WASTE GENERATION AND RESOURCE EFFICIENCY

SUBMISSION TO THE PRODUCTIVITY COMMISSION

ENGINEERS
AUSTRALIA

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1. INTRODUCTION

Engineers Australia is the peak body for engineering practitioners in Australia representing all disciplines and branches of engineering. Membership is now approximately 75,000 Australia wide. *Engineers Australia* is the largest and most diverse engineering association in Australia. All *Engineers Australia* members are bound by a common commitment to promote engineering and to facilitate its practice for the common good.

One of the most common adjectives associated with government policy statements is sustainability. Australian ecologically sustainable development policies, in the main, owe their origin to the adoption in 1992 of the National Strategy for Ecologically Sustainable Development. This policy was exceptionally wide ranging and its application covered all sections of the Australian economy and gave particular emphasis to cross sectoral issues and connections. The policy struck a cord with most Australians and the evidence of this, in the context of this Inquiry, remains in the strong support for recycling among the Australian public.

Engineers Australia members are strong supporters of sustainable development practices and indeed testify to this support through their agreement to *Engineers Australia's* code of ethics. Rarely is the lack of engineering technology or skill the limiting factor in achieving sustainable outcomes. In the experience of *Engineers Australia*, the more common limiting factor is inadequate or absent policy frameworks, including resource and economic management matters. *Engineers Australia* believes that further development of resource efficiency in Australia is hampered by inadequacies in waste generation and management practices. There are links back to the initiating policy framework which was part of the National Strategy for Ecologically Sustainable Development framework, but along the way changes have occurred which have seriously compromised the intent of sustainable development.

2. THE POLICY CONTEXT

Waste management is an element of the Australian National Strategy for Ecologically Sustainable Development (NESD) which was adopted by all levels of government in 1992.[1] The five key principles identified at that time were as follows:

- Integrating economic and environmental goals in policies and activities.
- Ensuring that environmental assets are properly valued.
- Providing for equity between and within generations.
- Dealing cautiously with risk and irreversibility.
- Recognising the global dimension.

Following on from this agreement the Australian and New Zealand Environment Conservation Council (ANZECC) adopted the national Waste Minimisation and Recycling Strategy in the same year[2]. This strategy established a national target of a 50% reduction in waste going to landfill by 2000 based on 1992 volumes. Complementary strategies were also established to cover kerb-side recycling (the National Kerb-side Recycling Strategy) and for the proper disposal of chemicals highly resistant to degradation (the National Strategy for the Management of Scheduled Waste). The major weaknesses of the national 50% reduction target were the absence of practical implementation plans and sanctions for failure to achieve targets agreed.

In 1998 the earlier approach adopted by ANZECC was extended to a framework for cleaner production[3]. A direct correspondence with the 5 principles listed above was combined with three underpinning principles to support the adoption of a United Nations definition. The three principles are:

- *Precautionary Principle*; this moves the burden of proof for the safety and efficacy of a process from society to the person or firm proposing the process.

- *Preventative Approach*; It is cheaper and more effective to prevent environmental damage than attempt to manage or fix it. Prevention requires upstream activity to influence the production process.

- *Integrated and Holistic Approach*; The need to adopt an integrated approach to environment resource use and consumption to ensure that addressing one pollution problem does not simply create another one.

The definition of cleaner production was that it is “the continuous application of an integrated preventative environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment.”

- For production processes this means conserving raw materials and energy and reducing the quantity and toxicity of emissions and waste before they leave the production plant.

- For products this means a life-cycle focus on the product from raw material extraction to product disposal.

- For services it means an analogous focus on service provision from service system design to consumption of services.

