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18 April 2008

SKM submission on ETS discussion paper
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SUMMARY

Dear Sir/Madam,

Submission on the ETS paper dated March 2008

Sinclair Knight Merz (SKM) is pleased to have the opportunity to make a submission on the Emissions Trading Scheme discussion paper.

SKM is an independent, multi-disciplinary consulting company head-quartered in Australia with 7,000 staff in offices around the world. We provide technical-based advice and services on power and industry, mining, infrastructure, buildings and environmental matters to the private and public sectors. More information on SKM can be obtained at <http://www.skmconsulting.com>.

SKM's views expressed in this submission are based firstly on its commitment to sustainability, and taking on a leadership role in this important area. Secondly, SKM believes its interests are broadly aligned with the long-term prosperity of the Australian and global economies, and believes that a submission on this important proposal is appropriate. SKM considers an ETS must strike a delicate balance between effectiveness and minimising economic and financial impacts to deliver the emissions reduction objective at minimum cost to Australia.

In making this submission we are acting on our own volition and have not been engaged or encouraged by any other party to make these comments on their behalf.

Our submission to the ETS review in this instance primarily concerns the stationary energy sector, with which we are very familiar.



We trust that these comments are of value to the inquiry – the ETS scheme that might be created from the inquiry's findings will be (and is now) a fundamental force in the energy sector for many years and we are very keen to support the design process of the scheme.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Rohan Zauner'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

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COMMENTS ON THE EMISSIONS TRADING SCHEME DISCUSSION PAPER OF MARCH 2008

1. Introduction

Our comments on the proposals outlined in the Discussion Paper are presented based on the Sections within the discussion paper and are founded on our knowledge and interest particularly in the stationary energy sector.

2. Framework to guide ETS Design

SKM broadly concurs with the framework discussion presented, and has no comments at this time.

