

InSinkErator Comment to the National Waste Strategy

InSinkErator welcomes the opportunity to comment on the National Waste Policy Consultation Paper. Australia faces a shortage in landfill sites. It is therefore sensible to take action to conserve the resource by more accurately valuing waste disposal so that market forces may correct the imbalance away from landfill.

One area to consider is food waste. It has been estimated worldwide that food waste makes up between 35 and 50 percent of all household generated waste.

Up until recently waste policy in Australia has not focused on food waste and its large contribution to landfills and greenhouse gas emissions. However numerous authorities across Australia are now starting to examine more closely the impact of food waste on household waste, landfill volumes and greenhouse gas emissions. For example, Penrith City Council has introduced an organics collection to help reduce the greenhouse gas emissions generated from the domestic waste stream.

International research spanning over a decade systematically indicates that Food Waste Disposers (FWDs) are an environmentally sustainable waste management solution that complement compost bins. FWDs are especially effective for households lacking facilities to compost or for those situated in apartment dwellings and for individuals who dislike separate collection and storage of food waste because of hygiene concerns.

Please see following international and national examples highlighting the benefits of FWDs:

- In 2007 Dr Tim Evans conducted an environmental impact study of food waste disposers in the UK for Herefordshire Council and Worcestershire Councils. The findings of Dr Evans' study resulted in Worcestershire and Herefordshire councils offering householders and builder's rebates towards the cost of installing FWDs as part of its strategy to divert biodegradable waste from landfill. The study showed that the carbon footprint of the counties would be reduced if more households used disposers. As part of its campaign the Worcestershire Council developed the following website: www.sinkyourwaste.co.uk

The study found that FWDs provide a convenient and hygienic means for householders to separate kitchen food waste and divert it from municipal solid waste landfill. (The synopsis of this research has been included at the end this document);

- In 2009, the Italian Senate lifted a ban on food waste disposers in order to encourage their use as an alternative to separate collection of organic waste;
- In 2007, the ACT removed provisions prohibiting the installation of in-sink waste disposal units in domestic plumbing work. The action was prompted by evidence suggesting that even high levels of disposer market penetration had very little effect on water usage (less than 1%,) and the increase in organic matter entering the sewerage system will not present problems;

- In 2008, it was decided that the annual fee for Food Waste Disposers would be abolished in Stockholm. The aim was to encourage more Stockholmers to get a FWD and contribute to increased biogas production; and:
- Today, InSinkErator is currently helping the Milwaukee Metropolitan Sewerage District save money and help the environment. They have a partnership where citizens of Milwaukee and surrounding communities are encouraged to grind more food in their disposers. Sending more food to the Milwaukee wastewater treatment plants enables those plants to convert the food waste into more electricity as well as more retail fertilizer (branded Milorganite). At the same time, this is resulting in less food being trucked to landfills, lessening negative environmental impacts (greenhouse gas emissions and leachate) of landfills. Please see following 'food to fuel' flyer on the Milwaukee Metropolitan Sewerage District website:
<http://v3.mmsd.com/AssetsClient/Documents/programs/Foodisfuel09forWEB.pdf>

How Food Waste Disposers assist implementation of the National Waste Policy: Managing Waste to 2020

Food waste in Australia represents approximately 26% of the municipal waste stream (page 37) contrastingly in the US it represents only 12% (according to the US EPA). This contrast may in part be a reflection of FWD ownership; 50% of households in the US have FWDs installed compared with only 5% in Australia.

The composition of food waste and lack of Australian Standards for landfill liners also sees associated landfill problems. As food waste is 70% water and there are no Australian standards for landfill liners or leachate management (page 24), 28% of waste ends up in unlined landfills; "Unlined sites received 5.7 million tonnes of waste annually or 28% of the total." (page 33)

Only 27% of landfills employ leachate treatment (page 33) so the food waste that ends up in landfills potentially increases the risk of groundwater contamination. Leachate is acidic and promotes the solubility of heavy metals which can migrate in groundwater and potentially contaminate drinking water sources.

FWDs also support the reduction of greenhouse gas emissions from landfills. FWDs can lead to an increase in biogas production for energy generation through anaerobic digestion at wastewater treatment plants. This process complements the goal, "advance the environmentally sound management of material" (page 4) in the National Waste Policy, consultation paper;

The use of FWDs also addresses questions 14 and 17 on page 11. The use of biosolids is increasingly viewed as a good alternative to organic fertilizers. Organic fertilizers require much more energy to produce and Phosphorus is fast becoming a limited resource. This reuse of biosolids is in accordance with goals (page 43) encouraging the utilisation of recovered materials. Biosolid reuse also fits with economic goals (page 45) to shift towards viewing wastes as resources.

National Waste Policy goals and FWDs

FWD units should be an essential component of sustainable household waste management in Australia.

It is essential for all jurisdictions to assess and/or implement FWDs as part of their waste management system. The benefits include:

- A decrease in food waste to landfill; subsequently assisting with Australia's shortage of landfill sites;
- Effective and compliant waste disposal in high density areas; and:
- A complementary approach the Australian Government's climate change and sustainability policy.

Recycling food waste by grinding it up in an FWD is an environmentally responsible and practical part of a holistic waste management strategy. FWDs have a modest environmental footprint. They are composed primarily of metal and can be recycled at the end of their life. And they use less than one percent of a household's total water consumption, less than a single toilet flush a day.

