Statistical office support for emission trading schemes

Developments in Australia

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Abstract

The Australian Government is establishing an emissions trading scheme. The design is scheduled to be completed by the end of 2008, with the scheme expected to start in 2010. This paper explores how official statistics can be used to support emissions trading schemes, both in design and implementation. In Australia's case, a key role for official statistics is to provide Input-Output tables of improved quality and timeliness to support the economic modelling underlying the scheme. Emissions trading schemes also provide opportunities for new types of statistics and they have implications for the measurement of economic activity in particular sectors and for the nation as a whole.

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Background

The Australian Government is establishing a national emissions trading scheme (ETS) as part of an effective framework for meeting the climate change challenge. The scheme will commence in 2010 and work has commenced on the design of the scheme. A 'green paper' canvassing options and preferred approaches on issues, such as which industry sectors will be covered and how emission caps will be set, is scheduled for release in July 2008. The paper will also include ways to address the impacts of emissions trading on Australian households, emissions-intensive trade-exposed industries and other strongly affected sectors. Following the release of the paper there will be public consultation leading up to the development of draft legislation by the end of 2008. During the early part of 2009 there will be a further phase of consultation on the draft legislation. A Bill is expected to be introduced in Parliament in March 2009, and enacted by mid 2009. During 2009 there will also be a round of consultation on the regulations that will underpin the scheme.

The Government has outlined five tests for its ETS:

- An effective ETS must be a cap and trade scheme and include all major emitters
- An effective ETS must effectively reduce emissions. The Australian Government has set a target of a reduction in emissions of 60 percent by 2050
- An effective ETS must be economically responsible. It must provide the right incentives to drive investment in low emission technologies and renewable energy. It is also vitally important that a domestic scheme does not undermine Australia's competitiveness and provides mechanisms to ensure that Australian operations of energy-intensive trade exposed firms are not disadvantaged
- An effective ETS must be fair, with both costs and benefits shared across the community
- An effective ETS must recognise the need to act now, hence the relatively short time-frame for establishing the scheme.

The Australian Government's Department of Climate Change (DCC) is responsible for designing the ETS. The design work builds upon the work of a 2007 Prime Ministerial Task Group on Emissions Trading. It is also drawing on the work of the 'Garnaut Review'. This Review, which is headed by Professor Ross Garnaut, is a joint Federal and State Government study to examine the impacts of climate change on the Australian economy, and to recommend medium to long-term policies and policy frameworks to improve the prospects for sustainable prosperity. The DCC is also being supported by the Australian Treasury in the economic modelling work underpinning the design of the ETS.

The ETS, in both its design and implementation phases, has significant implications for official statistics. In recognition of this, there has been an active dialogue between the Australian Bureau of Statistics (ABS) and the DCC, and other key stakeholders such as Treasury and the Garnaut Review, on statistical issues associated with the

ETS. This dialogue is occurring at both the operational and senior management levels. ABS support has been actively sought (and willingly provided) and the ABS has been provided with additional funding for some of the statistical work to support the ETS.

The statistical implications of the ETS include:

- statistical support for the design and implementation of the ETS, particularly with regard to the assessing the 'economically responsible' and 'fairness' elements of the scheme
- statistical support for examining the impacts of climate change generally
- the need to ensure that new economic activity caused by the ETS is properly measured in official statistics
- the need to ensure that the economic, social and environmental impacts of the ETS are properly captured in official statistics, particularly in order for policy issues arising from these impacts to be addressed.

Each of these implications is explored further below.

Statistical support for the design and implementation of the ETS

The ABS has been funded to support Treasury in their role of providing economic modelling for the establishment and ongoing monitoring of the ETS. The ETS is expected to alter the structure of the Australian economy and to produce 'winners' and 'losers'. The modelling will inform these distributional impacts and assist in the design of compensation schemes, particularly for low income households and energy-intensive trade-exposed industries, which are viewed as two groups likely to be significantly adversely affected by the ETS.

The economic modelling is being undertaken using computable general equilibrium (CGE) models, which are a class of economic model that use actual economic data to estimate how an economy might react to changes in policy, technology or other external factors. A particular feature of CGE models is that they are based on Input-Output (I-O) tables.

In Australia, I-O tables have typically been compiled by the ABS every three to four years[1] and these have generally been released some three to four years after the reference period. Most recently, the 2001-02 I-O tables were released in July 2006. However, in order to support the ETS economic modelling, more frequent and higher quality I-O tables are required. As a result, the ABS has been provided with additional funding to:

- compile the I-O tables on an annual basis
- reduce the period between the reference period and release data
- improve the quality of the data feeding into the I-O tables, and therefore improve the quality of the I-O tables themselves

[1] Annual Supply-Use tables, which are related to I-O tables, are produced to benchmark the national accounts, but these lack the depth of I-O tables for detailed structural analysis.

