WASTE GENERATION AND RESOURCE EFFICIENCY PUBLIC INQUIRY

SUBMISSION BY THE AUSTRALIAN BUREAU OF STATISTICS

February 2006

Introduction

Recent OECD statistics (2005) indicate that Australia's per capita municipal solid waste generation is 690 kilograms per year (1). While on the surface this appears like a straightforward number, the compilation of this single statistic is a complicated task. Currently there is no comprehensive, reliable and on-going source of waste information produced for all of Australia.

Quantifying waste data requires compiling information from throughout the economy, from the originating sources of the waste, to the organisations and government agencies that manage the waste once it leaves the point of production, and potentially to the end users of the waste or associated by-products. The flow of waste involves individuals, industry, not-for-profit organisations and all levels of government. Currently waste data sources are many and varied, as is the quality and frequency of availability of the data. For example, the OECD figure of 690 kilograms of municipal solid waste per capita for Australia in 2002, while only recently released, was based on "*Estimated data referring to the late 1990s*".

The Australian Bureau of Statistics (ABS) is Australia's official national statistical agency. It provides statistics on a wide range of economic, social and environmental matters, and covers government, business and the population in general. In the waste information field, the ABS is only one of a number of Federal, state and local government agencies that contributes to the overall pool of information. Industry associations and individual companies also contribute waste information.

The ABS submission will concentrate on addressing the issues of "*the adequacy of current data on material flows, and relevant economic activity, and how data might be more sufficiently collected and used to progress optimal approaches for waste management and resource efficiency and recovery*".

History of ABS waste-related collections and data

The ABS has conducted a number of waste-related surveys. These surveys have involved a number of different approaches; however, they largely revolve around measuring the supply and demand of waste services within the various sectors of the economy. The surveys have consisted of collecting data from:

- businesses and government agencies within the waste industry, i.e. organisations supplying waste-management services;
- businesses as waste producers and users of waste services, i.e. how much businesses spend on waste services;
- governments as waste producers and users of waste services, i.e. how much governments spend on waste; and
- households as waste producers, i.e. users of waste-management services and the activities undertaken within households to minimise the need for waste services (e.g. recycling and reuse).

A brief outline of the specific ABS Waste Surveys undertaken to date is outlined below:

1. Waste Management Service surveys

The ABS has conducted two waste management services surveys: the first in respect of 1996-97 and the second for 2002-03. These periodic surveys provide details of the performance and structure of organisations providing waste management services operating in Australia. The main focus of these surveys was to understand the nature of waste management activities, the composition of income generated, expenses incurred and the nature and volume of waste quantities. Volumetric data on waste going to landfill has been collected for a limited number of broad categories for some states and territories.

The scope of the Waste Management Services surveys included all employing private and public sector businesses that generated income predominantly from waste management services. Waste management services include the collection, transport and/or disposal of refuse (except through sewerage systems). The scope included the waste management activities of both government and private businesses. The surveys have not collected information on recyclables.

For further descriptions on these surveys and the resulting outputs see ABS catalogue no. 8698.0 *Waste Management Services, Australia*.

2. Household waste surveys

The ABS Household survey program collects limited information on the environmental behaviours and practices of households and individuals in Australia. Each year the survey contains one of a set of three yearly rotating environmental topics, of which waste management is one. The waste topic has been included in the surveys conducted in 1996, 2000 and 2003. It will next be included on the 2006 survey.

The waste management topic focuses on the waste management activities undertaken by households rather than volumes of physical waste produced. It provides information on the percentage of households that are recycling waste, type of waste recycled, methods of recycling, and reasons for not recycling. Australian level, as well as state/territory level, estimates are available.

