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InSinkErator Response Environment Bill 2019-2020
Commons Committee Stage **14 May 2020**

By email to: scrutiny@parliament.uk

InSinkErator is a leading manufacturer of kitchen sink appliances, including in-sink food waste disposers (FWDs). It is a division of Emerson Electric Co, a global technology and engineering company, which serves industrial, commercial and consumer markets. Food waste disposers are small appliances that fit under the kitchen sink and grind food waste to minute particles that flush easily through the waste pipe to waste water treatment. Here increasingly biogas, vital soil nutrients and fresh water are recovered.

As a UK company drawing on over eighty years worldwide experience in the food waste sector we are grateful for this opportunity to comment on those sections of the Environment Bill relating to the capture of unavoidable domestic food waste and the potential for recovery of value from this waste stream.

As these are core issues for our industry, over the decades we have accumulated (and continue to build) a formidable evidence base of scientific knowledge in our field — peer reviewed research executed by academics and recognised experts around the world. In addition to these data, we count on the practical experience of our operations in over 90 countries including those societies, such as Sweden and the Netherlands, considered to be leaders in sound environmental practices.

We take this opportunity to propose amendments to the Environment Bill and to support these with a submission that references the many developments in the published science and pilot programmes involving FWDs that are proliferating worldwide. This evidence demonstrates that any ambitious target for separate collections of household food waste must acknowledge the potentially crucial role of domestic food waste disposers in capturing this difficult waste stream and recovering its intrinsic value.

The evidence base is expanding rapidly as pursuit of the circular economy increases and pilot studies provide proof-of-concept. The COVID 19 pandemic has also highlighted the dangers of our society becoming over-reliant on a single-solution domestic food waste model, namely kerbside food waste collection. We have consistently raised concerns concerning the resilience of kerbside food waste collections since the introduction of the ‘Waste Hierarchy’ in the 2009 EU Waste (Framework) Directive and its subsequent modifications at EU, national and devolved administration implementation levels. The system is expensive for local authorities to implement, attracts low public participation and has shown a critical lack of resilience during the pandemic.

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Bill Amendments

We would propose that domestic food waste collection systems in England can be made more flexible and resilient by amending the Bill as follows:

Section 3 Waste and resource efficiency (Page 33)

Para 54 Separation of Waste

54 (4) Take out 'or' and add coma after composting and extend sentence as follows.. ' or utilising connected waste infrastructure'.

54 (5) amend to add (4) as amended after 'subsection'…

45 AZA England: separate collection of household waste from relevant non-domestic premises

(4) Amend to remove'or' and add coma after composting and extend sentence to 'or utilising connected waste infrastructure'.

(5) Amend to add (4) as amended after 'subsection'.

These proposed amendments would increase the flexibility of domestic food waste management in England as well as in the devolved authorities, subject to their individual consideration, making the systems more resilient as well as offering a proven solution for properties where food waste collections are often challenging such as urban flatted buildings. It will also create possibilities for food waste to be managed within properties and then recycled at waste water treatment works (WwTW) with onsite AD facilities, regardless of whether kerbside collection systems are functioning or not. Utilising existing infrastructure to transport food waste, disposers reduce the need for road transport, additional waste collections, vehicles, congestion and emissions.

In support of our proposals for amending the Bill, to ensure the retention of residents' choice to use domestic food waste disposers, we submit below further information. This draws on current scientific evidence to demonstrate the importance of establishing flexible and robust domestic food waste systems; better prepared to cope with unpredictable events such as the current pandemic, along with other inevitable disruptions such as industrial disputes or local authority budgetary constraints.

- **Promoting <u>solely</u> separate kerbside collection of food waste will diminish the opportunity for a more successful policy outcome**. The nation can hope to send virtually zero domestic food waste to landfill, but to do so viably and recover the biogas and fertilizer value, a range of methods must be adopted including FWDs, in order to suit all inhabitants, their behaviours and living conditions.

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- **There is no single option for managing food waste that provides the best outcomes under all conditions.** This realisation has prompted an array of recent studies using Life Cycle Analysis (LCA) and Multi-Criteria Decision Analysis (MCDA) to assess the relative performance of using disposers compared with other options, such as kerbside collection. Such approaches can compare the amounts of energy and nutrients recovered and also the magnitude of any environmental impacts. Several new studies have shown that the use of disposers in conjunction with anaerobic digestion (AD) at waste water treatment plants (WwTP) can, depending on the application, be the best or a competitive option[1, 2].

- **Experience in the most environmentally aware nations such as Sweden now demonstrates that, at best, the performance of domestic kerbside collection of food waste plateaus at a 47% capture rate**[3]. Low capture rates will render costly implementation unsustainable for local authorities and the target of zero waste to landfill unattainable. Pursuing the next step-change, Sweden is now implementing a range of large new-build eco-developments including Stockholm Royal Seaport[4] and Helsingborg H+[5] employing FWDs and innovative waste systems. Similar projects are also operating or under construction in the Netherlands.

