

16 August 2006

Mr Steve Rylands
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New Zealand Treasury
1 The Terrace
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cc. Mr John Scott

Dear Mr Rylands

COMMENTS ON KYOTO CARBON PRICE ANALYSIS OF AUGUST 2006

Thanks you for seeking my comments on recent advice provided by Mr Geoff Sinclair on an appropriate price for valuing New Zealand's potential greenhouse emissions liability under the Kyoto Protocol.

I support Mr Sinclair's approach of looking to current market values for tradable Kyoto emission permits as an indicator of this liability. Forward markets for Kyoto emission permits are deepening as the first commitment period approaches (commencing 1 January 2008), and these provide scope for entities (such as the New Zealand Government) to acquire emission entitlements now, that can be counted toward national compliance obligations under the Kyoto Protocol from 2008.

A range of risk factors impact on the prices for Kyoto 'paper' generated in forward markets. Chief among these are:

- Regulatory risk
 - associated with the bedding down of Clean Development Mechanism (CDM) and Joint Implementation (JI) certification processes
- Market risk
 - associated with the possibility of future price movements (and the 'opportunity cost' of locking-in early)
- Country risk
 - associated with the contractual reliability of the counterparty country
- Project risk
 - Linked to project specific factors such as timing, construction costs, abatement performance, etc.

These risk elements are discussed in greater detail in Attachment A, which is drawn from recent World Bank analysis and policy approaches to carbon markets.

These risks — particularly as they relate to delivery of a sufficient quantum of Kyoto emission units to cover a potential Kyoto liability in the 2008-12 period — are inherent in Mr Sinclair's advice on an appropriate emission price for estimating the (current) value of a potential future call on the New Zealand budget.

A prudential approach to valuing this liability (and the cost of making good on it) is appropriate. The New Zealand government would be free to develop its own policy on acquiring Kyoto 'assets' and the spread of quality (ie. risk) that would be acceptable within that portfolio. As noted, current options for acquiring Kyoto emission entitlements in forward markets focus on acquisition of certified emission reductions (CERs) from CDM projects or emission reduction units (ERUs) from JI projects. These entitlements can either be acquired through brokerage arrangements (operating within a 'market' environment characterised by increasing liquidity, conformity and explicit pricing of risk) or by building up a portfolio of actual abatement projects which offer the possibility of lower emission 'offset' costs, but also entail a higher level of risk — along the lines of those outlined above and detailed in Attachment A.

This spectrum of risks, and the different buyer-seller liability arrangements inherent in forward purchase contracts, drives the observed spread of reported CER and ERU prices. The ability to use CERs as an offset to obligations under the European Union Emissions Trading Scheme (EU ETS) also acts as a driver of the CER price — particularly those delivered prior to 2008.

As noted in the Allen Consulting Group advice delivered last year the design, coverage and eligibility arrangements of the EU ETS drive price outcomes that are not necessarily a good guide to Kyoto prices. Further, it is quite feasible that eligibility restrictions within the EU system could see EU ETS emission prices overshoot Kyoto emission prices. EU ETS demand has been highlighted as a key reason for CER prices exceeding ERU prices in recent times. Indeed, the import restriction on project based emission reduction allowances (capped at 8 per cent of the EU target amount) can be seen as a reason for the observed 10-15 per cent price difference between CERs and EUAs, as reported by Mr Sinclair.

Mr Sinclair cites the following price ranges for project based 'credits' — determined in the market over the last 6 months (as sourced from PointCarbon):

Category	Price range (EUR)
1. Seller endeavours to deliver flexible volume and buyer commits to buy what is delivered, even if it is not Kyoto compliant: Highest risk to buyer	CER: 5-7 ERU: 5-6
2. Seller endeavours to deliver flexible volume, buyer commits to buy if seller delivers	CER: 6-13 ERU: 6-9
3. Seller commits to deliver firm volume, buyer commits to buy if seller delivers. Valid only if certain preconditions met	CER: 13-15 ERU: 6-12
4. Seller guaranteed to deliver firm volume, buyer guaranteed to buy if seller delivers	CER: 15-19 ERU: N/A

It is notable that project based credits (with no guarantee of delivery or Kyoto compatibility) are currently trading in the range of 5-7 Euro per tonne CO₂e, with higher quality (ie. lower risk) credits trading in the range of 6-19 Euro. Clearly, the nature of the contracts, certification processes and the compatibility 'guarantees' provided are important to determining a 'benchmark' price.