For further descriptions on these surveys and the resulting outputs see ABS catalogue no. 4602.0 *Environmental Issues: Peoples Views and Practices, Australia.*

3. Environment Protection Expenditure (EPE) Surveys

In the early 1990's the ABS developed surveys aimed at providing an estimate of the expenditure spent on protecting the environment. Specifically, the EPE surveys cover current environment protection expenditure, capital environment protection expenditure and income from environment protection activities, collected by the following environmental domains:

- solid waste management;
- liquid waste management;
- management of air emissions;
- mine-site rehabilitation; and
- other environment management activities including protection of soil resources, protection of biodiversity and habitat, noise and vibration abatement.

Waste management is one of the main activities covered in the EPE surveys.

The EPE surveys covered the activities of Australian governments, businesses and households. The first EPE survey was in respect of 1991-92, with subsequent collections in respect of each financial year until 1996-97. The methodology for the EPE collections until 1994-95 was based on the Pollution Abatement and Control (PAC) framework introduced by the Organisation for Economic Cooperation and Development (OECD). The PAC framework focused solely on the cost of waste management for government, industry and the community.

The redevelopment of the System of National Accounts (SNA) for 1993 gave rise to two environmental accounting frameworks: the System of Integrated Economic and Environmental Accounts (SEEA, 1993) and the European System for the Collection of Economic Information on the Environment (SERIEE, 1994). The SEEA framework proposed a highly aggregated measurement of the cost of degradation and environment protection; the SERIEE framework proposed a more detailed accounting framework based on the Classification of Environment Protection Activities (CEPA). The SERIEE framework and classification was used as the basis for collecting environment

protection data in Australia by the ABS, with some adaptations for specific Australian conditions.

The last economy-wide EPE was conducted in respect of 1996-97 and since that time the ABS has conducted sector-specific EPE surveys including: the local Government EPE surveys in respect of 1997-98 and each subsequent year until 2002-03 (with the exception of 2001-02); and the Mining and Manufacturing Industries EPE in 2000-01. The range of industries covered was limited to mining and manufacturing industries as these are typically the largest consumers of environment protection goods and services.

The EPE surveys typically only collect financial data, that is, no physical or volumetric data is collected. However, the 2000-01 Mining and Manufacturing EPE survey collected, for the first time, some physical data on waste and recycling, measures implemented to minimises energy, water, material inputs and waste, eco-efficiency savings and environment plans. These new data items proved problematic to business in terms of understanding and reporting, and ultimately the results were of variable quality and unsuitable for publication.

For further descriptions on these surveys and the resulting outputs see:

- ABS catalogue no. 4603.0 *Environment Protection Expenditure, Australia*
- ABS catalogue no. 4611.0 *Environment Expenditure Local Government, Australia*
- ABS catalogue no. 4603.0 *Environment Protection Mining and Manufacturing Industries, Australia*

In general, past ABS approaches to compiling waste related data have centred on environment protection expenditures and income data for a number of reasons:

- they are indicative of the response of various sectors to environment protection regulations and policies;
- they provide some indication of the demand for goods and services provided by the 'environment management' industry;
- they form part of environment 'satellite' accounts designed to augment the core system of national accounts;
- they estimate expenditure on environment protection, by sector and environmental domain, including waste management; and
- they are understood by respondents and involve minimal reporting burden.

The collection of physical waste data

Typically ABS industry surveys have a primary objective of collecting structural information about the industry, i.e. the financial status of the industry, the employment of the industry, the commodities produced by the industry, etc. The resulting industry data is primarily used for compiling the

national accounts, as well as analysis or understanding specific industries. The data collected is largely financial and the addition of any ancillary data, such as the amount and types of waste produced, has proven problematic and not the primary focus of the survey.

In recent years the ABS has evaluated and tested (as part of the survey development process) the possibility of collecting some physical data, such as volumetric and type of waste data on various industry specific surveys (e.g. the construction industry survey). These approaches have proved problematic during survey development and testing and as such no physical waste data has been collected on any industry-based surveys, with the exception of the specific Waste Management Service surveys. Very few businesses record and maintain records on the amount and types of waste produced. As such, the compilation of waste and resource efficiency data would be very difficult and costly for most businesses to provide.