These developments extended an understanding of waste management from a side line issue (simply involving collection, recycling and disposal of whatever volume of waste generated) into processes which are integral to the efficient functioning of the economy and society. In the words of ANZECC “cleaner production can increase a business` competitiveness and an organisations`s efficiency, while minimising the environmental impact of the organisation’s activities. Increasing the efficiency of resource and energy use and reducing waste can reduce operating costs.”[4] ANZECC saw its strategy as a win-win for industry and the environmental movement alike.[5]

The strong and growing support for recycling among Australians is generally attributed to this connection. Australian Bureau of Statistics (ABS) data[6] show that the proportion of households that recycle waste has risen from 88.4% in 1996 to 95.4% in 2003. These strong results are evident in all States and Territories[7] and apply to an extensive range of household items[8] and to all types of households[9].

These connections are reflected internationally by the inclusion of reducing waste and consumption pressures as an indicator in the Environmental Sustainability Index prepared for the World Economic Forum by Yale and Columbia Universities in the United States[10]. This is an index of 21 separate indicators covering a wide range of measures grouped under five headings. Overall Australia ranks highly at 13 out of 142 countries assessed, but it is instructive to note that while Australia compared very highly for indicators under the heading "environmental systems," it compared poorly under the heading "reducing stress" which includes waste reduction. Australia's performance against designed systems is not as good as its performance in designing those systems.

Engineers Australia believes that sustainable environmental practices are important to economic and social development in Australia. Indeed, sustainability is a major tenet of *Engineers Australia's* code of ethics. It requires engineers to consider the long term impact of development on local and global ecosystems, and to consider what action needs to be taken to protect and restore them. In all work carried out by *Engineers Australia* in the past, the key drivers for change have been private and public sector client demand and clear direction from Government policies and practices. The relationship between the two drivers is plain.

3. THE STATUS OF AUSTRALIAN WASTE MANAGEMENT

Since the NESD was agreed in 1992 waste management in Australia has improved significantly. Community consciousness is reflected in the ABS data referred to above, but to what degree is Australian practice consistent with the policy framework outlined in the previous Section?

The inadequacy of statistics must be highlighted from the outset. ABS collection is limited to the mentioned surveys of people's views and attitudes and two surveys of the waste services industry, the most recent being for 2002-03[11]. The latter are the ABS follow up to the Industry Commission study of the waste services industry in 1993.The ABS surveys of people's views and practices regarding household waste management provide comprehensive and useful data to assist the improvement of municipal collections. Beyond confirming the conclusion of the Industry Commission that the waste management industry is heterogeneous to the point that it constrains comment on its characteristics and capacity[12], little information about resource flows will be found in the publications on the waste services industry.

A way in which ABS collections could be developed would be to extend present collections to include data on the types and amount of recycling undertaken by Australian households. This would enable analyses of the type and volumes of materials recycled to be undertaken, as well as the potential for further recycling by

households. Without such data the market for recycled materials cannot be adequately understood and the existing market imperfections could persist.

Relevant State organisations have clearly invested considerable funds and effort in the compilation of statistics on waste material flows but differences in methodology and statistics collected, and a persistent presence of spin, impedes consolidation. The best data relate to flows of particular materials and even here there are difficulties because very little detail is available. From the literature it is evident that the lack of consistent and comprehensive statistics is a widely recognised issue which presents difficulties on many fronts, including for long established, and respected, research organisations.

TABLE 1
SOLID LANDFILL WASTE QUANTITIES, 2002-03 (`000 tonnes)

SECTOR	Domestic & Municipal	Commercial & Industrial	Construction & Demolition	Other	TOTAL
NSW	1657	2358	1193	-	5208
VICTORIA	2132	na	2790	545	5467
QUEENSLAND	1108	522	200	986	2815
SA	na	na	na	na	1252
WA	741	420	1535	-	2696
TASMANIA	na	na	na	na	na
NT	na	na	na	na	na
ACT	82	98	27	-	207

Source: Australian Bureau of Statistics, Waste Management Services, Australia, 2002-02, Cat. No. 8698.0

