

# The practicalities of emissions trading

*Joshua Gans and John Quiggin*



*In the past year, climate change has moved from political controversy to political consensus — at least in relation to the need to limit emissions through price-based policies. Uncertainties remain; but with both major parties proposing to develop an emissions trading regime, it is timely to highlight some important practical issues that will face them on that path.*

In writing this, we take the case for action as given. There is a scientific consensus that global warming is taking place and that it is, in large part, due to the actions of humans on the planet. The policy prescription is to limit net emissions, although the precise technologies that will likely carry the load have yet to be developed. Consequently, in the short term, behavioural responses

are required, and to engage these appropriately, a price for carbon must be set.

Economists disagree about the way in which a carbon price might be generated. One set of economists (including the Pigou Club led by Greg Mankiw) supports a carbon tax. This would fix the price for emissions, leaving the quantity to be determined by the market. Concern has been expressed that reliance on national carbon taxes might limit opportunities for international cooperation. Other economists favour emissions trading, which involves the quantity being set by governments and the price by markets.

The issue with emissions trading is that it is largely unknown how it will operate in national and international markets covering a broad range of activity. As with the design of market mechanisms, some caution needs to be applied. Here we address the need for caution and the trade-offs implied.

### Implementing emissions trading

Policy making under uncertainty involves balancing considerations of flexibility and commitment. On the one hand, it is important to respond flexibly to new information. On the other, it is necessary to give investors and consumers clear signals on the direction of future policy and, in particular, to commit to a price path for carbon emissions which is consistent with the substantial reductions needed to stabilise the climate. The appropriate response is one that combines a firm commitment to a broad set of policy principles with a willingness to adjust particular policy parameters and instruments in the light of new information.

This encapsulates the two facets of the policy problem we face that need to be emphasised. First, any policy response to climate change needs to accommodate *uncertainty*. While there is a scientific consensus that global warming and other greenhouse-related climate change is a result of human activity, there is considerable uncertainty surrounding the rate at which warming will take place under various projections, and the extent and distribution of effects on human activity and natural ecosystems.

There is also considerable uncertainty on the economic side. Specifically,

offer immediate benefits in excess of immediate costs. For these policies, commitment isn't a problem. It becomes an issue, however, where the costs of a policy are front-loaded and the benefits follow later; or worse, do not accrue to those who incur the costs early on.

The problem is that the policy options we are evaluating today need to take into account uncertainty and the commitment challenge. They need to take into account uncertainty by allowing for flexible readjustment should efficient ways of dealing with emissions present themselves. At the same time, commitment is needed

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the best means for reducing carbon in the atmosphere is not clear. There are many options, ranging from direct abatement (restrictions on emissions regardless of source) to technological mandates (that eliminate the most harmful emitters) to mitigation (that offsets the carbon being put into the atmosphere). This means that, from an economic perspective, we are uncertain of the most efficient way forward and are unlikely to increase our certainty through scientific investigation.

Secondly, there are issues of *commitment*. Policy makers have no trouble implementing policies that

because much of what needs to be done to deal with emissions involves investments today which require a stable policy response to guarantee a return tomorrow. Absent policy commitment, there is a risk that the needed investments will not take place.

### How does emissions trading deal with uncertainty?

The first question we need to ask about emissions trading (or any scheme that may be part of it) is how it deals with uncertainty. One of the main benefits to having emissions trading as opposed to mandated behaviour or a tax on emissions is

that it provides more opportunities to respond flexibly to uncertainty. For example, many studies point to coal-fired power as being a prime source of carbon emissions. This suggests that a move away from coal-fired power might be appropriate and warranted. A tax that resulted in electricity consumers substituting away from coal-fired power or a mandate that restricted consumption of such power would reduce emissions from those sources.

