

Category: Building a New Ethic of Stewardship and Sustainable Development

The modern environmental movement—as distinguished from the conservation movement—is approximately 40 years old and has helped bring about numerous technical improvements including emission controls to prevent acid rain, banning the use of lead as a gasoline additive, mandating catalytic converters, and tertiary sewage treatment. And yet despite continuing—and in some cases even accelerating—degradation of the Earth’s biosphere, progress towards reintegrating human society and economy with the natural systems that support us appears to have stagnated during the last decade and a half. Certainly many new concepts have come along to help frame the movement in ways which align environmentalism with other social concerns, including economic progress and human rights/civil rights via sustainable development and environmental justice. Unfortunately these concepts remain vague and largely outside of mainstream discourse. Similarly, advancements in fuel cells, fusion, etc. continue, but these oft-hyped panaceas remain pies in the sky. What can we do now, in the interim? What can we do to reinvigorate interest in and action congruent with *being good stewards of the earth?*

It is my belief that instead of waiting for a silver bullet, the key lies in implementing the myriad overlooked, existing techniques and technologies; also known as best management practices (BMP). BMPs are typically little changes like waterless urinals, compact fluorescent light bulbs, or cloth napkins; these aren’t glamorous but can make a difference. To do this, first we need to honestly accept that there is no single solution to our environmental woes; one size fits all is only applicable to party hats and foam fingers. While it may not seem as elegant or gratifying, there is nothing dishonorable in implementing a piecemeal solution. A patchwork of improvements may even be more robust, since these improvements may allow for the independent and gradual phasing in and out of individual components as our understanding of systems change. Indeed,

some will take pleasure in noting the similarities between a measured application of specialized technologies and nature itself.

Co-founders of the Rocky Mountain Institute, Amory and L. Hunter Lovins along with journalist Paul Hawken published the celebrated book Natural Capitalism in 1996. The book focuses on these very themes of bio-mimicry, incrementalism, and application of existing know-how in addition to further research. It has been ten years since this best-seller—which has even been made freely available online—was released with dozens of roadmaps and business plans ripe for the picking, but where are our “flying cars”? (There is a joke among nuclear physicists that fusion has always been and continues to be “50 years away”) Clearly market forces have not been enough to initiate what some see as a second industrial revolution: a revolution where we acknowledge that the rules of the game have changed and that the traditional availabilities of labor (now plentiful) and resources (relatively scarce) are reversed.

Someone needs to lead by example, and governments at all levels have initiated efforts to do just that. The U.S. Postal Service has employed compressed natural gas (CNG) powered vehicles in its fleet for some time and public transit systems are beginning to catch-up as increasingly strict emissions standards are adopted by regulators. Green purchasing requirements such as the EPA’s Environmentally Preferable Purchasing are also proliferating, requiring or otherwise favoring the purchase of eco-friendly products given certain constraints. In practice this often means an agency must order Energy Star appliances or recycled paper en lieu of virgin fiber, a good step but an increasingly common practice in many sectors anyhow.

But what can we do at MIT? Beside the government, universities such as MIT enjoy a position especially well-suited to lead by example and contribute to the development and implementation of BMP. Not only are universities often the innovators, developing new methods and technologies, they are also probably the best equipped to test and study the same. However these studies need to happen outside the lab, in the real world subject to normal conditions and (ab)use. In the software engineering world this practice bears the colorful name “eating your own dog food”. Perhaps counter-intuitively, eating your own dog food is considered a good thing. After all, if a business won’t use its own product in day to day operations you might wonder what they know that you don’t. In-house adoption often leads to a better understanding of a tool or technique and serves as a catalyst for change and improvement. Additional benefits of educational institutions “eating their own dog food” are the impressions it can make on others; both their own students and the world at large.

Many potential improvements may yield only small payoffs, and give the impression of being but a drop in the ocean. Beyond the direct benefits of a change, and perhaps more importantly, doing something can influence the mindset of those participating. This can magnify the impact of any program several fold as long as one is careful not give a false sense of the scale of impact, thereby encouraging complacency or an attitude of “I’ve done my part”. Entire generations pass through the hallowed halls of our educational institutions during their formative years, when they are most receptive to change and the idea of future change. MIT has failed to take advantage of this opening and several avenues of improvement for sometime. For instance, there are significant gains to be made in energy conservation as well as the potential to further foster Yankee frugality.