Table 1 gives an indication of the scale of the waste management task using ABS data for 2002-03. The likelihood is that Tasmania and the Northern Territory generate waste at about the same scale as the ACT. Using this assumption, about 18 million tonnes of waste was deposited in landfills in 2002-03. The difficulty with statistics is highlighted by noting that other researchers reported that in 2000 the volume of solid waste generated was much larger at 26.5 million tonnes.[13] Similarly, according to Nolan-ITU[14] the proportion of waste land filled in Australia is not known accurately, but is estimated at about 80%, suggesting that about 20% is recycled. On the other hand, more emphatic and quite different data from Loughlin and Barlaz indicate that 36% of the Australian waste stream was recycled.[15] The ABS reports that OECD data indicates that Australians are among the top 10 waste generators in the OECD.[16]

The waste stream is typically divided into “at home” and “away from home” sectors[17]. The “at home” sector is the focus of local government authorities over-sighted by State and Territory governments and is represented by the Domestic and Municipal category in Table 1. Community perceptions tend to be informed by their experience with kerb-side resource recovery in Australia which is regarded as extensive[18] and this is reflected in the ABS perceptions data reported above. A key issue is that the “away from home” sector, that is, consumption of take-aways, picnics, etc. away from home,

does not perform as well and that Australia's international rating would be improved by a greater focus here.

An important unresolved issue for kerb-side recycling authorities is known as the "the gap." This is the net cost of collecting, transporting and sorting recycled materials. The argument is that "the gap" is increasing and presents a significant problem for future collections. The most commonly cited example was calculated by Nolan-ITU for metropolitan Sydney. This rather old example showed that in 1997 the cost of recycling was $67 million and revenue from the sale of recyclables was $17 million. Allowing for avoided land fill and related costs, the net cost was $36 million. Other research has extended this estimate to be a net outlay of $158 million annually[19]. The existence of this net cost points to the existence of externalities in the waste management system and/or to market failures in the market for recycled materials. Certainly it is suggestive of badly structured landfill disposal prices, which in turn mean that economic incentives are more conducive to disposal than to waste avoidance or recycling.

Recovery rates vary significantly between sectors. Consolidated data is rare, but a snap-shot for NSW in 2000 shows recovery rates of 25%, 28% and 63% for the domestic and municipal, commercial and industry and construction and demolition sectors respectively[20]. The estimate for the domestic and municipal sector is broadly in line with the estimate discussed above, but there is little available information to assess the other sectors.

Product data for recycling also provides a useful perspective and an indication of future directions.[21]

- All paper; Australia 47%; best Germany 71%; worst China 34%.
- Plastic packaging; Australia 16%; best Germany 53%; worst Ireland 3%.
- Total plastics; Australia 11%; best Austria 22%; worst Canada 3%.
- Glass containers; Australia 44%; best Switzerland 89%; worst Ireland 31%.
- Aluminium cans; Australia 67%; best Finland 95%; worst Ireland 16%.
- Steel cans; Australia 41%; best Japan 84%; worst New Zealand 8%.
- Waste to energy; Australia less than 1%; best Denmark 58%; worst Australia.

At State level the following recycling rates have been reported by various State and Territory organisations,

- NSW 40%.
- Victoria 53%.

- Queensland 37%.
- South Australia 65%
- ACT 69%.

These figures reflect differing priorities and recycling emphases but do not always appear consistent with product based recycling rates. *Engineers Australia* believes that regular, consistent and transparent waste management statistics are essential. State based statistics do not meet this criterion and impede the analyses needed to achieve long term reforms in waste management.

At the national level the main element of policy is the National Packaging Covenant administered by the Environment Protection and Heritage Council (EPHC) which is one of the successor organisations to the ANZECC. To quote from the Covenant's preface "the Covenant is the voluntary component of a co-regulatory arrangement for managing the environmental impacts of consumer packaging in Australia. It is an agreement based on the principles of shared responsibility through product stewardship, between key stakeholders in the packaging supply chain and all spheres of government—Australian, State, Territory and Local."[22]

Signatories to the Covenant commit to the continuous improvement in recovery and reprocessing of used packaging through annual action plans and support for curb-side recycling. The Covenant has been in place for many years and has been criticized for having vague objectives, its inability to press for change and its view on producer responsibility which is regarded as weak. In particular, the voluntary nature of the Covenant, in the context of externalities and/or inadequately structured disposal prices, is seen as a serious weakness[23]. The NSW waste strategy puts forward a much stronger position on waste avoidance implicitly disagreeing with the Covenant.