Emissions permits do the same thing since the requirement to purchase a permit increases the cost of coal-fired electricity. But they provide another option. It may be the case that, while coal-fired power is a prime source of emissions, it still represents a more efficient use of carbon than alternatives. Emissions trading allows those alternative users of carbon to bid for the right to abate. And if it turns out that they can abate more efficiently (for instance, by curtailing less valuable consumption), the price of a permit will adjust accordingly. The coal-fired plant may then decide to purchase permits rather than abate. In the end, the same aggregate emissions are released but in a more economically efficient manner.

But the options that emissions trading allows need not be based solely on the type of use. They can also be based on the location of use. In an international context, it is plausible that in Australia, where we have established coal-fired power, it is less efficient for us to abate emissions than for a new plant in China or India to be built that either uses an alternative fuel or is built so as to store carbon rather than emit

it. If we chose a policy that simply mandated emission levels or taxed coal-fired power in Australia, there would be no opportunity to influence decisions made elsewhere. Emissions trading offers that opportunity.

The potential for emissions trading to deal with uncertainty should not be over-stated. There are challenges. Some forms of emissions, and the associated abatement opportunities, are relatively easy to monitor while others are not. Absent measurement, there are fewer short-term trading opportunities. Of course, as solutions to measurement problems emerge, they can be built into the system. But we cannot take for granted that all activities can or will be appropriately measured and, given

this uncertainty, regulatory oversight will be required.

When we evaluate the type of emissions trading scheme that should be adopted, we need to assess the potential for such a scheme to deal with uncertainty in an efficient manner. This suggests two observations: first, intra-industry impacts and opportunities are more likely to be exploited via emissions trading than those arising between industries; and secondly, given this first point, locational opportunities for trading — nationally and internationally — are likely to be most important.

### How does emissions trading deal with commitment?

The issue of commitment is fundamental to any policy response to climate change. Many of the economic changes required involve investments or habitual adjustments, each of which incurs short-term pain before the environmental benefits are realised over the longer term. Moreover, the distribution of the benefits is diffuse. By the very definition of an externality, the main beneficiaries of abatement measures are not those who are asked to abate. Further, to the extent that the beneficiaries are extra-jurisdictional, our usual governmental means of internalising externalities are inoperable. Commitment to policy

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measures that will encourage abatement today is therefore a difficult challenge.

Emissions trading assists in the commitment challenge compared with other policies in several respects. First, by allowing firms to trade emissions, you allow them to manage their own adjustment while not compromising the overall level of abatement. Put simply, emissions trading targets the policy outcome directly — capping total emissions — while allowing the market to decide precisely how that policy goal is met. It focuses public policy on the variable of concern and results in less painful adjustment.

Secondly, emissions trading opens the possibility of resolving distributional issues upfront. The rights to permits initially allocated can be held in

trading. For one, there is an ongoing issue of what the emissions targets are and how to stick to them. If targets are the subject of deliberation

negotiations on emissions is that this type of ratcheting can arise.

For emissions trading to be successful, these issues need to be resolved. Once again, technological mandates are potentially easier to commit to and taxes, once established, can be hard to change. While emissions trading may allow for flexible adjustment and the building of a constituency for change, some measure of independent regulation and review is likely to be required. That said, these same issues were overcome in order to build our successful institutional management of monetary and competition policies. There is no reason why the same cannot be done for environmental management. The point is not to ignore the challenge as we develop our institutional policy response to climate change.

