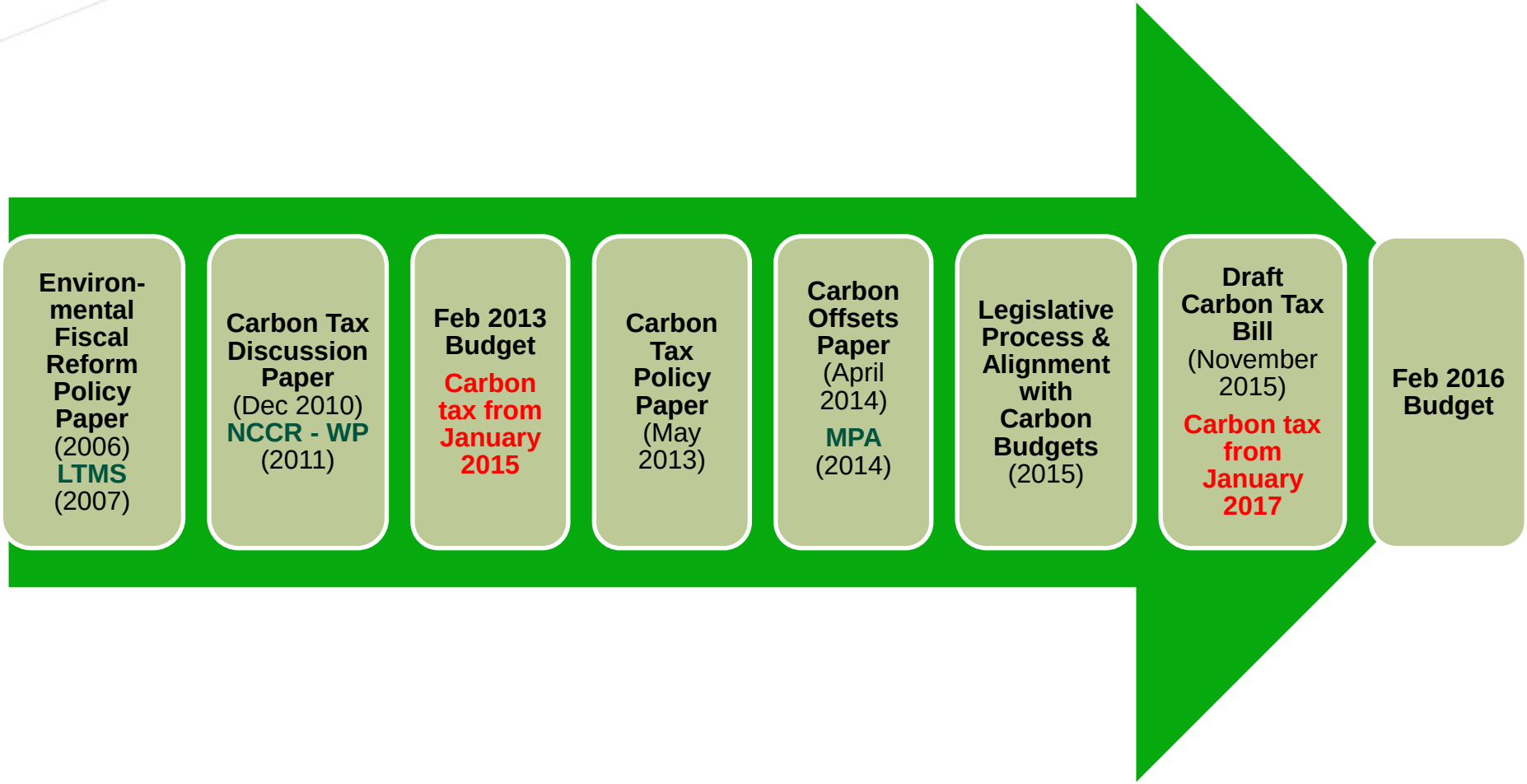
DNA Economics

The proposed carbon tax

NBI Carbon Tax Public Seminar

29 February 2016

Process to date



Adapted from National Treasury (2015)

Current status

- In 2013 Budget National Treasury announced first of January 2015 as implementation date for SA carbon tax

- Implementation date pushed out to first of January 2017 in Draft Carbon Tax Bill (November 2015)

- 2016 Budget Review:

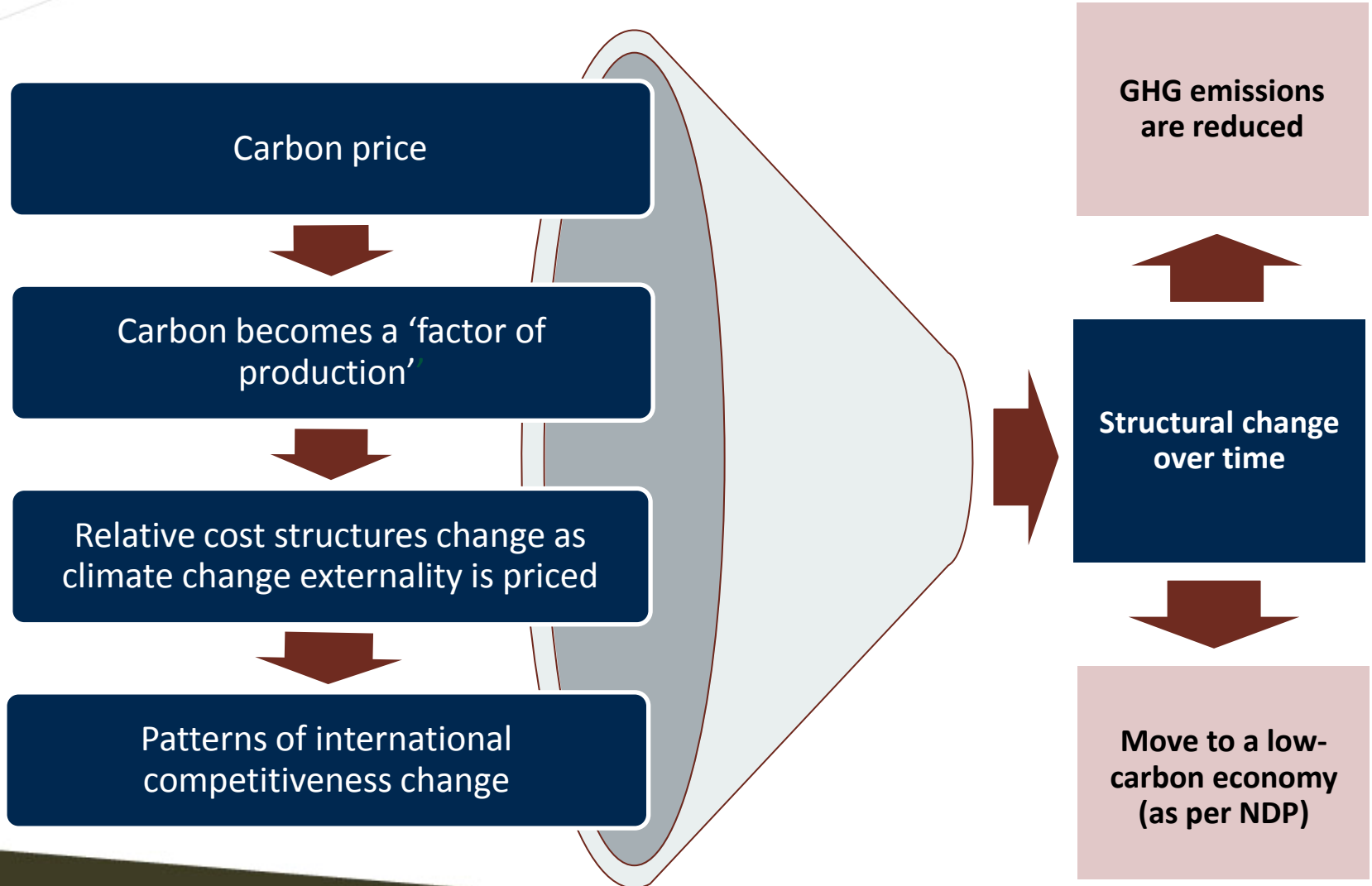
Update on implementation of carbon tax

The main aim of the carbon tax is to put a price on the environmental and economic damages caused by excessive emissions of greenhouse gases. A secondary aim is to change the behaviour of firms and consumers, encouraging them to use cleaner technology.

Given the economic outlook, the carbon tax has been designed to ensure that its overall impact will be revenue neutral up to 2020. The draft Carbon Tax Bill was published in November 2015, with 90 comments received to date. The draft bill will be revised, taking into account public comments and further consultation.