3. An Australian ETS prior to the establishment of an International Agreement on Greenhouse Gas Mitigation

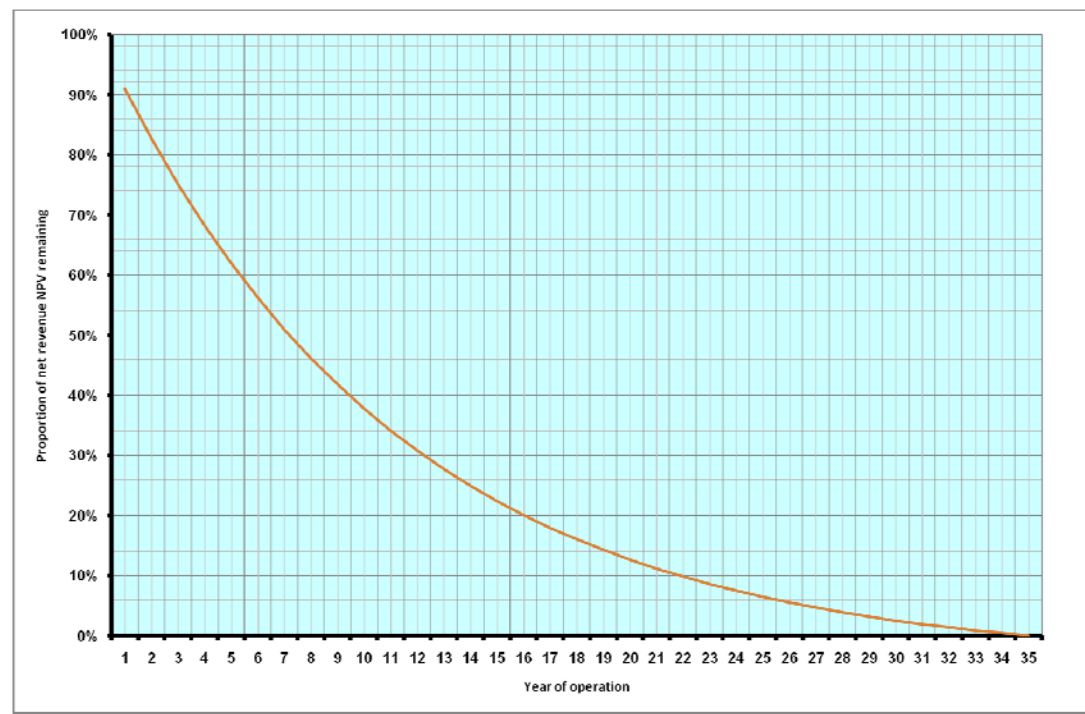
Trajectories

The trajectory selected for emissions abatement is key to the outcomes of the ETS dictating the cost to the economy and the amount of abatement gained. Once trajectories are established, energy market participants will model the future price and will factor this projection into their investment decisions. The more uncertainty there is regarding the stability of the chosen trajectory, the more uncertainty there will be in future ETS prices and hence more difficulty in investment decision making.

Five years is not a sufficiently long period of market framework stability when a large proportion of a firm's cashflows are entirely dependent on government discretion in setting the targets. A period of 15 years or more of framework stability may be needed for investment confidence. It can be seen from Figure 1 that approximately 60% of the NPV of a project's net revenue is created beyond Year 5 whereas only approximately 20% remains beyond Year 15 of a project's life.



■ **Figure 1 NPV of net revenue remaining through a project's life¹**



There is an intention that the Australian scheme be linked to an appropriate international scheme when the international scheme is designed and agreed. This creates the prospect that the trajectory for Australia's emissions reductions will be changed to match the internationally agreed trajectory and Australia's agreed share of the obligation. The greater the extent that the Australian ETS is different from the probable eventual obligation, the greater will be the economic shock of the transition.

Consequently, effort should be directed towards selecting trajectories for the Australian ETS which are the best current expectation for Australia's long-term international trajectory.

Unfortunately the international allocation of emissions between countries is far from being established at this stage.

Considering the economic shock of a change in trajectory, it could be expected that Australia's committed trajectory under the domestic ETS will play a significant role in establishing Australia's position when negotiating Australia's international commitment beyond the first Kyoto reporting period (to 2012).

¹ Based on 35 year life and discount rate of 9.5% pre-tax real, assuming constant real cashflows

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One perspective on how long-term allocations might be made between countries would be to recognise that the only truly equitable allocation of the planet's atmospheric "commons" (in this case its capacity to accept GHG emissions) would be for equal per-capita emission budgets.

Refinement of such a simple allocation model to consider other factors, such as whether this is truly an equitable allocation should be considered in due course.

Maximum economic efficiency however is probably dictated by allocation on the basis of maximum economic output per unit of emissions – that is allocation per unit of GDP.

These two allocation policies will inevitably result in different shares of the global emissions budget. It is suggested that an initial allocation policy biased (say 75% weighting) towards emissions per GDP unit and that transitions to a bias (again, say 75% weighting) towards allocations on a per capita basis over a term compatible with the life of capital assets and the structural change inertia of economies – perhaps 50 years would be an appropriate transition period – has the most merit.

If, as stated in the terms of reference for the inquiry, that an appropriate global target is for developed countries to reduce their emissions by 60% by 2050 against 2000 emissions levels, then this allocation model is sufficient to determine Australia's share and its interim targets.

The trajectory assigned to countries early on in the program might also include some weighting given to the initial rate of change of GHG emissions with time so that economic shock from sudden trajectory changes can be reduced.

If the rate of structural change called up by the ETS trajectory is greater than the rate that the economy can deliver, considering the rate that new technologies can be commercialised and the rate that new projects using alternative fuels can be conceived, approved and built, then prices in the ETS can be very high. If structural change cannot achieve the trajectory built into the ETS, the ETS price must rise until the emissions reduction is achieved by reduction in demand in the economy. Since energy markets like the electricity market are relatively inelastic in the short term, high prices are required to achieve demand reductions.



SKM notes two issues for consideration on this point. Firstly, demand for energy is largely driven by capital assets, with short term behaviour alone capable of producing only limited change. The trajectory must allow for capital stock turnover cycles to achieve deeper cuts in demand. Secondly, the ability to change the electricity generation mix is driven not only by the time in which new generators can be built, but is also affected by network capacity and coverage. In the case of renewable resources this is a significant issue for Australia.

