

MEETING THE CHALLENGE OF CLIMATE CHANGE: THE POVERTY OF THE DOMINANT ECONOMIC NARRATIVE AND MARKET SOLUTIONS AS SUBTERFUGE

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The dominant narrative that has framed policy debate on the challenge of climate change has been defined in terms of the notion that greenhouse gas emissions must be first and foremost regarded as an economic problem. This story presents the increasing atmospheric concentration of emissions presents as a failure of the price mechanism, the failure of the market to cost the damaging effects of the build up of greenhouse gases. This is a simple case of a negative externality for which conventional economic theory proffers a comparatively simple policy solution: put a price on carbon to reflect the economic costs of the externality, and do so by setting a cap on emissions rights, issuing emission permits and establish an emissions trading system to enable trade in these permits. The climate change reviews commissioned by the British Labour and Australian Labor governments, the *Stern Review* and the *Garnaut Review*, are emblematic of this narrative, although they brought comparatively little that was new to the debate (Stern 2007; Garnaut 2008). Rather, they helped to consolidate policy preferences that had been previously articulated within Australia by both Labor and, belatedly though briefly, conservative governments over the past two decades.¹

1 The idea of an emissions trading system was seriously canvassed when the Hawke Labor government established the Ecologically Sustainable Development Working Groups in 1990. Several reports outlining the merits in and form of emissions trading systems were issued by the Australian Greenhouse Office following its establishment in 1998 (The Australian Greenhouse Office 1998; 1999a; 1999b; 1999c; 1999d). While the successive Howard governments refused to ratify the Kyoto Protocol and opposed any setting moves to set a quota on greenhouse

A distinctive feature of this narrative has been its allure because it presents the market-based policy option as both economically efficient and cost effective, and this has stifled almost all voices that question the merits of this simple policy option to advocate other approaches to controlling emissions. For sure, there was a period when it appeared that the economic narrative of putting a price on carbon had been eliminated from the policy arena. This followed Prime Minister Rudd's bewilderment at his personal failure to garner support at the Copenhagen Conference for moving forward on a global post-Kyoto agreement and which subsequently prompted his decision, in April 2010, to postpone re-introducing into the House of Representatives the *Carbon Pollution Reduction Scheme Bill*. This retreat seemed to be confirmed when Julia Gillard dislodged Rudd as leader of the Labor Party and, as Prime Minister, reiterated the reluctance to entertain a commitment to an emissions trading system. This merely served to strengthen the momentum of the Liberal Party's 2010 election campaign hyperbole, that pricing carbon would constitute 'a great big new tax', should not be introduced and that there were purportedly cheaper ways of abating emissions. Above all, the concerted campaign by lobby groups and the conservative media challenging the science of climate change and the urgency for mitigation policies contributed to the more general erosion of public sentiment on the need for action.²

emissions let alone put a price on carbon, the Prime Minister did establish a task force to investigate emissions trading in December 2006 following the Business Council of Australia's decision to declare its support for an emissions trading system. The joint government-business task force its Final Report, in May 2007 recommending that holding off the establishment of an ETS was engendering considerable business and investment uncertainty and that the government should take the initiative to *set in place in a "measured manner" an Australian ETS (Australia 2007: 84-5)*.

- 2 A broad raft of conservative forces criticised the proposed Labor government's CPRS as being subterfuge for a carbon tax, the primary purpose of which was a revenue raising exercise that would not necessarily deliver any reductions in emissions within Australia, and which would impose a considerable cost burden on industry and the community, erode Australia's international competitiveness, and have no appreciable impact on global emissions. A particularly vociferous force in the unfolding debate has been the *The Australian* which established a dedicated 'After Copenhagen' space in its commentary pages, and published several commentaries that criticise the CPRS. See, for instance, Malcolm Colless "Tax-and-bribe is CPRS folly", 5 January 2010; Christopher Monkton "Open Letter to Rudd: Your misguided warming policies are killing millions", 6 January

The return of the Labor government following the August 2010 federal election has seen the political debate once again become defined by the economic narrative that a price be placed on carbon. This partly reflects the need to accommodate the Greens, whose support is critical to Labor's hold on government. But it is also as much the consequence of BHP Billiton's CEO, Marius Kloppers, and several business associations, including the Australian Bankers' Association, arguing that it was high time that a price be placed on carbon in order to end investor uncertainty. With the likelihood that the Gillard government, after re-reviewing climate change policy, will adopt some form of carbon pricing, it is appropriate for some critical reflection on the merits of this confidence in the capacity of the market to capture the cost of anthropogenic-generated emissions in a carbon price and for this to systematically drive change. Here I want to question the veracity of the dominant economic narrative which emphasises the challenge of climate change as an economic problem, that of market failure, whose remedy lies in extending the reach of the market to incorporate emissions because this is what conventional economic theory stipulates. In focusing on two exemplars of this preoccupation, the *Stern Review* and the *Garnaut Review*, I want to highlight the limits of the purportedly theoretically-informed policy prescriptions to consider the subterfuge that is entailed in their retreat from the preoccupation with market processes to normative considerations. Four broad considerations stand out.

After outlining the theoretical foundations on which this predilection for market processes is founded, I firstly question the position that the mechanisms recommended for incorporating emissions into a market system to put a price on carbon are consistent with the demands of the conventional economic theory. One dimension of this relates to the nature of price formation as this is postulated in conventional economic discourse, and whether the prices at which emission permits are traded alongside trade in related instruments, such as carbon credit offsets and carbon futures, can actually reflect the cost of emissions. The second focus of concern turns to consider the adequacy of the emissions trading system in enabling individual producers and consumers to respond to the

2010; Geoff Carmody "From Rio to Copenhagen the model was wrong", 13 January 2010; Malcolm Colless "Rudd's taxing climate policy is no longer an asset but a liability", 15 January 2010; Alan Moran "Lack of global agreement offers a change to cut our losses", 21 January 2010.

climate change challenge. I then turn to consider the extent which both the *Stern Review* and the *Garnaut Review* abandon their adherence to the conventional economic theory in recommending policy. In the face of the evidence that market signals might not provoke the rational responses among individuals that neoclassical economic theory presumes, and that contemporary markets do not fit the perfectly competitive market model or the efficient markets hypothesis that is the basis of the conventional economic discourse, both Reviews turn to normative economic policy recommendations. In doing so, I want to question the cost-effectiveness of emissions trading systems and point to commitments to economic sustainability and maintaining the pace of capital accumulation as the primary rationale for privileging emissions trading and putting a price on carbon.³

Privileging Emissions Trading: the Rationale for Pricing Carbon

The *Stern Review* and the *Garnaut Review* are the obvious starting points for reflecting on policy since both informed the policy designs advocated by the Blair Labour government and the Rudd Labor government. They view the climate change challenge as an economic problem, the consequence of ‘market failure’: the failure of the market to put a price on the costs associated with greenhouse gas emissions and which removes any economic rationale for producers to contain emissions. The argument is one that lies at the core of conventional environmental economic theory: emissions are regarded as negative (environmental) economic externalities that have costs which, if not reflected in the cost structure and the prices of the good or service sold by the emitter, are borne by others. Rectifying the market failure, either by abolishing the externality or preferably pricing the externality, is presented as the policy solution. Economists generally identify three possible policy solutions: establish a ceiling on emissions and require emitters to obtain permits, the so-called cap-and-trade or emissions trading system; impose a tax on

3 It is this objective of the search for a purportedly cost-free measure that informs the Liberal-National Coalition proposed policy alternative, a policy that would reward abatement and sequestration endeavours which, needless to say, would result in claims on the public purse.

emissions, which is generally presented as a carbon tax or a carbon-equivalent (CO₂-e) tax; and, regulate emissions-generating activities that requires emitters to adhere to some standards. Each entails some form of government intervention.

