



Submission to the House Standing Committee on Industry, Science and Resources on  
Innovative solutions to Australia's waste management and recycling industries.

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*The views expressed in this submission are those of the authors and not the University of  
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## Summary and key points

This submission argues for a cross-disciplinary approach to solving the current waste problem in Australia. We also contend that the current waste crisis is an opportunity for new businesses in Australia, and we provide a couple of case studies which outline how this can be achieved. Both case studies show the importance of government at all levels as a broker and facilitator in this transformation. Our perspectives at the University of Tasmania are that the waste problem is now fundamentally affecting the marine environment and require systematic changes. This can only be achieved by combining insights from behavioural economics, sustainability practices, consume behaviour and science to inform policy and engage with all stakeholders in the process.

### Key points

- Waste is a recurring problem which threatens bio-security and the food chain of the planet.
- Waste reduction can be achieved by new industrial models such as a circular economy which reuses waste and by the application of behavioural economics, sustainability practices and consumer behaviour to provide incentives to change behaviour.
- Waste reduction can be a economic and community resource, and two case studied supplied in this submission highlight this.
- The University of Tasmania has considerable expertise and experience working with industry and government, to help address this problem of national significance.

### Overview

The problem of the management of Australia's waste and recycling industries is a significant one. The National Waste Report 2018 (Department of Environment and Energy, Blue Environment Pty Ltd, 2018) found Australia generated 67 million tonnes of waste in 2016-17, of which 58 per cent was recovered. This equated to 2,700kg for each person. While the majority of this waste comes from the commercial and industrial sectors (including construction and demolition), approximately 560kg for each person is generated by households and local government.

The National Waste Report estimates that each person generates about 103kg of plastic each year. Of particular concern is the finding that only 12 per cent of the plastic that Australians put into their kerbside bins is being recycled. The problems were further highlighted when China stopped longer accepting waste products from Australia in 2017 and increased environmental concerns about plastics and microplastics in the marine food chain from krill upwards in marine species. The authors believe this is a problem requiring cross-disciplinary research, working closely with both industry and all levels of government to solve. There seems to be no technological "silver bullet" or "drop-in" solution readily available. Rather, a considered step change will be required from all stakeholders to modify logistics, manufacturing, and consumer behaviours. It is also quite likely a sequence of solutions will



need to be deployed, in order to create this systemic change (such as, the “circular economy” which aims to minimise resource usage and waste). The development of more “circularity” in the economy has the potential to benefit the national economy, the environment and the quality of life of Australian citizens. This is discussed later in the two case studies in this submission, where it is shown that there is considerable opportunities for Australian manufacturing and regional communities to re-use waste as an impetus to the development of new manufacturing industries and alternative energy generation.

As per the terms of reference our submission seeks to address the following areas in waste management and recycling:

- Industrial, commercial and domestic waste
- Waste in the waterway and oceans
- Landfill reduction
- Other related matters.



### Industrial, commercial and domestic waste

Rationale: ‘Reducing waste and turning the remaining waste into an economic resource’

The authors recognise that the Australian Government, in co-operation with the states and territories, wants to reduce plastic wastage and boost plastics recycling by strengthening the circular economy and maximising the economic value of waste plastic resources.

On 3 May 2019, the Morrison Government, committed to strengthen Australia’s recycling sector and help local manufacturers deliver a healthier environment while increasing jobs in the nation’s recycling industry. On 9 August 2019, CoAG agreed Australia should establish a timetable to ban the export of waste plastic, paper, glass and tyres, while building capacity to generate high value recycled commodities.