- improve the integration between I-O tables and other data sets relevant to the ETS design

This work has involved the ABS in early stages of policy development, but it is also a test of the organisation's responsiveness. Funding was only approved in December 2007, and the organisation has had to quickly staff up to handle the work. The first deliverables, which are classification concordances between the I-O tables and the consumer price index and household expenditure survey have already been provided to Treasury. These concordances support the modelling of the impacts of 'carbon prices' on consumer prices and on household (at population sub-group level) budgets. The ABS has also provided advice to Treasury on concordances between quantitative measures of greenhouse gas emissions and I-O industry groups.

The next key milestone will be to publish I-O tables for the 2004-05 reference year, which are scheduled to be released in June 2008. After this, the ABS will move towards the annual production of the tables and engage in a quality improvement program. A key component of this will be increasing, on a 'rolling basis' the range of I-O related information collected in the ABS's Annual Integrated Collection, which is the ABS's main economic collection from businesses across all industries.

A key challenge will be to ensure the relevance of I-O tables in their use as an information base for supporting climate change issues. For example, the energy intensiveness of industries becomes a much more important factor than it has been in the past and this has implications for the collection of data, the compilation of the tables and the dissemination of outputs. The ABS has previously released an environment account, the Energy and Greenhouse Gas Emissions Accounts 1992-93 to 1997-98 'energy account', which combines physical energy quantities with monetary I-O accounts, but this was some years ago before an ETS was 'on the radar'. This account attracted relatively little user interest at the time, but it is expected that statistics of that integrate the environment and economy will become much more important, and with much higher expectations around the quality of these statistics.

Statistical support for examining the impacts of climate change generally

As mentioned above, the objective of the Garnaut Review is to examine the impacts of climate change on the Australian economy, and to recommend medium to long-term policies and policy frameworks to improve the prospects for sustainable prosperity.

This work by the Garnaut Review is particularly relevant to the design of the ETS, as it is necessary in order to establish the emissions 'trajectory' that will underpin the scheme. A range of statistical information is required to support the analysis. While the ABS will not specifically introduce new collections to support the information requirements – partly because the time frames involved are too short – there has been discussions between the ABS and the Review Team on the availability of relevant statistics and how they might be appropriately used. It is possible that this could lead to the secondment of an ABS staff member to the Review Team for a period of time.

More generally, the ABS produces a range of economic, social and environmental statistics that support the analysis of the impacts of climate change, the adaptations

required and the impacts of mitigation. Notable examples include the water accounts, statistics on natural resource management, statistics on agricultural practices, and statistics on household environmental behaviours.

Capturing new economic activity in official statistics

The basis of the Australian ETS will be tradeable permits that enable the holder to emit a certain quantity of greenhouse gas, translated into carbon dioxide equivalent. Most, if not all, of these permits are likely to be allocated by way of some form of auction mechanism, which is expected to generate significant amounts of revenue for the Australian Government. A register of the permits issued will be established. There will almost certainly be organised trading in the permits involving, but not limited to, energy producers[2]. Markets for derivative instruments, such as futures and options are also likely to develop. There will be some form of an acquittal process under the ETS, and penalties are likely for non-compliance.

All of this has implications for government finance statistics, the national accounts and statistics about the market participants themselves, and in particular energy producers. The ABS will need to ensure that its statistics properly capture this new type of economic activity. It is likely that markets will emerge – particularly in derivative instruments – prior to the actual implementation of the ETS, so the statistical issues will need to be thought through, and the right collection mechanisms put in place, within a relatively short time-frame.

A particular issue is the treatment of the permits themselves in economic statistics. One of the issues considered in the update of the 1993 SNA[3] was 'contracts, leases and licenses'. Within this broad topic, emission permits are considered to be 'permits issued by government to undertake a specific activity'. They are specifically mentioned in paragraph 17.342 of the draft update, which concludes that 'the permits … constitute assets and should be valued for the market price for which they can be sold'. Preceding paragraphs describe how payments to government for the issuance of permits to undertake a specific activity are to be treated as taxes. The permit asset itself first appears in the other changes in the volume of assets account and changes in value, both up and down, are recorded in the revaluation account. When a permit is traded, a transaction in the asset between the two institutional units involved in the transaction is recorded.

Derivative instruments based on emission permits will be treated in the national accounts in a similar manner to other derivative treatments.

The updated 1993 SNA will be introduced in Australia's national accounts in the second half of 2009, which ties in well with the timing of the implementation of the ETS. The national accounting treatment of emission permits will also be implemented in other ABS economic statistics, including the balance of payments and government finance statistics around this time.

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[2] The point of obligation is likely to be set at the point of emission where practicable. Where transaction costs are lower than the cost of distortions that may arise, the point of obligation may be set upstream or downstream of the energy production as appropriate.

[3] All of Australia's economic statistics use the SNA as the underlying conceptual basis, so the national accounting treatment of the permits will flow through to other economic statistics where relevant.