Source: National Treasury (2016)

Purpose of carbon tax



Proposed carbon tax design

- Phased implementation
  - Phase 1: Jan 2017 – Dec 2020
  - Phase 2: Jan 2021 – Dec 2025

- Design of carbon tax reviewed for Phase 2
  - Carbon budgets alignment
  - Level of tax relief provided through allowances may change
  - May be done concurrently through a move to absolute allowances set on the basis of carbon budgets

Proposed carbon tax design (2)

- Carbon tax on all direct (Scope 1) GHG emissions (CO2, CH4, N2O, perfluorocarbons (PFC), etc) based on emissions factors provided in Bill
  - Energy combustion emissions factors (based on inputs)
  - Fugitive emissions factors (based on inputs)
  - Industrial Process and Product Use Emissions factors (based on inputs)
- From ‘stationary’ sources only
  - Transport fuels (petrol and diesel) will be taxed via existing fuel levy regime.
- Coverage determined by Notice in respect of the Declaration of Greenhouse Gases as priority air pollutants under the Air Quality Act
  - So firms that have to prepare Pollution Prevention Plans (PPPs) will have to pay carbon tax
    - Although some uncertainty about coverage between instruments – will be addressed at NBI Seminar 2

Proposed carbon tax design (3)

- Agriculture, forestry and land use, and emissions from waste, exempted from tax during Phase 1 (to be reviewed before Phase 2)
  - But transport fuel use in these sectors not exempt
- Tax rate: R120/t CO_2e
- But allowances reduce effective rate (relative, not absolute threshold)
  - Maximum cumulative allowances differ between sectors/activities
- Carbon offsets reduce effective rate further – but amount of offsets that can be used is capped
- No tax on sequestered CO2e (but can only utilise sequestration up to amount of combustion emissions)

Proposed carbon tax design (4)

Sector	Basic tax-free allowance for fossil fuel combustion emissions %	Basic tax-free allowance for process emissions %	Fugitive emissions allowance %	Trade exposure allowance %	Z-factor allowance %	Carbon budget allowance %	Offsets allowance %	Maximum total allowances %
Fuel combustion								
Energy Industries								
Main activity electricity and heat production	60	0	0	0	0	5	10	75
Petroleum refining	60	0	0	10	5	5	10	90
Manufacture of solid fuels & other energy industries	60	0	0	10	5	5	10	90
Manufacturing industries and Construction	60	0	0	10	5	5	10	90
Iron and steel	60	0	0	10	5	5	10	90
Non-ferrous metals energy	60	0	0	10	5	5	10	90
Chemicals	60	0	0	10	5	5	10	90

Source: Schedule 2 of Draft Carbon Tax Bill (2015)

Proposed carbon tax design (5)

- Carbon tax will be ‘revenue ‘neutral’ during **first phase** due to revenue recycling
  1. Carbon tax rebate for the renewable energy premium (cost of renewable energy purchased from Independent Power Producers as per NERSA’s Multi Year Price Determination (MYPD) Methodology).
  2. Reduction in levy on electricity generated from non-renewable sources to address increases in the cost of electricity
     - NT media statement mentioned Phase 1 of carbon tax will be “neutral on the price of electricity”
  3. Funding of tax incentives for energy efficiency activities (energy savings)
  4. Increasing the allocations for free basic electricity/ alternative energy
  5. Funding of public transport and initiatives to move freight from road to rail

Source: Draft Carbon Tax Bill Media Statement (NT, 2015)

Proposed carbon tax design (4)

- Revenue will be recycled in this order, but size of individual allocations not clear
- So not clear how far down carbon tax revenues will cascade
- Also not clear how relative tax burdens will change as result of recycling
  - Firms will not benefit from recycling options in direct relation to their carbon tax costs

- Commitment mechanism for ensuring tax is revenue neutral also not clear
  - Mentioned only in Draft Explanatory Memorandum, not Draft Bill itself

Admin and institutional arrangements

- Administration
  - SARS administers tax on the basis of self reporting of emissions
  - Verification done by DEA (National Atmospheric Emissions Inventory System (NAEIS)) and DoE (Central Energy Database, will supply energy combustion data to the NAEIS)
  - Transfer of information from NAIES to SARS will have to be managed carefully
  - Significant admin burden remains with SARS
    - Lots of calculations in tax design (Schedule 2 allowances, trade allowance, performance allowance, remove diesel emissions, sequestration capped, amount of offsets used)
    - Most of these calculations on firm rather than industry basis
    - None of this information is coming from DEA (only emissions by 'type')
    - Not clear how additional information from firms is going to be obtained or verified

Admin and institutional arrangements (2)

