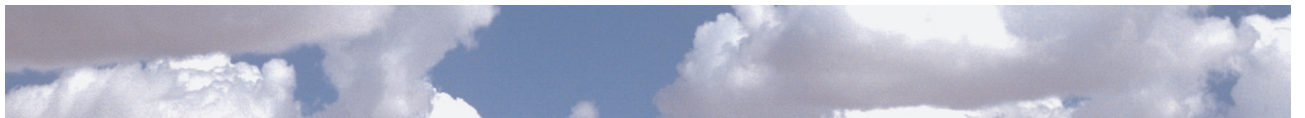


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Emissions Trading Briefing Note No.1

The Adequacy of Proposed Emission Targets



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Introduction

A range of measures are being introduced across the world in an attempt to reduce emissions of greenhouse gases and combat global warming. In Australia one such measure is the proposed National Emissions Trading Scheme (NETS), as set out in the states' joint discussion paper 'Possible Design for a National Greenhouse Gas Emissions Trading Scheme'. More recently the Commonwealth Government has established a taskforce to investigate the desirability and types of trading schemes.

There is a high level of public interest in climate change mitigation, as evidenced by opinion polls, attendance at Al Gore's 'Inconvenient Truth', ongoing media attention and the prominence given to the economic analysis of the Stern Review, which identified that the benefits of early action to mitigate greenhouse gas emissions far outweighed any costs. Given this level of interest and support for taking action on climate change it is important to assess whether the emissions caps proposed for NETS or other similar schemes are

sufficient to contribute to a lowering of the risk associated with climate change impacts. This briefing note focuses on NETS because it is the most advanced thinking available for Australia. However, the views presented here are just as applicable to other schemes that may emerge.

The proposed National Emissions Trading Scheme (NETS) will operate as a cap-and-trade scheme for the stationary electricity sector. Two caps are proposed: 176 mega-tonnes (Mt) in 2030, (same level of electricity generation emissions in 2000); and 150 Mt in 2030, (15 per cent reduction on 2000 levels). However, given that deep cuts in greenhouse gas emissions by 2050 are required to avoid high risk climate change, and that even deeper cuts are required to stabilise the carbon concentration in the atmosphere, NETS is unlikely to deliver the required level of greenhouse reduction to reduce the risks of severe climate change.

Setting of Targets for Greenhouse Gas Reduction

The setting of targets for greenhouse gas reduction is essentially an exercise in risk management. There is no debate that some form of climate change will occur - the question is how much and what will be the impact on the planet and society? The intensity of climate change is a function of carbon dioxide (and equivalents) concentrations in the atmosphere; when stabilisation occurs; and the point and timing of peak emissions.

Impacts arising from climate change will continue to increase in intensity until stabilisation occurs. Stabilisation is achieved when annual greenhouse gas emissions are less than the Earth's natural capacity to absorb greenhouse gases from the atmosphere (estimated to eventually decrease to 5 giga-tonnes of carbon dioxide equivalent - GtCO₂e) [2]. This implies that emissions must be reduced to less than one tonne CO₂e per capita.

The point and timing of peak emissions affects the cumulative build-up of greenhouse gases. A later peak at a higher level of emissions dramatically increases the concentration of greenhouse gases in the atmosphere and will require even steeper cuts to emissions. Conversely, the sooner and lower the peak of global greenhouse emissions, and the lower the concentration of CO₂e at stabilisation, the lower the risk of dangerous climate change. For instance, the concentration of greenhouse gases for 2005 is 430 ppm CO₂e with accompanying emissions of 45 GtCO₂e. Under business-as-usual this concentration will increase to 630 ppm CO₂e by 2050, with a corresponding annual emission level of 84 GtCO₂e. This trajectory carries the 'certainty' of exceeding 3 degrees centigrade (°C) increase in global temperature and a 50 per cent risk of temperature increases of more than 5°C [2].

The only way to manage this risk is to reduce emissions. For example, see the following table. [2]

Stabilisation ppm	Risk of 2° increase	Risk of 3° increase
550	63-99%	21-69%
500	48-96%	11-61%
450	26-78%	4-50%

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Reducing climate change risk will involve significant cuts in greenhouse gas emissions. There are a number of targets that Australian jurisdictions have adopted in response to global warming and risk management.

These are presented in the following section.