The preferred policy measure within conventional economic discourse is an emissions trading system because this is regarded as the most efficient and cost-effective means for rectifying market failure. This is based on a foundational proposition within neoclassical economic theory, as this is evident for instance in the concept of the perfectly competitive market or the efficient markets hypothesis, that the *laissez-faire* market is the most effective arena in which to pursue the objective of reducing emissions. The conventional discourse contends that it is only when economic agents, be these the individuals producing emissions or consumers and especially those suffering the consequences of climate change, are fully-informed about the value of an economic activity that they can, by participating in markets, make rational decisions about how to maximise gains or benefits and minimise costs in order to optimise their wellbeing. If economic agents are to play any role in the optimisation of the atmospheric concentration of greenhouse gas emissions, they must be informed of the (social) costs of emissions, and this requires that these costs are signalled in real monetary terms, that is, priced, and accordingly reflected in producers' cost structures and in market prices.

The foundation for this idea of economic agents responding efficiently and in a cost-effective manner is the neoclassical economic conception of the profit maximising producer and the utility or welfare maximising consumer. It is useful to reflect on the theoretical construct that underpins this conception of price formation in a little detail in order to expose the limits of the argument as well the apparently conflicting presumptions about what market prices, corrected for market failure, actually reflect and signal.

The key influential conceptual point of entry for postulating economic efficiency through the market has been the theory of the firm. In the perfectly competitive economy, in which individual producers are assumed not to be able to have any influence on the price they can sell their product, they are price takers (just as consumers are), the firm seeks to maximise its profits by choosing whatever technique of production, combination of factor inputs and level of production that enable it to produce the good or service at the lowest possible cost given the market

price. The guiding rule is that the firm will do so by calculating the per-unit cost of producing different quantities of output compared with the revenue that can be generated from selling these different quantities. This is the classic story of ensuring that the marginal costs associated with producing additional units of output do not exceed the marginal revenue generated by the sale of these units. When earning normal profits are treated as a component of the cost of production, the key consequences of this construct are that in a competitive market competition will tend to erode opportunities for earning more than average or normal profits and that firms will maximise profits when marginal costs equal marginal revenue. Competition will lead the firm to produce at the lowest possible average unit cost so that profits are maximised when the firm is producing at the 'least cost point of production'. When all firms producing a particular product are producing at this 'least cost point of production', this cost corresponds to the market price, and because this is the 'least cost point of production, the competitively-determined price can also be regarded as the 'efficient price'.

Within this conventional oeuvre consumers engage in a similar process to that of firms. Given their limited financial resources and with the object of maximising their utility or economic wellbeing, it is contended that consumers assess the relative benefit to be derived from purchasing a good or service *vis-à-vis* the relative prices of other goods and services before deciding on the actual combination of goods and services to buy. Consumers undertake a subjective valuation of the relative value of different combinations of goods and services, but it is the economic signal of the price that is their comparator, and this is important because within the conventional economic discourse the market price is regarded as the embodiment of economic information.

Herein lies the substance of the contention that the market is the most efficient and cost-effective mechanism. It is efficient because the competitive impulse drives producers to produce at the 'least cost point of production', and the industry sells the good or the service at an 'efficient price'. It is cost-effective because the allocation and utilisation of resources are the result of individuals deciding how to maximise their economic wellbeing and minimise economic costs based on the information that is purportedly embodied in the market price.

The problem of ‘market failure’ arises because the economic costs associated with greenhouse gas emissions are not priced, and producers and consumers, including those suffering the economic effects of climate change, are thus not able to factor these costs into their calculus. Market-based outcomes are less than efficient and less than optimal. The conventional theory contends that this situation be rectified by capturing the economic costs associated with those suffering the externalities in cost and price structures. Negative externality costs should be reflected in the ‘least cost point of production’ and the ‘efficient price’. This is the conceptual foundation upon which both the *Stern Review* and the *Garnaut Review* form their analysis: the need to put a price on carbon that captures “the marginal social cost (MSC) of greenhouse gases – the cost to society of emitting one extra unit of emissions” (*Stern Review* 2009: 101; *Garnaut Review* 2008: Ch.1).

The emissions trading system is regarded as the preferred measure for rectifying the market failure in the conventional narrative. Capping emissions and issuing rights to emit up to the level of the cap requires firms that emit greenhouse gases in the course of producing to go into the market to buy permits, so that a value is then placed on emissions, reflected in the permit market price which purportedly captures the social cost of emissions. In so far as trade in emission permits adds a cost to production, environmental (economic) costs are internalised in cost and price structures to reflect the real economic cost of production. Economic agents – the producers and consumers, including those suffering the effects of emissions – will be presented with the necessary economic information, costs and prices, that enable them to make fully-informed calculations as to how best to respond to the realisation that there are economic costs associated with anthropogenic-generated emissions.

The conventional economic approach envisages the effect of internalising the costs of emissions being twofold. Costs of production will increase, and this will provide the incentive for producers engaged in energy-intensive activities to consider adopting cost-effective and innovative ways of abating, or sequestering emissions, to reduce the cost that they would have to incur in order to undertake polluting activities. Market prices will increase and, because consumption goods that do not generate emissions in the course of their production will become more price competitive, consumers are likely to find low-energy intensive

goods more price attractive resulting in a change in consumption patterns and thereby reinforcing the pressure for changes in production activities.

While there are alternative policy measures that could be adopted to internalise emission costs – such as carbon taxes or regulatory requirements – the emissions trading system is canvassed as the preferred option because it provides individuals with the freedom to respond to the corrected price signal in ways that are most appropriate for their economic situation.⁴ Both the *Stern Review* and the *Garnaut Review* dismiss the alternative policy measures because they are not considered as economically efficient as emissions trading systems, since these would not leave decisions to individual firms or consumers to determine what is in their best personal economic interests but impose a one-size-fits-all tax or standard that take no account of individual circumstances. Nor are they regarded as cost-effective because these other measures require administrative processes and charges that are avoided when economic information can be embodied in carbon prices in what is regarded as a comparatively costless manner. Notwithstanding this, the *Stern Review* and the *Garnaut Review* do canvass supplementary roles for these other measures.

If this emissions trading market is to function effectively, then it is crucial that permit prices are relatively stable in order to convey a consistent message about the cost of emissions. A common argument is that price stability is necessary for investment certainty, and this is made in the face of the concern that there is no necessary guarantee of price certainty particularly in nascent emissions trading systems. The concern is that price volatility erodes the capacity for rational economic calculation and gives rise to investment uncertainty. The experience of the European Union Emissions Trading System provides a salutary lesson in this respect. There are many possible causes explaining the potential for price volatility – such as the uncertainty in the regulatory environment or the shape and coverage of the emissions reduction target

4 The purchase of this logic in informing conventional wisdom and policy preferences is well illustrated by the intervention of the newly-appointed Minister for Climate Change, Greg Combet, in debate on carbon pricing: “Decentralising the signal to abate through a carbon price, means the government does not have to prescribe how they are to reduce their emissions. A carbon price therefore encourages ingenuity and innovation. It does this through everyday decisions of investors and businesses.” (Combet 2010).

trajectory or the extent and range of carbon credit offsets that could be certified, and of course changing fundamentals as the effects of climate change become more pronounced – and these are acknowledged in the *Stern Review* and the *Garnaut Review*, and, because the market cannot be guaranteed to deliver price certainty, they each turn attention to considering mechanisms that will assist in addressing this problem.

