

How Green Is My Value Chain?

by Hardin Tibbs

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Transforming the value chain into a value loop can save natural resources and enhance a business's long-term prospects.

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We seem all too willing to accept that waste, pollution, and the overexploitation of natural resources are inevitable by-products of the business cycle. Consider the typical, vaunted “value chain”: Suppliers extract raw materials from nature, the manufacturing sector turns them into products, and retailers sell them to consumers, who throw away the packaging, and often eventually the products, as waste. In each link, companies and consumers — consciously or not — despoil the environment. Nonetheless, businesses generally concentrate solely on their own place in the chain, making sure to add at least enough value to generate a profit while using whatever materials and energy are needed to create that value. For their part, consumers are by and large just as cavalier about the consequences of their actions.

But disturbing statistics are beginning to serve as an indirect indictment of the value chain. One stands out. In 2003, our overall consumption of natural resources exceeded the earth's ability to renew those resources by a whopping 25 percent, according to the World Wildlife Fund. Given that we've reached such a troubling point, we must ask: can the world's economy thrive without damaging or depleting natural resources?

One possible solution is what I call a “value loop.” Under this approach, the beginning and end of the value chain are linked together so that materials, prod-

ucts, and waste can flow among suppliers, manufacturers, and customers in a sustained cycle. The goal: to promote technologies and business models that have minimum impact on nature throughout the loop — or that incorporate it in a beneficial way.

The forward half of the loop — from raw materials to manufactured product to trash — is already in place. The challenge now is to create the return half of the loop, collecting waste material and reprocessing it into new “raw” material. This requires a sequence of steps, including “product take-back,” product demanufacture (breaking down an item into its basic elements), and materials reprocessing. The business challenge of the return path is to create value with each of these steps — just as value is created during the forward half. This could be accomplished through regulation-based or through innovation-based business models.

A recent example of the former has already been introduced in Europe, in the form of so-called product take-back legislation, which mandates the recycling of consumer products at the end of their useful life and requires that new products contain a minimum percentage of recycled materials. The European Union's End-of-Life Vehicles Directive of 2000, for instance, requires automakers to pay for the cost of taking back and recycling old cars, starting with vehicles sold in 2001, while setting a date of 2015 for 85 percent of the metal in cars to be recycled and

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banning the use of hazardous heavy metals.

As a result of this directive, European car manufacturers such as BMW and Volkswagen are beginning to develop environment-friendly strategies that include targets for recycled content, the redesign of cars to make them easier to demanufacture, and the use of materials that are easier to reprocess into a reusable form, thus keeping down the costs of the return loop and making it economically viable for third-party reprocessors to take part in the value loop.

As critical as legislation will be in promoting the creation of value loops, companies need not wait until laws are passed; instead, they could devise innovation-based business models that protect natural resources. For example, as existing environmental regulations continue to drive up the cost of routine waste disposal, recycling businesses will be able to charge higher fees for picking up recyclable trash. This disposal fee can subsidize both the cost of collection and the expense of breaking down the material so it can be reused. That would make the price of recycled goods competitive with non-recycled products.

Mining companies could rethink their role in the value chain by “mining” the scrap flows in urban areas — such as cars, trucks, and other steel-rich equipment — and cutting out the recycling middlemen. This notion has already placed steel mini-mills in such scrap-rich locations as the suburbs of Sydney, Australia, where steel maker OneSteel has established a new plant devoted to just this kind of reclamation. Mining companies might also begin to sell reusable metals like “cyclic copper,” which they would lease to product manufacturers that would include it as an environmental feature in their products. When the product is not useful anymore, the

manufacturers would take it back, retrieve and extract the cyclic copper, and return it to the mining company for recycling, putting it back in the value loop.

Another approach involves developing a service model for products that have traditionally been purchased and then thrown away. For example, rather than selling its products outright, Atlanta-based carpet manufacturer Interface Inc. leases them to consumers, agreeing to replace worn carpet when necessary and to remove and recycle carpets at the end of their useful life, rather than tossing them into a landfill.

Further out on the cutting edge is an Athens, Georgia-based energy company called Eprida, which has developed a complex process for recycling biomass such as wood chips and agricultural waste. Converting the biomass into charcoal releases hydrogen, which can be sold to make ethanol and biodiesel. Another by-product is ammonia, which can be recombined with the charcoal and waste from power plants to make nitrogen fertilizers whose high carbon content fixes them more completely to the soil, thus reducing runoff. In business terms, the process creates a closed loop for carbon, instead of releasing it into the atmosphere as carbon dioxide.

The energy required to maintain value loops must not be ignored, however, and to get the most out of this new closed value chain we need to both develop ways to use less energy and perfect more easily renewable sources of energy — hydrogen cells, for instance. And even if value loops can be made energy- and resource-neutral, the question of growth in demand, from both increased population and rising affluence, arises. Answering it means either finding new sources of materials to feed the growing demand or using fewer materials to make finished products. Dubbed “dematerialization,” this has already been taking place for

some time: Compare the relatively miniscule set of materials required to make a personal computer today with the components found in an IBM 360 mainframe. Ultimately, for the concept of the value loop to succeed on a global scale, the rate of dematerialization throughout the system must exceed the rate of growth in demand.

Creating interlocking value loops throughout the global economy would be no mean task. It's not impossible, but it would require significant technological advances, an acceptance of the severity of the environmental problems we face, and the will — on the part of both businesses and consumers — to make the shift from value chains to value loops. And, most of all, a strong business case will have to be made to show that there's potential profit and long-term success in protecting natural resources. Without the economic incentive, nothing will change. +

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