Environmental Impact Study of Food Waste Disposers

for The County Surveyors' Society, Herefordshire Council and Worcestershire County Council

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Synopsis by J Howell-Thomas, Worcestershire County Council

1 Synopsis

This study examines the financial and environmental impacts of food waste disposers (FWD) and finds that they provide a cost-effective, convenient and hygienic means of separating kitchen food waste (KFW) at source and diverting it from landfill. The study also finds that this costs less and has a better carbon footprint than other routes.

In terms of Best Value Performance Indicators, FWD reduce BV84 (kilograms of household waste collected per head of population), BV86 (cost of household waste collection per household) and BV87 (cost of waste disposal per tonne municipal waste).

Herefordshire Council and Worcestershire County Council have been pioneering in promoting installation of FWD. FWD have the benefit of separating at source a difficult fraction of biodegradable waste and diverting it using existing infrastructure and without entailing any regulatory bureaucracy.

The net global warming potential¹ (GWP) of separate collection and treatment of KFW by composting is -14 kgCO₂e/tKFW. For households with FWD feeding to wastewater treatment works where sludge is treated by anaerobic digestion, the biogas is used as renewable energy, the biosolids are used on land and the GWP is better than -168 kgCO₂e/tKFW². This is the pathway for Severn Trent Water's works in Herefordshire and Worcestershire and Welsh Water's works in Herefordshire. In contrast, landfill is +743 kgCO₂e/tKFW.

The cost of collecting and disposing KFW via the solid waste route in Herefordshire and Worcestershire averages £18.63 per household*year and the quantity is 180 kgKFW per household*year (2005/06 actuals). This is the approximate annual saving for each installed FWD. By February 2007, 640 FWD had been installed under the Herefordshire and Worcestershire cashback scheme at a total cost of £39,650, i.e. £62 per FWD, which represents a payback period of only 3 years and 4 months. The ground KFW is transferred to the wastewater collection and treatment system and therefore adds to the costs of the water company.

Water companies are understandably concerned about changes that might adversely affect demands on water resources or that would increase sewer blockages; field trials in several countries have shown that FWD do not affect water usage or accumulation in sewers significantly. Wastewater treatment works (WwTW) are designed to treat biodegradable material suspended in water, i.e. similar to the output

¹ Global Warming Potential is expressed as carbon dioxide equivalent (CO₂ e) over 100 years.

² This figure is based on direct before and after measurements in a town where 30% of households had FWD installed.

of FWD. Ground KFW has been found actually to improve the composition of wastewater for the advanced nutrient removal processes that are now being demanded of WwTW. The additional cost for water companies depends on the route for treating and using or disposing the sewage sludge; for the route most usual in Herefordshire and Worcestershire it would be about £0.68 per household*year, this is only 4% of the cost of the MSW-landfill route.

Overall, food waste disposers appear to be a very cost effective means of separating putrescible kitchen waste at source and diverting it from landfill. The carbon footprint of FWD feeding to a WwTW with anaerobic digestion (AD) and electricity generation (CHP)³ is competitive with separate collection of KFW delivering to centralised AD with CHP and significantly better than centralised composting. They are convenient and hygienic for householders but do not discourage home composting. Home composting is ideal for kitchen and garden waste but some householders are unable or are not inclined to practise it. FWD avoid the problems of odour and vermin that can be associated with separate collection via the solid waste route.

Herefordshire Council and Worcestershire County Council (H&W) have been in the vanguard of exploring the potential of FWD as an alternative for people who do not wish to home compost, collect and store kitchen food waste (KFW), etc.

Field studies have shown that use of FWD has a negligible effect on water consumption, that the ground KFW is conveyed in sewers at normal flow velocities and that in practice there is no increase in accumulation in sewers, that only about 3 kWh/household*year is used by FWD but that the food waste generates at least 33 kWh/household*year electricity from biogas at wastewater treatment works (WwTW) that have anaerobic digestion, which is the most

prevalent type of sludge treatment in the UK. Field studies have confirmed that FWD do not influence sewer blockage neither are the particles large enough to block the screens at CSOs (combined sewer overflows). When sewage sludge is used on land (which is the route for the majority in the UK), the organic matter in KFW is conserved and the nutrient cycles are completed. FWD increase the amount of biosolids produced at a WwTW but the extra cost of wastewater treatment and of treating it by AD with biogas CHP and recycling the biosolids to agriculture is less than one-tenth of the amount saved by H&W for the solid waste route. Historically WwTW were required to remove suspended solids, biological oxygen demand (BOD) and ammonia from the water. Suspended solids are collected, together with surplus biomass from removing the BOD as sewage sludge and treated. The ammonia is converted to nitrate. Many WwTWs are now required to remove nitrogen (nitrate as well as ammonia) and phosphorus in addition to solids and BOD. The preferred treatment is 'biological nutrient removal' (BNR) but the wastewater at many WwTW does not have sufficient carbon to sustain the biomass needed for BNR and WwTW have to purchase additional carbon (e.g. methanol) and chemical dosing (commonly iron). FWD assist BNR by adding carbon.

This study has found that food waste disposers (FWD) provide a convenient and hygienic means for householders to separate kitchen food waste (KFW) at source; they divert it from municipal solid waste landfill. Importantly, FWD do this using existing infrastructure and, by taking wet putrescible matter out of the solid waste stream, they make management of the dry fractions easier and less expensive and avoid odour issues, which have proved so detrimental to public acceptance of alternate weekly waste collections. There is no reason that FWD should discourage home composting since FWD are not designed to take garden waste and indeed

³ This is the route in H&W

exclusion of cooked KFW from home composting might encourage home composting.

2 Acknowledgements

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