

Design and its role in tackling global food loss and waste 'farm to fork'

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1 Introduction to the panel

During the past decade, there has been extraordinary growth in the focus and attention on food loss and waste (FLW). Research has highlighted the extent of the problem across the entire food supply chain, including its interconnectedness; challenges facing developed and developing nations; the vast quantities and volumes of loss and waste; and the drivers and causes of such loss and waste (Gustavsson, Cederberg et al. 2011, ReFED 2016, WRI, CGF et al. 2016, Hegnsholt, Unnikrishnan et al. 2018, Lewis 2019). Globally, it has been estimated that over US\$1.2 trillion of food is lost or wasted across the food supply chain per annum, equivalent to 1.6 billion tonnes of material. Without the introduction of major reduction measures, this figure is projected to increase to 2.1 billion tonnes and \$1.5 trillion dollars by 2030 (Hegnsholt, Unnikrishnan et al. 2018). Thus FLW represents a massive misuse of financial and natural resources, but also opportunities for sustainability gains if acted upon.

The implications of failing to tackle FLW are multiple: financial for businesses, governments and society; social including food security; and environmental, including release of greenhouse gas emissions, impacts on land and water use, ecosystem/species extinction impacts. The issue also links closely with acute and growing environmental crises including pollution (Poloczanska, Brown et al. 2013, O'Neill, Oppenheimer et al. 2017), climate change (Klinglmair, Sala et al. 2014, Venier L.A., Thompson I.D. et al. 2014), and resource depletion (Klinglmair, Sala et al. 2014, Venier L.A., Thompson I.D. et al. 2014). Environmental benefits conferred by the reduction of FLW also means that these efforts contribute towards commitments to the reduction of greenhouse gas emissions, such as the United Nations Framework Convention on Climate Change (Bajzelj 2016, ReFED 2016, Lipinski, Clowes et al. 2017a, IGD and WRAP 2018, ARCADIS, RMIT University et al. 2019). Thus actions on FLW hold promise in triple bottom line outcomes on a global scale.

For years design has been touted as defining a significant portion of the environmental impacts of everyday products and systems (Lewis, Gertsakis et al. 2001). This follows for food systems which combine material and digital infrastructure, for which design plays a crucial role in creating. Therefore design is critical in determining better environmental parameters for FLW, and such action relates to United Nations (UN) (2023) sustainable development goal (SDG) 12 i.e. design can assist the transition to sustainable consumption and production patterns. SDG target 12.3 – the reduction of FLW “by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses (Lipinski, Clowes et al. 2017b),” begs the question how best to tackle the issues regarding FLW and achieve these set targets? To that end, this panel explores how design may contribute to global efforts to reduce FLW.

2 Thematic link of the panel

The track [Changing] Ecosystems invites research projects, case studies, and critical reflections on: design for sustainable materials and energy, product design for sustainability, product-service system design for sustainability, design for sustainable Distributed Economies, design for Circular Economy, design for sustainable business models, design for sustainable informal economies, design for sustainability transition, and design in the context of sustainability transitions (theory, methods and tools). With the proposed panel focus on design intervening for FLW reduction, as a key global transition and the clear link of FLW to sustainability crises, the panel is both relevant and compelling for track participants and wider congress delegates.

3 Aim of the panel and agenda

Below are the discussion points and agenda for the panel at this point, which centrally aims to explore how design may contribute to global efforts to reduce FLW:

0-10 minute mark	Context internationally (10 min)	Simon Lockrey
10-75 minute mark	Panel session (65 min discussion) - Brief introductions by Simon. Questions are in lieu of a discussion for each.	Simon to facilitate
	<p>1. How does design of innovative technologies, either digital, physical or even social, play a role in a system without FLW?</p> <ul style="list-style-type: none"> - Covering digital platforms, tools, data sharing, supply chain changes, infrastructure, packaging/ FLW reduction/ other consumer interventions. Could cover novel circular setups of supply chains – coming closer to the consumer which enables more resilience. - Relate to Courtauld (UK), EC Directives (EU), and AU i.e FIAL (2021) interventions; Infrastructure investment (0.49 mT); R&D/ innovation grants (0.68 mT); Improve manufacturing/ processing technologies (0.58 mT); Harvesting/ sorting of all grades (0.91 mT); Data analytics/ waste auditing (2.69 mT); Processing technologies to extend shelf life (0.54 mT); Consumer behaviour change (1.9 mT) 	Directed to Jack initially, then the panel
	2. What ‘good practice’ is needed for organisations to design out FLW?	Directed to