- **The challenges of moving to a more circular economy will require imagination and innovation, using both new and updated technologies to achieve objectives.** This is amply evidenced by Northern European states including Sweden, Belgium, Germany and the Netherlands[6], all investigating alternatives that include FWDs.

- **The contemporary ethos of the circular economy increasingly views waste water treatment as a production line for energy and nutrient recovery.** Today nothing is wasted. 'Waste' water is considered a rich font of naturally occurring resources[7] -- biogas, soil nutrients, phosphates, nitrates and clean water. Various case studies in European programmes such as H2020 Run4Life[8] are exploring the best ways of exploiting these resources for energy recovery and 'natural' fertilizers.

- **A growing understanding that the substrate in food waste enhances the efficiency of recovery of energy and nutrients from other waste water sources is prompting re-assessment of co-digestion by experts in countries as diverse as Australia[9] and**

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[1] Edwards J., et al (2018) Life cycle assessment to compare the environmental impact of seven contemporary food waste management systems. Bioresource Technology 248 (2018) 156–173.

[2] Iacovidou, E. & Voulvoulis, A multi-criteria sustainability assessment framework: developmentand application in comparing two food waste management options using a UK region as a case study N. Environ Sci Pollut Res (2018) 25: 35821. https://doi.org/10.1007/s11356-018-2479-z

[3] H. Kjerstadius, S. Haghighatafshar & Å. Davidsson (2015) Potential for nutrient recovery and biogas production from blackwater, food waste and greywater in urban source control systems, Environmental Technology, 36:13, 1707-1720, DOI: 10.1080/09593330.2015.1007089

[4] http://www.stockholmroyalseaport.com/

[5] https://hplus.helsingborg.se/

[6] Skambraks A-K., et al., (2017). Source separation sewage systems as a trend in urban wastewater management: Drivers for the implementation of pilot areas in Northern Europe. Sustainable Cities and Society 28, 287–296.

[7] Ambulkar A. (2018) The Emerging Era of Wastewater Valuables. Water and Wastewater Treatment. https://wwtonline.co.uk/Blog/the-emerging-era-of-wastewater-valuables

[8] https://run4life-project.eu/about/

[9] Edwards J., et al., (2017) Life cycle inventory and mass-balance of municipal food waste management systems: Decision support methods beyond the waste hierarchy. Waste Management 69 (2017) 577–591.

Ireland[10]. The addition of ground food waste is proving that it can add considerable value and enhance the standard recovery of energy from municipal waste water, by adding nutrients that increase efficiency[11].

- **Food waste disposers play a key role in preparing unavoidable food waste for maximum recovery.** Ignoring their relevance will prove a barrier to innovation, particularly addressing those householders unwilling or unable to participate in separate kerbside collection of food waste. In addition, many local authorities may face challenges that necessitate the use of several options to meet their waste management obligations. The January 2020 study by Resource London entitled 'Making Recycling Work for People in Flats' highlights the need to adopt alternative methods to maximise domestic food waste capture in flats. The study carried out across 12 London local authorities looked at how to improve the poor levels of recycling from London' estates, especially as it is forecast that 46% of London residents will live in flats by 2030. Despite a highly engaged programme of education, improved signage and bin location the study still only managed to improve food waste collection from 10.7% to 13.9%; although this waste stream accounted for 28% of all waste from the flats in the survey. To improve food waste capture in multi-occupancy buildings, **Amsterdam's Waste Plan 2020 – 2035** proposes the installation of 350 food waste disposers in Buiksloterham[12].

- **There have been concerns that FWDs may cause sewer blockages or encourage the formation of FOG. Extensive current laboratory work at the University of Sheffield, funded by the Engineering and Physical Sciences Research Council (EPSRC), is showing these fears to be unfounded.** It has already defined the precise characteristics of food waste particles emitted by FWDs for a wide range of typical foods, their settling or re-entrainment capacity and how they are transported through the sewers[13]. An interim report defines the characteristics of ground particles for 18 common food types and permits the evaluation of any mix that represents a typical diet[14] The current phase is examining the transformation of these particles as they pass through the sewer system and their potential contribution to biogas recovery. The work aims to provide a tool for local authorities and waste water operators to measure the potential risks and benefits that FWDs can offer in specific waste water systems.