Australia should not only give careful consideration to the initial trajectory aspirations of the domestic ETS, it should at the same time establish a policy and direction on negotiating future international commitments. Recognition of the need to balance both economic efficiency and equity outcomes globally as discussed above could be a core part of Australia's international policy platform on GHG emissions budgets.

SKM also notes comments reported in the media regarding the option of allowing the market to determine the optimum trajectory, and the view that up to 40 years worth of permits could be released onto the market at one time. SKM is sceptical this approach would work in practice, and points to examples such as fishing grounds being over-exploited to the point of collapse as instances where the same rational behaviour could be expected but has not occurred in practice. It is likely that commercial discount rates and commercial asset lives, and individual interests linked to short term outcomes are different than the discount rates that should be applied by society over such long terms and this produces the wrong behaviour. Such an allocation method would also be difficult to be amended if this is found necessary later. International agreements are also likely to contain commitments to intermediate milestones, which would be incompatible with a scheme with long term pre-allocation of permits.

What should be done with the auction proceeds?

On page 32 of the discussion paper it is claimed that the price paid by households would be the same whether permits are free issued or auctioned. This is not expected to be the outcome in practice.

To illustrate the issue, SKM offers a model of a hypothetical simplified electricity market with a structure like the Australian NEM.



Take the market as initially supplied 100% by coal fired power (and with gas fuelled stations as the only alternative) and assume that the desired trajectory has it that a 10% reduction in GHG emissions is required in a particular year relative to what they would be without an ETS. Assume that supply and demand are reasonably in-balance and that there is some load growth – hence the expected market price for electricity in an energy only market like the NEM must be strongly related to the long run marginal cost (LRMC) of the most efficient new entrant generator².

Consider the following simplified approximations of reality of the relevant market parameters:

■ **Table 1 Simplified electricity market generator parameters**

Generator type	Short run marginal cost excl. ETS cost (SRMC)	Fixed cost (including return of and on capital)	Resulting LRMC excl. ETS cost at 100% capacity factor ³	GHG emissions rate
Coal	\$15/MWh	\$250,000/MW/a	\$43.54/MWh	1.0 tonnes/MWh
Natural gas	\$30/MWh	\$150,000/MW/a	\$47.12/MWh	0.5 tonnes/MWh

Take the market size as 180,000 GWh/a (= 180 million MWh) which is roughly the amount of electricity generated by coal in Australia at the present time. Ignoring requirements for reserves and other factors, there is 20,548MW of supply capacity required. Given the parameters above, with this generated wholly by coal in this simplified market the GHG emissions would be 180Mtonnes/a.

² If it were consistently lower than the new entrant's LRMC then new generation would not be built and prices would tend to rise as further demand growth exposed a shortfall in supply. If it were consistently higher then new generation would be constructed and the extra supply capacity relative to demand would reduce the market price.

³ This means the cost based on the plant operating at full capacity for every hour in the year. In this simplified model plant availability issues etc are ignored.

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Without an ETS, the power is produced by coal and the market price is based on a coal new entrant LRMC and hence is \$43.54/MWh from Table 1. Consumers pay $\$43.54 \times 180\text{M MWh} = \7.84B^4 . Coal fired electricity generators (there are no gas fired ones yet in this simple market with these parameters) receive the same amount and consequently achieve exactly their correct coverage of fixed costs including their appropriate return of and on capital. Government does not participate as there are no ETS permits to allocate or auction.

Now consider the consequences of an ETS that produces a 10% reduction in GHG emissions from the sector, that is emissions are driven to $0.9 \times 180\text{M} = 162\text{Mt/a}$. Assume demand is inelastic and remains at 180M MWh. The most economically efficient set of generators to cover this demand and meet the emissions target would be if 80% were provided by the coal generators (144M MWh) and 20% were provided by gas fuelled generators (36M MWh).

Case 1 – Permit allocation by infallible government authority

The idealised (and impossible) optimum allocation method would be if there were an infallible allocating entity that knew exactly who the most efficient set of generators were and that allocated the correct amount of ETS permits for free directly to these entities. There would be no need for the entities to trade between themselves in this case.