- Alignment of reporting mechanisms needs to be addressed
  - Carbon tax not perfectly aligned with mandatory reporting regulations
    - Not all emissions covered by carbon tax have to be reported (reporting is on an activity basis in draft mandatory reporting regulations)
    - Emissions factors and reporting approaches not aligned
    - Etc – will be covered in more detail during Seminar 2
  - Reporting periods not aligned
    - Carbon tax on basis of "six-monthly environmental levy accounts and payments" (Draft Bill p20)
    - But mandatory reporting done on an annual basis

- Admin burden may not have been considered sufficiently (risk of disputes and additional admin for firms)

Carbon tax calculation

Amount of carbon tax payable is equal to

- Carbon tax on Combustion emissions: (Total GHG emissions from fossil fuel combustion minus sequestered emissions) X R120 X (1 - sum of all relevant tax-free allowances)

Plus

- Carbon tax on industrial processes and product use missions: Total GHG emissions from process activities X R120 X (1- sum of all relevant tax-free allowances)

Plus

- Carbon tax on fugitive emissions: Total GHG emissions from fugitive emissions X R120 X (1 - sum of all relevant tax-free allowances)

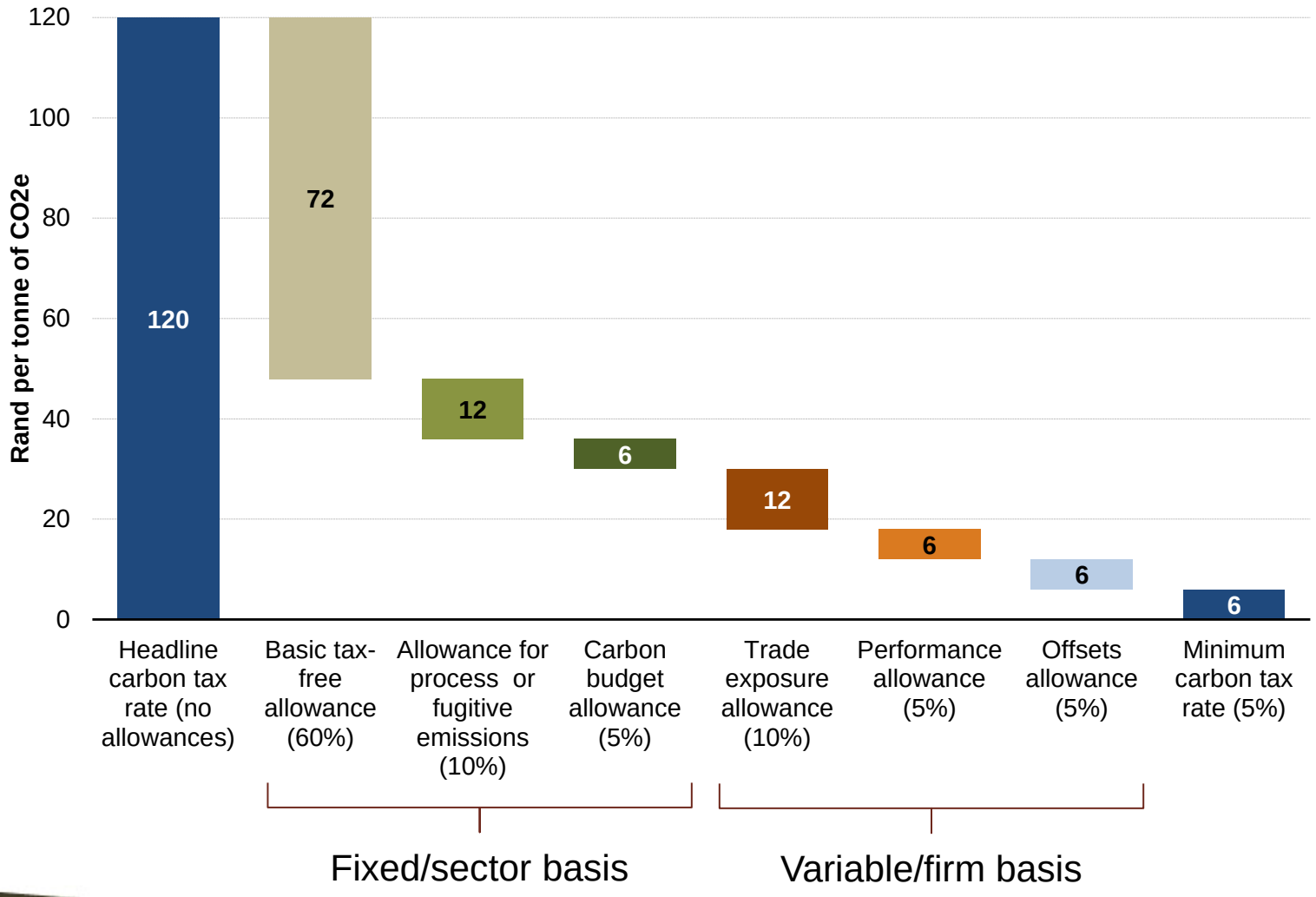
- Restrictions
  - Larger or equal to zero
  - 95% or smaller

