Plastics: Diabolic Or Fantastic?

Professor **David C Wilson** reflects on the dominant story of his CIWM Presidential year, how we respond to the crisis of plastics entering our oceans. Which plastic uses are diabolic and which fantastic?

Blue Planet 2 has certainly put plastic wastes leaking into the oceans, and solid waste management in general, firmly on the political agenda. Add to that the "China ban", and we had the makings of the "perfect storm". The question now is not whether bans on certain uses of plastics will be contained in the new Defra Resources and Waste Strategy, but rather, how far will it go? By the end of my term of office, I will have participated in more than 20 CIWM Centre meetings and external events, of which 50 percent have focussed specifically on plastics, and a further 25 percent have had it as a major issue. CIWM has also contributed to the debate with two major reports, of which more later.

This is my fourth column on plastic wastes and has been inspired by The Klosters Forum (TKF) in July[1], on how to stem the flow of plastics into the oceans, to which I was invited as CIWM President. To quote: "TKF creates a space in which time is set aside for participants with relevant backgrounds to focus on a single issue. …. Our focus is on creating viable solutions, which we do by creating networks, brokering collaborations and incubating thought leadership". Perhaps the message that hit me most strongly was from the young British designer Caroline Till, who pointed out both the design failure of our continued use of massive quantities of an indestructible material for single use items; and also the responsibility of the design world: "we designed our way into this issue and therefore can and should design our way out".

Diabolic Or Fantastic?

THE CONTENT of the workshops was organised by the NGO Common Seas, led by CIWM member, another designer Sophie Thomas. The first session took as its starting point two UK policy commitments: "…work towards eliminating all avoidable plastic waste by end of 2042" (UK Government 25 year Environment Plan); also "…by 2025 take actions to eliminate problematic or unnecessary single-use packaging items through redesign, innovation or alternative (reuse) delivery models" (UK Plastics Pact). Our task in breakout groups was to explore which plastics are avoidable or unnecessary (or as I have paraphrased it "plastics diabolic"); or to turn it the other way around, which plastics are necessary and unavoidable ("plastics fantastic")?

Two concepts seem to me to provide the basis for a way forward here. One is our own use-phase based classification[2], developed on behalf of the Resourcing the Future (RTF) partnership (CIWM, ESA, the Resource Association & WRAP) for the June 2018 RTF conference (September Journal pp 34-35). Five categories are defined according to the length of time a given plastic item is used for its intended purpose, with categories one and two both being very short life (< 1 day), differing in the size of the product and thus in their leakage potential into the ocean.

A complementary approach emerged in embryonic form from

Klosters, as a "plastics hierarchy", with "essential" uses at the top (which need to be managed carefully), and "pointless" uses at the base (which need to be banned). In the middle are several categories: hard to replace; problem plastics; and replaceable. Some uses could also be considered as "unacceptable", when the level of environmental harm cannot be justified regardless of the benefits.

These concepts allow us to separate plastic uses conceptually into three broad categories. At one extreme are the unacceptable, pointless, and often very short term (or diabolic) uses. Some bans are already in place or have been proposed, for example on microbeads in cosmetics, cotton buds, straws or coffee stirrers, while others could and arguably should follow. But the RTF report suggests that the two very short-term use categories together only account for about 11 percent of total plastic use by weight, so the recent selective bans really are just tinkering with the tip of the iceberg.

At the other extreme are what might be termed necessary or sustainable ("fantastic") uses, which may be a combination of essential uses such as many medical infection-control applications, and also some longer life uses where the properties bring other (carbon) benefits, such as light-weighting cars and aircraft, and where concepts such as design for dismantling and design for recyclability are now well established. The RTF report suggest that their medium and long-life use-phases account for 37 percent by weight of total plastics; these uses need to be optimised, so over time quantities could be managed down; but equally many medical uses will be in shorter term categories.

This leaves the third, "indeterminate", category in the middle, which is also the largest (52 percent of plastics by weight in the short life (1 day – 2 years) use category). The plastics hierarchy suggests a hypothetical breakdown here into problem, replaceable and hard to replace plastics, which could provide the basis for a medium-term strategy. Early focus could be placed on phasing out the problem and replaceable plastics. For hard to replace plastics, one focus should be on redesign and consolidation into a smaller number of truly "easy to recycle" plastics used for "higher environmental value" applications, such as preventing food waste.

None of this will be easy. There are also "confounding" equity issues to consider: low-cost plastics have brought to the very poor in developing countries both essential amenities (safe drinking water in plastic pouches or bottles) and modern luxuries (eg, cosmetic sachets). Much further research is needed, both to work up the emerging concepts discussed here, and to turn them into practical solutions that work across entire supply chains and in both developed and developing countries.

A Wedge Approach

IMPLEMENTING THESE ambitions will require a wide range of interventions. Another take home message from Klosters was that there is no single solution: "we need silver buckshot and not a silver bullet". Which leads us into the second round of workshops, which were based on the "wedge" approach, originally designed to facilitate work on mitigation measures to stabilise climate change by sub-dividing the work required into a series of manageable chunks or wedges.

Here, Common Seas are working up five primary wedges to support the development and evaluation of strategies to minimise the flow of plastics into the rivers and oceans: plastic production reduction; materials and product design; reduced waste generation; improved waste management; and better litter capture. The wedges are clearly inter-related, and one issue will be managing the inter-sections between them.

Interestingly, at least three, and arguably all five, of the wedges fall within CIWM's scope of better resource and waste management. The other 2018 CIWM (and Wasteaid UK) report mentioned earlier fits here. "From the Land to the Sea"[3] presents the evidence that extending waste collection to all and eliminating open dumping in developing countries would cut the quantity by weight of plastics entering the oceans by 50 percent. These are two of the sub-wedges within "improved waste management", so it may be that focusing preferentially on some wedges could have both a larger and a quicker impact than others. As I argued earlier in the year (June Journal, pp 16-17), we need to ensure that "the baby is not thrown out with the bath water", and that in the UK, helping developing countries improve their solid waste management systems remains an important core of our policies going forward. CIWM have already opened discussion with Common Seas on future collaboration.

Conclusions

PLASTICS CAN be fantastic materials. Their use for infection control, light-weighting cars and aircraft, and reducing food waste have all been positive. Equally, it makes little sense to use more than 60 percent of the exponentially growing quantities of this essentially indestructible material for short-life, single-use applications. We need to ban or eliminate diabolic uses, particularly those products that appear designed to enter the oceans as easily as possible. And as resource and waste professionals, we need to work hard with other stakeholders over the coming years to design out many of the "indeterminate" uses, so that by say 2030 we can be confident that all plastics currently being produced are indeed going into necessary, unavoidable and fantastic applications. ■

References

1. https://www.theklostersforum.com/ocean-pollution-2018/
2. Eliminating avoidable plastic waste by 2042: a use-based approach to decision and policy making. Resources Futures and Nextek, for CIWM, ESA, Resource Association and WRAP. Published at the Resourcing the Future Conference RTF June 2018. https://bit.ly/2I6qFoU
3. From the Land to the Sea – How better waste management can improve the lives of the World's poorest and halve the quantity of plastic entering the oceans. CIWM and Wasteaid UK, March 2018. https://bit.ly/2pjZFeL

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