The prospect of price volatility introduces a paradox in the predilection for a market-based emissions management system because, while price volatility raises some questions about the effectiveness of the free market, the *Stern Review* and the *Garnaut Review* refuse to countenance their confidence in the workings of the market. The paradox lies in their appeal to yet another market as the instrument for instilling stability in the emissions permit market. They look to the supportive role of ‘secondary markets’, markets in carbon futures markets, including trade in carbon credit offsets and CO₂ derivatives, to stabilise emission permit prices. While carbon futures markets enable economic agents to put a price on their time preferences, they consider that the carbon futures trade will help prefigure the price of carbon permits. This is because trade in carbon futures will put a value on future emission rights, or costs, with reference to the present when there is a well defined emissions reduction trajectory in place, and because futures trade is regarded as considered to be more robust than that in emission permits, futures markets are held up as deepening and adding liquidity to carbon markets. Carbon future trading will, it is contended, signal a ‘discovery price’ around which carbon emission permit prices should gravitate (*Stern Review* 383; *Garnaut Draft Report* June 2008 393; *Garnaut Report – Final Report* 312, n3. 319, 322).

The idea of markets underpinning price formation across time to provide direction for the value of carbon permits draws on the conventional analysis of exhaustible resource pricing, first articulated by Harold Hotelling in 1931. Hotelling argued that competition should ensure that an exhaustible resource will be extracted at a socially optimal rate and that the net present value, as measured in terms of price, of a unit of the resource would likely be the same for each extraction period over the life of the exhaustible resource (Hotelling 1931; Devarajan and Fisher

1981).⁵ A well-defined emission reduction trajectory is comparable to Hotelling's exhaustible resource horizon so that price at which carbon futures are traded should align with the price of emission permits via the 'discovery price' and deliver price stability through time. In effect, carbon futures trade unveils an 'efficient' carbon permit price that reflects the calculations of producers and consumers weighing up the costs and benefits of buying emission permits or offset credits, securing future rights to permit or offset emissions, or hedging against the risk of holding or not holding these future rights.

The Constraints on Competitive Carbon Permit Price Determination

In this idealised market economy, capping emissions and issuing emission permits provides the means to internalise the costs engendered by greenhouse gas emissions, and putting a price on carbon is reckoned to encourage both producers and consumers to change patterns of production and consumption to adopt less carbon intensive practices. However, this proposition is far from unproblematic, and the most obvious reason is that the structure of an emissions trading system does not neatly match the ideal market construct proselytised in conventional economic theory.

In the first instance, the extent to which the market price of carbon permits corresponds with the externality cost of emissions will be effected by the magnitude of the cap. The permit price will reflect the confluence of permit supply, as well as the availability of carbon credit offsets, and the demand for permits, and more often than not the history of established schemes indicates that the supply of permits is not set independently of envisaged demand. Most schemes set targets that sanction existing emission levels. The price of permits will also be effected by the method of permit allocation, varying according to whether permits are issued by means of a system of grandfathering, issued free to existing emitters, auctioned. The range of carbon credit offsets that are sanctioned will likewise impact on the demand for permits and thus price, as will the availability and cost of available

5 The 'present value' of the price is based on the (market rate of interest) discounted market price for each period of extraction.

abatement technologies that enable emitters to reduce the need to buy emission permits. The setting of these parameters takes the design of the market right outside the realm of economic discourse, so that price formation is as much if not more the product of the various administrative determinations that set the parameters of the market as the effect of economic agents signalling their preferences within the market.

There is a lack of symmetry in the functioning of emissions trading markets. With emissions capped, the expression of economic preferences can only be reflected in the price at which permits will be bought and sold. Moreover, this lack of symmetry is evident in the differential capacity of economic agents to exercise their sovereignty, in contrast with most other commodities markets in which producers or consumers can through their preferences influence both the quantity and the price at which a good or service is exchanged. Emissions trading systems are designed principally to engage producers in a surrogate pollution pricing market, the emissions permit market.

The operational focus of the system is concentrated on getting those enterprises that emit greenhouse gases to meet some of the costs they impose on the economic community by requiring them to pay for the right to emit by buying permits. Consumers are essentially alienated from the market. In theory, those suffering the economic consequences of climate change could enter the market and exercise their preference to reduce the magnitude of emissions buying permits, then acquitting and retiring the right to emit, but the asymmetry of the permit market places these economic agents at a distinct disadvantage. It might be economically rational for these individuals to pay an amount for permits that is less than or equivalent to the marginal economic costs they suffer as a result of the incremental increases in the concentration of greenhouse gas emissions, to acquit these permits to reduce emissions and thereby improve their wellbeing. But sufferers confront a different order of opportunity costs to those of polluters because the scope for sufferers to engage in the welfare-enhancing activity of buying and acquitting permits is in fact quite limited. Individual sufferers have to forego some economic pleasures, drawing on their financial resources in order to buy permits to secure the (non-monetary) enhancement in their welfare so that their capacity to express their preferences for the level of emissions that would be deemed optimal is circumscribed. By way of contrast, emitters approach the assessment of their position by weighing up the real financial benefits – the net marginal private benefits - to be

gained from buying permits, or taking some other form of action to avoid having to buy permits, in order to engage in production and sell the product. The benefit in engaging in emissions trading is, in effect, more the domain of the polluting firm.

The lack of symmetry is evident in another important respect in so far as individual sufferers also confront a ‘tragedy of the commons’ situation. The capacity of individual sufferer’s actions to reduce emissions will at best likely have an insubstantial impact on the overall magnitude of emissions unless their actions are matched by a significant number of others suffering the effects of emissions acting in unison. Such actions could also be to the advantage of emitters because the more those suffering the effects of anthropogenic-generated emissions seek to alleviate their suffering by buying and acquitting permits, the more successful are trading arrangements in delivering the emissions reduction target, and the less pressure on government to rein in emissions and the greater the scope for those producing and issuing emissions to avoid reducing their emissions through time. Thus, as one failure market is addressed – with externality costs internalised in the sphere of production – other market failures are generated in other economic domains.

Securing an ‘Efficient Price’: Looking to the Future?

It is also constructive to consider the shortcomings in the conviction that price signals generated in futures markets provide an accurate guide for pricing carbon – the ‘discovery price’ – in a nascent emissions trading market as well as instil confidence in this measure of emission costs – in the ‘efficient price’ – to frame behaviour through time. There are a couple of concerns that warrant reflection.

