PROTECT

A MATERIALS MANIFESTO

RADICAL CHANGE IN THE DESIGN AND DEVELOPMENT OF PACKAGING TO MAKE IT MORE SUSTAINABLE IS POSSIBLE, AND WE NOW KNOW HOW TO ACHIEVE IT.

> BY ANDREW H. DENT, PHD

The last five years have witnessed a revolution in the way we view objects, and the materials that package them. What were once simple decisions about whether packaging was "well-designed," useful or beautiful, now have another dimension: is it sustainable?

And through this five-year period, the way in which we approach that word, the way we "see" sustainability has also changed. It has ranged wildly from fad to fad, as designers and manufacturers learn about (and fight against) whatever the latest version of "green" is. We have had the bamboo era, with bikes, fabrics, computer casings, plates, and even a phone made from this highly versatile plant. There was the PLA era, where we wanted everything to be made from that wonderful corn-based plastic. We have avoided PVC, even when, in some cases, it proved to be the better, lower-impact choice (though, for packaging applications, it *is* best to avoid it if you can).

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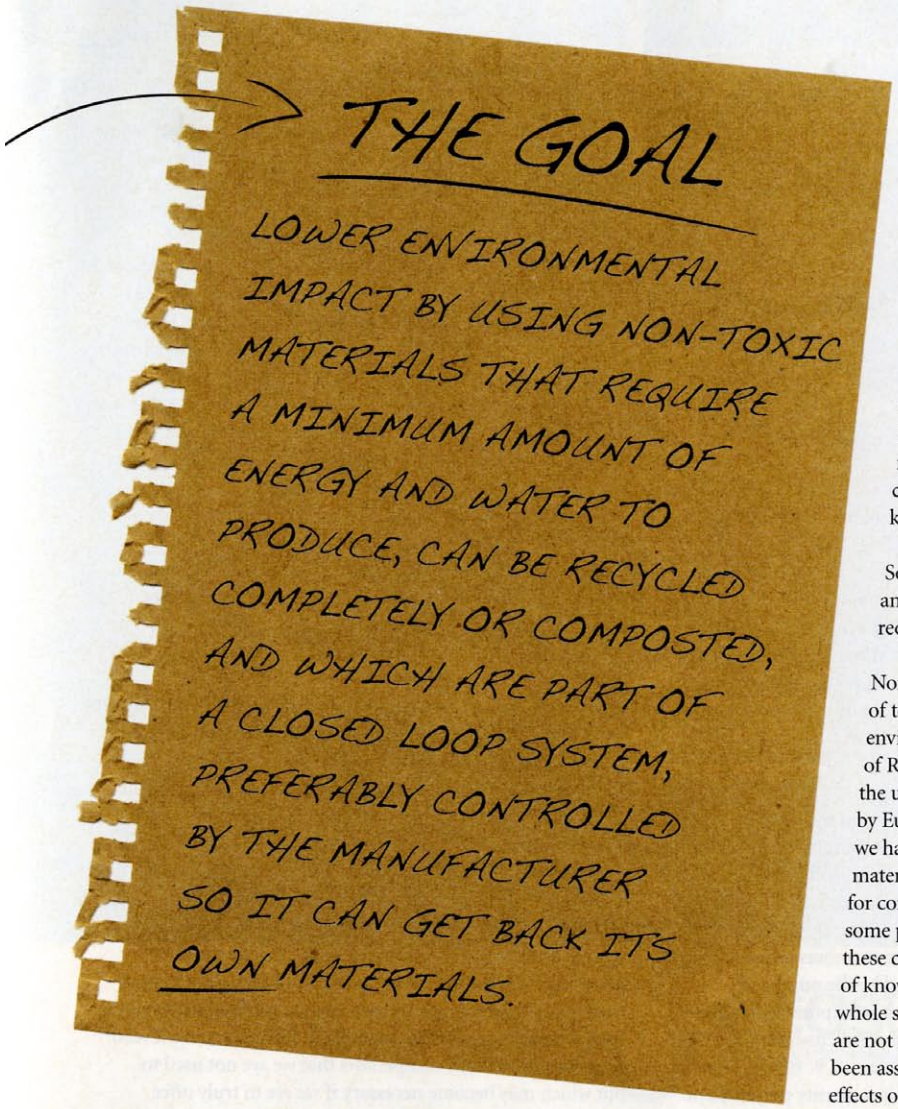
But we have learned a lot. Of course, we have made mistakes, but there has been much experimentation… and we have had to do it quickly, much quicker than any other materials revolution so far. We believe we are now at a point where we know how to design sustainably—to avoid the mistakes, lower our impact and make better products. It is, of course, obvious now that the selection of one material type for all packaging was never going to offer the ultimate solution. Each new package design needs to approach the problem with the same goal in mind, but use different materials to get there.

SO WHAT IS THE GOAL?

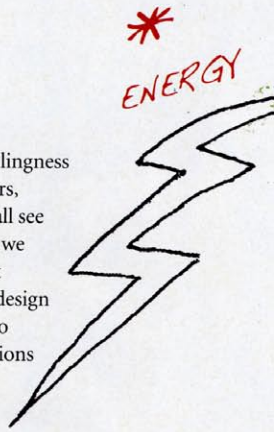
IT CAN'T BE STATED MORE STRONGLY



Given that we know all this, why is it so damned hard to achieve? Because almost every bit of progress that has come before this moment—all those years of brainy chemists, materials scientists, engineers and designers improving stuff—has been sending us in the other direction, away from good sustainable design. Late 20th and early 21st century consumerism has been a high-speed train going in exactly the opposite direction of sustainability.