The public policy settings to reduce plastic waste and boost plastics recycling have been considered in isolation, both within and across the Australian, state and territory governments. Public policy outcomes and government investment will remain sub-optimal without a holistic approach to public policy development and implementation. The Australian Government’s commitment, coupled with the CoAG agreement, provides the first realistic opportunity to address existing public policy failings. Critical considerations include:

1. Australia has a small plastic recycling market and limited infrastructure. These constraints are compounded by a market failure, whereby new plastic is cheaper to produce than recycling existing plastic. It could be argued that without market intervention, there is no incentive for manufacturers to use recycled materials. Establishing the type and level of market interventions is critical to addressing waste reduction and boosting recycling. Limited behavioural research to understand and develop recycling education programs has been conducted nationally.
2. The South Australian Government which is recognised for its national leadership in recycling practices noted in its submission to the Senate Environment Committee’s ‘Never waste a crisis: the waste and recycling industry in Australia’ (2018) that advice and understanding of what can and cannot be recycled, can significantly impact consumer behaviour and decisions regarding waste. The South Australian Government also raised the importance of education in the effort to reduce the amount of waste going to landfill.
3. Without national and regional behavioural insights, determining the cost-effective public policy settings is unlikely. Data is notoriously poor around the waste generation and diversion across all levels of government, and there are no mechanisms for the collation of waste generation and diversion data at a national, and in some instances at a state/territory, level.

### International and domestic approaches to dealing with industrial and domestic waste: Is the circular economy the panacea?

Businesses around the world are beginning to adopt “reverse logistics” or develop a circular economy as a means of limiting the amount of waste, managing costs and providing greater



value to the business. Coca-Cola, for example, is moving to a zero-waste approach in packaging by reducing its use of plastics and developing a circular economy (Fleming, 2019). This approach mirrors the development of sustainable materials management and packaging re-use policies by the American Institute for Packaging and the Environment (Ameripen) (Lilienfeld, 2016). There is emerging research which suggests consumers value and are willing to pay for products, which have been reused as part of the circular economy (Lieder, Asif, Rashid, Mihelič, & Kotnik, 2018; Machado, Almeida, Bollick, & Bragagnolo, 2019; McKinsey Insights, 2019; Scherer, Emberger-Klein, & Menrad, 2018; Shen, Liu, Zhang, & Choi, 2019). For example, consumers in fashion report feeling more virtuous about using pre-worn or re-purposed clothing, and value companies more highly if they are involved in a circular economy (Gaur, Mani, Banerjee, Amini, & Gupta, 2019). They are also more likely to adopt packaging made from recycled or bio-based plastics, both in terms of concern for the environment and the disposal of bio-waste (Russo, Confente, Scarpi, & Hazen, 2019). It has even been suggested that the use of a circular economic approach, is a source of competitive advantage for companies, given the value place on it by consumers (Jayaraman & Yadong, 2007).

However, there are significant barriers to the development of a circular economy. The Australian Packaging Covenant (APCO), between industry and government, has been in operation for 20 years with a new strategic plan every five years and yet, there has been no universal shift towards reuse or a circular economy (Food & Beverage Industry News, 2019). Complicating implementation, is that the covenant has over 1,500 organisations and involves eight different government organisations. The organisations involved are also across a number of industry segments, which means there will be different problems and priorities to consider in each sector.

The movement to a circular economy requires changes in not just manufacturing and packaging, but also significant modification in design and materials (Marrucci, Daddi, & Iraldo, 2019). The CEO of APCO, Brooke Donnelly has commented for example, that the phasing out of single-use plastics packaging through redesign, innovation or alternative delivery methods is an important way forward to reduce waste (Food & Beverage Industry News, 2019). Circular economic business models have also been found to help generate innovation, such as bio-paint spin-offs in Italy (De Angelis & Feola, 2020) and the development of business incubators in the U.S. dealing with waste (Greenwalt, 2019). While this research is promising, it has been shown that the economics of recycling is only possible when there are higher revenues for waste for local councils (Folz, 1995). So addressing the waste issue must include the incentive to reuse and repurpose, along with enhancing the economic value to do so. There are inherent switching costs in changing any process, and given the complexities in modern economies, there appears to be an important role for government to help facilitate a move to a more sustainable future. There also seems to be a vital role for researcher and universities to help facilitate this process by providing evidence for policy changes and understanding motivations to change and barriers which may delay this.