Tax-free allowances

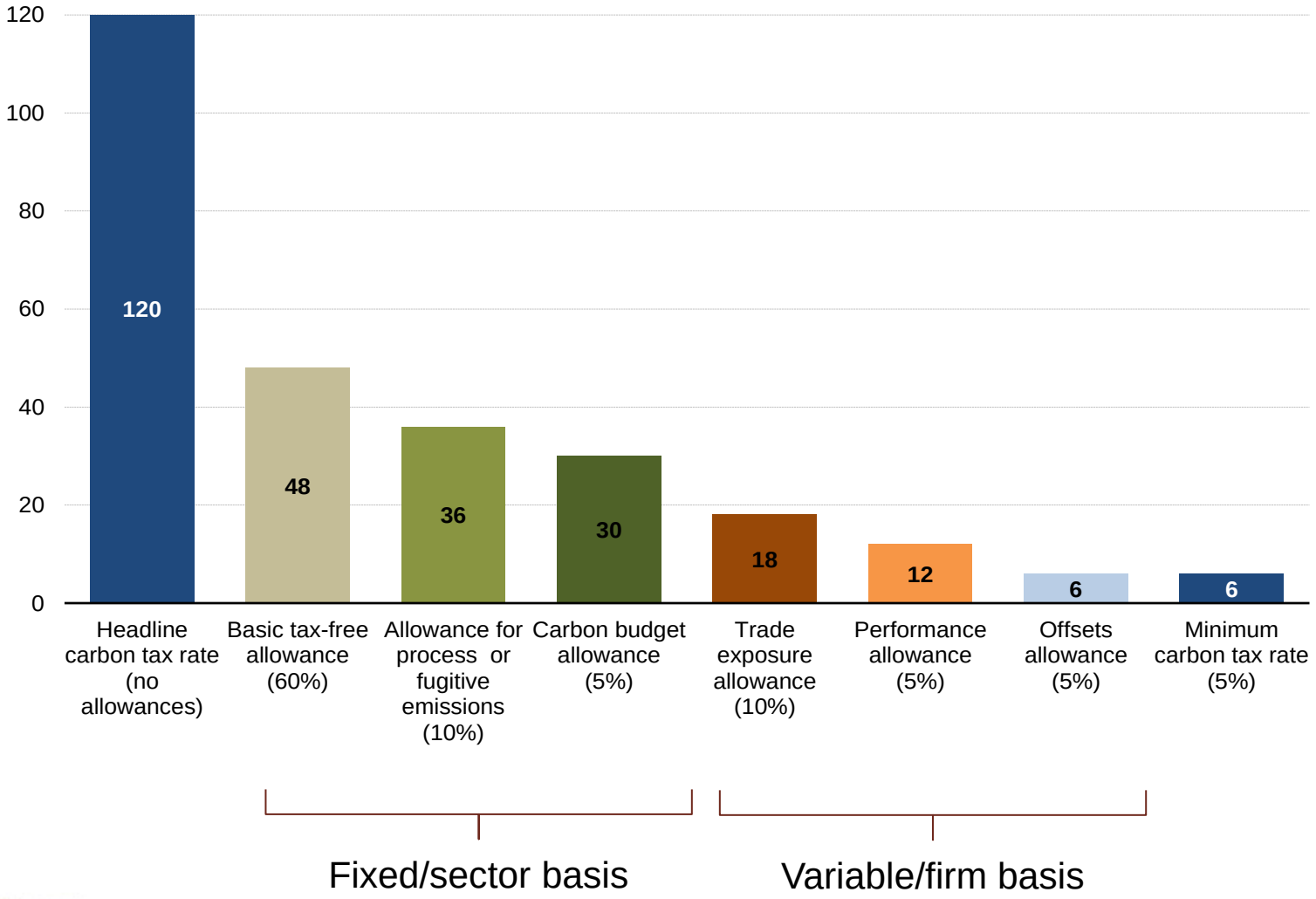
- Tax-free allowances provide tax-relief during Phase 1 to ensure smooth transition to low carbon economy and address carbon leakage concerns
  - 'Carbon leakage' refers to possibility that firms/sectors that are subject to a carbon tax may lose sales in domestic or export markets to firms/sectors from jurisdictions that have an unfair cost advantage due to not having to pay a carbon tax