As well as ensuring that the new economic activity generated by the ETS is properly reflected in economic statistics, the ABS will be keen to ensure that there are appropriate statistics about the issuance, acquittal and trading of the permits. Well-functioning markets need to be underpinned by good information, and statistics on turnover, price etc for the permits and associated derivative instruments will be important. It may, however, not necessarily be the role of the ABS to produce such statistics; instead it may be sensible for them to be produced as a by-product of the regulatory function or by the organiser(s) of the market or markets. If this is the case, the ABS will be keen to work with these producers as part of the national statistical system to both provide any assistance in the production of relevant statistics and to ensure that the needs of users for information to support decision making is being met.

As well as statistics on market activity in emission permits, the emission market will need to be underpinned by other, relevant statistics, just as financial markets are underpinned by regular and high quality statistics in areas such as the national accounts, balance of payments and the consumer price index. In particular, the ABS has been advised that participants in the emission permits market will likely be seeking high quality quarterly information on emissions themselves. Currently, such statistics are only available annually, with a lag of about two years. The Australian Government has recently commenced a program to streamline and upgrade the reporting of energy-related information as part of various regulatory processes by establishing a National Greenhouse and Energy Reporting System (NGERS). The System will be administered by a statutory office holder – the Greenhouse and Energy Data Officer (GEDO) – within the DCC. The ABS is working closely with the DCC in the design of the System, including providing advice on units, classifications and standards. The will also work closely with the GEDO to maximise the statistical opportunities that the scheme offers, including the possibility of more frequent and timely statistical data on energy production and usage and associated emissions. An important feature of the legislation underpinning NGERS is that it enables the ABS to obtain unit-record information for statistical purposes.

Measuring the economic, social and environmental impacts of the ETS

The implementation of an ETS in Australia will almost certainly have significant economic, social and environmental impacts that will need to be understood, and that in themselves are likely to the subject of policy decisions. For example, it is expected that the ETS will cause price 'shocks' that will impact on the consumer price index, and have implications for monetary policy. Some of these impacts – particularly the economic ones -- may be felt prior to the introduction of the ETS as the likely 'forward' price of carbon is factored into decision making processes. It is important that the ABS understands the potential for these impacts, so that these can be taken into account in making decisions about the range and frequency of its various statistics leading up to and following on from the implementation of the ETS, so that statistical methods can be checked to determine that impacts associated with the ETS will be properly captured in the statistics, and so that, wherever possible, the particular impacts of the ETS can be identified[4].

[4] This last mentioned issue – that of identifying wherever possible the particular impacts of the ETS – can be challenging. In 2000 the Australian Government introduced a new taxation system which, among other things, included a goods and services tax. While the ABS sought to measure the impact of

So far, only preliminary consideration has been given to identifying the statistics that are most likely to be affected. However, it is clear that a wide range of statistics will be affected, including but not limited to:

- the consumer price index (with there also being issues around the limitations of using a fixed-weighted index and the best time for reweighting the CPI)
- the household expenditure survey, to understand changes in household expenditure patterns
- the balance of payments, to understand the impact of non-resident involvement in the emission permits market
- capital expenditure statistics, to understand the impact on investment decisions
- research and development and innovation statistics, to understand how businesses and other institutions are dealing with challenges associated with higher energy prices
- profit statistics, to understand the impact on business profitability
- transportation statistics, to understand changed transport patterns
- household and business energy use statistics, to understand changed patterns in the usage of energy
- regional economic and social statistics, to understand impacts that are likely to vary from one region to another, with 'energy intensive' regions[5] likely to be particularly impacted
- statistics on renewable energy, to understand the impact of changes in relative prices for various energy sources and to understand responses to complementary initiatives to the ETS to encourage the use of renewable energy.

In the next few months the ABS will work closely with key users, and in particular the DCC and Treasury, to better understand the potential impacts and what needs to be done to prepare for them.

Concluding remarks

The design and implementation in Australia of the ETS has significant statistical implications, some of which are directly associated with the ETS and some of which are indirect. The ABS has had the opportunity to work closely with the key policy agencies working on the ETS and it has been able to secure some additional resources to support the development of the ETS. Continued close dialogue with the policy agencies, as well as other users with an interest in the statistical impact of the ETS, will be essential if the ABS is to ensure, by its efforts and in working in partnership with others, that these impacts are properly captured in statistics produced by the national statistical system.

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this, it was unable to fully quantify all of the impacts. Nonetheless, the efforts of the ABS in quantifying what it was able to were appreciated by users.

[5] Such regions could include those with significant energy producing activities or with significant energy-using industries.

In recent years, the ABS has had a focus on increasing in its relevance and responsiveness, particularly in terms of 'cutting edge' policy issues. The ETS offers a tremendous opportunity for the organisation to show its capabilities, and so far the results are pleasing. However, there are challenges. Many of the statistical issues are complex, and ensuring that the right skills are available is a particular issue that needs to be addressed. Also, the statistical impacts will be felt across a number of areas within the ABS, so coordinating the work will be important (as will coordinating communication with key external stakeholders). So far, the ABS has not established formal processes to do this, but it is likely to shortly establish such processes under the oversight of relevant senior managers. A lot of work needs to be done in a relatively short period of time, so good project management will be essential.

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