- **Even in countries and regions where use of FWD is as high as 50%, there has been no change in the hydraulic loading of collection systems or increase in blockages.** FWD are installed in 94% of households in Anaheim, California: it experiences no more sewer problems than cities that have a much lower percentage of installations. Los Angeles has historically had a high penetration of installed disposers (estimate 80%). As part of its zero-waste programme the city sanitation department has now invested US$2million in a 500-home pilot programme, fitting upgraded disposer models, to increase residents' usage and recovery of biogas at the Hyperion Water Reclamation Plant.

[10] Awe O W. et al., (2018). Anaerobic co-digestion of food waste and FOG with sewage sludge – realising its potential in Ireland. International Journal of Environmental Studies, 75:3, 496-517.

[11] Kim et al., (2019). Modeling the impact of food wastes on wastewater treatment plants. Journal of Environmental Management 237 (2019) 344–358.

[12] Uitvoeringsprogramma afval en grondstoffen 2020 – 2025

[13] Legge A., et al. (2018) Modelling of Food Waste Disposer particle transport through a sewer network. Proc. Urban Drainage Modelling Conference. Palermo, Sicily. September.

[14] https://zenodo.org/record/3697303#.XmBGUaj7TIU

- **Disposers grind food waste to minute particles that are easily transported through the sewers.** In Sweden the long-term effects on sewers in areas where food waste disposers had been installed was monitored and found to be negligible[15] .

- **Numerous field studies have analysed changes in water use when FWDs are installed. All agree that any change is small and of no consequence to water resources or to the hydraulic loading on sewers or WwTP** [16] [17] [18] [19] [20] In-sink food waste disposers are primarily used during food preparation or post-meal clearing up. Water that is used to wash a vegetable or rinse a plate is also used to flush vegetable peelings or food scraps through the disposer. Water is rarely used exclusively to run a food waste disposer.

Food waste is a particularly difficult waste stream, that can present health hazards to susceptible people and more generally if mismanaged. Its mixed, wet, organic and animal content make it troublesome to store and transport, and costly to process. Because food waste is challenging to manage, householders require options. In order to engage their support the methods offered must suit varying levels of environmental commitment, types of homes, available space and location.

Effective food waste management requires a range of options to suit the characteristics of individual communities. Provision of separate food waste collections will not guarantee participation in all circumstances over the long term. This is a costly endeavour for local authorities to set up and maintain. Low participation will render separate collection economically and environmentally unjustifiable for some local authorities. They must be provided with alternatives.

As previously highlighted, evidence in Northern Europe and the wider world is demonstrating that successful policies will rely on a range of solutions that suit the living conditions, environmental commitment and capabilities of local inhabitants.

In densely populated urban areas where there are space and traffic constraints, ageing populations or disabled vulnerable residents, the storage of food waste and the requirement to carry it to the kerbside will not be viable for all households. Food waste is a volatile waste stream and even emissions from composting are now demonstrating hazardous consequences for vulnerable individuals.

Local authorities must be permitted to exercise discretion to choose from a range of options. Imposing mandatory weekly food waste collections to multi-occupancy city properties or flats over commercial premises, does not increase residents' storage capacity or guarantee their participation. Providing additional funding to local authorities for infrastructure would surely be welcomed but it will not enable residents in flatted properties or with low mobility to proffer their food waste for separate collection.

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[15] Mattsson,J.; Hedström, A. and Viklander, M. (2014) Long-term impacts on sewers following food waste disposer installation in housing areas– Environ. Tech. 35(21):2643-2651

[16] Jones (1990) in Canada found no significant difference in water use in 45 homes 2-month with, 2-month without FWD

[17] Nilsson et al. (1990) 100 new apartments; population 211 in Sweden. Average water use over 6 months before FWD fitted was 183 L/cap.d. After FWD fitted the average was 170 L/cap.d. This 7% reduction was inexplicable but not attributable to FWD per se.

[18] Evans et al. (2010) Sweden, the mean daily wastewater flow was 0.6% less (but not statistically significant) when 50% of 3700 households used FWD than when none used them (120 weeks each).

[19] DeOreo et al. (2011) metered and logged water use in 735 homes across 10 water agencies in California. 85.6% of the homes had FWD, they used 49.5 litres/day less water than the homes without FWD

[20] Defra Market Transformation Programme, 18/02/2008,Briefing Note BNXS43 Food waste disposers an overview

Currently commercial AD is subsidised and it is unclear when it will become profitable. Thus, it would be hard to predict when kerbside collected food waste might become viable or the extent of the further public funding requirement for local authorities to support this model over the longer term.

Meanwhile, with the evolution of the circular economy advances in technology are proliferating and regulation should not impede the development of innovations that will ultimately overcome the challenges of source separation of food waste and recovery of its inherent value.

InSinkErator would welcome the opportunity to share the latest evidence and many projects, referred to previously, that are now utilising leading edge methodologies to manage unavoidable food waste.

Ashley Munden
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