Australian state targets for greenhouse gas reductions include:¹

Australian Targets for Greenhouse Gas Reduction

- New South Wales – return to 2000 levels by 2025 (112.1 MtCO₂e), and a 60% reduction on 2000 levels by 2050 (44.8 MtCO₂e) [3]
- Victoria – the Victorian greenhouse strategy sets no overall reduction target [4], however there is a Labour Party election commitment for a 60% reduction by 2050² (48.0 MtCO₂e based on 2000 levels of 120.1 MtCO₂e)
- Queensland – no overall reduction target set under greenhouse strategy [5], however strategy up for review over next 18 months
- Western Australia – no overall reduction target [6], however the Premier is reportedly putting together a climate change action plan due for release in February/March 2007 that will consider a target
- South Australia – draft greenhouse strategy sets no overall reduction target [7], however SA Government has introduced a bill requiring a 60% reduction by 2050³ (13.0 MtCO₂e based on 1990 levels of 32.4 MtCO₂e)
- Tasmania – draft climate change strategy sets no overall reduction target [8], however target of 7.4 MtCO₂e by 2020 (25% reduction on 2000 levels of 9.8 MtCO₂e) suggested in 'Tasmania Together (Revised 2006)'⁴
- Australian Capital Territory – draft climate strategy indicates support for a 60% overall reduction target [9] – finalised strategy with target expected early in 2007
- Northern Territory – no overall reduction target set in strategy for greenhouse action [10].

The above Australian targets can be compared to - the Californian reduction target of 80% on 1990 levels;⁵ the proposed European Union target of 20% (and possibly 30%) by 2020; and also to the need to ultimately reduce anthropogenic greenhouse gas emissions to a level where natural systems are able to absorb them (estimated by the Stern Review to eventually reduce below 5 GtCO₂e globally, or less than one tonne CO₂e per capita). Based on ABS projections on population, this translates to less than 33 MtCO₂e – or a 95% reduction on 1990 levels. These reduction scenarios are examined in the context of the NETS caps on electricity emissions in the following section.

National Emissions Trading Scheme: Overview

The discussion paper 'Possible Design for a National Greenhouse Gas Emissions Trading Scheme' sets out the potential operation of a scheme for the stationary electricity sector. Under NETS, liable parties are initially those electricity generators with a capacity of over 30 mega-watts electricity (MWe), although there is the flexibility to introduce other participants, such as other large stationary energy users. NETS is a cap-and-trade scheme where participants must submit a permit for each equivalent tonne of carbon dioxide (1 t CO₂e) they emit. Permits can be traded and banked, but borrowing against future allowances is not allowed.

Some allowable activities will create offset credits, which will also be tradable. Nominated activities include forestry, carbon capture and storage, reduced industrial process emissions and methane destruction, as long as they meet additionality, permanence and measurement criteria. However credits will not be created through the generation of renewable energy to avoid the 'double dipping' situation where an electricity generator could be credited for both a reduced carbon intensity and for the generation of renewable electricity, even though only a single 'unit' of greenhouse gas reduction has occurred.⁶ This means that ongoing

1 All amounts of greenhouse gas reported as net state emissions from AGO See <http://www.greenhouse.gov.au/inventory/stateinv/>

2 See http://www.vic.alp.org.au/alp/pdf/policies/factsheets/Climate_change_fact_sheet.pdf

3 See <http://www.ministers.sa.gov.au/news.php?id=1053>.

4 See <http://www.tasmaniatgether.tas.gov.au/>

5 See http://www.climatechange.ca.gov/documents/2006-09-27_AB32_GOV_NEWS_RELEASE.PDF

6 Liable participants who do generate renewable electricity will, however, save approximately one permit for every mega-watt hour (MWh) of carbon neutral electricity generated. This would essentially free up a permit to trade or bank and should drive demand in the renewables sector.

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support for renewable electricity generation (and demand management) needs to be maintained, external to a scheme.

The proposed operation of NETS suggests that the value of permits and offsets will be underpinned by a penalty for non-compliance. Each permit (or offset credit) carries the right to emit 1 t CO₂e and will be given for free (grandfathered) to avoid immediate adverse impact on electricity generators and 'trade-exposed, energy-intensive' companies. Any remaining permits would be auctioned.

There are two emission reduction targets scenarios for 2030: a cap of 176 mega-tonnes (Mt) (same level of

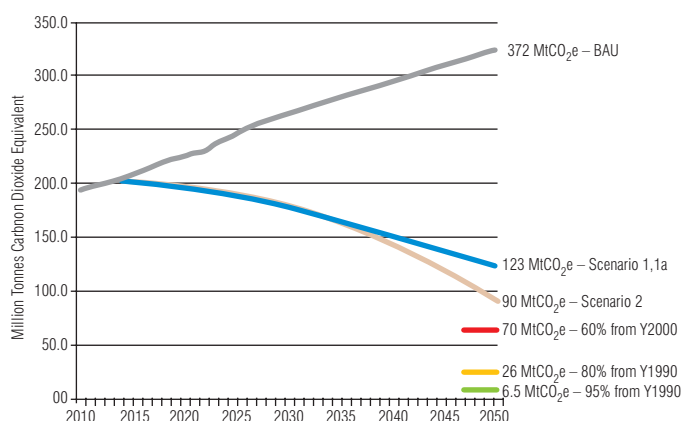
emissions as in 2000); and a cap of 150 Mt (15% reduction on 2000 levels). Adjustments could be made under an enlarged scheme, and revised to achieve international comparative performance. The proposed scheme start date is 2010, ideally administered by the Commonwealth, however, a Ministerial Council or Forum, Scheme Developer and Scheme Regulator could be established by the States and Territories in the absence of Commonwealth involvement [1]. In February 2007, the states announced they would implement the scheme in 2010 if the Commonwealth has refused to act. The performance of NETS in the context of broader targets for greenhouse gas reduction is discussed in the following section.

