CHAPTER FIVE

Resource Capital Transparency

Developing a Resource Capital Balance Sheet

Environmental Capital is Nature in place. Resource Capital is the stuff humans take from Nature for our own uses. A Resource Capital Balance Sheet is the second of the five balance sheets that help us sum up the well-being of our society.

When we measure environmental capital, we measure the well-being of living systems. What is it we measure when we pull together a resource capital balance sheet?

I see three broad sets of questions to be addressed. [reference Story of Stuff in previous chapter]

The first question is one of resource capital Adequacy, and I would use this measure primarily to address infrastructure. Does our society, or any society, have enough infrastructure to prosper? Is the tangible capital able to provide shelter and education and employment and commercial outlets and recreation? In addition, we might also ask if there are enough consumables to help everyone lift themselves out of poverty.

The second question is one of Sustainability. Do the technologies that produce our stuff honor the Five Zeroes of Sustainability? Or, more precisely, do they satisfy the last three zeroes – Zero Net Loss of Resources, Zero Cumulative Pollution, and Zero Cumulative Waste?

The third question is that of resource availability. Will the world have the water it needs to grow the crops it requires? What are the limits to water availability were agriculture to be run on a sustainable basis? What are the limits to forestry resources in a sustainably run future? What are the limits to fish resources, if sustainable fish harvesting were the standard for all?

Characterizing and Measuring Adequacy

Building a set of measures for adequacy will be a challenge, but it is one we can meet.

Start from the bottom and work up. Several sets of tangible assets are crucial to economic development in the poorest of the world's countries. Safe drinking water and sanitation assets are essential for survival and health. Health facilities are essential too – clinics, drugs, labs, and hospitals. Educational capital is essential, beginning with elementary schools and middle schools, including not only the school buildings but also the books and materials that students require so that they can learn. Agricultural capital is vital, too. Water must be captured, stored, and made available to farmers. Runoff must also be properly managed so that the long-run vitality of the fields and gardens isn't compromised. Transportation resources are essential too, the roads and vehicles that connect producers both with their customers and with their suppliers. Every society needs an effective energy infrastructure, to distribute both electricity and liquid fuel. And every society needs an effective communications system.

Then, with infrastructure in place, one also wants a diverse business community, with all the

tangible assets to match.[1]

In the world's poorest countries, so many pieces of the economic puzzle may not be present at all. How can an impoverished society get itself started on the path of growth if it is so poor all its meager resources are consumed in daily survival? A Resource Capital Balance Sheet for an impoverished country ought to reflect its terrible deficits, not for the purpose of heaping scorn but for the purpose of attracting starter investments.

Once a country gets over that first big hurdle, and accumulates an essential core of critical resources, its growth opportunities improve considerably. Growth won't be endless, not for the wealthy, but a proper measure of growth is essential for everyone. All countries deserve opportunities to follow their own S-curve paths from pervasive poverty to respectable prosperity.

The balance sheet measure of Adequacy has two major components, coverage and sophistication.

Coverage is about inclusion. Are the necessities of resource capital available to everyone? Or have some groups been left out, by reasons of geography, or race, or tribe, or economic status?

Sophistication refers to technological intensity. Are the resources simple and relatively primitive? Are they world class? Or are they somewhere in between?

Suppose, for example, that one were tasked with fleshing out a measure of educational capital. First one would look at coverage. Does every child have proper access to education, or have some been excluded? Then one would look at the sophistication of the educational capital. Do most school systems stop at 5th grade? Or 8th grade? Or 12th grade? Or does the society also have an ample supply of technical schools, community colleges, and advanced centers of learning?

One would ask similar questions in every important category – water and sanitation facilities, health facilities, agricultural infrastructure, transportation facilities, energy facilities, communication facilities. Is everyone covered? Are the facilities primitive, partly advanced, or fully modern?

The broad measure of a business sector would also focus on coverage and sophistication. Do all parts of a society have the business capital that one would hope? Would its sophistication be appropriate? Or do some areas get left behind, while some business sectors struggle with outdated assets?