While ERU prices are likely to be less affected by EU ETS-specific factors (and hence hold the promise of a 'clearer' Kyoto price), it also appears to be the case that the market is currently attaching higher risk to ERUs (and discounting price as a result) due to concerns about country risk and progress made in certification processes. ERU prices embody these two effects — current values being driven predominantly by speculation over the post-2008 Kyoto market and compliance concerns — however, it is difficult to differentiate one from another. Assuming 'high quality' ERUs have a similar risk rating to 'high quality' CERs, the current pattern of prices continues to give credence to the view that the Kyoto price is likely to be below the EU ETS price — even after 2008.

Mr Sinclair appears to have given appropriate weight to these considerations and based his analysis on the best information publicly available. The use of weighted average prices (reflecting the volume of trade occurring at particular prices) has been used where possible, and he rightly distinguishes between a project-funding approach — involving acceptance of project specific risk (as commonly reflected in the World Bank portfolio of carbon investments) — and more sophisticated brokerage deals (as offered by PointCarbon and Natsource).

In this context, his view that a price of around US\$7.20 per tonne CO₂e (based on an exchange rate of 1Euro = US \$1.27027) would be likely to fall at the lower end of market expectations and embody a significant degree of non-delivery risk is not unreasonable. Similarly his rationale for rejecting the higher-end market prices for CERs (eg. US\$16.51) is sound. The challenge lies in determining:

- a reasonable 'high end' estimate for Kyoto-price expectations embodied in the market trades that can be observed; and
- an appropriate 'best estimate' Kyoto price falling in this range.

Using a mid point approach, Mr Sinclair uses Point Carbon data to estimate a Kyoto price (determined through arms-length brokered deals) of US\$ 12.07. He then (again) takes the midpoint of this number and the US\$7.20 estimate emerging from World Bank data to arrive at a 'best estimate' value of US\$9.65 — this based on a rationale that, in buying Kyoto allowances (or setting aside funds for their purchase) a portfolio approach would need to be adopted. An equivalent interpretation is that, as the Kyoto market matures there will be increasing price convergence, with the settling price for Kyoto allowances being around the US\$9.65 figure.

While it would be useful to apply more 'science' to analysis in this area (ie. an econometric approach focused on risk premium and partitioning in the market, or use of volume weightings), this would require a major study and access to data that is clearly not in the public domain. Given these constraints, Mr Sinclair's methodology and advice looks robust — and his proximity to the day-to-day operation of greenhouse markets makes him well placed to provide expert advice on contractual issues and expectations that ultimately underlie the exhibited range and trend in market prices.

Having said that, Mr Sinclair's warning that this exercise is 'fraught with difficulty and uncertainty' bears highlighting.

A key issue relates to the 'maturity' of the Kyoto markets and uncertainty around future supply and demand conditions. Mr Sinclair notes that there are major 'quality' issues associated with project-based allowances (ie. CERs and ERUs) and gilt-edged allowances tend to be most expensive. On the other hand, arbitrage and improved confidence in the system should see greater trade volumes, liquidity and price convergence. Further, the entry of significant new suppliers and purchasers in the shape of Russia, Japan and Canada will shift prices again — as will the bedding down of certification processes associated with abatement 'credits' from CDM and JI.

Mr Sinclair's proposed estimate of **US\$9.65** as an indicator price for the purchase of Kyoto-compliant emission allowances represents a reasonable basis for calculating potential budget impacts — should New Zealand decide to source allowances from the current market. However, the relative youth and volatility of the emissions market means that this 'indicator price' may be subject to considerable revision over time. The range of price and quality in the (developing) Kyoto emissions market, and the relative cost of domestic abatement action, are factors in determining the appropriate mix — and cost — of actions needed for New Zealand to deliver on its Kyoto Protocol target.