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many different ways. One possibility is that they are sold for a fixed price by governments. Another is that they are allocated to households. Or they could be allocated to firms — either firms generally or in selected industries. This allows policy makers to affect behaviour — by causing decisions at the margin to adjust for environmental harm — while mitigating resistance based on financial impact. Emissions trading allows a constituency to be built in ways that other policy measures cannot, since they do not offer the same flexibility in sharing the pain of adjustment.

and negotiation every few years, there may be a temptation to restrict permit allocations to those based on emissions at that time. Realising this, emitters may face diminished incentives to abate today. Certainly, one of the criticisms of international

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There are other issues of commitment that are not resolved by emissions



## The need for learning

The practical issues associated with uncertainty and commitment demonstrate the need for learning to occur in developing an effective emissions trading scheme. While examples exist around the world, the circumstances of the Australian economy dictate that there is more to be done. We simply do not know how onerous it will be to measure emissions, allocate permits, manage the yearly flow of permits, establish ongoing targets and commit to all this once we have done it. We do not know what subtle rules and regulations might distort behaviour or prove too costly. We do not know how liquid the markets for emissions might be. And we do not know how essential international engagement will be in order to generate an effective regime.

The need for learning has a clear implication — we cannot afford to wait. It is foolish to suggest that we wait and see whether the high end of environmental harm (or international pressure) materialises before deciding to establish an emissions trading scheme. Our ability to respond quickly is unlikely to be

high. Already we have squandered a decade not considering the viability of alternative environmental policies. We cannot afford another decade of ‘wait and see’.

Put simply, setting up an emissions trading scheme and institutions for the economic management of the environment gives us an *option value*. It will mean that, as uncertainty is resolved regarding the right policy

forced to suffer austerity programs and experience real short-term pain. We can minimise the prospects of this outcome by having in place the knowledge, expertise and legal framework to react when the need arises.

There are several implications for how this learning might be achieved. First, it is unlikely to arise from a weak but national emissions

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targets, we will be in a position to adjust our expectations to meet them. Without knowledge of how to conduct policy, we may be left with painful decisions, in much the same way as economies that fail to handle inflation or manage debt are

target. While this would allow some learning, it would not allow us to experience environmental management with tough constraints. Secondly, it may be appropriate to target industries where emissions can be reliably measured first and put in emissions trading regimes there. Finally, the best industries to target would be those for which the environmental and economic benefits of curtailing emissions were but one product of abatement.

Two examples of such industries and activities stand out. *Electricity* is an industry that currently operates a market for generation which enables competition between different fuels producing the same end-product. Moreover, the industry is sophisticated in its use of financial instruments to manage



risk. Generating plants could be inspected and rated each year for their emissions content. Emissions would be measured as a function of output which would be easily observable with little in the way of audit costs. Indeed, this is perhaps why minimum mandates have already been established in electricity generation. For all these reasons, electricity generation is a good first target for establishing an emissions trading regime.

The second industry that would make a good target would be *automotive transportation*. The age and make of a motor vehicle is the information required to measure its emissions. In addition, the fuel used is directly proportional to emissions generated. Permits could be distributed to owners directly along with annual

thereby build up understanding for any future expansion of the scheme. Alternatively, and more simply, producers of motor fuel could be required to buy permits, although this may forgo a direct impact on motorists' awareness of the emissions they generate and of the need to pay a price for those emissions.

It is also desirable to promote trade in mitigation and offsets in the early stages of any scheme. Markets for carbon offsets through forestry activities already exist, and any national scheme should support these markets. But can these be broader? For example, a tree planted in NSW does the same as a tree planted in Indonesia to offset carbon emissions. Promotion of such schemes should encompass broader options.

A staged, progressive introduction of emissions trading leaves open the door for other environmental policies. Carbon taxes could be introduced to cover other industries or technological mandates could continue to be evaluated. The point is that such policies should be complements to emissions trading. They should be reserved for areas where dealing with uncertainty is not a large issue or where committing to an emissions target is difficult. ■

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registration and then presented when purchasing fuel. Unused permits could be traded. Third-party brokers could ensure that high users can purchase options while those who choose to forgo motor vehicle transportation can recoup value from their choice. Such an approach would bring most citizens into the emissions trading arena and

It is important to promote international trade in emissions and to encourage the development of internationally agreed standards for the achievement of genuine and sustainable offsets. This would set us on an evolutionary path, ensuring our environmental management policies matched those in place elsewhere.