This case is a hypothetical benchmark against which to compare other cases.

The market price of electricity would reflect the new entrant price of new generation which if the ongoing GHG emissions trajectory were progressively tighter would always tend to be a gas fuelled plant. That is, the market price would rise to \$47.12/MWh and this would be paid by customers and received by (all) generators. An alternative assumption without progressively tighter emissions limits (and hence with a mix of new entrants of coal and gas fuels in the 80:20 ratio) is not considered here.

⁴ In this simple market, other costs paid by customers are ignored including transmission and distribution charges, losses costs, market fees and the like.

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In this case customers pay \$8.48B for their electricity, a rise of \$645M. The coal fired generator fleet receives $80\% \times \$8.48B = \$6.79B$ and the gas generators receive \$1.7B. The gas generators receive exactly the right amount to cover their fixed and variable costs (including appropriate return of and on capital). The coal fired generators' contribution to their fixed costs would be $(144M \times (47.12 - 15) / 20,548 =) \$225,100/MW/a$ which suggests a write-down of the value of their assets by the capitalised value of $(250,000 - 225,100 =) \$24,900/MW/a$ which would be approximately a loss of \$251,000/MW in equity value. Government receives no revenue in this case.

Case 2 – Permits issued free to existing generators (100% “grandfathering”)

An ETS is formed and the 162M permits are free-issued to existing (coal) generators. Permits are traded and gas generators acquire the requisite number of permits (18M) for their operation to cover 20% (36M MWh) of the load, the same as case 1. The price established in the ETS market will be that which makes the variable cost of coal and gas equal, or where $15 + 1xP = 30 + 0.5P$, for which $P = \$30/tonne$.

The LRMC of new entrant gas fired generation changes to $\$47.12 + 0.5 \times 30 = \$62.12/MWh$ and this becomes the electricity price in the market.

Consumers pay $\$62.12 \times 180M = \$11.2B$. Again, gas fired generators receive just the right amount to cover their non-ETS variable costs, fixed costs and the cost of the permits. Coal fired generators receive the market value of electricity on their production plus the permit sales revenue, or $\$62.12 \times 144M + \$30 \times 18M = \$9.49B$. Deducting their variable costs of operation, the coal fired generators receive a contribution to their fixed costs of \$357,000/MW/a – which would be a windfall gain and an increase in equity value (which capitalises to \$1.1M/MW gain on the same basis as above). Again, the government gets nothing.

Case 3 – 100% auctioning of permits

In this case the government auctions all the 162M permits. Both coal and gas generators bid for them and again the price should settle at the same \$30/tonne.

The new entrant cost based on gas fired generators is again \$62.12/MWh.



Consumers pay \$11.2B again, gas fired generators again receive exactly the appropriate revenue to cover their fixed and variable costs but this time the coal plants' revenue is only the electricity sales revenue of $\$62.12 \times 144\text{M} = \8.95B . After deducting their non-ETS variable cost and the cost of purchasing permits, their contribution to fixed costs is $((8.95\text{B} - 144\text{M} \times 15 - 144\text{M} \times 1 \times 30) / 20,548 =) \$120,000/\text{MW}/\text{a}$, a loss of $\$130,000/\text{MW}/\text{a}$ ($\$2.67\text{B}/\text{a}$ over the fleet) which would capitalise to a loss of equity of $\$1.3\text{M} / \text{MW}$.

In this case the government has revenue of $\$30 \times 162\text{M} = \$4.6\text{B}/\text{a}$.

However, consumers have paid $(\$11.2 - 8.48 =) \$2.7\text{B}/\text{a}$ more for their electricity than they needed to to meet the GHG reduction objective (which is established by case 1 above), and coal fired generators have lost equity value at a rate of $\$2.67\text{B}/\text{a}$.