The presumption that futures markets can herald an accurate carbon price overlooks the extraordinary complexity in trading arrangements. We need only reflect on the range of carbon offsets that are being traded to appreciate the complexity and, in a number of instances, the lack of integrity of these offsets and carbon credits. There is abundant evidence that carbon credits issued under the terms of the Kyoto-compliant Clean Development Mechanism, for example, do not deliver real additional carbon reduction benefits. It is apparent that the proposed UN-backed REDD scheme – Reducing Emissions from Deforestation and Forest Degradation – is resulting in some bogus carbon sequestration schemes

that could deliver another tranche of suspect carbon offset credits. The plethora of carbon offset instruments that see Kyoto-compliant offsets being traded, for instance, alongside a host of voluntary offset instruments, with some endorsed under the terms of national, regional or local government emissions trading systems or abatement schemes and others being issued in anticipation that they might be recognised, has transformed what economists regard as a relatively simple market into an extraordinary complex field. The Labor government's planned Carbon Farming Initiative is a case in point because this proposes to reward farmers and other landholders for pursuing abatement activities, while apparently not addressing whether such activities are additional to established practices or unsustainable practices that could normally be avoided or minimised.⁶ The considerable variability in the status of offsets does not provide much of a foundation for a transparent and stable carbon derivatives market that can contribute to circumventing uncertainty – and price volatility! – in carbon markets.

The appeal to futures markets to provide a 'discovery price' around which emission permit prices would gravitate prompts some doubts as to the veracity of what it is the basis of the 'efficient price' which in conventional economic discourse is associated with the 'least cost point of production'. The significance of the 'Hotelling rule' is that the price of carbon does more than set a 'discovery price'. In this construction, carbon futures can be thought of as a bit like Alice's looking glass; they establish a 'window into the future' that purportedly unveils an 'efficient' intertemporal carbon permit price formed in the context of the emissions reduction target. But, as Donald MacKenzie (2006) has observed, because they influence decisions as well as policy, futures markets help to make this future. Price formation and decisions about mitigating emissions entail producers weighing up the costs and benefits of buying emission permits or offset credits *vis-à-vis* securing future rights to permit or offset emissions or hedging against the risk of holding or not holding these future rights. The deepening and enhanced liquidity that is engendered by futures markets, in effect, results in an inversion of the forces that shape price formation. Current prices will be driven by expectations, including speculation, about futures pricing, and thus bear

6 The fact that the design and reach of emission trading systems are a product of political processes, and not institutional arrangements based on some systematically and well-defined economic logic, underscores this.

little relation to the marginal cost of emissions – or the marginal cost of abatement – and what would be regarded as an ‘efficient’ emission permit price (Chan 2009).⁷

A second concern with this appeal to carbon futures providing direction on pricing overlooks the make-up of carbon futures markets as not simply being a complement to emission permit and carbon offset trading as the conventional economic narrative would have us believe. Trade in carbon futures is partly moved by the desire to hedge against the risk of having to purchase emission permits. But this hedging facility impels a more comprehensive engagement with financial markets as hedge funds and a wider range of investors enter the carbon market in search of arbitrage opportunities. Doubts about the efficacy of futures markets setting an ‘efficient price’ are surely reinforced by George Soros’ reported observations that cap-and-trade markets can be manipulated by the ‘gaming’, or gambling, in carbon futures markets (Kassenaar 2009). Carbon futures trading cannot be defined simply in terms of the form and reach of the emissions regulatory environment.

The dramatic growth in the ‘secondary’ market for carbon futures trading *vis-à-vis* trade in emission permits, the bundling of carbon offsets to be on-sold as asset-backed securities, points to an increasing disconnect between the derivative and the underlying asset that raises serious doubts about the notion that futures markets can guide ‘efficient’ carbon permit pricing. This disconnect is compounded by the extent to which derivatives and futures trading is dominated by speculative endeavour, and speculation is the dominant characteristic of the sector. As we have witnessed over the course of the global financial crisis, products designed to reduce volatility appear to have contributed to new forms of volatility. The notion that trade in carbon futures can engender price stability in the permit market is not convincing.

7 The burgeoning carbon market promises to become the world’s largest traded commodity according to the chairman of Climate Exchange (*The Australian Financial Review* 9 December 2009). The US carbon market is estimated to become a \$US200 billion industry by 2020, while carbon trader Carbon Point estimates the demand for carbon credits in the US could be ten times this if a cap-and-trade system is instituted (Schapiro 2010).

Market Failure and Perversity: Managing the Market?

The contention that emissions trading systems provides the most efficient and cost-effective means for meeting the challenge of climate change is based on assumptions about the economy being competitive and that producers and consumers respond in rational and expected ways to changes in price signals. But the *Stern Review* and the *Garnaut Review* acknowledge that this construct does not always accord with reality.

The contemporary economy bears little resemblance to the ideal construct of the competitive market. Market imperfections are in fact quite pervasive. Industry structure, and especially those sectors that generate most emissions, is predominantly oligopolistic in character.⁸ Administered pricing or regulated pricing in the case of electricity and other energy supplies, as distinct from competitive pricing, is often the norm. In fact, the scope for effecting adjustments to industry practices in response to carbon pricing may be quite limited because pricing in this sector, as well as in other carbon-intensive industries, is commonly subject to long-term arrangements that are underscored by hedging against price electricity increases.

The Reviews also recognise that price signals do not necessarily engender the behavioural responses of the profit or welfare maximising individual firms or consumers that are presumed by conventional economic theory. Price incentives may not be sufficient to drive investment in the deployment or design and development of new technologies to transition from carbon-intensive activities (*Stern Review* 397-12; *Garnaut Review* 35-7). There is a range of possible reasons for this: individual investors may fear competitors free riding on their technological breakthroughs; the public good character of some technologies requires a scale of investment beyond the capacity of individual enterprises; or, the time frame of the returns on investment in research and development may be too protracted and discourage investors. The potential for price signals to not have the catalytic effect that the conventional theory presumes prompts argument for some government intervention to implement measures that supplement the

8 Interestingly, the *Stern Review* and the *Garnaut Review* note the lobbying might of corporations, but do not think through the ramifications this has for the import of the *laissez-faire* market model.

price signals in carbon markets. Such measures include tax incentives to underwrite the innovation and deployment of the new technologies (*Stern Review* Ch.17). Such initiatives, in turn, become subject to speculation in futures markets.

The potential for perverse responses to price signals is yet another qualification to the effectiveness of the market. It is recognised that producers or consumers who anticipate the imposition of a cap on future emissions could take precipitate actions that magnify the quantum of emissions. This problem of ‘moral hazard’ can also be manifest in polluters postponing the adoption of measures to mitigate emissions in anticipation of being offered financial incentives to act.

Emissions trading systems are privileged over other forms of market intervention because of a confidence in market processes that presumes trade in carbon permits and offsets will be organised in terms of a perfectly competitive market. Yet, while recognising the limits of this presumption, both the *Stern Review* and the *Garnaut Review* refuse to question the merits of this conviction. Stern, for instance, is quite explicit in his response: “[t]he appropriate response to substantial market failure is not to abandon markets but act directly to fix it (*Stern 2009a*: 11). Paradoxically, however, both argue the need for instituting mechanisms to support the efficient market functioning and to ensure that all goods and services are sold at an ‘efficient price’ or, what Stern refers to as, the ‘right price’, the price that reflects that least cost point of production where the marginal costs of emissions correspond with the marginal cost of abatement (*Stern Review 2007*: 36; *Garnaut Draft Report*: 10; *Garnaut Review*: 312). Interestingly, in a later contribution to debate, Stern recommends the need for those overseeing the emissions trading system to monitor the carbon market to ensure that the marginal abatement costs of each and every sector of the economy are tracking in line with this ‘right carbon price’ (*Stern 2009*: 103).