Some case studies of the circular economy in action in Australia, show the importance of government and suggest in part an important consideration of universities to assist government, industry and communities reduce and reuse waste.

*CLEAN Cowra NSW*

“Cowra Low Emissions Action Network or ‘CLEAN’ was established in 2007 as a community-led group which originally focussed on coordinating the bulk purchase of solar. Since 2011, CLEAN has been collaborating with local and state governments, industry and Community to develop a local biomass to energy project (Wright, Sharpe, & Giurco, 2018, p. 329). The project aimed to provide low-cost local electricity through a community-led business model, which is represented in Figure 1. The project was led by a dynamic and committed architect, helped by a local entrepreneur, and supported in-kind by local and federal governments. The local council was a key stakeholder in the project, providing financial support and was a source of municipal organic waste for processing. Expertise from the NSW government in the form of the Sustainability program, helped with the competitiveness and environmental leadership of the program. In 2015 the program was a finalist for the Global Accenture Award for Circular Economy Pioneers. The role of the government was seen as crucial in not only providing preliminary support but also in building relationships, enhancing credibility, providing stability and supporting specific outcomes (Wright et al., 2018). The role of the government going forward is also to help other communities interested in developing and scaling up such an approach.

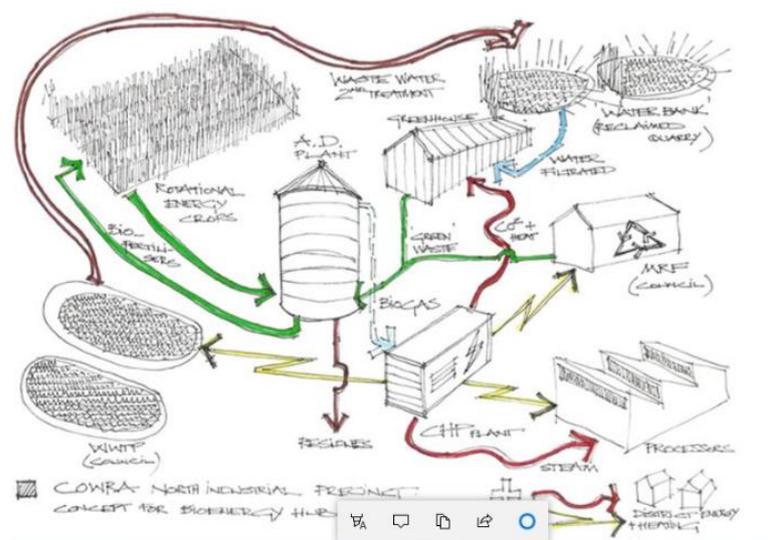


Figure 1: The Cowra CLEAN project. A local example of a circular economy. Source Wright et al. (2018, p. 330)



*Envorinex. A Tasmanian company that transforms PVC waste.*

Envorinex is, based in George Town, Tasmania and manufactures injection moulded and extruded products from recycled PVC (mainly window frames) and polypropylene. Its recycled product range includes noise abatement fencing, matting, beehive foundations, septic tanks, raised garden beds and guardrail delineators. The company sells 5% of its products in Tasmania, exports 55% to mainland Australia and the remaining 40% to North America, Japan, New Zealand, Papua New Guinea, the South Pacific region and Europe (Plastics News, 2013). The company uses a number of collection points to collect waste in mainland Australia, including the Oakleigh Centre for Intellectually Disabled Citizens in Victoria, where builders deliver off-cuts for the company to grind and ship to Tasmania for processing. The PVC septic containers manufactured by Envorinex are especially valued in developing countries where sanitation is lacking. In 2013, the company joined the PVC Recovery in Hospitals program, and now recycles medical products such as tubing, intravenous fluid bags and oxygen masks. This program was officially launched by Australia's peak PVC industry body, the Vinyl Council of Australia in Melbourne. Central to the success of the company has been the Tasmanian Freight Equalisation Scheme, as freight is a major expense.

