

29th October 2015

Waste & Resource Efficiency Team
Sustainability Policy
Department of Environment, Land, Water and Planning
Level 1, 8 Nicholson Street,
East Melbourne, VIC 3002

Dear Madam/Sir,

Managing E-Waste in Victoria – Starting the Discussion

PGM Refiners ('PGM') is the largest e-waste recycling operation in Victoria, based in Dandenong. Our operation has a capacity to process over 15,000 tonnes of e-waste utilising innovative mechanical separation technologies. PGM recently purchased the 'BluBox' to recycle next generation e-waste, specifically flat panel display units such as LCD TVs, monitors, laptops and tablets which contain mercury. Mercury is a major environmental and occupational hazard. Our investment in the 'BluBox' was awarded a Sustainability Victoria grant. Another defining feature of PGM is that it runs as a social business providing a minimum of 70% of front-line jobs to disadvantaged workers who have experienced long-term employment.

One of the major challenges facing the e-waste recycling industry is that an increasingly large amount of toxic electronic waste is being sent to landfill, rather than being recycled. This is both undermining the electronic waste recycling industry and a significant threat to the environment. Therefore, PGM Refiners fully support and applaud the Victorian government initiative to ban e-waste from landfill.

PGM Refiners offers our cooperation to the Victorian Government in developing the policy for banning e-waste from landfill. Please find our responses to the 'Managing e-waste in Victoria' discussions attached. Should you require any further information please do not hesitate to contact us.

Yours Sincerely,



Karvan Jayaweera

PGM Refiners Responses to Summary of Questions

1. Is the proposed definition of e-waste clear to you?

Yes

2. Are the proposed categories of e-waste clear to you? If not, can you suggest any specific changes to the existing categories, or another method of categorisation?

E-waste categories are clear.

3. What specific issues do you believe we need to address by banning e-waste from landfill?

The following are specific issues PGM Refiners suggests to address:

- Funding to assist with the collection and recycling.
- Public education focusing on the environmental and health impacts of e-waste and why we should recycle. In PGM's experience, the majority of the public and general local government have little knowledge of e-waste, the surrounding issues and current recycling schemes.
- Education for local government and landfill operators on the true cost of landfill, especially costs for remediation of a closed site.
- Logistics solutions for regional areas. Subsidies for transport may be required. Innovative collection methods would need to be developed to reduce transport costs. For example, certain e-waste could be pre-compacted under controlled conditions to maximise logistics volumes per load.
- Establish environmental, health and safety risks and resource recovery around e-waste items. For example, CRTs monitors contain lead compounds and by chemical assay would be classified as Prescribed A waste. LCD monitors contain mercury which poses an OHS risk if broken or crushed. General households would have minimum hazardous components.
- Reduce illegal dumping by offering free or minimum charge disposal to the public.
- Set recycling standards. This could be achieved through implementing a requirement for recyclers to be EPA licensed. Track inbound and outbound e-waste for recycling facilities.
- Set recovery target. For example, scrap metal recyclers could recycle a portion of e-waste currently, however, only the larger scrap metals are recovered. The majority of plastics and circuit boards are lost as floc waste material which is usually sent to landfill. True end-of-life e-waste recyclers should be able to recover the majority of these materials.

4. What do you see are current and future impacts of e-waste on the environment or human health? Can you provide examples?

- Leaching of hazardous compounds into the environment e.g. lead, mercury, arsenic. Independent testing commissioned by PGM Refiners shows that CRT TVs should be categorised as Prescribed Industrial Waste due to lead leachability far above Prescribed A Industrial Limits. PGM has conducted a toxic analysis on a representative sample of CRT TVs and Monitors using a NATA approved lab. The analysis was done in accordance to testing standards required by the Victorian EPA's IWRG631 – "Solid Industrial Waste

Hazard Categorisation and Management” guidelines for total concentrations and leachability. PGM's analysis revealed leachability of lead is 62 mg/L, well above Prescribed A Industrial Limit >4 mg/L. In addition, total concentration of lead is 3533 mg/kg fitting within Prescribed B Industrial Limit of between 1,500 mg/kg and 6,000 mg/kg. In accordance with IWRG631, CRT TVs and Monitors should be treated as a Prescribed A Waste. Currently CRT TVs and Monitors are treated as a domestic waste in Victoria.

- Remediation costs to landfills.
- Exposure to mercury found in fluorescent lamps, tubes and LCD equipment (TVs, monitors, tablets, laptops, smart phones, etc.) The study ‘Evaporation of Mercury from CCFLs during Recycling LCD Television Sets’ by Linkoping University, Sweden concluded that LCD TVs contain mercury ranging from 0.1mg to 10mg per lamp. In addition, the study reported a mercury air concentration 0.058mg/m³ after 60 mins of breaking a 42-inch LCD TV. The Australian workplace time weight average exposure standard for mercury vapour is 0.003 mg/L. Current recycling technique for recycling LCD equipment involves the manual dismantling of flat panels, laptops, mobile phones and tablets. This is very labour intensive and can lead to an environmental, health and safety hazard from the accidental breakage of the mercury vapour tubes due to their high fragility. Breaking a tube can expose mercury vapour and dust to personnel and immediate environmental surroundings. Processes are required to effectively handle this type of material such as closed dismantling rooms operating under negative pressure with mercury air filters or automated equipment such as the ‘BluBox’. PGM Refiners are commissioning the BluBox at its Dandenong facility which will be dedicated to recycling LCD equipment safely, handling and separating the mercury content.
- E-waste exported to third world countries eventually disposed in off-shore landfills that have sub-standard environmental controls, and ultimately exporting Australia’s problem.

