TECHNICAL NOTE #27

GHG Emissions Benchmarking & South African Carbon Tax

This summary is based on the Draft South African Carbon Tax Regulations published by National Treasury on 30 November 2015.

TECHNICAL CONTRIBUTOR

This summary was developed by EcoMetrix Africa for the Energy Efficient Clay Brick (EECB) Project.

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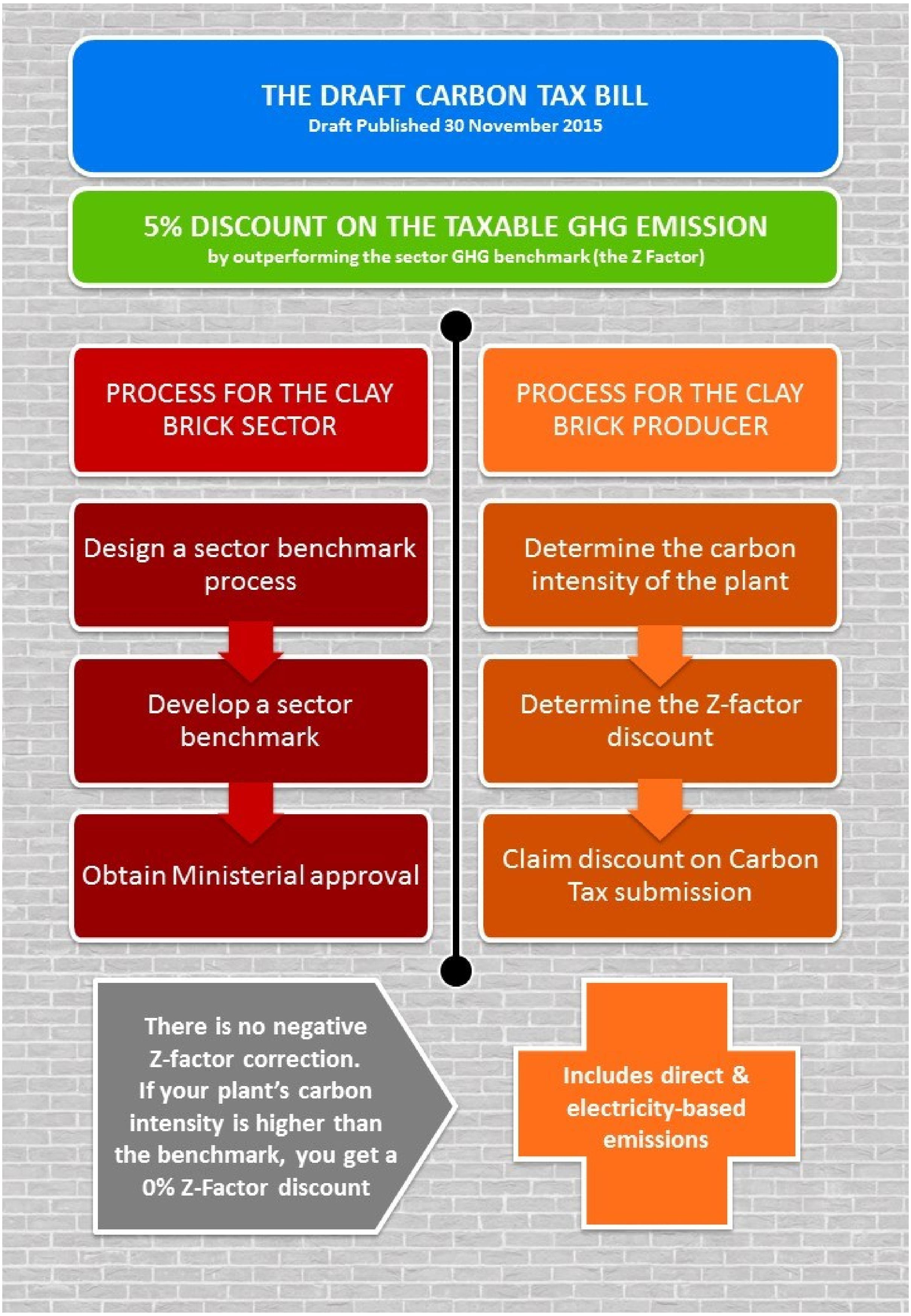