In 1994 the MIT Electronic Research Society created an email list named reuse for members of the MIT community to notify each other of sundry material for reuse that might otherwise be discarded. The list continues to thrive as a community driven effort however it often runs into conflicts with institutional forces and a lack of official support for its mission; namely sanctioned drop-off locations. On the other hand an extension of the reuse concept dubbed StuffFest, initiated by the student environmental group S.A.V.E, has received support from both Housing and Facilities. StuffFest is a venue for students to discard unwanted but otherwise usable items at the end of the academic year, before they move for the summer. Anyone can take or leave whatever they wish and the remainders are sorted for recycling or donation to charities where appropriate and feasible.

StuffFest is an attempt to acknowledge that the semi-annual migration of students results in a large amount of functional personal accoutrements being discarded as waste. However even some of the most basic elements of modern life are destined to enter the waste stream as house-keeping staff empty out rooms, only to be replaced by new purchases the following year. If a student does not pack up his hangers, either because of space limitations or because the initial price leads their loss to be viewed as insignificant, they are apt find their way into the dorm dumpster without thought of the fact future residents will also need to hang their clothes. This situation is played out in an exaggeratedly comic form when hundreds of high school students visit the campus for a few weeks to participate in advanced study programs. Couldn't we change the way we do things? Why not place a sign in the back of the closet for the benefit of both students and the housekeeping staff that states: If you do not wish/need to take hangers, please do

not discard them, leave for use by next tenant.

The academic computer network setup by Project Athena contains hundreds of computers and dozens of printers. The information services department (IS&T) responsible for maintaining their operation is notoriously resistant to the adoption of best management practices to increase efficiency. It was not until a few years ago that printers began to print double-sided by default. As far back as the mid-90s, when early power-saving technology (DPMS) had begun to become common in computer monitors IS&T refused to use DPMS because they felt that users would not know what to do with a machine that had a blank screen. Not only is this a gross underestimation of their users, were it even true it's a self-perpetuating philosophy. Because of IS&T's lack of initiative the environmentally concerned user was confronted with a crisis of conscience: violating the Athena Rules of Use which to this day forbid turning off equipment or saving energy.

IS&T's argument is clearly void in today's world of the ubiquitous hibernating laptops and power-saving photo copiers yet Athena machines still do not use DPMS. In 2002 I participated in a student study of the campus environmental footprint, part of which entailed an examination of computer usage and energy requirements. It showed that the computer clusters were not properly sized to the number of users and a large proportion of machines are always free. Furthermore, the number of unused machines naturally increases during off-peak hours, particularly early in the morning. Why doesn't Athena take advantage of modern power saving features like ACPI and WakeOnLan to automatically power down unused equipment overnight and on again in the morning? This is particularly relevant given that in a business as usual scenario campus demand

for electricity will outstrip the supply of the MIT Central Utility Plant by the end of the decade. While it may not be possible to economize our way out of this predicament, there is no harm in trying.

There are any number of existing BMP to implement, let alone those being developed today. The National Wildlife Federation (NWF) has gathered a collection of eco-academic BMP in several publications including [Ecodemia: Campus Environmental Stewardship at the Turn of the 21st Century](#) and [Green Investment, Green Return: How Practical Conservation Projects Save Millions on America's Campuses](#). The practices these texts advocate range from rudimentary recycling programs to purchasing local produce for preparation by dining services, from using re-refined oil in campus vehicles to replacing herbicides with native ground cover that fills out and does not require weeding; many areas of MIT landscaping include the infamous invasive exotic: “burning bush” (*E. alatus*). Through its Campus Ecology Fellowship program the NWF also promotes the adoption of these practices as student-led projects. Another non-profit dedicated to bringing sustainable practices to universities is Boston’s own Second Nature.

To pick-up on an earlier point, there is a certain cachet that becomes associated with a method or tool subsequent to its adoption by a prestigious institution, even without actively promoting it. This increases general interest in the practice and can lead to expanded experimentation and adoption. MIT and other universities owe it to our communities to try everything we can, for our sake and theirs.