Both these examples show the important role of government and industry associations as facilitators of a circular economy approach to the reduction of waste.

### Waste in the waterways and oceans

The Senate Environment Committee's 'Toxic tide: the threat of marine plastic pollution in Australia' (2016) notes the significant gaps in knowledge about the effects of marine plastic pollution, including both the population-level impacts of ingestion and the effects on human health of plastics in the food chain. The Committee also notes hundreds of species of fauna including birds, turtles, cetaceans, pinnipeds and corals have been negatively affected by ingestion and entanglement. The 2016 Senate Environment Committee report, however, found limited research has been undertaken to fully understand the extent of plastic debris in our coastal areas and waters.

At the August 2019 CoAG meeting, Environment Ministers were tasked with advising on a timetable and response strategy, following consultation with industry and other stakeholders, in relation to plastic waste and plastics recycling. This presents a unique opportunity to reset the public policy framework for plastic waste and plastics recycling. Importantly there is an opportunity to present the choices, constraints and possibilities associated with managing plastic wastes and developing a plastics recycling market while minimising plastic waste impacts on human health and our environments (land, waterways and marine).

We believe there is an important role for universities, industry bodies and scientists to assist CoAG and Environment Ministers in understanding the current constraints and future possibilities and to better inform public policy choices. The following knowledge gaps which require closing are:



1. **Quantitative understanding:** Government policy, parliamentary inquiries, industry and community groups all agree that existing quantitative analysis is inadequate in determining the actual scope of the problem.
2. **Mathematical and statistical modelling:** To inform the choices, constraints and possibilities via mathematical and statistical modelling, measurement, and research analysis. This analysis, building on the National Waste Report, will give a 'reality' to the numerical values associated with plastic waste and plastics recycling.
3. **Market(s) understanding:** Given the market failure to date, coupled with the accompanying impact on the Australian recycling industry following changes to export practices into Asia, there is a need for a quantitative and qualitative assessment of the Australian market in relation to volume and value, the various customer segments and buying patterns, the competition, and the economic environment in terms of barriers to entry and regulation.

Analysis of prospects for projects that reduce plastic waste and help build domestic and international markets for recycled plastics is critical, particularly in relation to how new opportunities can respond to an identified need or market demand. Supply risks, market dynamics and commercialisation opportunities also need to be evaluated.

Additional analysis is also required to identify how market opportunities will build human capability in waste reduction, manufacturing and recycling industries.

Public policy should be informed by analysis of substitute products that offer the same or similar benefits, with less health and environmental impacts. This analysis needs to determine:

- how advanced substitute technologies are, such as biodegradable materials
- if substitute technologies are appealing for consumer use
- the substitute price points and risks to supply and price changes
- any barriers that may stop a customer from switching.

4. **Human health:** A recent collation of 50 international research papers provides an accurate calculation of human ingestion rates, which is about 2,000 tiny pieces of plastic each week. The study focused on microplastics of less than 1mm, which are the most commonly ingested contaminants. Bottled and tap water was the largest single source of plastic ingestion and of the consumables, those with the highest recorded plastic levels included shellfish. Although ingestion levels have been quantified, research is required to understand the actual human health impacts of ingesting plastics.
5. **Environmental impacts:** While this finding is consistent with state and territory reporting, collation of the national research effort is required, so that the extent of the knowledge gap can be determined. The collation of research into prevention technologies is also required to evaluate the technologically feasible options available



to reduce the level of plastic and other pollutants reaching waterways and marine areas.

6. **Behavioural insights:** Increasingly, public policy options are informed by an inductive approach to policymaking that combines insights from psychology, cognitive science and social science. Empirically-tested results to discover how humans actually make choices to assist in reducing the use of plastics and to improve the recycling of waste plastics would create policy possibilities not yet realised. This analysis would link behavioural insights to reducing health and environmental impacts as well as reduce use and increase recycling.