	<ul style="list-style-type: none"> - Covering best practice guidance, capacities, skills, training, and roles i.e. new role for the food retailer as an example. - Relate to Courtauld (UK), EC Directives (EU), and AU i.e. FIAL (2021) interventions; Voluntary agreements (5.69 mT); Employee engagement and behaviour change (0.95 mT); Cold storage/ chain improvements (0.60 mT); Date labelling best practice/ extension (0.93 mT) Improve manufacturing/ processing technologies (0.58 mT); Retail operational efficiency improvements (0.50 mT) 	Virginia initially, then the panel
	<p>3. How can we design good policy and what role could it play to reduce FLW?</p> <ul style="list-style-type: none"> - Covering transformative innovation through policy, could also cover group certifications, directionality of innovation, etc - Relate to Courtauld (UK), EC Directives (EU), and AU i.e. FIAL (2021) interventions; Voluntary agreements (5.69 mT); Tax credits/ exemptions (1.58 mT); Date labelling best practice/ extension (0.93 mT); Tackling unfair trading practices (0.47 mT) 	Directed to Jakob initially, then the panel
	<p>4. What is the role of collaboration in design for reducing FLW (In light of some of the discussions about linkages between people and organisations)?</p> <ul style="list-style-type: none"> - Covering partnerships down/ upstream, data sharing, joint agreements, new trade practices, group certifications, social innovation practices, etc. - Relate to Courtauld (UK), EC Directives (EU), and AU i.e. FIAL (2021) interventions; Voluntary agreements (5.69 mT); Data analytics/ waste auditing (2.69 mT); Employee engagement/ behaviour change (0.95 mT); Tackling unfair trading practices (0.47 mT)...basically big ticket items are 'glued together' with collaboration/ sharing! 	Directed to Fredrik initially, then the panel
	<p>5. What big actions can design play a role in farm to fork to drive FLW to nil?</p> <ul style="list-style-type: none"> - What are the major opportunities in this thrust to design for reducing FLW? - Cover hot spots and solutions in FAO/ UN/ EU work - Proposed interventions in various WRAP studies - Cover FIAL (2021) and CRC work in Australia - Relate to Courtauld (UK), EC Directives (EU), and AU i.e. FIAL (2021) interventions; Voluntary agreements (5.69 mT); Data analytics/ waste audits (2.69 mT); Consumer behaviour change (1.9 mT); Tax credits/ exemptions (1.58 mT); Employee engagement/ behaviour change (0.95 mT) 	Directed to Anna and Davide initially, then the panel
75-90 minute mark	6. Questions from the audience	

4 Panellist biographies

Simon Lockrey: Associate Professor Lockrey from RMIT School of Design is the Reduce Program Leader in the AU\$121 million Fight Food Waste CRC. Dr Lockrey's research involves the deployment of sustainability strategy, co-design, and tool development for global companies, including Chep, Visy, Nestlé, Lendlease, Costa, Grocon and Breville, as well as governments and not for profits. Simon is currently Executive Director of Glowpear, VP of Automotive Historians Australia, and on the board of International Sustainable Development Research Society.

Jakob Trischler: Associate Professor Jakob Trischler's research focus is on involving users as co-designers in the development of new service solutions. Based at the CTF Service Research Center in Karlstad, Sweden, he also investigates how citizen-driven innovations can address complex challenges related to unsustainable production and consumption practices. Jakob's research is published in leading international journals, such as Journal of Service Research, Journal of Business Research, Public Management Review, and Journal of Public Policy and Marketing.

Fredrik Nilsson: Professor Nilsson specialises in packaging logistics at Lund University Department of Design Sciences. Through the lens of complexity theory, he explores and develops new knowledge around sustainable and circular supply chains. He has led several projects related to food and packaging waste in the context of global supply chains as well as local and regional contexts. Professor Nilsson writes the Journals of Cleaner Production, Food Control, Business Logistics and International Journals of Production & Operations Management, and Logistics Management.

Virginia Martin Torrejon: Dr Martin is a postdoctoral research associate at the City, University of London. She holds a PhD in mechanical engineering, and her expertise spans the development of new food products and biobased materials for different applications. As a recipient of the 2023 MSCA Fellowship, she will soon explore the development of seaweed-based materials for packaging applications at Brunel University London.

Jack Pickering: Dr Pickering is a Postdoctoral Research Associate at the University of Sheffield Management School. He has researched variations in regional food consumption, changing media/ policy approaches to migrant labour in the food system, and is currently working on reducing plastic packaging and food waste through product innovation simulation. He specialises in qualitative social research and ethnographic methods, and his research interests include food systems/ consumption, consumer issues/consumer cultures, and changing retail spaces.

Anna Meroni: Deputy of the School of Design at Politecnico di Milano, Professor Meroni runs research projects in service and strategic design for sustainability to foster social innovation, participation, and local development. With a specific expertise in co-design strategies, methods, and tools, she has also led projects around sustainable food systems and services. Professor Meroni is responsible for tasks on the national project ONFOODS, funded through the Italian Ministry of University and Research by the European Union – NextGenerationEU.

Davide Fassi: Associate Professor Fassi focuses his research on spaces and services with a community centred approach at the Politecnico di Milano. A member of the International Coordination of the DESIS Network (Design for Social innovation and Sustainability), he is also a coordinator of the DESIS "Off Campus Nolo", a neighbourhood living lab. Associate Professor Fassi is responsible for tasks on the national project ONFOODS and on a Creative Europe project on small and remote places.

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