1.72
CO_2 Emissions from OHF (t):	**-**
Total CO_2 Emissions from Iron & Steel Production (t):	**9,218,000.00**

Equation 4.5 : CO_2 from Pig Iron not processed into steel (Tier 1):	
Pooled Iron not converted to steel (t):	
Pooled Iron (not converted) emission factor (tCO_2/t Pooled iron produced):	1.35
Total CO_2 Emissions from Pooled Iron not converted into steel (t):	**-**

'Pig Iron not processed into Steel' equation should only be considered when Pooled Iron is sold. Otherwise, there will be double accounting in the following year.

Equation 4.6 : CO_2 from Direct Reduced Iron (Tier 1):	
DRI produced (t):	1,400,000.00
DRI emission factor (tCO_2/t DRI produced):	0.7
Total CO_2 Emissions from DRI Production(t):	**980,000.00**

Equation 4.7 : CO_2 from Sinter Production (Tier 1):	
Sinter produced (t):	5,700,000.00
Sinter emission factor (tCO_2/t Sinter produced):	0.2
Total CO_2 Emissions from Sinter Production (t):	**1,140,000.00**

Equation 4.8 : CO_2 from Pellet Production (Tier 1):	
Pellet produced (t):	-
Pellet emission factor (tCO_2/t Pellets produced):	0.03
Total CO_2 Emissions from Pellets Production (t):	**-**

Total CO_2 Energy Emissions (t):	**2,166,271.83**
Total CO_2 Process Emissions (t):	**11,338,000.00**
Total CO_2 Emissions (t):	**13,504,271.83**

In the above example, Company 2P produces iron and steel using natural gas, LPG and Sasol gas and coke from coal. The energy combustion and fugitive emissions are grouped together as energy emissions in the final calculation because of the complexities in trying to separate them out. Several assumptions on coke production and coke oven by-products had to be made to try and separate out the emissions and be able to assign them to particular processes.

Rate of the carbon tax: Section 5

Section 5 of the carbon tax bill specifies the headline carbon tax will be introduced at a rate of R120 per ton of CO_2-equivalent. To provide certainty to firms and a clear long-term price signal, the annual increase to the nominal carbon tax rate by the rate of consumer price inflation plus 2 per cent up to 31st December 2022, and adjustments in line with inflation thereafter is also specified. This in line with the Carbon Tax Policy Paper of 2013 which *proposed "that the tax rate of a R120 per tCO2-eq be increased at a rate of 10 per cent per annum until the end of 2019, followed by a review during 2019, with the intention to announce a revised annual rate of increase in the 2020 Budget"*.

Calculation of amount of carbon tax payable: Section 6

The carbon tax liability is determined by multiplying the tax base adjusted for the allowable tax-free thresholds with the carbon tax rate. The base is set and defined in section 4 and the rate is set in section 5. Tax-free thresholds will be allowed during the first phase to moderate the impact of the tax, taking into account potential adverse impacts on international competitiveness of key sectors and to enable a smooth transition to a low carbon economy. The tax-free allowances will range between 60 per cent and 95 per cent resulting in an effective carbon tax rate of between R6 and R48 per tCO_2-eq. A deduction for emissions emanating from the use of liquid fuels (petrol and diesel) in stationary processes is provided to avoid double taxation. The carbon tax on liquid fuels (petrol and diesel) will be imposed at source, as an addition to the current fuel taxes.

The amount of tax payable will be calculated as follows:

T (tax payable) =

{**E** (Energy combustion emissions) – **D** (diesel and petrol emissions) – **S** (emissions sequestered by company as verified by DEA)] x 1- **C** (where **C** is the sum of the allowable tax-free thresholds related to combustion) x **R** (tax rate)} + {**P** (process emissions) x 1- **J** (where **J** is the sum of the allowable tax-free thresholds related to process emissions) x R (tax rate)} + {**F** (fugitive emissions) x 1-**K** (where **K** is the sum of the allowable tax-free thresholds related to fugitive emissions) x R (tax rate)}.

