

Maintainable Environmentalism

Will the Real "Environmental Community" Please Stand Up?

Michael Theroux

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Since when is dedicating your life to saving the Planet *not* considered an "environmentally friendly" thing to do? Who is included in the "environmental community" anyway? Is it just the folks who see the things that have gone wrong and complain about it, or does it include the people who are out there every day working to fix the mess we've all made?

We all choose how we spend our time during this Life. Hopefully we can all find ways for caring for our Mother Earth. We have the freedom to live the way we want, as long as we first, *do no harm*. Passively standing by doing nothing doesn't help, and preventing anything from getting done is **NOT** the equivalent of doing no harm. Each of us in our own way must be an active part of the *global* "environmental community". The alternative is to continue the practice of Waste of our way of life and of our planet's natural resources.

Given the severity of our abundant problems, most Thinking Humans would not consider Doing Nothing as a reasonable solution. Fighting to make sure Nothing happens does not define nor claim the "moral high-ground", but rather signifies surrender to what some perceive as the inevitable calamity of the human condition. Simple preservation is not maintainable for humankind in the long term. Unless one concedes that true environmental protection can only be accomplished in the absence of Man, we all must Do Something for our environment with the best tools we have, doing the very best we can. If you can't or won't help, at least you can get out of the way.

The Socio-Enviro-Economic Resource Imperative is something most Humans understand:

- We need to Waste Less, Reuse what we can, and constantly Recycle.
- We need to stop throwing our discarded resources into leaky buckets in the ground.
- We need to convert what we *do* eventually discard into the new stuff we need.
- We need to produce biofuels locally to reduce and then replace import of foreign oil
- We need to stop poisoning ourselves and our environment, and really clean things up.
- We need to slow the destruction and evisceration of our virgin natural resources.

We need every tool in the box to make these crucial goals into realities.

In the beginning back at the time of the Stockholm Convention, a bunch of good people sent up a Hue and Cry against the practice of simply lighting a match to trash and letting it "render to ash" ... against what at that time constituted "industrial incineration". Stockholm marks the start of the global push to reduce industrial release of Persistent Organic Pollutants (POPs). Incinerators have gotten cleaner and cleaner, until Mass Burn Incineration makes heat for electricity out of municipal solid waste, with very, very little pollutant release. What today's state-of-the-art incinerators DO is make clean, affordable and arguably renewable energy.

What incineration does not do is *recover materials* to be returned to productive use. Trash Burners are primarily for Disposal and for Energy Generation, not for recovery of the molecules in those discards. Incineration does not compete with Conversion for Recovery; these are different tools for different purposes. Incineration competes with King Coal, Bubblin' Crude, Monster Dams and "Safe" Nuclear for supplying our basic heat and power. Conversion Technologies can *recover molecular resources*. Without trying to assign value or to justify Favorites, it is import to recognize that these are different tool sets all together. Before you pick winners and losers, at least know the difference.

Maintainable Environmentalism might be defined as making the best use of the tools and resources we have available. For a chimp in the jungle, that might be using a stick to dig bugs out of a log. For Urban Dwellers, the tools need to be a bit more complex.

Recognize what the tools of Conversion Technology (CT) can do: *Resource Recovery*. "Resource Recovery" is the collection and separation of certain waste materials for processing into new forms, which will become raw materials for new products. In addition to being able to generate renewable energy, CTs are designed to turn our discards into products. The collateral benefits are impressive; they include reduced dependence on petroleum and less mining for virgin materials. Consider, if you will, what these ultra-clean CT tools can accomplish in cleaning up the mess we have already made and recover resources at the same time. They can also accomplish what the Environmental Protection Agency (EPA) calls "incremental mitigation"; replace old, dirty processes with clean new processes, a little at a time.