- Tax-free allowance thresholds calculated as percentages rather than absolute thresholds
  - Tax on percentage of each type of emissions
  - Akin to standard approach of providing % relief (95% cap)
  - No scope for coming in below threshold and paying no tax

Tax free allowances (2)



Tax free allowances (3)



Tax free allowances (4)

- Because of design of carbon tax, 5% allowance does not lead to 5% change in carbon tax liability
  - Moving from 15% liability (based on cumulative allowances) to 10% is 33.33% reduction in carbon tax payable
  - Moving from 10% to 5% is a 50% reduction in carbon tax payable
- So seemingly small allowances can have large impacts on decision-making
- Tax-free allowances capped, but not at similar levels
  - Fuel combustion mostly capped at maximum allowances = 90%
    - Fuel combustion for 'Main Main activity electricity and heat production' capped at 75% free allowances (60% Basic + 5% Carbon Budget + 10% Offsets)
  - Industrial process emissions allowances capped at 95%
  - Fugitive emissions allowances capped at 95%

Tax-free allowances (5)

- Basic tax-free allowance of 60% on all emissions
- Carbon budget allowance
  - 5% for per cent allowance for ‘participating in carbon budget system’ / ‘complying with information reporting requirements for the carbon budgeting process’
    - Not clear what constitutes participation – broadest interpretation is that all firms will get carbon budget allowance since PPP will be a statutory requirement under Air Quality Act
  - Extra support does not constitute alignment
    - Carbon budgets do not allow offsets
    - Performance allowance may reward absolute increase in emissions
- Process emissions
  - Additional allowance of 10% on firm’s industrial process and product use emissions (not all emissions)
- Fugitive emissions
  - Additional allowance of 10% on firm’s fugitive emissions (not all emissions)

Performance allowance

- Performance allowance rewards firms for being more carbon efficient than their peers
- Z-factor scales up basic allowance in relation to sector emissions intensity benchmark
  - Up to 5% additional allowance if firm's emissions intensity is better than sector benchmark
  - Voluntary – so no penalty for being worse than benchmark
- GHG emissions intensity benchmarks for different industrial sectors or sub-sectors will be specified in regulation
  - Based on inputs received from different industry associations or companies
  - Intensity benchmark will include both Scope 1 and Scope 2 emissions (p 24 EM)
- Z-factor rewards 'additional' action – meaning unclear…
- Because Z-factor only kicks in once firm's emissions intensity is below the benchmark – only benefit to firms that are already as carbon efficient as (or more carbon efficient than) industry average

Performance allowance (2)

- Not clear if sequestered emissions or offsets are included in Z-factor calculation
  - Sequestered emissions seem possible
  - But offsets probably not
    - Allowance reduces tax rate, not taxable emissions
  - Offsets are included in total amount of allowances applicable to combustion, process and fugitive emissions
    - Double counting if reduce both tax base and tax rate
- Rationale: encourage reduction in carbon intensity of production
  - Implicit assumption: carbon price to low to incentivise change for very large interventions
    - Additional efficiency “kicker” required
    - **Tax benefit larger than effective tax rate since not only does firm pay no tax on emissions reduced, but they also pay a lower carbon tax rate on all remaining emissions**
    - Carbon tax reduction of more than R140 per tonne found in modelling for every tonne of emissions reduced that is taken into account for Z-factor calculation

Performance allowance (3)

- Measured at end of period (pay tax this year on last year's emissions)
  - Carbon price uncertain for all emissions ➡ carbon costs uncertain
  - ETS with support/grandfathering
    - Amount of free emissions known upfront (based on previous period's production)
    - Price of remaining emissions uncertain
    - But trading equalises carbon prices (and reduce carbon costs)
- Opportunities for firms with cheap/easy mitigation options
- **Focus on incremental efficiency improvement**s risk missing larger structural shifts
  - Increasing output by 15% while only increasing emissions by 10% leads to a higher performance allowance (provided that frim was within 0-5% Z-factor band previously
  - So carbon tax rate can go down as absolute emissions go up

Performance allowance (4)

- Downside risk created by nature of production processes
  - Typically configured to operate most efficiently at full capacity
  - Changes in output influence carbon-intensity of production
    - Reductions in output tend to increase carbon-intensity
  - But only affects firms that are more carbon efficient than benchmark
- Carbon-efficiency adjustment could lead to pro-cyclical carbon price for efficient firm
  - In times of depressed demand GHG-efficient firms may find that their carbon tax liabilities (as a percentage of costs) increase at the same time as their revenues decline (provided that had a better than average GHG-emissions intensity to start with)
  - Depends how fast industry benchmarks are adjusted
- Allowance capped at 5%, but impact on carbon tax liability can be up to 50%