EXAMPLES OF TAX PAYABLE CALCULATION

The formula used to calculate the carbon tax liability elaborated on in section 6 (1) of the revised bill is as follows:

X = {(E – D - S) x (1 – C) x R} + {P x (1 - J) x R} + {F x (1 - K) x R}

Example 6

Company 1C produces electricity and heat from sub-bituminous coal mined underground. It uses 2000 tonnes of sub-bituminous coal and produces combustion emissions 3708.20 tCO_2e.

Company 1 is not trade-exposed but has outperformed its peers, has complied with information requirements for its carbon budgets and has decided to use the full carbon offset allowance. There was no use of liquid fuels or any sequestration activities by Company 1.

Thus Company 1 is eligible for the basic 60 per cent tax-free allowance for (energy) combustion emissions; receives the 5 per cent allowance according to the performance allowance (Z-factor calculation) for outperforming its peers and 5 per cent allowance for complying with carbon budgets information requirements; and is eligible for the full 10 per cent offset allowance. The sum of Company 1's allowances is **80 per cent** (60+5+5+10) for fossil fuel combustion emissions. The carbon tax liability for Company 1's combustion emissions will be calculated as follows:

*E = A * B = 2000 * 1.8541 = 3 708.20 tonnes CO_2e*

F = D = S = P = 0

C = 60% + 5% + 5% + 10% = 80%

X = {(E – D – S) * (1 – C) * R} + {P * (1 – J)} * R} + {F*(1-K)*R} =

{(3708.20 – 0 - 0) * (1 – 0.8) * R120} + 0 + 0 = R88 996.80

Example 7

Company 2C produces electricity and heat from charcoal as well as diesel in open cycle gas turbines (OCGTs) for their processes. The company uses 1000 tonnes of charcoal and 500 000 litres of diesel (equivalent to 418.5 tonnes). It produces 170.63 tCO_2e emissions from charcoal combustion, and 1185.44 tCO_2e emissions from diesel combustion.

Company 2 is not trade-exposed but has outperformed its peers, has complied with information requirements for its carbon budgets and has decided to purchase its full carbon offset allowance. There were no sequestration activities by Company 2.

Company 2 is eligible for the basic 60 per cent tax-free allowance for energy combustion emissions; receives the 5 per cent allowance according to the Z-factor calculation for outperforming its peers and 5 per cent allowance for complying with carbon budgets information requirements; and is eligible for the full 10 per cent offset allowance. Since liquid fuels are taxed at the point of sale, their emissions are subtracted from the total combustion emissions to avoid double taxation. The sum of Company 2's allowances is **80 per cent** (60+5 +5+10) for fossil fuel combustion emissions. The carbon tax liability for Company 2 for fossil fuel combustion will be calculated as follows:

$E = A_1 * B_1 + A_2 * B_2 = (1000 * 0.170623) + (418.50 * 2.8326) = 1\ 356.07$ *tonnes* CO_2e

$D = 418.50 * 2.8326 = 1\ 185.44$ *tonnes* CO_2e

$F = S = P = 0$

$C = 60\% + 5\% + 5\% + 10\% = 80\%$

$X = \{(E – D – S) * (1 – C) * R\} + \{P * (1 – J)\} * R\} + \{F*(1-K)*R\} =$

$\{(1\ 356.07 – 1\ 185.44 - 0)* (1 – 0.8) * R120\} + 0 +0 = R4\ 095.12$

The carbon tax paid for diesel will be included in the fuel price and will not require any further submissions by the company. Because charcoal is a blended fuel, its CO_2 emissions are not considered hence the low tax liability for combustion emissions.

Example 8

Company 3 is an iron and steel manufacturer. Within its operation, it has a coke oven, electric arc furnace, blast furnace, and an oxygen furnace for steel production. The company produces iron and steel using natural gas, LPG and Sasol gas and coke from coal. Company 3 generated 1,568,000 tCO_2e fugitive emissions from coke production; 598,271 tCO_2e combustion emissions; and 11,338,000 tCO_2e process emissions.

Company 3 is trade-exposed, has process and fugitive emissions. It has outperformed its peers, has complied with information requirements for its carbon budgets and has decided to purchase its full carbon offset allowance. There were no sequestration activities by Company 3.

