# Stanford eCorner

## Upcycling, Not Recycling

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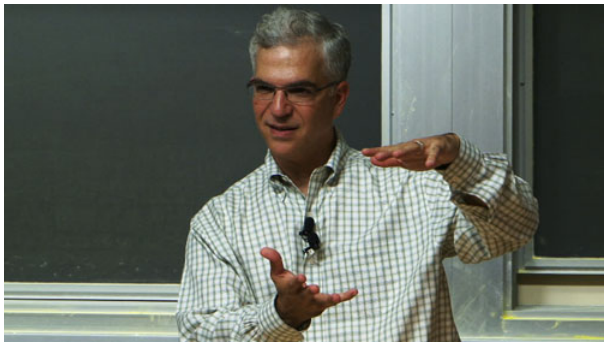
**Video URL:** http://ecorner.stanford.edu/videos/2301/Upcycling-Not-Recycling

As William McDonough wrote in his book *Cradle to Cradle*, we should stop thinking of post-consumer goods as "waste", and instead start thinking of them as "food" in the product chain - upcycling raw materials and turning them into useful raw materials, rather than just alleviating the burden offset by recycling. Sun Microsystems' CTO Greg Papadopoulos looks at this challenge from the perspective of engineering, and encourages the technical and scientific sectors to think not in terms of product degradation, but to look at manufacturing and design in terms of disassembly and endless reuse.



**Transcript**

On the left hand side is a set of words: reduce, reuse, recycle, eco-efficiency. You all like that stuff. You hear it. It's kind of the food pyramid of the eco-efficient living world. I want you to forget it. It's not that it's not important. It's just in some sense if you look at it, the left hand side of this is really about making things less bad and an engineering or constructive way of it is how do we make things good or how do we make things better. That is the lifecycle view that we see the phases of lifecycle as you make a product, you use a product. This last phase is not recycling. It's about renewing the resources that you used in the product.

I'm going to go into this right hand side, tear it apart. The first step here is to just redraw the cycle a little bit differently for you and plus give you - this is by the way, if you haven't read Cradle to Cradle by McDonough and Braungart, you can read it literally a day on the beach. Do it. It's really important. Go do it. This is just taking, it's our interpretation of this. It was actually a very inspiring foundation for the work that we've done. So I'm just taking the cycle and ignore the green arrow. Green is good now, right? That's a good color. I've just linearized the, okay, you start with some resources and materials, if you will, the food for this process.

You make something. You use it and then at the end you ask, do I renew it or what's the end of that cycle? At the end of the cycle, I have essentially waste. Waste can be a good thing, so this is part of your recalibration and rethinking about this stuff. If you go through this cycle, you may look at, depending on the product, the eco implications on this, the ecological footprint of the product will be very different. It could be that the making, the manufacturing of the product is where most of the impact is. It could be that it's operations, so in our business, server, computer systems. Most of their ecological impact is in their use. It's the energy consumption over their lifetime. If you have your laptop, most of it, the eco impact is actually in its manufacture because they don't consume that much energy over their lifetime. And some things may be it's the e-waste at the end.

So the important closing of this cycle is this green arrow and the really key concept according to McDonough and Braungart is, are you able to essential up-cycle this waste into something that's a useful resource to restart your cycle? It's different than recycling and often they will use the term recycle to be down-cycling. If you take some nice plastics that you build bottles out of

and shred them up and you get less nice stuff to go build clothing, that's down-cycling. It's a degrading those materials as you go through the process. It's almost an entropy argument here. How do you get this waste back into the cycle? In their term, waste equals food.