One important contribution of a balance sheet for Resource Capital will be the clarity it creates. Those regions that are desperately poor will be brought out of obscurity and their condition documented on the Resource Capital Balance Sheet. At the same time, regions that are doing well but have yet to receive the credit they deserve will also have a chance to have their capabilities recognized more widely.

Characterizing and Measuring Sustainability

Nature, as we know, recycles everything. Everything living eats something, while it is alive, and once it has died, it decays and in turn becomes food for something else.

In *Cradle to Cradle*,[2] William McDonough and Michael Braungart have written an excellent description of how this same principle can be humanity's guide to a sustainable future. McDonough is an American architect who specializes in green architecture; for a time he was Dean at the University of Virginia's School of Architecture. His collaborator, Michael Braungart, is a chemist from Germany.

We must learn to think of all our products as consisting of "nutrients," McDonough and Braungart write. Organic molecules can become natural nutrients, while inorganic molecules can become technical nutrients. The authors envision a future in which every product in every store is the fruit of recycled materials. Food and some fiber products will be made exclusively from organic nutrients; everything else will be made from a combination of organic and technical nutrients, or from technical nutrients alone.

Once any product reaches the end of its service life, it is meant to be recycled. It is fed, if you will, into a recycling system designed to recapture one hundred per cent of its nutrients. Those nutrients go back upstream, and await their turn as the feedstock of future products. Total throughput extracted from mines and oil wells and gas wells drops to zero; just as total throughput heading toward production landfill and consumer good landfill drops to zero.

For this performance standard to be met, manufacturers will have to rethink both their processes and the components from which their products are made. Done well, this is likely to benefit the bottom line. "Subaru says it has saved millions of dollars by combining green thinking with in-depth studies of its processes, suppliers, and equipment," according to Alan G. Robinson and Dean M. Schroeder in their Wall Street Journal article, "Greener and Cheaper."[3]

If products are to be recycled, at the end of their service life, they have to be manufactured in ways that promote recycling. If products are not to be toxic, they have to be made from "nutrients" which are known to be Nature-friendly, not from components that are known to be toxic. Product specifications often include a Bill of Materials, and Cradle to Cradle suggests that some of the compounds engineers now specify for their bills of material are likely to flunk the criteria for acceptable technical nutrients. Whenever this happens, there's a redesign challenge to be met. Find an alternative substance that will meet customer needs, and that can also be recycled successfully later on as a technical nutrient. If every product's bill of materials is restricted to nutrients that can be recycled, we can maintain a modern lifestyle in a world all of whose products meet a cradle to cradle standard.

McDonough and Braungart know what it means to think long and think large.

The math of sustainability confirms their vision. If we think long, as one must if humanity it to protect our planet's health for the next ten thousand years, we shall have to honor the Five Zeroes. And, in that spirit, we shall have to impose upon our Resource Capital Balance Sheet a system for tracking the sustainability of all our resource capital.

Let's start with sneakers. Back when I suffered from plantar fasciitis, I started buying New Balance sneakers, and it is the brand I stay with. Even so, I have no idea how "green" the bill of materials for my sneakers might be. Nike advertises a recycling program for sneakers, but not for the purpose of making new sneakers from the leftover nutrients of the old. Instead, Nike uses castoff sneakers to create a spongy playing surface for sports activities.

There are three sets of questions to ask of a sneaker manufacturer.

First, to what extent is your product made from resources that are being mined/produced/harvested sustainably? If everything is drawn from resources that are regularly replenished, that's all to the good. Your product passes the first test, Zero Net Loss of Resources.

Second, is it certain that your product adds no permanent pollutants to the environment? Are the chemicals that escape into the air safe and biodegradable? What about any chemicals that may

escape into the food chain? As tread wears off the soles of sneakers, in tiny particles, are those particles fully biodegradable? If nothing in the manufacturing or the wearing of the product adds pollutants to the environment, the product passes the next test, Zero Cumulative Pollution.