Company 3 is eligible for the basic 60 per cent tax-free allowance for fossil fuel combustion emissions; the basic 70 per cent tax-free allowance for process emissions; 10 per cent for fugitive emissions; 10 per cent for trade exposure; receives the 5 per cent allowance according to the Z-factor calculation for outperforming its peers and 5 per cent allowance for complying with carbon budgets information requirements and finally is eligible for the full 10 per cent of offsets allowance for combustion emissions and the full 5 per cent offsets allowance for fugitive and process emissions. Thus, the sum of Company 4's allowances is **90 per cent** (60+10+5 +5 +10) for fossil fuel combustion emissions, **95 per cent** (70+10+5 +5 +5) for process emissions, and **95 per cent** (60+10+10+5 +5 +5) for fugitive emissions and its total tax liability will be calculated as follows:

E = 598 271 tonnes CO_2e

P = 11 338 000 tonnes CO_2e

F = 1 568 000 tonnes CO_2e

D = S = 0

C = 60% + 10% + 5% + 5% +10% = 90%

J = 70% + 10% + 5% + 5% + 5% = 95%

K = 60% + 10% + 10%+ 5% + 5% + 5% = 95%

X = {(E – D – S) * (1 – C) * R} + {P * (1 – J) * R} + {F*(1-K)*R} =

X = {(598 271 – 0 – 0) * (1 – 0.9) * R120} + {11 338 000 * (1 – 0.95) * R120} + {1 568 000 * (1 – 0.95) * R120} = R 84 615 262.

Amount of tax payable in respect of electricity generation

Section 6 (2) deals with the calculation of the tax liability by entities that generate electricity for distribution taking into account the generation of electricity from renewable energy). This section outlines a formula that will be used to calculate the tax liability for electricity generation and provides a credit for the actual (calculated) implicit carbon price in any given year based on the renewable energy "premium" (e.g. wind, solar and small-scale hydro). The renewable energy premium (REP) credit will reduce the impact of the carbon tax on electricity prices and will avoid the so-called "double taxation". The REP will be determined by the Minister of Finance by way of a notice. The REP will be calculated annually in consultation with Eskom, NERSA and the DoE.

In addition, fossil fuel electricity generators subject to an environmental levy, will be allowed to offset some of their carbon tax liability from the revenue generated from the environmental levy (ELR) in the

first phase up to 31st December 2022. The minimum offset allowed will be zero. This arrangement will help ease the transition for the electricity sector.

The amount of tax payable by taxpayers for the generation of electricity from fossil fuels should be calculated as above and should then be adjusted as follows:

TE_{final} (final tax payable by electricity generator) = TE (tax payable by electricity generator) – REP credit - ELR

Part II. Allowances

Tax-free allowances are provided to entities to provide for a smooth transition to a low carbon economy and to take into account potential international competitiveness and carbon leakage concerns. The basic tax-free threshold will be 60 per cent for the fuel combustion emissions and 70 per cent for process emissions. An up to 5 per cent performance allowance based on the GHG intensity benchmark associated with over performance within the sector and up to 5 per cent allowance for complying with information reporting requirements for the carbon budgeting process is provided. Furthermore, additional allowances are provided of up to 10 per cent for companies that are trade exposed and 10 per cent for some companies with fugitive emissions.

As per the 2013 Carbon Tax Policy paper, a carbon offset allowance up to a maximum of 10 per cent for combustion emissions and up to a maximum of 5 per cent carbon offset allowance for process or fugitive emissions is available to taxpayers. The carbon offsets mechanism provides flexibility to taxpayers to reduce their carbon tax liability and also encourage locally-based emissions reduction in sectors not directly covered by the tax.

These percentage tax-free thresholds could be reduced in the second phase of the carbon tax to strengthen the carbon price signal and / or replaced with an absolute tax-free threshold in line with the proposed carbon budgeting system. The DEA and NT have completed a study on the most appropriate alignment and integration of the carbon tax and carbon budget instruments post 2020 with the support of the World Bank's Partnership Market Readiness initiative. A report outlining the key principles and interface options for the integration of the carbon tax and carbon budget instruments has been completed. The mandatory carbon budgets regime will be introduced in a way that is fully-aligned with the carbon tax, and resulting in no double penalty. An integrated review process to assess both instruments will be done, which will inform any significant changes in the tax rate and the implementation of the carbon budgets.