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ATTACHMENT A

Risks affecting prices in forward carbon markets

(except from World Bank Carbon Finance Business Implementation Note No. 4, 'Risk and Pricing in CDM /JI Market, and Implications on Bank Pricing Guidelines for Emission Reductions', 17 September 2005, pp.2-3)

For the purposes of this Note, Emission Reductions (ERs) relate to any project (CDM or JI) that generates emission reductions, where "Emission" is synonymous with "removals" from sequestration projects.

Risk in CDM/JI projects: implications for VER/CER and ERU contracts

Described below are the two main types of risk inherent in CDM projects: carbon specific risks and project risks, and their respective impacts on (forward) contracts that trade in VERs, CERs or ERUs. Carbon asset risks as described below and most project risks do not are applicable to EU allowances, as they are issued by national governments.

Carbon Asset Risks

Regulatory risk: This relates to uncertainties regarding (a) what specific regulations will be required for projects pursuant to the Clean Development Mechanism and Joint Implementation and b) whether the project, and ultimately the ERs (emission reductions), will be registered with the CDM Executive Board or the JI Supervisory Committee. The most significant component of regulatory risk is additionality risk, which relates to whether the project will be deemed additional by the CDM Executive Board or eligible by the JI Supervisory Committee (which is yet to be established). Although tools are in place to assess and demonstrate additionality, approval depends on the weight of evidence required to be submitted to the Executive Board.

Another significant regulatory risk is baseline risk, which relates to the reliability of the baseline (the estimate of emissions that would have occurred without the project), the methodology for measuring ERs vis-à-vis the baseline, and whether the ERs verified as delivered by the registered project will ultimately be certified as eligible under the Kyoto Protocol or other regimes.

ii) Market risk: relates to the expected market price of ERs on delivery. ERs are purchased in a forward contract (in most cases) at a fixed price, which may be different from the market price of ERs at the time of delivery. When contracting for ERs at a fixed price, the buyer assumes the risk that prices may drop in the future (and the seller, the risk that market prices will increase). The price of ERs is highly speculative and their liquidity is not assured (for reasons of uncertainty of whether large quantities of asset classes will enter the market in the first commitment period, in particular Assigned Amount Units).

iii) Country risk: relates to the risk that: (a) the host country will ratify and subsequently comply with its obligations under the Kyoto Protocol (b) for JI projects, whether the host country will transfer the Emission Reduction Units as agreed by the project sponsor.

Project risk

In addition to carbon-specific risks, carbon buyers are subject to a range of risks similar to those faced by other project investors, including whether the project will perform as expected, and for ER buyers, whether it will deliver the contracted quantity of ERs. Typical risks include:

i) Construction risk – will the project begin operating on schedule?

ii) Performance risk – generally, will the project operate as expected? For example, for renewable energy projects, critical elements are:

1. resource risk: this is to do with security of supply. What is the likelihood that the resource used as fuel source (e.g. wind, water or biomass) will not be available in the required quantities; and,
 2. technology risk: will the equipment perform according to expectations?
- iii) Financial, business and regulatory risk – has the project achieved financial closure? What will the competitive environment for the project be? Given the capital structure of the project, will its cash flows be sufficient to fund planned investment, operations and maintenance, debt service requirements and a generate reasonable return? Are the project and its sponsor(s) financially viable and likely to remain so?
- iv) Contract risk – are the contracts in place adequate, enforceable and durable?
- v) Counterparty risk – are the signatories to key contracts (such as power purchase agreements) creditworthy and likely to abide by their terms – notably, will they pay on time?
- vi) Generic country risk – including political risk such as expropriation and foreign exchange convertibility.

The above-mentioned risk categories are compounded with uncertainty and time delays during the CDM/JI approval process. Under the CDM, these typically relate to whether new methodologies will be accepted by the CDM Executive Board and, if so, when such approval can be expected and whether the methodology that is ultimately approved will reduce the quantity of emission reductions initially anticipated. At the time of writing, the time required between submission of a new methodology and registration of a project has been substantially more than expected.

However, with time and experience, delays and uncertainty with project registration are expected to decrease, regulatory certainty to increase and overall carbon risks to decrease.

World Bank (17 September 2005)