THE DRAFT CARBON TAX BILL
Draft Published 30 November 2015
5% DISCOUNT ON THE TAXABLE GHG EMISSION
by outperforming the sector GHG benchmark (the Z Factor)
PROCESS FOR THE CLAY BRICK SECTOR
Design a sector benchmark process
Develop a sector benchmark
Obtain Ministerial approval
PROCESS FOR THE CLAY BRICK PRODUCER
Determine the carbon intensity of the plant
Determine the Z-factor discount
Claim discount on Carbon Tax submission
There is no negative Z-factor correction. If your plant's carbon intensity is higher than the benchmark, you get a 0% Z-Factor discount
Includes direct & electricity-based emissions

GHG Emissions Benchmarking & South African Carbon Tax

1. What is GHG emissions benchmarking?

A benchmark is defined as a '*standard or point of reference against which things may be compared*'. Hence benchmarking is checking your own performance against a set benchmark. It is widely accepted that climate change is caused by the emission of man-made Greenhouse Gases (GHGs) into the atmosphere. For this reason more and more companies, either voluntarily and/or obligatory monitor and report their Greenhouse Gas (GHG) emissions.

It is not possible to conduct a meaning full benchmarking exercise if the overall measured value is not correct for the, what is often referred to as 'the activity level'. For example it is interesting to know how much fuel is consumed by a car in a given year (say: 4,000 litre) but this value has a lot more meaning if it is corrected for the total kilometres driven in the same year (say 20,000 km). By dividing the kilometres driven by the fuel consumed in the same year it becomes apparent that the car drives 4km/litre of fuel. This value can then be compared to a set benchmark, for example, the fuel consumption characteristics as provided by the car manufacturer. If these indicate a fuel efficiency of 8km/litre it is apparent that the efficiency of the car is a lot lower than the benchmark.

GHG emissions are often reported in tonnes of Carbon Dioxide equivalent per year (tCO_{2e}/year). To be able to develop a benchmark against which GHG emissions can be assessed these total emissions need to be corrected for the activity level.

In the above example the activity level used is the number of kilometres driven but dependant on the 'carbon intensity' that one would like to determine the activity level can take many different shapes. For example MWhs generated, tonnes of steel produced, etc. the box below provides the basic formula used for GHG emission benchmarking across a wide range of sectors.

2. The South African Carbon Tax benchmark component

The South African government intends to implement a Carbon Tax for the country's GHG emitting sectors including the Clay Brick sector[1]. Technical Note 24 '*The South African Carbon Tax legislation and its impact on the Clay Brick Sector*' provides more detail on the Carbon Tax design itself but in a nutshell the Carbon Tax bill calls for a levy of 120 ZAR/tCO_{2e} for direct onsite emissions from stationary activities and applies a number of discounts based on the characteristics of a sector covered under the Tax as well as company specific characteristics and activities.

[1] Source: Draft Carbon Tax Bill (see: http://www.treasury.gov.za/public%20comments/CarbonTaxBill2015/Carbon%20Tax%20Bill%20final%20for%20release%20for%20comment.pdf)

One of the discount components under the Carbon Tax is the so called Z-Factor which in essence provides companies covered under the tax with the opportunity to claim a discount on its taxable volume of up to 5% of its total GHG emissions. The box below provides the formula that forms part of the draft Carbon Tax bill and aims at determining the Z-factor discount for companies that have a lower Carbon intensity per unit of product that the sector benchmark.

Figure 1: Z-Factor Carbon Tax discount formula

$$Z = (A / B - C) \times D$$

Where:

Z represents the percentage to be determined;

A represents:

(i) the sector or sub-sector greenhouse gas emissions intensity benchmark as prescribed by the Minister; or

(ii) where no value is prescribed as required by subparagraph (i), the number zero;

B represents the measured and verified greenhouse gas emissions intensity of a taxpayer in respect of a tax period;

C represents the number one; and

D represents the number 100.