#### Opportunities for dealing with plastic waste in oceans

In addition to determining the root cause, the delivery of innovative national and international research would have a regional benefit, including throughout the Pacific, where the issue of waste plastics is a significant social and environmental issue. The benefits of this research would directly contribute to the Australian Government's Pacific Partnerships Program, by sharing health impact analysis, environmental research findings and new approaches to managing and recovering residual plastic waste. The University of Tasmania has directly relevant research partnerships across the Pacific, including research on the prevalence of plastics in Pacific Island fish and the accumulation of beach-based plastics on Pitcairn Island.

#### Landfill reduction

Landfill reduction can be achieved via a three-pronged approach: reduce, reuse and recycle. Waste generation can be reduced, for example, by encouraging households to choose products without packaging and which are longer living. Households should also be steered towards repairing and reusing products, instead of replacing them when faulty. For unavoidable waste, households should to be encouraged to properly sort waste and recycle (OECD 2017).

As with most other sustainability problems today (e.g. climate change, deforestation, overfishing), landfill waste problems are rooted in human behaviour (Vlek and Steg 2007). For example, laziness as well as lack of information and awareness are the main reasons people put their recyclable waste into garbage instead of recycling bins (Guan 2019). Waste management solutions, however, often overlook the essential role that households' behaviours play, tending to focus instead on technological breakthroughs and structural changes within our societies (Linder et al. 2018; Geislar 2017).

In this part of the submission, we focus on behaviour change as a solution to landfill problems. Policies to bring about behaviour change can be based on price or on behavioural



insights. The former utilises traditional market-based instruments, such as taxes and subsidies, to induce economically rational changes in behaviour. The latter, which is our particular focus, applies behavioural insights to address behaviours that deviate from rational economic predictions.

### Nudging: Policies based on behavioural economics insights

Behavioural economics is a research programme designed to study economic behaviour through the lens of human psychology. Traditional economics explain and predict behaviour using the assumption of instrumental rationality, i.e. decision making to maximise particular objectives based on all relevant information. However, while maximisation rendered human agents predictable on paper, what was predicted increasingly clashed with how people were found to behave in real life. Behavioural economics was developed with the agenda of enriching economic theory based on how humans actually act. Thaler & Sunstein argue in their book *Nudge* (2008) that being aware of how people actually act and the psychology underlying their behaviours will serve to improve policy design. A “nudge” policy intervention happens when the decision context is designed based on behavioural insights to steer people’s behaviour into a certain direction.

In terms of sustainability, nudges have been applied successfully, for instance, to reduce energy consumption (e.g. Brown et al. 2013; Ayres et al. 2013; Kallbekken et al. 2013; Costa & Kahn 2013; Pichert & Katsikopoulos 2008), limit water, paper and towel consumption (e.g. Egebark & Ekström 2016; Schultz et al. 2007) and reduce food waste from restaurants (e.g. Kallbekken & Sælen 2013). Here, we propose nudges as a potential innovative solution to landfill problems. Compared to technological developments, structural changes or price-based policy tools, nudges appeal to human psychology and represent a lower-cost, lighter-touch approach.

Below we outline some main cognitive factors and psychological biases that affect human behaviour relating to landfill reduction, and identify potential solutions based on behavioural insights.

### Systems 1 and 2

The dual-process model of human cognition recognises that people have two modes of processing information (e.g. Kahneman 2011):

- *Experiential* (System 1) – rapid and automatic, using emotion and intuition for more immediate responses; and







- Changing default options to “green” ones, such as banning the provision of single use products such as plastic bags, cups or straws (e.g. Wagner & Toews 2018);
- Encouraging producers to produce modular products where faulty parts can be easily repaired, changing the default from replacement to repair (OECD 2017);
- Getting households to commit to only a certain amount of waste within a particular period, and helping them stick to it via monitoring, feedback, advice and/or incentives. This could be done at the level of the community, local council or suburb;
- Rewarding households who have achieved a certain lower baseline may generate a new positive norm. Again, this could be done at the level of the community, local council or suburb.