No wonder it's hard.

That said, in the time in which we have seen the sustainable design revolution occur, we have also witnessed a great surge in innovation and in our willingness to adapt. We, as consumers, producers and designers, all see that change is needed, and we are open to it. I believe that truly radical change in the design and production of objects to create more sustainable versions is possible – and now we know how to achieve it and, more excitingly, we have a customer base who wants it and knows why they want it.



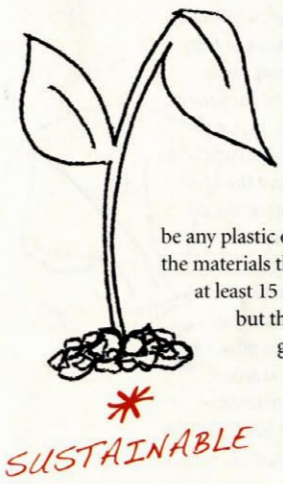
So let's take our sustainability goal and work through the various stated requirements.

Non-toxic materials should mean a lack of toxicity for humans, animals and the environment alike. With the adoption of RoHS (a policy directive prohibiting the use of certain hazardous substances) by Europe, China and some U.S. states, we have a standardized set of restricted materials that we can all agree are harmful for consumer products: mercury, lead and some phthalates used in PVCs. However, these chemicals are very much a baseline of known hazards to humans. There are a whole set of other chemicals that, while they are not specifically restricted, have not fully been assessed in terms of their long-term effects on both humans and the environment. The better alternative is to choose materials and additives that are known to be beneficial to our ecosystem, offering nutrition to: the environment they end up in, our bodies through close and prolonged contact, the air through off gassing, or the earth through correct disposal.

Using a minimum amount of energy and water to develop packaging is one part of sustainability that has had a head start simply because this tends to be something that increases efficiency (and therefore cost-savings)—a strategy that every production process strives for. Even better, of course, is the use of renewable energy, which is seeing many advances being made in the efficiencies of solar power, wind and other alternatives to coal and oil. >

Producing packaging that can be completely recycled or composted is our next step. For recycling, just making something recyclable does not mean that it necessarily will be. The material itself, the additives that go into it (biodegradable plastics are not appreciated in recycling streams) and the shape of the package will all affect whether it will get used again. Our infrastructure for reclaiming glass, aluminum, steel and paperboard is well developed, but plastics, due to the many types of similar-looking polymers available, still lag far behind in their recycling percentages.

ASTM International, the not-for-profit organization that develops international standards for materials, products and systems, recently asked its members to vote on changes to the current system used to identify plastics for recycling, with its well known symbol of numbers in a triangle of arrows. Numbers 2 through 6 will remain unchanged, but members are asking if PET (currently identified by the number 1) should specify whether it incorporates coatings that are above a 0.5 percent concentration. In addition, the numbers 8, 9, 10 and 11 are being proposed for low density polyethylene (LDPE), PLA (the corn-based bioplastic) and other non-PET polyesters, respectively. Also, it has been proposed that those using the number 7, a designation of "*other*" (it could be any plastic or combination of plastics) should now detail all the materials that are used. All of these proposals are said to be at least 15 months to three years away from implementation, but they show that there is an increased demand for greater clarity surrounding the types of plastics we use for packaging.



The aforementioned paperboard—and indeed all paper products—have the advantage of both being recyclable *and* biodegradable. Admittedly, laminating papers with foils prevents them from being fully degradable, but there are inks and films that are as degradable in landfills and in the environment as paper itself. Of course, biodegradability is a big issue at present, particularly for packaging. But consider that recycling facilities don't want plastics treated with additives that promote biodegradation to contaminate their products, as it can cause their recycled bales of PET bottles to degrade prematurely. And there are a lot of arguments about how effective the biodegradation process is, where it should happen (in a landfill, in the sea, on the side of the road), and what the product physically breaks down into before it finally has a chance to biologically degrade. The choice to make a package recyclable or biodegradable should be considered on a case by case basis, weighing all the aforementioned issues and making the best decision for the current situation, rather than what we hope the future to be.

Closing the loop of a packaging product lifecycle is probably the toughest part of this sustainability manifesto, because it is the area where you have least control. Getting back the raw materials from the packaging you produce assumes a relationship with recycling facilities and, also, a level of education and tacit agreement from consumers such that they are willing to sort their waste sufficiently to ensure a good recycling stream. Of course, this all means that you are not only going to get your own materials back but, more than likely, materials from competitors as well. But if you have all agreed to use exactly the same materials (as is the case in the water and beverage industries with PET), then you can be sure that the recycled stuff you get back is good enough to be used again. This relies on a level of cooperation between competitors that we are not used to, but which may become necessary if we are to truly offer sustainable packaging solutions.

And isn't that the whole point? We are in this not only for ourselves, but also for everyone else, the planet and the future generations who will have to take care of it. **BP**

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