The allocation of tax-free allowances under the carbon tax will be calculated as per activity undertaken shown in Schedule 2. This is based on the IPCC activity classification and is aligned with the

mandatory reporting requirements under the DEA 2017 NGER and accompanying Technical Guidelines for the Monitoring, Reporting and Verification of GHG Emissions by Industry.

Basic tax-free allowance for fuel combustion emissions: Section 7

All entities that generate emissions from energy combustion will qualify for a basic, tax-free allowance of 60 per cent on actual reported energy combustion emissions. The tax will become payable for emissions that exceed the threshold.

Basic tax-free allowance for industrial process emissions: Section 8

GHG emissions from chemical processes that occur in fixed stoichiometric ratios (e.g. coal gasification, crude oil cracking and the production of cement, iron, steel, glass, ceramic and certain chemicals, such as calcium carbide and titanium dioxide) have limited potential for mitigation over the short term. A higher tax-free basic percentage-based threshold is therefore provided for these emissions compared to energy combustion emissions. A basic percentage-based threshold on actual industrial process emissions of 70 per cent is applied, below which the tax will not be payable.

Allowance in respect of fugitive emissions: Section 9

This section provides for a tax-free allowance to entities that generate fugitive emissions. An additional tax-free allowance of 10 per cent will be provided to sectors with fugitive emissions. This allowance is provided due to the limited potential for mitigation of fugitive emissions over the short term.

Trade exposure allowance: Section 10

This section provides for a tax-free allowance to entities that are trade exposed and sensitive to potential international competitiveness. Potential adverse impacts on industry competitiveness are addressed by providing an additional maximum 10 per cent tax-free trade exposure allowance.

The trade exposure allowance is sector-based including exports and imports. Trade intensity will be used as a proxy for trade exposure which will be determined at a sector or subsector level based on the World Customs Organisation - Harmonised System Convention (HS Code)[1] classification and available

[1] World Customs Organisation: Harmonised System Convention

national data for the corresponding production per sector. In instances where adequate production data is not available, the closest proxy for production will be considered.

The trade intensity of a product/s for a particular sector / subsector will be based on the sum of the value of imports and exports divided by production. The trade intensity will be calculated for the sector or subsector, using the formula below:

Trade Intensity = (X+ M) / P

Where: X = Exports (“final” products only)

M = Imports (“final” products only)

P = Production

The tax-free allowance will be structured as graduated relief with sectors qualifying for the allowance depending on the magnitude of their deemed trade exposure. The trade exposure allowance will be determined according to the trade intensity category (high, medium or low) of a sector. For the medium trade intensity category, trade intensity will be multiplied by 0.33 in order to determine the associated trade exposure allowance for sectors in this band.

	Trade intensity	**Trade exposure allowance**
Low trade intensity	< 10 %	0 per cent
Medium trade intensity	≥ 10 % to < 30 %	3 to 9 per cent
High trade intensity	≥ 30 %	10 per cent

An intensity threshold of 30 per cent will ensure that sectors with a trade intensity of 30 per cent and more will automatically qualify for the full maximum 10 per cent allowance (high trade intensity). Those with a trade intensity of less than 30 but equal or greater than 10 per cent will receive a progressive allowance of between 3 and 9 per cent (medium trade intensity). Sectors with a trade intensity of less than 10 per cent will not qualify for the allowance (low trade intensity).

For companies with activities in different sectors with varying HS code categories, and that potentially face different trade intensity risk levels simultaneously, a weighted average of the different tax-free allowance levels will be calculated. This will be based on the total sales of a company. The final level of the trade exposure allowance that the company is eligible for will be determined in line with the proportion of sales of specific final goods to total sales of the company.

The qualifying activities and their respective trade exposure allowance will be published in a regulation to the carbon tax act.

Performance Allowance (Z-factor): Section 11

This section deals with allocation of a tax-free allowance to entities that have proactively implemented GHG mitigation measures.