Third, have arrangements been made to ensure that your product is fully recycled once its useful life is done? Some recycling of sneakers has begun, but it is voluntary and limited. I can testify from having toured the local Waste Management recycling plant that WM is not in the sneaker recovery and recycling business as of now. Nor does my local New Balance shoe store invite its customers to leave their old sneakers behind for recycling. Only those products that are fully recycled deserve a passing score on Zero Cumulative Waste. And there is quite a distance to go. According to the Environmental Protection Agency, this nation has approximately 1800 landfills, down from 20,000 in the early 1970s, and the ones that remain are expected to be full in twenty years. Of the 254 million tons of household trash Americans produce annually, 137 million tons end up in landfill and another 32 million tons are burned. So far, only 85 million tons are recycled or composted.[4]

These three questions are for every manufacturer, of course, not just sneaker manufacturers.

Incorporating these insights into a Resource Capital Balance Sheet will present some interesting challenges.

First, the balance sheet design team needs to develop an efficient hierarchy of industries and products. Anyone visiting its web page should be able to find any industry and any product class with only three or four clicks. This begins as a blank hierarchy, not as a score sheet. The first challenge is getting the product list spelled out properly and arranged within a sensible hierarchy of categories.

Second, the balance sheet organizers need to pull together a proper scoring system. This will be a long and painstaking process, but one that in time yields rich rewards.

How might we imagine a scenario that will yield the scoring system needed? It makes sense to me to begin by saluting the work of the American National Standards Institute (ANSI). Under its sponsorship, an extraordinary library of engineering standards have been created. Each standard codifies the specifications for a particular product or service, so that every negotiation between a buyer and a seller can be guided by a consistent standard.

Each standard is the fruit of a multi-firm committee process. Years ago I sat in on the early stages of an ANSI-sponsored discussion about standards for photovoltaic panels. The question on the table was an interesting one. How many watts of power would one expect a panel to produce on a “sunny day”? This was an awfully squishy concept for the engineers gathered in the room, and it was clear that a precise and workable way of stating the desired specification would emerge only slowly.

At its heart, it is a workable and responsible process for creating standards, and my hunch is that it would become the basis for addressing sustainability standards as well. Engineers will need the help of environmental scientists and other professionals in this work, and their goal will be the creation of precise operational terms for implementing zero net loss of resources, zero cumulative pollution, and zero cumulative waste.

From clear and dependable standards will come clear and dependable scoring. In time, as an ANSI style process moves forward, the blanks on the initial Balance Sheet will be replaced by

tangible scores based on credible measurement procedures.

Characterizing and Measuring Resource Availability

No balance sheet on resources will be complete if it omits resource availability. Water by all accounts is a vanishing resource in many parts of the world. Anyone clicking on this balance sheet needs to be able to see a clear statement of water resources – what they used to be, what they are now, and what they are projected to be. The Environmental Capital Balance Sheet will look at watersheds from an ecosystem health perspective; the Resource Capital Balance Sheet will look at water also as a resource for agricultural and residential uses. Forests are important resources for making paper products, at least at present. As paper recycling technologies improve, the importance of forests might diminish, but the state of forest resources is a matter for specialists to quantify.

Resource availability is not a simple measure. It is a function of resource requirements, which in turn is a function of technology. Non-sustainable technologies place a heavy burden on resource capital. Partially sustainable technologies place a lighter burden on existing resources, and fully sustainable technologies place the lightest burden of all. The balance sheet design team will have to find a proper methodology for presenting resource availability to reflect not only gross consumer demand, but also the character of the methods and technologies by which the resources are to be used.

The Resource Capital Balance Sheet will take some time to reach maturity. It may be twenty or thirty years before its unscored blanks are replaced by dependably generated scores. The list of blanks is part of its value, though. It will stand as a One Stop Checklist for product sustainability. Like a thermometer for a charity fund drive, it keeps the goal of sustainability in the public consciousness, not just in the U.S., but worldwide. It rewards those who make progress, and, in its own way, holds up to criticism those who do not. It becomes a quiet but insistent tool for improvement. And, somewhere on its extensive product list, it gives each of opportunities to become part of the solution.

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[1] This list of capital resources is drawn in part from *The End of Poverty*, by Jeffrey Sachs. Penguin Press, 2005.

[2] William McDonough & Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*. North Point Press, 2002.

[3] Wall Street Journal, March 23, 2009.

[4] Washington Post, Brigid Schulte article, March 14, 2009.