Offsets

- Reduce carbon tax liability by 5% or 10% (could be up to 50% of tax liability)
- Carbon Offsets discussion paper published in 2014
  - Specifics of proposed carbon offset mechanism still being developed
- But concerns around
  - Administrative costs due to use of existing standards that have not really taken off in South Africa
  - Limited pool of local allowances – only SA-based credits allowed (Eskom can offset 10% of its emissions and Sasol 5% of its emissions!)
  - Offsets can only be generated by firms that are not subject to the carbon tax
- Benefit of R120/tCO2e for each tonne of emissions offset - so can have large impact and incentive effects
  - But large emitters within carbon tax next cannot use this as mechanism to pool funds or reduce risk of large mitigation projects

Trade exposure allowance

- Trade exposed allowance
  - Defined only on basis of ratio of exports to sales (no consideration of imports)
  - Sliding scale of support
  - Support depends on firm performance, not sector performance (which is international norm)

Table 2: Trade-exposed, tax-free threshold relief

Exports (E)	
0.4	
% relief (Y2)	% of sales
0	Below 5
2	5
4	10
6	15
7.2	18
8	20
10	25
10	30
10	35
Y2 = 0.4 × E E must be >5%	
Maximum for Y2 = 10%	

Source: Explanatory Memorandum to Draft Carbon Tax Bill (2015)

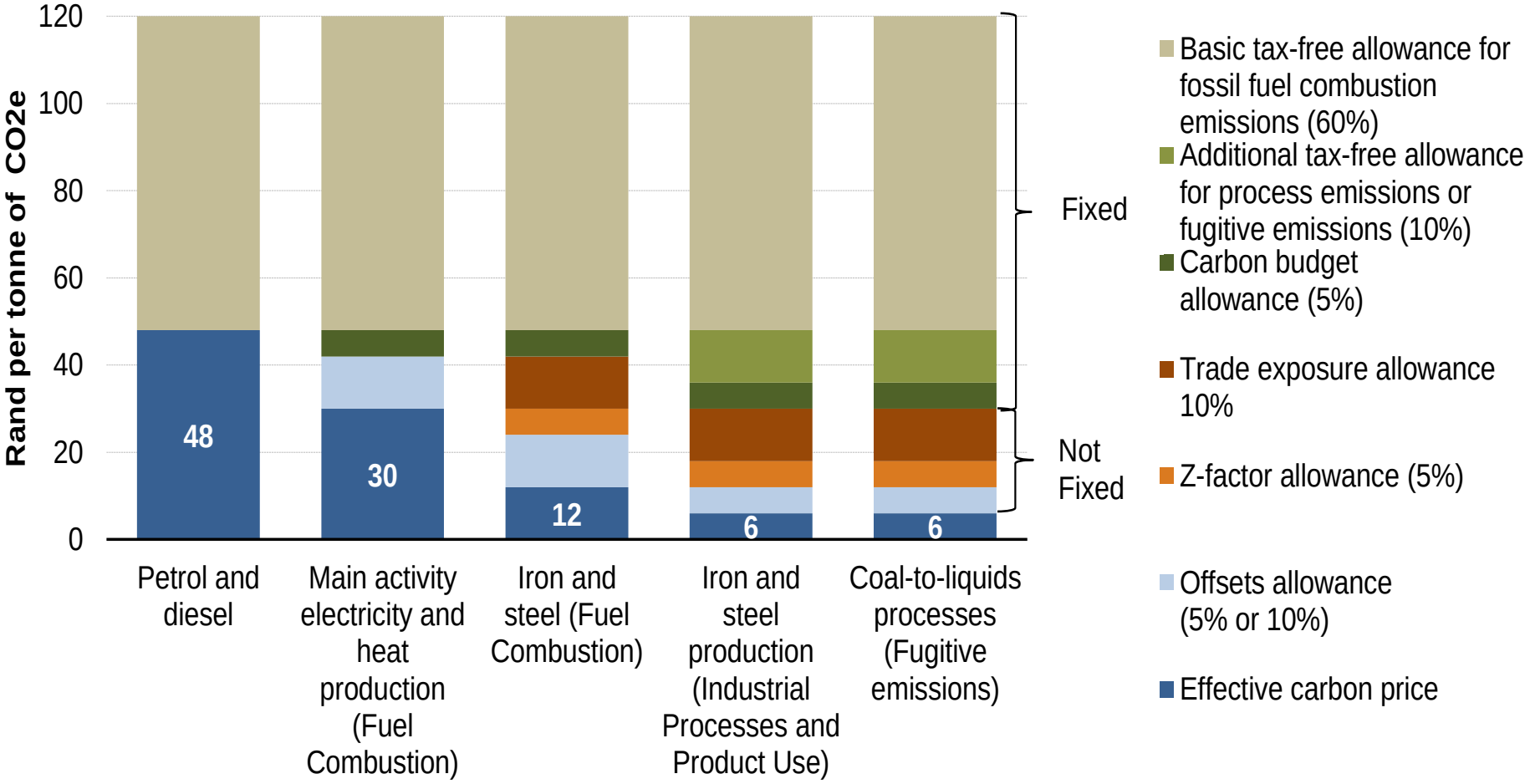
Trade exposure allowance (2)