Waste within environmental frameworks

The basis for most of the environmental collections within the ABS revolve around developing an approach that allows data to be collected or compiled for both immediate needs (such as policy requirements) as well as for longer term and possible future needs (such as long term analysis and associated impacts). Consequently, the survey standards and methodologies employed need to be statistically sound and repeatable, especially if the survey results are to be used to assess and monitor change. A major element of this involves using the methodologies and frameworks described within the *System of Environmental and Economic Accounting (SEEA), 2003* (2). Put simply, SEEA is a guideline that describes how a set of accounts (typically physical rather than financial) can be compiled that will allow analysis of the interactions within and between economy and the environment and vice versa.

The term 'waste' is broadly defined as any substance that may be emitted, discharged or deposited into the environment to cause or potentially cause adverse environmental change and as such waste emanates from material flows within the economy. Waste generated in the economy can broadly be divided into various waste streams. Numerous waste streams exist in Australia. These waste streams involve the flow of solids, liquids and gaseous materials which are emitted as waste to either the land, water or the atmosphere. ABS appreciates the terms of reference for this inquiry has been directed to look at solid waste only, with the further exclusion of some of the more toxic wastes (e.g. nuclear waste).

Within SEEA, all solid, liquid and gaseous wastes are known as "residuals". Residuals are subsequently defined as the incidental and undesirable outputs from production and consumption processes within the economy. Consequently within SEEA the residuals can be measured by looking at their flow, i.e. the flow of residuals from the source, such as the manufacturing process to their ultimate sink: land, air or water. Thus to measure waste it is possible to develop a set of physical supply and use tables. For residuals (or waste) the physical supply tables would look at the substances by origin and the use tables would look at the destination of the waste flows. ABS also appreciates that the terms of reference for this inquiry excludes products or substances that are reused by the organisation that generated them.

Material Flows and Material Flow Accounts

The Commission's inquiry into Waste Generation and Resource efficiency is to have regard, amongst other things, to the adequacy of current data on material flows. In this section, the ABS explores material flows from a statistical perspective. In particular, following discussions with officers from the Productivity Commission and Commonwealth Department of Environment and Heritage, we believe the development of an environmental account for solid waste may be of interest to the Inquiry.

Material flows in their broadest sense cover all inputs and outputs to the economy. For example, water, energy and waste. Data on these inputs and outputs can be assembled into an environmental accounting framework via SEEA 2003 (2). In general, the ABS, UN and the OECD support and promote SEEA. We actively work together on statistical frameworks and standards for producing environmental accounts. For example, Australia is one of the few countries that produce an environmental account for Water.

SEEA 2003 defines material flow accounts (MFA) as a means of providing *" an aggregate overview, in tonnes, of annual material inputs and outputs of an economy" (2) p121.* It is ABS understanding that MFAs are usually economy wide and cover all inputs and outputs to production in a highly aggregated form ie aggregating water, energy and waste etc. Germany has produced a (economy-wide) material flow account and an English summary can be found at http://www.dst.dk/HomeUK/Statistics/ofs/NatAcc/NinthMeet.aspx?

In addition to supporting individual environmental accounts, the UN and OECD are also supporters of (economy-wide) MFAs. While the ABS can appreciate international agency approval of, and support for, (economy-wide) MFAs, Australian data analysts and the ABS are currently not strong supporters of (economy-wide) MFAs, particularly when used as environmental impact indicators.

The fundamental concern with (economy-wide) MFAs is that they often oversimplify the situation and the real impact on the environment. This occurs for a number of reasons, and is principally due to the need to use a common unit of measurement across different materials. For example, adding a tonne of nuclear waste to a tonne of lawn clippings to get two tonnes of waste is not sensible. The dramatically different impacts these two wastes have on the environment means that the costs of managing these two wastes are also very different. For example, nuclear waste would not be dumped in backyards; nor would a waste dump be specifically built for lawn clippings.