This Covenant has been strongly opposed by local government and environment groups. Opposition from local government relates to the emphasis in the Covenant on kerb-side collection and recycling. Local government disagrees with the EPHC view that local government will benefit financially by collecting larger kerb-side quantities and that in turn these benefits would off-set the greater costs associated with "away from home" collections. Local government argues that current recycling practices already result in net costs which would be increased under the Covenant[24]. A major argument is that the Covenant encourages end-user recycling and disposal while doing little in practice about up-stream waste minimisation. Local Government Associations have resolved to not become signatories to the Covenant. *Engineers Australia* agrees that a broader approach is needed.

The Boomerang Alliance argues strongly that the Covenant emphasis on kerb-side collection is misplaced because it ignores the growing trend towards "away from home" consumption which accounts for nearly 50% of food and grocery packaging. The Boomerang Alliance favours greater emphasis on waste avoidance by producers and disaggregated recycling targets. The latter are not favoured by local government which is a member of the Alliance. The Alliance sees disaggregated targets as a way of eliminating the variability shown in the above product recycling rates and a way to stretch performance towards the standards evident among the best performing

European countries. The Alliance also favours setting targets for reducing the use of non-recyclable materials in packaging. *Engineers Australia* does not agree that disaggregated targets are needed for recycled materials. However, *Engineers Australia* does favour the establishment of targets for minimising the use of non-recycled materials.

The National Packaging Covenant incorporates the concept of "product stewardship" which provides for shared responsibility by "all participants in the packaging supply chain, consumers, recycling service providers, reprocessors and all levels of government" for the environmental impacts of their sphere of activity. The Covenant clearly covers headings such as design, production, distribution, disposal, research market development education labelling, wholesaling and retailing and recycling and reprocessing. To all intents it appears to be comprehensive. Yet, the Covenant's emphasis on recycling in practice and the vehement opposition to the Covenant by local government does not appear to be consistent with a broad and integrated approach.

4. CONSIDERATION OF THE ISSUES

The historical close link between growth in expenditure on waste management and gross domestic product has been recognised by most commentators, including the predecessor of the Productivity Commission[2526]. The ANZECC cleaner production framework was an attempt, among other things, to de-couple economic growth from environmental degradation.[27] Equally important objectives are the conservation of energy, the recovery of value from wastes and reduction of hazardousness[28]. The approach gives rise to a hierarchy of actions in a waste management strategy. In order of priority these actions are as follows:

- Strict avoidance.
- Reduction at source.
- Product reuse.
- Recycling, composting and energy from waste.
- Landfill.

The first three points summarise to *waste avoidance*, while the last two refer to *resource recovery* and *waste disposal*, respectively. Inherent in ANZECC`s cleaner production framework is a life-cycle approach to waste management which prioritizes waste avoidance over resource recovery and waste disposal, and in turn, prioritizes resource recovery over waste disposal.

The ANZECC framework requires that the interconnection between different elements in the production and consumption chain be taken into account in evaluating elements of the framework. Thus the savings which accrue to sound waste management practices are not necessarily confined to material use and could be realised in other forms such as lower energy costs and lower disposal costs. Low

energy costs have been a vital contributor to Australian comparative advantage and saving on energy use will help to maintain this in the context of rising energy costs. There are also the added benefits of lower greenhouse gas emissions resulting from lower energy use. The potential to reduce greenhouse gas emissions serves to emphasize the importance of integrating waste management policies and practices in an overall resources management framework.