NETS and Electricity Sector Emission Reductions

Under the proposed emissions trading scheme, greenhouse emissions from stationary electricity generators will be capped according to emission reduction targets. As noted previously, there are two potential targets presented in NETS: firstly a cap of 176 MtCO₂e in 2030 (same as 2000 levels); and secondly, a cap of 150 MtCO₂e in 2030 (15% less than 2000 levels). The scheme also outlines a methodology for fixing caps over a period of ten years and indicates likely cap reductions for the following ten years. Therefore at any point in time participants will know the fixed cap of emissions for the upcoming ten years and will have a lower and upper limit of caps for the following ten years. This would inform investment decisions and create some certainty. The proposed scheme also flags that caps would be adjusted if the scheme was enlarged, and also revised on the basis of international comparative performance. However in the discussion paper the proposed reduction scenarios are only modelled up until 2030 [11]. Although NETS has ostensibly been designed with emissions caps that track in line with a 60% reduction, there is a certain ambiguity as to whether proposed targets developed under NETS will deliver this goal.

Modelling of NETS performance for the discussion paper assumed a growth rate of emissions under business-as-usual (BAU) of 1.7 per cent [11]. However, the difficulty with extending this growth rate to 2050 is that there is invariably some form of market correction that disrupts continuous compound growth. To account for this adjustment, a lower growth rate of 1 per cent for BAU between 2030 and 2050 is used here. This provided an estimate of electricity sector emissions in 2050 of 372 MtCO₂e under BAU. The three reduction

targets discussed above and applied to electricity emissions at 2050 are as follows:



Forecast performance of NETS compared against business as usual and 60%, 80% and 95% reduction targets (derived from [11])

- 70.4 MtCO₂e – 60 per cent reduction on 2000 levels (this would reduce to 51.6 MtCO₂e if 1990 levels of 129 MtCO₂e were used [12])
- 25.8 MtCO₂e – 80 per cent reduction on 1990 levels
- 6.5 MtCO₂e – 95 per cent reduction on 1990 levels.

The modelling for NETS suggests that Scenarios 1 and 1a peak in 2014 at 199.1 MtCO₂e, while Scenario 2 peaks slightly earlier and higher in 2013 at 200.6 MtCO₂e. As is shown in the Figure, following the trend curve established by modelled performance between 2010 and 2030 suggests that Scenarios 1 and 1a will deliver a 30 per cent reduction on 2000 levels (5% reduction on 1990 levels) by 2050. Applying the same approach to Scenario 2 suggests that a 49 per cent reduction will be delivered on 2000 levels (39% reduction on 1990

levels) by 2050. On the basis of this analysis, none of the scenarios put forward under NETS would meet a 60 per cent reduction target (on 2000 levels) by 2050, and would also fall short of meeting a 20 per cent reduction

on 2000 levels by 2020 (141 MtCO₂e), let alone meeting California's target of a 80 per cent reduction on 1990 levels.

Adequacy of NETS Targets

While it is acknowledged that the NETS operational model has the flexibility to increase caps on electricity sector emissions beyond 2030, and as such has the theoretical capacity to deliver on 60, 80 or even 95 per cent reductions by 2050, the trend line of emission reductions modelled to 2030 suggests that a 60 per cent reduction on 2000 level emissions will not be met. This is problematic in the context of achieving an Australian wide 60 per cent reduction (223.4 MtCO₂e based on 2000 net emissions of 558.1 MtCO₂e), let alone achieving an 80 per cent reduction (110.4 MtCO₂e based on 1990 net emissions of 551.9 MtCO₂e [13]), as different sectors will have different capacity for emission reduction. For example, emissions from Australian agriculture may face constraints to reduction caused by associated enteric emissions from livestock. Similarly emissions from solid waste may be difficult to

reduce because of legacy issues from many biologically active small landfills. These factors may require increased reductions from sectors such as electricity generation, which have known point sources and where emissions can be accurately measured.

Focussing on for example a 30 per cent reduction in emissions (based on 1990 levels) would alter the trajectory of emission cuts needed to meet either a 60 or 80 per cent reduction target. Furthermore, an interim target would also dramatically reduce cumulative emissions from the electricity sector, and reduce the potential for entrenching carbon intensive infrastructure into the national electricity grid. A carbon trading scheme such as NETS is needed in the race to reduce greenhouse gas emissions, however if targets set in the scheme are not effective, there is a real risk of much effort with little appreciable benefit.

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