An additional tax-free allowance up to a maximum of 5 per cent, based on the Z-factor formula, is available to reward all companies that have taken voluntary actions to reduce their GHG emissions. This will be calculated with reference to the agreed GHG emissions intensity benchmark (including both direct and indirect emissions) for the sector or sub-sector. Essentially, firms below the sector or sub-sector emissions intensity benchmark will be rewarded.

GHG emissions intensity benchmarks for different industrial sectors or sub-sectors will be specified in a regulation. This regulation will be developed based on inputs received from the different industry associations or companies.

Carbon budget system allowance: Section 12

In recognition of the carbon budgets process being developed by DEA, an additional 5 per cent tax-free allowance will be provided to companies participating in phase 1 of the carbon budget system.

Written consent of the approval of the carbon budget by the DEA is required for a company to qualify for the tax-free allowance. During the first phase, this provides an incentive for entities to participate in the carbon budget system and voluntarily declare their emissions.

Offset allowance: Section 13

This section provides for the use of carbon offsets by companies to reduce their tax liability. Carbon offsets are proposed to provide entities with additional flexibility to reduce their GHG emissions. Carbon offsets can be used by firms to reduce their carbon tax liability by a maximum of 10 per cent of their combustion emissions and 5 per cent of their total fugitive emissions or 5 per cent of their total process emissions. A revised Carbon Offset Regulation will be published for public consultation in early 2018.

Part III. Limitation of allowances

Limitation of allowances: Section 14

This section provides a limitation on the overall maximum tax-free allowances and allowances with respect to carbon offsets that an entity liable for the carbon tax may receive. The overall maximum tax-free allowance (threshold) is limited to 95 per cent.

Part IV. Administration, tax period and payment of tax

Administration: Section 15

This section describes the administration procedures regarding the tax. The carbon tax will be collected by SARS and will be administered through the Customs and Excise Act, 1964.

Tax period: Section 16

This section describes the time period to which the tax applies. This is aligned to the mandatory reporting period of one calendar year.

Payment of tax: Section 17

This section specifies modalities regarding the payment of the tax. A taxpayer is required to submit six-monthly environmental levy accounts and payments as prescribed by rule in terms of the Customs and Excise Act.

Part VI: Miscellaneous

Reporting: Section 18

This section requires that the Commissioner of SARS must submit annual reports to the Minister of Finance on:

- GHG emissions reported by taxpayers; and
- Amount of revenue generated from the carbon tax.

Regulations: Section 19

This section specifies complementary regulations to be introduced namely:

- Emissions intensity Benchmark Regulations;
- Regulations for the trade exposure allowance; and
- Regulation on the Carbon offsets.

Amendment of laws: Section 20

This section specifies the extent of amendments to the Customs and Excise Act required in order for SARS to administer the carbon tax.

Short title and commencement: Section 21

This section specifies the commencement date of the tax.

SCHEDULE 1

Schedule 1 provides emission factors for energy combustion, process emissions, and fugitive emissions for specific GHGs as stipulated in the NGERs based on the IPCC Third Assessment Report (TAR), which should be used for mandatory reporting requirements under the NAEIS system developed by the DEA. Although the emission factors are reported per gas, examples in section 4 on tax base determination show how the carbon dioxide equivalent (CO_2e) emission factors should be derived using the TAR GWPs. The carbon tax will be applicable to CO_2e emissions.

SCHEDULE 2

The carbon tax will be calculated as per sectoral activities classification in Schedule 2. The classification reflects the IPCC classification and is aligned with the DEA mandatory NGER requirements.

It may be difficult to administer the application of the carbon tax to the land-use, land-use change & forestry and waste sectors due to the inaccuracies, absence of appropriate measurement and verification procedures for GHG emissions. The land-use, land-use change & forestry and waste sectors will therefore be excluded during the first phase, largely due to administrative difficulties in measuring and verifying emissions from these sectors. Consideration will be given to include these sectors under the carbon tax regime after the first phase taking into account measurement and monitoring challenges. However, if the land-use, land-use change & forestry and waste sectors produce emissions from fossil fuel combustion, such as from coal or liquid fuels, these emissions will be liable for carbon tax. Activities in agriculture/ forestry/ fishing/ fish farms (IPCC code 1A4c) will therefore be subject to the tax.

SCHEDULE 3

See notes on Clause 15 in the revised bill.