Discussion

The extent to which coal fired generator owners should be compensated will be a judgement matter for government weighing up such things as:

- The loss in asset values faced by individual asset owners, beyond the level that will be experienced broadly throughout the economy (“disproportionate loss”),
- The magnitude of this value loss to coal fired generation owners relative to other asymmetrical risk value changes to be expected in that business (eg due to the cost of meeting environmental emission reduction requirements generally),
- When investors in that market could have reasonably known about the prospect of a carbon price, made an estimate of it and priced it into their investment decisions,
- Australia’s reputation as an appropriate place to invest in long-lived capital assets without undue risk perceived of regulatory expropriation, and
- The residual value that should be placed on the asset prior to the ETS, considering the age and character of the asset. The uncertainty in measuring this residual value should also be a factor.

Regarding consumers, SKM considers there is a case to be considered that in the short term at least, electricity customers shouldn’t be required to pay any more than the extra amount required to induce the structural changes in the market to produce the GHG emissions objective. This amount is set by case 1 above which achieves the GHG target at minimum cost to the consumer.



Case 1 is only hypothetical. In practice a blend of cases 2 and 3 will be selected. While all three cases achieve the GHG emissions reductions, cases 2 and 3 are at significantly higher cost to the consumer than case 1.

It is accepted that the circumstances of case 1 cannot be produced (the infallible allocator) however a comparable effect can be produced by noting that in a market where the point of emission (and GHG charge) is at the wholesale end of the market, it is possible to return some of the excess charges collected (auction proceeds) to the electricity consumer on a \$/MWh basis at the retail end of the market. This does not in any way hinder the necessary structural change in the generation sector that produces the GHG emissions reduction. Taking the money out of the sector does produce the additional price signal at the retail level that reduces demand via demand elasticity however this would go further than the policy target of achieving a set amount of GHG emissions reduction.

Keeping the proceeds within consolidated government revenue on behalf of customers (and reducing taxes say) is not at all perfect because electricity consumers and taxpayers are not well aligned, especially where industry is concerned. That is, there is the potential for energy price impacts to produce significant wealth transfers from energy users to other sectors of the economy.

Further, it is not difficult to return (a portion of) the proceeds to consumers on a \$/MWh basis – the existing MRET scheme effectively manages to charge consumers on the basis of \$/MWh distributing the cost of meeting the MRET target. Returning (a portion of) ETS auction proceeds money to consumers in the same way is no more difficult.

And yet the discussion paper doesn't seem to consider this as a possibility.

It is accepted that where the charge is imposed at the wholesale level to signal a change in emissions at the end-user (retail) level, as would apply to the transport fuels sector, it is not possible to return the excess collected money without destroying the emissions reduction price signal. That is the option of returning money to consumers exists in the electricity sector but not in the transport sector.



Returning some of the auction proceeds to electricity consumers reduces the carbon price signals seen by electricity consumers. Higher electricity prices reduce electricity demand and hence GHG emissions via demand elasticity, efficiency improvements and fuel selection decisions. Achieving a balance by returning a portion of auction proceeds to electricity consumers should be considered. This balance might change over time considering the response time of the electricity consumption sector to price signals (via capital turnover rates for energy using equipment).

The above discussion serves to show that:

- it is not a given that the outcomes to consumers are independent of the 'auction versus allocate' decision where the set of electricity consumers is not equal to the set of taxpayers enjoying the benefits of the auction proceeds,
- where an ETS scheme includes a portion of auctioning of permits, some portion of the auction proceeds attributable to the electricity sector should be considered for return to electricity consumers on a \$/MWh basis, and
- the sums of money involved, and hence the change in value of assets in the economy and the impacts on sectors of the economy are very large.

It is asserted that the energy sector should not cross-subsidise other sectors of the economy and the sector should not bear any burden beyond that required to achieve the target GHG emissions reduction objective.

Permit lending

Referring to page 37 – The proposal that the scheme authority (a public institution) should be acting as a credit provider to the private sector should be strongly opposed. The sums involved are large and the authority is unlikely to have the prudential systems and controls that are required for this activity.

Institutions with long experience in lending to the private sector already exist and are best placed to make a credit market for the ETS system if it is necessary and appropriate.