5. What do you see as potential impacts (both positive and negative) from recovering e-waste?

Positive

- Environmental
- Health and Safety especially with mercury emissions
- Jobs creation
- Increased resource exports
- Increased feedstock for recyclers and better volume certainty leading to further investments into new processes and technologies.

Negative

- ‘Cowboy’ operators cutting OHS and environmental compliance
- Illegal Dumping

6. Do you believe there are particular reasons for not recovering e-waste?

No

7. Do you believe there are other issues with the e-waste recycling market, or with specific stages of the e-waste recycling market?

Life-cycle of re-use where items with short life span are sold to developing countries only to become a waste problem for them once the product has reached its end of life.

8. Are you aware of other barriers to achieving a sustainable e-waste recycling market?

- New generation of products are becoming more and more difficult to dismantle due to their size and low resource recovery. Automation is required to sustain future recycling. However, for automation some manual dismantling is still required particularly for the removal of batteries to avoid explosion. This will be an issue for intricate new products such as the iwatch or surface pro where it is difficult to remove the batteries.
- Volume certainty for recyclers to make new investments in recycling processes. Banning e-waste from landfill would assist with recyclers in making these decisions, knowing that the products have to be properly recycled, rather than competing with the cheap landfill alternative.

9. Do you think e-waste and its components are undervalued in Australia?

No, there are well established markets for e-waste components, however recycling charges are sensitive to fluctuations in the scrap commodity market.

10. Do you believe that banning e-waste from landfill will achieve these outcomes?

Banning landfill would certainly assist, however the issues raised in Q3 would need to be addressed. See also Q8 response on volume certainty.

11. Are there other outcomes you believe the commitment should, or is likely to, achieve?

As part of the 'Improve recycling technology' a point on improving and sustaining high but practical recycling standards need to be incorporated. This would ensure a level playing field amongst recyclers and avoid 'cowboy' type operators. Developing and implementing practical recycling standards would also play a major role in achieving the listed outcomes.

12. What criteria do you think will be useful to help us determine how the different types of e-waste are managed in Victoria?

Items proposed adequately covers e-waste criteria.

13. Do you think some regions will require more time to prepare for a landfill ban than others?

Some of the smaller regional councils would require time, however in PGM's experience working with regional councils, the majority have or are seeking to have some form of

collection in place for the NTCRS however the major barrier are logistics costs. Funding to assist in logistics would allow the smaller regional councils to meet the ban.

14. What changes, if any, will need to occur in your region before e-waste can be banned from landfill and managed appropriately?

Public and local government education

15. Do you think banning e-waste from landfill in Victoria will need to take a phased approach? If so, what do you think should be key considerations in determining how the phasing occurs?

Not necessary. There is already abundant capacity for recycling products that fall under the NTCRS where many recyclers are still working well under capacity. By expanding the ban to other e-waste it would assist recyclers in sustaining a business, returning investment on capital and maintain/expanding jobs.

16. Do you believe there are other principles that must be considered in the development of Victoria's approach to ban e-waste from landfill?

No

17. What other tools do you think we will need to consider when designing Victoria's approach to banning e-waste from landfill? Be as specific as you can and consider details such as:

- Data on different product categories including composition, scrap value, hazards.
- E-waste projection models.

18. How do you think community could be supported to ensure e-waste continues to be recovered and recycled?

- Funding assistance

19. What unintended consequences do you think the landfill ban could cause? Please provide as much detail as possible and refer to any research or case studies that might help to support your feedback

PGM's concerns as a recycler are covered in 6.5 other considerations, well done!

20. How do you think the design of the approach to banning e-waste could be designed to mitigate these unintended consequences?

- Free or low cost recycling for the public. Funds to cover recycling to be collected through other avenues. E.g. rates, levies etc.
- Recycling standards.

- Recyclers to be EPA licensed. Facilities inbound and outbound material tracked.
- Working with Federal Government to place limitation on types of items that can be exported for re-use. Limitation on items age if practicable. For example, 3 year laptop would have re-use value, however, a 5 year toaster or CRT TV would unlikely have a re-use value.

21. Are you aware of any policy developments or reviews, both interstate and nationally, that may be useful in the design and implementation of the e-waste commitment?

No developments, however apart from the ACT, SA and the SHOROC group of councils in NSW have had an e-waste landfill ban since 2009. It would be worthwhile discussing the outcomes of their e-waste ban to landfill if not already.