Confidence in the capacity of market-based pricing to drive change surely must also be placed in doubt when it is considered that both the *Stern Review* and the *Garnaut Review* contend that it is essential that every effort should be made to identify the prices necessary to bring about what they judge to be the ‘right level’ of abatement (*Stern 2009*: 100-101).⁹

9 Even if all costs associated with the production of a good or service are reflected in the price of the product there is a broad consensus among ecological economists

The Conventional Wisdom: Engaging Normative-Based Policies

These qualifications are surely a remarkable surrendering of confidence in the effectiveness of market processes. But this should not surprise because it is emblematic of the several different ways in which the *Stern Review* and the *Garnaut Review* realise that the conventional economic discourse they invoke to identify the challenge of market failure and to inform the policy solution cannot be effective without recourse to supplementary policy measures that are not theoretically but rather normative based.

The most obvious manifestation of the appeal to normative judgements is with respect to mapping possible emissions trajectories. Within conventional economic discourse the optimisation of emissions should be contingent upon enabling all producers and consumers to calculate the costs and benefits of realising their various preferences and priorities through the market. This is the foundation of subjective preference theory. As noted, optimising emissions trajectories presents an insoluble problem because it is not realistically possible to provide the opportunity for all economic agents who are or will be affected by climate change to express their preferences through the market. Present-day communities are unable to give voice to their preferred emissions reduction trajectory, while this is even more so for future generations because past and current decisions about emission levels shape the world that future generations will inherit. This presents a dilemma for the conventional theory and the policy prescriptions that promise to deliver an optimal emissions trajectory.

The *Stern Review* and the *Garnaut Review* implicitly recognise the limitations in trying to chart an emissions trajectory on the basis of some

that relying on marginal changes in prices to engender the changes required to meet the climate change challenge will be inadequate. The uncertain and potentially irreversible consequences of the increasing concentrations of greenhouse gas emissions in the atmosphere indicate that the focus should be on the absolute magnitude of emissions concentrations and not marginal changes. Relying on marginal price adjustments presumes the possibility for engendering behavioural responses that will result in a smooth transition towards a low-carbon economy whereas the prospect of positive feedback mechanisms could see tipping points breached and runaway climate change (Barbier 1989; Hansen 2009).

market-signalled inter-generational social welfare function (Stern 2007 Ch 2; Garnaut 2008 Ch 1). Instead of trying to capture some semblance of a future that reflects the purchase of subjective preference theory, their mapping of different emission trajectories has next to nothing to do with pathways informed by economic theory, and are based primarily on scientific modelling in the first instance, and practicality or political sensibilities in the second.¹⁰ These eclipse any sense of an emissions reduction trajectory that is economically optimal.¹¹

The normative nature of these two projects is further underscored by their conclusions about how best to account for the value of future costs and benefits of the different emissions trajectories. The problem they confront is that conventional economic theory does not provide definitive guidance as to how to measure the value of the different cost and benefit calculations for various emissions trajectories through time. The dominant tendency has been to argue that the future value of an asset, or benefits and costs, should be discounted at a rate equivalent to the market interest rate (Productivity Commission 2007). This is justified in terms of the notion: that individuals have a time preference for the present over the future; that productivity gains will result in the relative price of things falling through time; or, that the monetary value of an investment will generally increase through time as the investment earns a return in the form of interest or profits. The effect of discounting is to devalue the future costs of climate change.

Both the *Stern Review* and the *Garnaut Review* take issue with this approach to discounting on inter-generational equity grounds. They argue that a discount rate based on market discount rates is inappropriate because the atmosphere is a public good, that it has no substitutes, and that we should be giving equal weight to securing the conditions that help to ensure a sustainable future.¹² The Reviews make the case for

10 The terms of reference required that the *Garnaut Review* consider target trajectories in the range of 450ppm and 550ppm CO₂(e) atmospheric concentrations.

11 Stern argues in *A Blueprint for a Safer Planet* that it is probably politically sensible to aim at keeping emissions below 500ppm (150), while the *Stern Review* indicates a preferred target of 450 ppm if a number of tipping points are to be avoided (Stern 2009: 39).

12 Ironically, the recommended emission concentration targets could well result in runaway climate change.

choosing a discount rate that is less than the market rate of interest. This makes a significant difference to charting the preferred emissions trajectories because the lower rate of discount amplifies the significance of future costs and benefits and this strengthens the case for pursuing early climate action. This has prompted some quite robust debate within economic discourse and trenchant critique of the *Stern Review's* position (Nordhaus 2007; Weitzman 2007). Irrespective of the merits of the argument for a lower rate of discount advanced by the *Stern Review* and the *Garnaut Review*, the point that must be recognised is that economic theory does not help us make the decision about the value of the future. This is an ethical issue, and necessitates appeal to normative judgements, and yet this decision about valuing the future is crucial to determining emissions trajectories.

Concerns with the potential for price volatility, especially in the initial years of an emissions trading system, also prompt normative policy recommendations designed to minimise volatility. The *Garnaut Review* (197, 227-30), for instance, recommended that the emissions trading include the opportunity to purchase carbon permits and offsets in international markets while simultaneously restricting the on-sale of permits overseas, at least in the formative years of the system, in order to reduce the prospect of price inflation. It also suggested fixing the price during the transition period, and this same logic has informed Garnaut's more recent advocacy of a carbon tax (*Garnaut Review* 350-1). In contrast, the suggestion that market certainty could be enhanced by setting a floor, below which carbon prices could not fall, was rejected outright by the *Stern Review* (376).

In invoking measures to suppress the potential for price instability, the Reviews are in effect conceding that the *laissez-faire* market is not the unassailable institutional edifice for meeting the challenge of climate change they purport it to be. But there is a more suspect agenda at play here, and this is the desire to try to contain the costs that would confront industry and consumers were the carbon pricing panacea to be given free rein. And this exposes a fundamental tension because it is widely acknowledged that transitioning out of the most greenhouse gas emissions industries will require a much more substantial carbon price than that envisaged by, and advocated in, the *Stern Review* and the *Garnaut Review* and certainly the carbon price being discussed within government.

Rethinking the Economic Calculus: the Cost Effectiveness of Emissions Trading

The many qualifications regarding market performance, I contend, undermine confidence in the notion that emissions trading systems is the most efficient and cost-effective means of meeting the challenge of climate change. The contention is never tested, but rather simply asserted. The issue of cost-effectiveness in particular is a crucial oversight because the need to make some reckoning of the transaction costs associated with institutional interventions to address market failure was a pivotal concern of Ronald Coase's iconic contribution to the debate on environmental externalities (Coase 1960). The conventional wisdom within economic discourse is that there is no economic merit in proceeding with a policy measure to rectify a market failure if the costs incurred in order to establish the mechanisms that internalise environmental externality costs exceed the likely benefits. While the *Stern Review* and the *Garnaut Review* do not consider an emissions trading system to be a costless exercise, they most certainly downplay the significance of the costs involved in designing, implementing and monitoring such a system and of shoring up all of the associated market failings. The *Garnaut Review* does acknowledge that emissions trading systems do carry transactions costs, and that some of these transaction costs amount to a "deadweight loss on the economy", yet it misses the more substantive point that transaction costs are not going to be negligible (*Garnaut Review* 2008: 314).