Although the formula itself needs to be amended as part of the final version of the Carbon Tax bill to address a number of practical glitches (e.g. the outcome is not a percentage but rather a range of numbers from -100 upwards) it indicates that only once a greenhouse gas emissions intensity benchmark is prescribed by the Minister. National Treasury as the government entity charged with designing the Carbon Tax bill indicated that it would like to see the benchmarking process being driven bottom. Whereby sector or sub-sector benchmarking approaches and levels could be presented to government for discussion and ultimately approval by the minister.

3. The Clay brick Sector Carbon Benchmarking definitions and process

In 2013 the Clay Brick Sector conducted a study to identify a process that could be applied to determine the Clay Brick sector Carbon Benchmark with the aim to become the first sub-sector to obtain a Z-factor benchmark approved by the minister. In its submission to National Treasury in August 2013 and subsequent discussions with the Carbon Tax development team at National Treasury the following sector specific definitions and benchmark determination procedures was presented.

3.1. Clay brick Sector Benchmarking definitions:

The following definitions were proposed to define the sectoral scope to which the benchmark could be applied as well as a standardised unit of product that could serve as the 'activity level' component of the benchmarking formula.

- **Clay Brick Sub-sector**: From a Carbon Tax perspective the Clay Brick Industry falls under the Ceramics & Glass sector as defined in the Carbon Tax Policy Paper. The products and production methods use for the production of bricks differs widely from those within the glass (e.g. widows and bottles) and ceramics (e.g. roof tiles and pots) industries. It is therefore proposed that the clay brick industry is defined as a subsector under the Glass & Ceramics sector as described in the Carbon Tax Policy Paper;

- **Brick Equivalent**: Bricks are produced in many different shapes and sizes. Within the Clay Brick Industry it is common practice to convert all the different types of bricks into their equivalent of a standard brick which is defined as a so called 'Imperial Brick' and is 222mm long, 106mm wide and 73mm high at a weight of between 3 and 3.5 kilograms per brick. To be able to have meaningful notations of the Clay Brick Industry's carbon intensity in tCO_{2e} a 1,000 Brick Equivalent unit has been used for the benchmark.

3.2. Clay Brick Sector Z-Factor benchmarking process:

The following process and calculation method to determine a Clay Brick sector Z-factor benchmark a South Africa clay brick carbon intensity benchmark was proposed:

1. Collect multi-year; production volume, electricity and fossil fuel consumption (incl. energy value) data (possibly by setting up and maintaining a clay brick producer database);

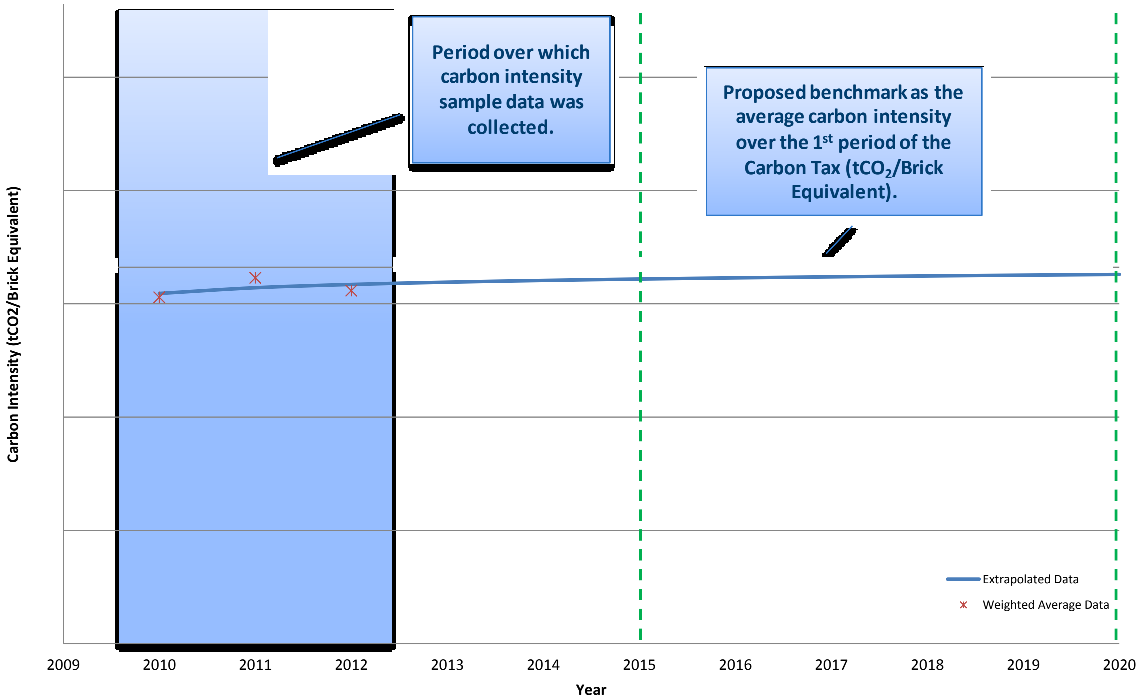
2. Apply the latest IPCC data on GHG emission per energy value per fuel type (volume 2) to determine scope 1 and the Eskom annual report determine scope 2 emissions of the sector;