## Present bias

Intertemporal decisions are those where the decision maker makes value comparisons between immediate and delayed outcomes. The rate at which a person is willing to trade immediate for delayed outcomes is known as their individual discounting rate (IDR). IDR has been observed to decline with time. In other words, the longer the delay, the larger the factor by which people discount the value of future outcomes (Laibson, 1997). Put simply, people prefer short term gains over longer term benefits, i.e. they have a present bias.

By their very nature, sustainable choices require people to incur tangible costs now for (perhaps intangible) future benefits. For example, when considering purchasing a longer-life product, people may focus more on the upfront higher cost instead of the longer term benefits, or when considering sorting waste and recycling, may focus on saving time and effort instead. People often demand single use plastic bags, cups and straws for immediate convenience, rather than planning ahead and bringing their own.

## Solutions:

Present bias can be countered by interventions that encourage people to engage and identify with their future selves and situations. Commitment mechanisms can be used to allow people to commit now to a future course of action. Incentives can also be provided to offset the immediate costs of actions with delayed benefits. Some recommendations:

- Showing people realistic time-progressed renderings of themselves, their children and the environment in which they live, to make salient the need to take care of the planet for future generations (e.g. Hershfield et al. 2011);
- Helping people to match their future actions with their current intentions using commitment devices. Like with the status quo bias, getting households to commit to a certain amount of waste within a particular period, and helping them stick to it via monitoring, feedback, advice and/or incentives;
- Incentivising (perhaps via subsidies or rewards) immediate acts of reducing, reusing and recycling, to offset the upfront costs of these actions. For example, discounts on council rates for households who have generated less waste compared to the mean or subsidising the purchase of longer-life products or modular products;
- Timing of interventions matter, as salience of particular issues will be heightened at different junctures (e.g. insurance purchases increase after disasters) (Slovic 1987). Campaigns to reduce landfill can be made to coincide with relevant events, e.g. World Environment Day (5<sup>th</sup> June) or after particular environmental disasters.





## Related matters

The University of Tasmania as a key resource for government and industry.

The University of Tasmania is uniquely positioned to help the nation meet the challenge of reducing plastic waste and boosting plastics recycling while minimising impacts on human health and our environments because we have:

- well-aligned research programs across all required disciplines (health, social sciences, business, environment (land waterways and marine) and engineering)
- critical infrastructure to conduct research
- a track record of working with governments on critical challenges
- a track record of industry collaboration with national and SMEs
- the commitment and ability to leverage our capabilities nationally through relationships with other universities in Queensland, Western Australia and New South Wales.

The authors welcome further discussion with the government on how we can best support the government to carry out this critically important work.

## References

- Andersson, M., & von Borgstede, C. (2010). Differentiation of determinants of low-cost and high-cost recycling. *Journal of Environmental Psychology*, 30(4), 402-408.
- Ayres, I., Raseman, S., & Shih, A. (2013). Evidence from two large field experiments that peer comparison feedback can reduce residential energy usage. *The Journal of Law, Economics, and Organization*, 29(5), 992-1022.
- Brown, Z., Johnstone, N., Haščič, I., Vong, L., & Barascud, F. (2013). Testing the effect of defaults on the thermostat settings of OECD employees. *Energy Economics*, 39, 128-134.
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, 12(4), 105-109.
- Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence*, 1(1), 3-15.
- Costa, D. L., & Kahn, M. E. (2013). Energy conservation “nudges” and environmentalist ideology: Evidence from a randomized residential electricity field experiment. *Journal of the European Economic Association*, 11(3), 680-702.