Another significant omission in costing emissions trading systems is the failure to consider the significance of 'secondary markets' and, in particular, carbon futures and associated derivatives markets, in underwriting trade in emissions permits and carbon offsets. There is no reckoning of the transaction costs related to the functioning and monitoring of these markets, especially since they are held up as a steadying influence for emission permit pricing. And monitoring trade in these instruments is not going to be straightforward because it will entail arrangements to ensure the integrity of a growing assortment of instruments, ranging from Kyoto-compliant permits and offsets, permits and offsets sanctioned in some political jurisdictions but not others, and voluntary permits and offsets. The trade in carbon derivatives is promoted and dominated by international financial institutions and hedge funds that have an interest in manipulating trades for their own

advantage, and, in light of the destabilising impact of derivatives that led to the global financial crisis, some degree of regulation would seem imperative.

An additional factor in considering the professed positive function of carbon futures in setting a ‘discovery price’ for emission permits is that there is a price to be paid for this function. Trade in carbon futures is motivated by the opportunity to profit from hedging risk, and the returns for this business would presumably be reflected in the price of the asset and thus also mirrored in the market price of emission permits. With trading in secondary markets already a magnitude many times greater than that in the underlying asset markets, and these markets anticipated to grow at an exponential rate, this obviously has significant implications for a more realistic reckoning of the true cost of transacting in the emissions trading system.

One other aspect of this reflection on transaction costs that has been the focus of some attention relates to the proposals to address the equity concerns that follow from the distributional implications when carbon is priced. Two particular concerns were taken up by the *Garnaut Review*: the impact of escalating electricity charges on low income earners and the erosion of the competitive position of emissions-intensive industries exposed to international competition with industries not subject to a carbon pricing regime. In both instances, the *Garnaut Report* recommends that the disadvantage should be offset by compensation programs. Critics have quite correctly argued that this would amount to revenue churning, and the cost of administering this has not been calculated as one of the costs associated with an emissions trading systems. Irrespective of the merits of the compensation proposals, some accounting of the cost of administering the program is appropriate, and yet the *Garnaut Review* completely sidesteps any appraisal of the transaction costs associated with such redistributive arrangements.¹³

13 The Abbott-led Opposition coalition has made a great deal of fuss about the proposed *Carbon Pollution Reduction Scheme* as a ‘Great Big Tax’. The point in drawing attention to this is not to defend this hyperbole, but merely to emphasise just how limited the *Garnaut Review*’s benefit-cost exercise actually was. The point can be made even more strongly when it is considered that the *Garnaut Review* was extraordinarily remiss in not fully costing all of the ‘economic costs’ associated with anthropogenic-engendered climate change: the ‘Type 2 costs’, those costs arising from the likely impact of climate change on established

Beyond Cost Effectiveness: the Cost of Buying Support for Emissions Trading

The *Stern Review* and the *Garnaut Review* are mindful that implementing an emissions trading system is not going to be a straightforward task. They accept that the institutional capacity to establish a scheme that is comprehensive in its reach is lacking. Measurement and monitoring emissions across the whole economy could be prohibitively expensive, so they do not, for instance, envisage all industries being covered by emission reduction target obligations. In the first instance only the more carbon-intensive industries and those industries in which emissions can be readily measured should be included in the scheme. The industries would be required to acquire the right to emit greenhouse gases by buying emission permits or carbon credit offsets. However, notwithstanding a longstanding commitment to the ‘polluter-pays’ principle and while setting a cap might be regarded as a straightforward exercise, conventional economic discourse offers no clear direction on the preferred approach for allocating emission permits or sanctioning carbon credits offsets. Because the policy possibilities are sufficiently equivocal, the consequence has been that normative considerations have tended to frame allocation decisions, and policy design has become a prisoner of intense political lobbying. (Ronald Coase recognised the vexed nature of the allocation problem, and in effect sidestepped the issue by maintaining that an optimal outcome was not contingent on who the pollution permits were allocated to.¹⁴) Agreement on the recognition

economic activities; ‘Type 3 costs’, the costs of catastrophic climate change, and ‘Type 4 costs’, ‘non-market costs’ such as loss of biodiversity and loss of human life – which the most basic of conventional environmental economic analyses would regard as mandatory for a considered cost-benefit appraisal. Had the Garnaut Review bothered to make these calculations then economic case for action to abate emissions would have been all the more persuasive.

- 14 Coase challenged the logic of the ‘polluter-pays’ principle, as this was advanced by Arthur Pigou in *The Economics of Welfare* (1920), arguing that the internalisation of the cost of the externality to secure an efficient market outcome did not necessarily require that the polluter to acquire the property right to pollute. Coase argued that, as long as there was the possibility for the polluter and those suffering the effects of pollution to trade in the pollution permit, it did not matter who was issued or acquired the permit. Each of the parties would be moved by the same consideration to maximise their economic wellbeing. Polluters would buy, or sell, permits while ever the benefits of polluting exceeded, or were less than, the

of carbon credit offsets is likewise a normative consideration. The consequence has been that, despite the appeal to conventional economic theory, the design of most emissions trading systems has been politically defined.

To their credit, the two reviews do canvass the case for different allocation options. The *Stern Review* draws on the Coase position to adopt what might be considered a somewhat pragmatic approach to the question of permit allocation. It proposes that the allocation could include a mix of ‘grandfathering’ and auctioning. Some pollution entitlements should be ‘grandfathered’, that is, issued free-of-charge to existing polluters. The justification for this is that investors should not be disadvantaged by changes in the regulatory regime that would impose unforeseen costs and which might also erode their capacity to invest in emissions-abatement technologies.¹⁵ ‘Grandfathering’ is also seen as encouraging the polluters to endorse and become engaged in the new regulatory regime.

By contrast, the *Garnaut Review* recommends an approach that is more consistent with the ‘polluter pays’ principle: all those industries included in the emissions trading system should be required to purchase through auction the right to emit. The *Review* recommended restricting compensation because polluters should not be rewarded for their established emissions practices. Contrary to claims that the competitiveness of coal-fired generators would be eroded if they did not receive compensation, the *Review* maintained that they be required to buy emission permits because increases in this sector’s cost structures

cost of having to buy the right to permit. Those suffering the effects of the pollution would have an incentive to buy a permit if the price of the permit was less than the costs they suffered from the pollution, or if they held permits to sell the permit if the revenue obtained was greater than the costs they would experience from the pollution. According to Coase, the opportunity to trade overrides the logic of an argument that required the polluter to have to buy permits because requiring them to buy a permit would alter the existing economic or distributional arrangements to their disadvantage. While this contention has won much favour, the principle has important implications for the distribution of property rights as I will argue. As discussed above, Coase’s ‘market solution’ overlooks the asymmetry that frames the bargaining positions of the polluter and the sufferer.

15 This consideration ignores the fact exiting polluters have had plenty of warning of the possibility of a change in the regulatory environment given that the Kyoto Protocol anticipated the eventual adoption of a global emissions trading system.

could be passed on to energy users. Compensation should be limited to emissions-intensive, trade-exposed industries because their international competitiveness would be eroded if their competitors were not subject to comparable cap-and-trade regulations. Without some compensation these industries could simply relocate to other countries not burdened by a carbon price, resulting in the so-called ‘carbon leakage’ phenomenon. The *Review* sets out quite precisely the terms of any compensation arrangement to ensure that these industries continue to compete in a level playing field and do not reap windfall profits in the process (*Garnaut Review* 2008: Ch.14). As Garnaut anticipated, and the *Garnaut Review* noted, the bases of permit allocation would be subject to considerable political pressure, and this is one of the reasons why the *Review* was so explicit in arguing the case for restricting the reach of compensation entitlements.