The policy context described in this submission has not been fully reflected in the observed outcomes in Australia. While there is no doubt that waste management practices today are significantly better than they were 20 years ago, equally the evidence suggests that major gains remain unrealised. The key reason appears to be that the Commonwealth Government has reduced its role in respect of sustainable development in recent years and has relied on the voluntary arrangements in the National Packaging Covenant as the core of its approach to waste management and resource use. *Engineers Australia* believes that the ANZECC cleaner production framework is far more appropriate. This approach is based upon principals of precaution, prevention and continual improvement which have already been applied by Government in other areas of policy, it is consistent with the objective of maximising the effectiveness of the Australian economy and it is consistent with improving the competitiveness of Australian firms.

Engineers Australia is convinced that the Productivity Commission Inquiry will encounter the same difficulties encountered by others when it reviews available statistical information. *Engineers Australia* believes that National leadership is essential to ensure that the efforts made by the States to expand statistical collections are not dissipated by inconsistency and by differences in definitions and emphases. There is a widespread view that the waste reduction targets set as a result of the 1992 Waste Reduction Strategy have not been met and there appears to be official reluctance to revisit these objectives.[29] *Engineers Australia* believes that exploring these views is an appropriate way to kick-start a process of building greater coherence and consistency in statistical collections.

While waste avoidance appears in policy statements, implementation plans have been missing, and, in practice the emphasis has been on resource recovery and disposal. Similarly, the scope for synergy between waste management policies and other resource management policies as highlighted by the ANZECC framework has received little if any attention in recent years. Engineers Australia accepts that overall economic reform is a progressive process which transcends the life of individual governments. *Engineers Australia* regrets the lack of priority accorded to cleaner production, incorporating a life-cycle approach to waste management. Resource efficiency in Australia cannot be achieved through a continuation of current arrangements which give undue emphasis to some elements of a comprehensive policy and little to others.

Materials which enter the production and consumption chain and which are potentially recyclable, but become waste, are an indicator of inefficiency in resource use at both firm and economy wide level and represent factors reducing the general competitiveness of the Australian economy. *Engineers Australia* believes that some of the economic behaviour observed may well be the result of indirect subsidies distorting decision making. Examples range from landfill fees which are too low to

poor identification of waste avoidance decision makers. This serves to emphasize the importance of a holistic approach and why National leadership is of paramount importance.

The National Packaging Covenant, as the pivotal program of the Commonwealth approach to waste generation and resource efficiency, is long overdue for independent evaluation. *Engineers Australia* believes that it is essential that the evaluation be conducted against the policy context from which waste management in Australia developed and by researchers independent of the waste management industry. The evaluation should also encompass the hierarchy of costs and benefits in waste management from producers to local councils responsible for kerb-side recycling.

5. ENGINEERS AUSTRALIA VIEWS

Engineers Australia believes that sustainable environmental practices are important to economic and social development in Australia. Indeed, sustainability is a major tenet of *Engineers Australia's* code of ethics. It requires engineers to consider the long term impact of development on local and global ecosystems, and to consider what action needs to be taken to protect and restore them. In all work carried out by *Engineers Australia* in the past, the key drivers for change have been private and public sector client demand and clear direction from Government policies and practices. The relationship between the two drivers is plain.

Engineers Australia believes that regular, consistent and transparent waste management statistics are essential. Current ABS statistics are at best rudimentary and are insufficient for National policy. State based statistics do not meet this criterion and impede the analyses needed to achieve long term reforms in waste management. *Engineers Australia* believes that National leadership is essential to ensure that the efforts made by the States to expand statistical collections are not dissipated by inconsistency and by differences in definitions and emphases.

Engineers Australia believes that the ANZECC cleaner production framework is an appropriate framework for a national policy framework on waste management. This approach is based upon principals of precaution, prevention and continual improvement which have already been applied by Government in other areas of policy, it is consistent with the objective of maximising the effectiveness of the Australian economy and it is consistent with improving the competitiveness of Australian firms.

Engineers Australia regrets the lack of priority accorded to cleaner production, incorporating a life-cycle approach to waste management. Resource efficiency in Australia cannot be achieved through a continuation of current arrangements which give undue emphasis to some elements of a comprehensive policy and little to others.

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