- De Angelis, R., & Feola, R. (2020). Circular business models in biological cycles: The case of an Italian spin-off. *Journal of Cleaner Production*, 247, N.PAG-N.PAG. doi:10.1016/j.jclepro.2019.119603
- De Groot, J. I., Abrahamse, W., & Jones, K. (2013). Persuasive normative messages: The influence of injunctive and personal norms on using free plastic bags. *Sustainability*, 5(5), 1829-1844.
- Egebark, J., & Ekström, M. (2016). Can indifference make the world greener?. *Journal of Environmental Economics and Management*, 76, 1-13.
- Elster, J. (1989). Social norms and economic theory. *Journal of Economic Perspectives*, 3(4), 99-117.
- Fehr, E., Fischbacher, U., & Gächter, S. (2002). Strong reciprocity, human cooperation, and the enforcement of social norms. *Human Nature*, 13(1), 1-25.
- Fleming, M. (2019). Coca-Cola: We need to reframe the way we talk about the plastic problem: The soft drink giant's CEO James Quincey is encouraging a two-pronged approach to sustainable packaging that includes both zero waste and reducing companies' carbon emissions. *Marketing Week (Online Edition)*, 1-1. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=139304235&site=ehost-live>
- Folz, D. H. (1995). The economics of municipal recycling: A preliminary analysis. *Public Administration Quarterly*, 19(3), 299-320. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=7153173&site=ehost-live>
- Food & Beverage Industry News. (2019). Incorporating circular economy not as easy as it seems. *Food & Beverage Industry News*, 48-49. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=137313280&site=ehost-live>
- Gaur, J., Mani, V., Banerjee, P., Amini, M., & Gupta, R. (2019). Towards building circular economy. *Management Decision*, 57(4), 886-903. doi:10.1108/MD-07-2018-0728
- Geislar, S. (2017). The new norms of food waste at the curb: Evidence-based policy tools to address benefits and barriers. *Waste Management*, 68, 571-580.
- Greenwalt, M. (2019). ASU, City of Phoenix announce circular economy incubator ventures. *Waste360*, N.PAG-N.PAG. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=135109290&site=ehost-live>
- Guan, F. (2019). Insights from behavioral economics to decrease pollution and reduce energy Consumption. *Low Carbon Economy*, 10(02), 11.



- Hammond, J. S., Keeney, R. L., & Raiffa, H. (1998). The hidden traps in decision making. *Harvard Business Review*, 76(5), 47-58.
- Hershfield, H. E., Goldstein, D. G., Sharpe, W. F., Fox, J., Yeykelis, L., Carstensen, L. L., & Bailenson, J. N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research*, 48(SPL), S23-S37.
- Jayaraman, V., & Yadong, L. (2007). Creating competitive advantages through new value creation: A reverse logistics perspective. *Academy of Management Perspectives*, 21(2), 56-73. doi:10.5465/AMP.2007.25356512
- Johnson, E. J., Hershey, J., Meszaros, J., & Kunreuther, H. (1993). Framing, probability distortions, and insurance decisions. *Journal of Risk and Uncertainty*, 7(1), 35-51.
- Kahneman, D. (2011). *Thinking, Fast and Slow*. Macmillan.
- Kallbekken, S., & Sælen, H. (2013). Nudging hotel guests to reduce food waste as a win-win environmental measure. *Economics Letters*, 119(3), 325-327.
- Kallbekken, S., Sælen, H., & Hermansen, E. A. (2013). Bridging the energy efficiency gap: A field experiment on lifetime energy costs and household appliances. *Journal of Consumer Policy*, 36(1), 1-16.
- Laibson, D. (1997). Golden eggs and hyperbolic discounting. *The Quarterly Journal of Economics*, 112(2), 443-478.
- Lieder, M., Asif, F. M. A., Rashid, A., Mihelič, A., & Kotnik, S. (2018). A conjoint analysis of circular economy value propositions for consumers: Using “washing machines in Stockholm” as a case study. *Journal of Cleaner Production*, 172, 264-273. doi:10.1016/j.jclepro.2017.10.147
- Lilienfeld, R. (2016). When sustainable packaging requires yin and yang thinking. *Packaging Digest*, 53(4), 27-27. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=119049419&site=ehost-live>
- Linder, N., Lindahl, T., & Borgström, S. (2018). Using behavioural insights to promote food waste recycling in urban households—Evidence from a longitudinal field experiment. *Frontiers in Psychology*, 9, 352.
- Machado, M. A. D., Almeida, S. O. d., Bollick, L. C., & Bragagnolo, G. (2019). Second-hand fashion market: Consumer role in circular economy. *Journal of Fashion Marketing & Management*, 23(3), 382-395. doi:10.1108/JFMM-07-2018-0099
- Marrucci, L., Daddi, T., & Iraldo, F. (2019). The integration of circular economy with sustainable consumption and production tools: Systematic review and future research agenda. *Journal of Cleaner Production*, 240, N.PAG-N.PAG. doi:10.1016/j.jclepro.2019.118268