There are obvious equity and distributional implications with the introduction of an emissions permit scheme. These were the subject of interest for the 2007 Prime Minister’s Taskforce. The Taskforce recommended that enterprises be given a one-off free permit allocation as compensation for the additional costs that would follow with any change in the regulatory environment (114-115). Incongruent as it may seem, the Labor government’s *Carbon Pollution Reduction Scheme Green Paper* took the lead from the Taskforce’s recommendation and ignored the position advocated in the *Garnaut Review*. But, it proposed a more generous handout, recommending that emissions-intensive trade-exposed industries be shielded from the prospect of competitive disadvantage through transitional assistance by means of a grandfathering arrangement through the free issue of carbon permits over an extended time frame.¹⁶ The *CPRS* also included provision to expand the magnitude of support should the energy-intensive sectors expand. It was anticipated that the permit allocation would be equivalent to 25% of total emission permits and, should the sector grow, this could potentially increase to 45% by 2020. The draft *CPRS* also resolved to provide assistance to coal-fired power generators through the Electricity Sector Adjustment Scheme. Intense industry lobbying resulted in assistance

16 The *CPRS* Green Paper proposed that those sectors with an emissions intensity above 2,000 tonnes of CO₂-e per million dollars in revenue receiving 90% of required permits, and those with an emissions intensity between 1,500 and 2,000 tonnes given 60% of required permits.

being extended by the time the *CPRS White Paper* was released. The policy broadened the reach of those sectors – enterprises with an energy intensity range of between 1,000 and 2,000 tonnes – that would be issued free up to 60% of the permit target requirement, thereby including the developing LNG industry.

The implications of this would have been quite profound. There was the immediate advantage awarded the energy-intensive trade-exposed industries. Fryer, et.al., calculated that if a carbon price of \$20 per tonne CO₂-e applied, the assistance to energy-intensive, trade-exposed industries would amount to almost \$3 billion, with almost 30 per cent concentrated in the aluminium refining industry (Fryer, et.al., 2008). Four companies – Rio Tinto, Alcoa, Norsk Hydro and Alumina – would be the principal beneficiaries. With a higher carbon price the redistributive benefits would be even more substantial, with research by Daly and Edis forecasting that, with a carbon price of \$35 per tonne, industry assistance would be 8 per cent higher, while the revenue generated from the auctioning of emission permits would increase by only 1.4% (Daly & Edis 2009). Yet they observed that the most energy-intensive industry, the aluminium industry, was generally, by world standards, a low-cost producer, highly internationally competitive, and that there was little justification for transitional assistance. In fact, it was argued that without assistance the introduction of an emissions trading scheme would have a comparatively negligible impact on corporate profitability. Furthermore, in anticipating lobbying from another sector, the report concluded that a “carbon price is very unlikely to materially affect” investment in the expanding LNG industry. The report also concluded that there was no justification for providing transitional assistance to coal ore and cement producers.

The Treasury has also provided some measure of the more general cost implications of the proposed CPRS. In 2009 it reported on the anticipated consequences of the financial impact of the CPRS, predicting that, over the period 2008-09 - 2010-11. Accounting for both the revenue generated from auctioning permits and the aforementioned compensation arrangements, there would be a net \$3 billion drain on the budget (Treasury 2009). Subsequent negotiations between the Rudd Labor government and the Turnbull-led Opposition resulted in even more concessions being offered that would have considerably increased the claim on the public purse. More recent undertakings by the Victorian Labor government to push ahead with its emissions-reduction strategies,

by retiring the most polluting of the brown coal generating plants in Victoria, the Hazelwood power station, would add to this claim.¹⁷

Further Augmenting the CPRS Bill: the Cost of Supporting Sequestration

A critical and enduring feature of successive Australian governments' emissions reduction targets policy has been that target objectives could be easier to achieve by accessing carbon offsets and sequestration initiatives. In fact, government policy has not placed much emphasis on actually reducing emissions. One obvious illustration of this can be noted by reflecting on the proposed support for the emissions-intensive industries under the CPRS which assumed that energy-intensive industries would continue to grow as would the magnitude of their emissions. Carbon credit offsets and sequestration initiatives have, almost by necessity, emerged as the pivotal preoccupations of government emissions policy, yet exciting interest in these is contingent upon the incentives on offer, and the principal incentive, a carbon price, because it remains low, is proving insufficient to drive investment in these options. The consequence has been that governments have had to offer extra-market incentives to engage investment in carbon offsets and in research and development of different sequestration technologies. Governments have been quite proactive in instigating a number of schemes that would expand the range of carbon offsets and sequestration initiatives, and these have been pursued at some considerable cost. Three stand out for consideration.

Carbon capture and storage (CCS) is held out as a key plank for abating emissions particular from coal-fired power generating plants. A carbon

17 The government is pressuring the Federal government to contribute to the compensation package that owner of the Hazelwood plant, International Power Australia, is seeking in order to write-off its investment by decommissioning the plant (Manning 2010; Murphy 2010). This follows lobbying by International Power for compensation despite the fact that when it purchased the plant following the privatisation of the State-owned electricity sector in Victoria in 1996 it sought legal advice on the implications of potential changes in the environmental regulatory regime that could result in the introduction of a carbon price. Hazelwood, apparently, has been one of International Power's most profitable assets.

price is supposed to provide the impetus for emitters to invest in research and adopting this technology. However, it is generally agreed that the carbon price would have to be significantly higher than is envisaged under the terms of the CPRS before the technology could be commercially viable, setting aside the issue that the technology is still in the exploratory stage. Reflecting this uncertainty, emitters have demonstrated very little interest in investing in research and development of CCS technology. Government has led the way in committing funds to support almost all of the research and development that has occurred to date, and even though there have been considerable efforts to engage private sector interest through cooperative research endeavours, private sector investment has been negligible. This was demonstrated with the Queensland government's efforts to spearhead funding for a government-private sector research program (Rosewarne 2007).¹⁸ The Federal government sought to speed up research by funding cooperative research programs, with a trial being developed in the Otway Basin, although the more significant initiative was the Rudd government's decision to establish the Global Carbon Capture and Storage Institute in 2008, committing \$A100 million annually over four years, and signing up twenty other governments and 80 corporations to promote collaborative undertakings.¹⁹

The potential cost of the government's commitment to CCS technology could be even more substantial because, with the object of encouraging major emitters to buy into the technology, the government has indicated its preparedness to assume responsibility for the risks associated with carbon sequestration. In 2008, the Labor government amended the Commonwealth Offshore Petroleum Act 2006 with a view to establishing property rights to support offshore storage as well as for the government to assume liability for the risks of future failure in offshore storage facilities, and the government is moving to establish a nationally-consistent framework with State and Territory governments for

18 The Queensland government has recently announced its intention to withdraw support for CCS.

19 The Australian government is the major financial supporter of the Institute, although the Obama administration has recently announced that it will contribute \$US500,000 to support the Institute's work (Kerin 2010). Interestingly, it is a demonstration project in Texas, the Tenaska Trailblazer Energy Center, that has attracted the largest single tranche of support – of \$8 million – to date (Morris 2010a)

geological storage.²⁰ The States of Queensland and Victoria have already passed legislation covering terrestrial sequestration, with New South Wales about to pass similar legislation, and the legislation decrees that the state will assume more immediate responsibility for the risks associated with the CO₂ reservoirs.²¹ The significance of this commitment is not simply related to supporting the continued growth of the emissions-intensive trade-exposed industries. As the Minister for Resources has indicated, establishing viable CCS technology is crucial to the future of Australia's coal export industry.²²