3. Divide the combined scope 1 and 2 emissions by the total production in brick equivalent to determine the average carbon intensity of the sector (tCO_{2e}/Brick Equivalent) per baseline year;

4. Extrapolate the annual carbon intensity to cover the 1st period of the Carbon Tax

5. Take the average of the annual carbon intensity over the first period to determine the appropriate Z-Factor benchmark for the clay brick sector.

During a meeting with National Treasury's Carbon Tax team in February 2015 the above definitions and process we discussed in detail and received positively by the team. The graph below provides a schematic representation of the methodology used to determine the carbon intensity benchmark for the Clay Brick Industry.



Following the discussion with National Treasury it was proposed that the dataset (provided by a relatively small sample of brick makers to demonstrated how the above outlined definitions and process could be applied) would be replaced by that data collected as part of a Life Cycle Analysis (LCA) that was ongoing at the time and covers a much larger sample of brick makers and included a data verification process.

3.3. How would an approved Clay brick sector benchmark benefit a brick maker?

As mentioned, once a Clay Brick GHG emission benchmark has been approved by the minister it can be used by brick makers to obtain a discount on the volume of its GHG emissions over which it has to pay carbon tax.

The detailed process as to how this discount can be claimed will be published by National Treasury and/or SARS (as the executing entity of the Carbon Tax but in essence a brick maker would start with calculating the carbon intensity of its operation for a given tax year (expressed in tCO2e/Brick equivalent). He then would divide the sector benchmark by the carbon intensity of his operations.

If the outcome of this calculation is a number smaller than 1 the carbon intensity of his operation is higher than the sector benchmark hence no discount can be claimed. It is important to note that this does not result in a 'penalty' in the form of a negative discount.

Brick manufacturers who are more carbon efficient then the sector benchmark can claim up to 5% discount on their taxable GHG emission volume.
Brick manfacturers that are less carbon efficient then the benchmark do not get penalised within the Z-Factor component of the Carbon Tax.

If the outcome is larger than 1 this means the clay brick makers operations are less carbon intensive then the sector benchmark and a discount on the taxable volume of GHG emissions can be realised.

According to the draft Carbon Tax bill the discount that can be realised is capped at 5% of a company's total emission.

Although this provides an opportunity for brick makers to reduce their tax burden by improving the carbon efficiency of their operations in relation to the benchmark, it is important to note that in its current form the formula seems to suggest that the discount percentage is distributed linearly. In other words, if an operation is 2% more carbon efficient then the benchmark, a discount of 2% can be claimed. In practical terms this means that no additional Z-Factor discount can be obtained by becoming more than 5% carbon efficient than the sector benchmark.

For further information on the Climate, Carbon and Energy Regulations:
The Clay Brick Association of South Africa
Website: www.claybrick.org/climate-carbon-energy-regulations

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This publication is based on Draft Carbon Tax Bill and the Draft Regulations: Carbon Offsets published by the National Treasury on the 2nd of November 2015 and 20th of June 2016.

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