- McKinsey Insights. (2019). When you pick that pre-worn jacket, the environment wins too. *McKinsey Insights*, N.PAG-N.PAG. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=138616768&site=ehost-live>
- Newell, R. G., & Siikamäki, J. (2014). Nudging energy efficiency behavior: The role of information labels. *Journal of the Association of Environmental and Resource Economists*, 1(4), 555-598.
- OECD (2017), *Tackling Environmental Problems with the Help of Behavioural Insights*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264273887-en>
- Pichert, D., & Katsikopoulos, K. V. (2008). Green defaults: Information presentation and pro-environmental behaviour. *Journal of Environmental Psychology*, 28(1), 63-73.
- Plastics News. (2013). Tasmanian firm transforms PVC waste. *Plastics News*, 25(19), 0019-0019. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=89738607&site=ehost-live>
- Russo, I., Confente, I., Scarpi, D., & Hazen, B. T. (2019). From trash to treasure: The impact of consumer perception of bio-waste products in closed-loop supply chains. *Journal of Cleaner Production*, 218, 966-974. doi:10.1016/j.jclepro.2019.02.044
- Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1(1), 7-59.
- Scherer, C., Emberger-Klein, A., & Menrad, K. (2018). Consumer preferences for outdoor sporting equipment made of bio-based plastics: Results of a choice-based-conjoint experiment in Germany. *Journal of Cleaner Production*, 203, 1085-1094. doi:10.1016/j.jclepro.2018.08.298
- Schultz, W. P., Khazian, A. M., & Zaleski, A. C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence*, 3(1), 4-23.
- Shen, B., Liu, S., Zhang, T., & Choi, T.-M. (2019). Optimal advertising and pricing for new green products in the circular economy. *Journal of Cleaner Production*, 233, 314-327. doi:10.1016/j.jclepro.2019.06.022
- Simon, H. A. (1972). Theories of bounded rationality. *Decision and Organization*, 1(1), 161-176.
- Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280-285.
- Wright, S., Sharpe, S., & Giurco, D. (2018). Greening regional cities: The role of government in sustainability transitions. In W. Leal Filho, J. Rogers, & U. Iyer-Raniga (Eds.), *Sustainable development research in the Asia-Pacific region: Education, cities, infrastructure and buildings* (pp. 327-343). Cham: Springer International Publishing.



Thaler, R., & Sunstein, C. (2008). *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Yale University Press.

Vlek, C., & Steg, L. (2007). Human behavior and environmental sustainability: Problems, driving forces, and research topics. *Journal of Social Issues*, 63(1), 1-19.

Vince, J., & Hardesty, B.D. (2016). Plastic pollution challenges in marine and coastal environments: From local to global governance. *Restoration Ecology* 25 (1), 123-128.

Wagner, T. P., & Toews, P. (2018). Assessing the use of default choice modification to reduce consumption of plastic straws. *Detritus*, (4), 113.