The government may well justify this expenditure in terms of the limited purchase of market mechanisms to drive research and development of a public good, but this financial commitment raises yet another qualification regarding the effectiveness of the market as the preferred institutional mechanism for addressing the challenge of climate change. A similar argument can be made with respect to the government's efforts to expand the array of carbon offsets through its investment in the International Forest Carbon Initiative to support improved forest management and reforestation programs in Indonesia and Papua New Guinea. The \$273 million project is linked to moves within the Intergovernmental Panel on Climate Change to authorise carbon offset credits through forest sequestration programs in developing countries under the terms of the UN's Programme on Reducing Emissions from Deforestation and Forest Degradation. The Australian government is proceeding rapidly with the initiative in Indonesia, through the Kalimantan Forest and Climate Partnerships, which is designed to generate carbon forest credits.²³

20 See *The Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill* and the *Regulatory Guiding Principles for Carbon Dioxide Capture and Geological Storage* endorsed by the Ministerial Council on Mineral and Petroleum Resources.

21 *The Greenhouse Gas Storage Bill*, New South Wales.

22 Some measure of the extent of the inequity in the proposed compensation arrangements and how these will be to the benefit of a few transnational corporations is unconsciously well articulated by the Minister's support for CCS: "major companies such as BHP, Rio, Xstrata, Anglo, Peabody, etc...regard carbon capture and storage as part of their future" (Morris 2010a). We might add that these companies have contributed comparatively little to funding research in CCS.

23 The KFCP scheme has attracted considerable criticism from local community and environmental groups because the reforestation program, which is primarily in

Finally, and a somewhat related scheme, is the program that has been extended following the Rudd Labor government concessions to the Turnbull-led coalition in the manoeuvres to secure support for the CPRS. The Carbon Farming Initiative is being developed to enable farmers, foresters and landholders to generate carbon credits through soil sequestration and foresting. The government envisages the scheme could generate up to \$500 million in carbon credits over the next ten years, and one Western Australian company, Carbon Conscious, has recently announced plans to invest in plantation timber and signed a deal to sell carbon credits overseas (Morris 2010b; *The Australian Financial Review* 13 October 2010: 5). While the immediate cost of this to the government is comparatively small, with \$46 million being set aside to establish the scheme, the carbon offsets generated would not count towards Australia's target commitments because these offset credits would not be certified under the terms of the Kyoto Protocol. While it appears that the government will treat these offset credits as currency that could be acquitted against an enterprise's designated emissions target, these will not count towards the nation's Kyoto target. In fact, the government would have to purchase Kyoto-compliant carbon offsets to ensure that the national target, inclusive of the Carbon Farming Initiative offsets, correspondences to its internationally-agreed target.

The government initiative to develop a more robust cap-and-trade system by expanding the tranche of potential tradeable carbon offset credits will simply serve to deepen the claim of the emissions trading system on the public purse, and further erode the substance of the argument that the emissions trading system is the more cost-effective option.

terms of the establishment of plantation timbers for pulp milling and palm oil plantations, has resulted in forest and peat clearing and the displacement of indigenous communities from traditional lands. The criticisms of the scheme highlights the way in which additionality requirements under the Kyoto Protocol are effectively downplayed or ignored.

Conclusion

The terms of the debate on climate change policy have been dominated by a conventional economic narrative. I have argued that there are two principal dimensions to this, one that presents climate change as an economic problem, of market failure. The other locates the solution in policy formulations that reference conventional economic theory which purportedly privilege market-based mechanisms, tradeable emission permits, as being the most efficient and cost-effective. The *Stern Review* and the *Garnaut Review* are emblematic of this particular narrative. They each contend that expanding the reach of the market provides the institutional means for giving voice to the ambition to secure a sustainable future. In their world view, the market provides the most economically democratic means for capturing the preferences to secure this future. This is, at least, the rhetoric.

The argument in support the market-based system being efficient is based on a conventional economic theory conception of economic agents giving voice to their preferences is response to meaningful price signals that capture the costs of emissions when neither of these conditions are manifest. A cap-and-trade system effectively circumscribes the opportunity for individuals to exercise a preference for a particular emissions trajectory, and this is at odds with subjective preference theory that demands that individuals have the unfettered right to give voice to their economic preferences. The conviction in the merit of putting a price on carbon in order to engender efficient outcomes can also be regarded as a somewhat hollow gesture. By their own admission, the *Stern Review* and the *Garnaut Review* recognise the capacity for price to effectively capture the cost of environmental may be somewhat limited, and hence their appeal to a range of other institutional mechanisms to underwrite the efficacy of the market. Even if the market price were to capture the 'right' measure of the costs of emissions, it is not at all clear that this will prompt the appropriate behavioural responses without the aid of supplementary measures. To this must be added the concerns of ecological economists that price signals will likely not provide the necessary impetus to drive the necessary transition from the high-carbon economy and avoid the prospect of runaway climate change.

The confidence in the cost-effectiveness of the emissions trading system is an even more dubious claim. The ostensibly simple solution for

addressing market failure is far from a costless exercise. It entails creating a whole raft of other markets and property rights. The effective functioning of this multilayered market requires a complex institutional architecture being established to oversight emissions trading, as well as for the associated secondary markets. This will entail substantial transaction costs, and any reckoning of these costs must include all of the ancillary initiatives designed to bolster and to ‘deepen’ the carbon trading system – the carbon offsets, the considerable public funds invested in research and development in low-carbon technologies and other sequestration technologies, including carbon capture and storage technologies – and these come at some considerable cost as well as turn the market building exercise into a political feast.

The irony here is that the institutional transformation that is being proposed has resulted in more energy, and funds, being invested in establishing measures to expand the possibilities for polluters to trade their way to meeting designated emissions reductions targets. This exposes an extraordinary asymmetry embodied in the cap-and-trade construct because the emissions reductions target trajectory, already compromised by the objective of reconciling targets with the practicable or the ‘politically possible’, become even more fungible.

This embrace of the practicable or the ‘politically possible’, I contend, overwhelms any meaningful adherence to the conventional economic theory’s entreaty that the cost of environmental externalities be internalised in prices. The conventional economic discourse becomes subterfuge for maintaining the commitment to the continued expansion of economic activity as well as creating new opportunities for wealth enhancement. This commitment to maintaining the pace of economic growth is the foundational concern of both the *Stern Review* and the *Garnaut Review*.

In the interests of not frustrating the growth objective, not only are polluters rewarded for their polluting activities, capitalising on the costs they have imposed, and continue to impose, on others, but a whole other raft of rent-seeking and revenue-making opportunities is presented. This is as much a political exercise, played out within the nation-state and globally, as carbon offset arrangements provide the potential for windfall gains for farmers and landholders. Carbon capture and storage arrangements transform the spent resources of depleted oil and gas reserves into valuable assets, and carbon trading promises to foster an

extraordinary expansion in carbon futures and derivatives trade, while the forests of the South are transformed into sequestration sites to help the polluters of the North avoid any meaningful engagement in meeting emissions reduction targets. Defining emissions reduction targets that will help avoid the potential for runaway climate change is a subordinate consideration (IPCC 2007; Hansen 2009). The *realpolitik* of the emissions trading system is a none-too subtle agenda to sustain capital accumulation.

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