However, one of the components of an (economy-wide) MFA is an environmental account for solid waste. Such an account would enable the adequacy of current data on waste to be assessed and assembled into an internationally recognised framework. Further, the ABS considers lower level, substance or sector specific environmental accounts, such as a solid waste account, are a valuable tool in helping to understand impacts of production and consumption on the environment and hence for directing policy. It could, for example, illustrate where resource recovery is economically possible or enable comparison of the cost of waste disposal between organisations or different waste types.

The ABS believes that to maximise the understanding of the flow and impacts of waste, both in the economy and environment, waste data analysis needs to be disaggregated so that the individual waste streams or waste types can be measured, monitored and analysed. For example, analysis of solid waste separately to hazardous waste.

As noted earlier, the collection of data such as volumetric and type of waste data from businesses is problematic. At present very few businesses record and maintain records on the amount and types of waste produced. This would make the compilation of waste and resource efficiency data difficult and costly to provide, and would be an issue that would need to be addressed if a waste account was to be produced.

In this section, the ABS has explored material flows from a statistical perspective. The adequacy of current data on material flows is an area in which the ABS is interested, and we believe the SEEA 2003 framework has much to offer. We would be happy to assist with further explanation and advice in this area.

Future requirements for waste data and information

At the inaugural ABS Centre of Environment and Energy Statistics Advisory Board meeting in August 2005, members highlighted that waste and waste management would be a topic of emerging and increasing interest. The ABS program currently has within its forward work program, a continuation of the waste management services survey in 3 or 4 years time, and a continuation of the rotating series of questions on the household survey program to include waste and waste minimisation topic every 3 years. Currently there are no plans or resources for future Environment Protection Expenditure surveys of either government or industry.

While SEEA is a methodology for integrating environmental and economic accounts, the ability to apply it to any country is dependant on having good data. Since most of the interactions between the environment and the economy have a physical basis, the underlying need is for a good set of physical accounts. Once the physical data has been compiled the next stage would be to complement the physical accounts with economic data, thus adding an economic context to the physical measures.

Waste is a part of the SEEA framework and understanding the waste, environment and economy interactions requires a solid understanding of the waste flows. Understanding and measuring waste flows is a large and ongoing task. Waste, by definition, is an undesirable by-product of production and as production and consumption increases, so does the amount of waste. While economic production is usually well measured and recorded the indirect outcomes, such as waste, are often poorly recorded and reported, thus making data collection difficult

The potential roles for the ABS post the Commission's *Inquiry into waste generation and resource efficiency* could involve:

- Repeating existing surveys, including redeveloping the surveys to better align with current requirements. In the case of the Environment Protection Expenditure surveys of either government or industry, resources to reinstate this survey would be required. Plans are in place to repeat the waste management industry survey in 3 or 4 years time, but this would be subject to priorities and resource availability;
- Assisting others in collection and collation of waste data, particularly in the area of defining agreed statistical concepts, frameworks, standards and data requirements
- Developing waste accounts for particular waste streams such as solid waste. It is expected that the development of stream-specific waste accounts would most likely highlight data gaps and deficiencies rather than produce usable accounts in the first instance.

The experience gained from these activities, and in particular the development of a waste account, would be extremely valuable for the designing of subsequent surveys (which could be run by the ABS or other agencies) and for the development of classifications and standards for recording of waste data by waste producers and those providing disposal services. Such a development path would be similar to that of the ABS Water Accounts.

The ABS environment program is currently limited in its capacity to address waste statistics at this time. Should the Inquiry recommend that the ABS take action on some or all of these issues, the ABS would need to seek resource commitment from government and/or industry sources.

Gemma Van Halderen, Assistant Statistician, Industry and Environment Statistics Branch (ph 02 6252 6977, email g.vanhalderen@abs.gov.au) is the ABS contact for this issue. Gemma would be happy to discuss these matters further with the Commission.

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February 2006

References

1. OECD 2005 *Environment at a Glance*, OECD Environmental Indicators.
2. UN 2003 *Integrated Environmental and Economic Accounting*: final draft