The authority should set a penalty value at a rate (in \$/certificate) conservatively above the expected forward price – if the entities are credit worthy the private sector financiers can lend them the money. Indeed in a mature market private financiers should lend the entities the permits themselves and be able to set appropriate charges for doing so.



It may be appropriate to allow the penalty payers a 5-year timeframe where they can redeem the penalty paid at the penalty price paid by surrendering the missing permits. Such a system would provide some cover to entities in a shortfall position if the private credit market is poorly operating (eg early in the scheme's life) without creating a credit exposure for the authority.

Using the NEMMCO prudential arrangements as a guide may assist given that NEMMCO is a public entity that trades with the electricity market participants. NEMMCO's exposure to the credit worthiness of electricity customers is only a few weeks for comparably sized cashflows and yet their prudential arrangements require substantial credit support from their trade debtors. The proposed exposure in the ETS system is perhaps for years rather than a few weeks and is hence a much more doubtful enterprise for a public institution.

Administrative allocation of permits, eg to TEEII's

Referring to p38. Where an administrative allocation is to be made on the basis of past emissions or activities, such as on baselines of historic emissions, the issuing authority should place a high regard on the integrity of the metrology used to define the historical emissions. For example, where reporting of emissions was historically done on a voluntary basis or for administrative purposes only, these measurements may not have been made with adequate integrity for large value transactions to be based upon them. While appropriate governance measures can be placed on future measurements according to their value, it is impossible to remedy historical measurements which are not made to the appropriate level of accuracy.

SKM notes that by definition TEEII's will be large emitters, at least per unit of GDP, and that by effectively insulating them from the ETS a significant proportion of the economy and potential abatement pool will be excluded from the market. While SKM understands the valid trade and global emissions outcomes that are served by the treatment of TEEII's, this area stands as one of the few distortions to an otherwise simple ETS proposed in the report.

SKM poses two questions for the Review:

- 1) How significant a distortion to the ETS is the insulation of TEEII's from the price signals and incentives an ETS will bring? Put another way, what proportion of the abatement opportunities exist within TEEII's, and what cost will their exclusion have on the overall operation of the scheme that must be borne by other sectors?



- 2) If the answer to the previous question is “significant”, would it be a prudent policy option for the Australian Government to pursue international agreement on TEEII’s as quickly as possible. That is, while binding constraints on emissions from developing countries may not be accepted in the short term, would a compromise position be to at least impose a notional carbon price on TEEII’s in those countries (or exports at a minimum) such that the global trade in these goods is not distorted?

4. Optimal Design Features of an Emissions Trading Scheme under a Global Agreement

Refer to the comment on trajectories above.

5. Impacts on Economic Activity and Income Distribution

Existing and future generation supply

Referring to pages 49 & 50 – reference is made in the discussion paper to the role of natural gas as a lower emission fuel to coal. SKM also believes that the advent of an ETS will create additional market space for gas fired power generation from the present time until the time when advanced technologies (such as coal power plants incorporating carbon capture and storage) are available. If, as anticipated, these technologies are not available for commercial, widespread deployment prior to 2020 then the price of carbon emissions and the depletion rate of Australia’s gas reserves will depend strongly on the GHG reduction trajectory chosen for the ETS for the next one to two decades. Given this, it is suggested that the design of the scheme not be finalised prior to a review of:

- Gas reserves and the impact on gas consumption rates of proposed ETS trajectories,
- What would be the impact of delays in the development and commercialisation of alternative technologies on gas reserves’ consumption rates and the ETS price, and
- What will be the impact of an ETS on gas price and is there sufficient competition in the gas market to prevent inappropriate behaviour by gas market participants.

Permit sales and public finance

Referring to page 55 – The Section discusses calls upon the auction proceeds. As noted above, the point should be made that the ETS should create the change required in the economy to achieve the selected GHG emissions reductions at the lowest economic cost and no more.



If there are sectors in the economy to which public monies are appropriately applied, these should be assessed on their merits without reference to specific funding sources – that is, they should be funded from consolidated revenue. If funding of a measure is tied to specific revenue sources then problems arise where it is tempting to design the ETS to achieve the funding target rather than the policy objective of the ETS.