- Lack of imports in trade exposure calculation is problematic
  - Exposure to carbon leakage is function of imports and exports
  - More efficient firms are exporting → Firms that compete against imports probably more at risk
- Trade allowance only provides support to exporters with direct emissions
  - Highest direct carbon tax rate on Main Activity: Electricity & Heat
  - Fine if electricity price doesn't increase (much), but what about next 5 years
  - What happens when carbon tax increases (base rate ↑ or allowances ↓) and electricity levy is already at 0?

Trade exposure allowance (3)

- Calculated on firm-level data, not industry
  - Exports can be influenced by factors like location or access to infrastructure
  - Current level of exports not perfect indicator of potential to export for individual firm
  - Firm exports more variable than industry/sector exports
- Similar firms treated differently
  - This has been shown to be problem from a competition perspective during carbon budget process

Carbon taxes in different sectors



Source: DNA Economics based on Carbon Tax Bill (2015)

Range of carbon taxes – not one tax

- Same activity (i.e. combustion of coal in boilers/onsite electricity generation if tax is levied on a sector rather than activity basis) could be subject to different carbon prices
- Distorts firms' energy choices, may lead to unintended consequences
  - Firms minimise their overall energy costs (including carbon tax liability)
  - Ignoring efficiency adjustment, carbon price Eskom faces when emitting one tonne of CO_2e from combusting of coal is around R30/tCO2e
    - Carbon cost associated with burning coal at Iron and Steel firm is around R6-R12/tCO2e
    - Depending on how carbon tax costs of Eskom and IPPs are passed on into regulated electricity prices in future, may influence choice between grid electricity and other energy sources while grid electricity is largely coal-based
- Tenuous link between carbon price and carbon liabilities creates opportunities for **windfall profits** in concentrated markets
  - Pass on more than carbon costs

Davis Tax Committee

- First interim report on the proposed carbon tax for South Africa (2015)
  - Raised issue of revenue forecast
    - Difficult to do
    - Could change significantly if more offsets are generated than anticipated
    - Downside of full revenue recycling
  - Need for up-to-date modelling of carbon tax impact
    - “A more detailed analysis of the impact of the carbon tax proposals and revenue recycling is required for the DTC to meet its mandate.”
    - “pleased to note that the Draft Carbon Tax Bill indicates that further modelling is underway”
    - But modelling has been ongoing for 2-years now (World Bank/PMR)
    - This carbon tax design is VERY difficult to model
  - Unlikely that Industry emissions intensity benchmarks can be agreed by 2017
  - Specifics around revenue recycling needs to be spelled out
    - How exactly is this pie going to be divided (and how many times!)

Conclusion

- Attempted to address a number of important issues
  - Obviously tried to take local context into consideration
  - Innovative approach to carbon tax design
- Administratively tax is very complicated
  - Government and private sector capacity likely to be an issue
- Uncertainty regarding carbon price faced by firms in Phase 1
  - Plays havoc with incentives and investment planning
  - Makes it VERY difficult to model

Conclusion (2)

- Uncertainty about carbon price path going forward
  - No clear path provided
  - Reduction in thresholds could potentially cause spike in carbon price in second period
- High likelihood of unanticipated consequences
  - Very difficult to predict firm behaviour when faced with barrage of different incentives
- Simpler design with more consistent carbon price may be desirable, for example:
  - One set of combustion allowances, one set of process allowances and one set of fugitive emissions allowances, combined with more sophisticated mechanism to competiveness issues

If you have any questions about this presentation,

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