Those dedicated to this Waste Conversion industrial sector have been trying so hard for so long to do SOMETHING other than poke another 8 mile deep well, looking for Energy; doing SOMETHING other than flushing our wealth of resources down the proverbial drain; doing the Right Thing by turning our societal left-overs back into goods. Why try so hard for so long? Well, to make money, of course ... but no, really, because it's the right way to go about making the Energy stuff we need to run our gazillion cars, and heat our humongous homes, and light our sea-to-shining-sea cities. It is a whole lot better than continuing to dump our precious resources in a (albeit well lined and monitored) hole in the ground, and expecting our children's children to keep paying to make sure it all stays put.

Front-End Recycling: Materials Recovery Facilities (MRFs) are the front-line for CTs, using closely integrated human-plus-machine, kinetic-driven sorting processes to selectively reclaim as much value from municipal solid waste (MSW) as is both economically and functionally possible. MRFs do a great job these days of sorting and removing the hazardous, the reusable and the recyclable goods from the never-ending MSW stream. But once we've removed the car batteries and paint cans, set the CPUs and Monitors off to one side, picked out the cans and bottles, and pushed as much Green Waste and cardboard off the tip floor as we think we can sell, we have managed at our best to separate about 50% for "recycling". So whatever CT plans we have, we MRF First!

While we're really, really busy with our front-end Reduce, Reuse, and Recycle parts of the Waste Management Hierarchy, half of everything gathered still goes in the Dispose category. That other 50% is *post-recycling residual*: gritty, moist, mostly-biomass, rapidly rotting tonnage that still has to go *somewhere else*. Right now, that Elsewhere is (you guessed it) either a landfill or an incinerator. In a MRF that receives 2,000 ton per day through the front door (small for most of our municipalities), that means 1,000 tons per day or over 350,000 tons per year of "post-recycling MSW residuals" have to go out the back.

Back-End Recovery has two pathways to avoid Disposal: that gritty residual can either be "burnt" to directly recover thermal energy for combined cooling, heating, and power generation (CCHP), or converted using non-combustion technology designed for molecular resource recovery. In Europe, the choice is usually Both. After collecting and MRFing, some of the residual goes to sterilization and compression to make Refuse Derived Fuel for CCHP, while most of the wet goo goes into anaerobic digestion (AD) for bio-methane recovery, and the dry crud undergoes thermal conversion to syngas. The European Union (EU) uses every arrow in their "waste management for resource recovery" quiver. Knowing the difference between the bird-point-equipped arrows intended for precision and the Big Game broad-head tipped shafts characterizes the well versed and well equipped Hunter. So too must we now understand the fine differences between these Resource Recovery tools and their appropriate uses.

The Bright Line Difference between Incineration and Conversion could stand a visual example. Light a wooden match, and look closely at the burning end. There is a space between the top of the match, and the bottom of the flame. That space is un-combusted gas being release by the match head as it super-heats. The Flame starts when enough Oxygen gets mixed with that produced gas to cause it to burn with a flame, or to "combust". The match releases a "Producer Gas", which is a synthetic fuel gas or "Syngas", and what happens between that match top and the next use of that gas is the real difference between Incineration and Conversion.

Incineration is designed to mix oxygen with this syngas and *immediately* encourage direct combustion. Conversion waits; the CT system is designed to allow operators to figure out what that Syngas *is* before Final Use, so both the feedstock and the conversion system can be optimized for desired output. Perhaps that Output is to combust the checked and as-needed modified syngas in an engine; perhaps instead the syngas is further refined for pipeline injection as renewable natural gas. Perhaps it is passed over catalysts and converted to a diesel equivalent, or bubbled through microbes to make a variety of short-chain alcohols.

Depending on the Input, the CT system can purposefully recombine the molecular components as they are taken apart, reforming and refining the raw Producer Gas in unending combinations. Energy, yes: as super-clean burning gaseous and/or liquid fuels that can be stored and transported. But we can also produce any configuration of “green chemicals” that directly compete with the best foundation commodities that can be derived from Petroleum to make any number of products we use every day. With increased and advanced MRF capabilities integrating Conversion Technologies, more kinds of “waste” can come in the front door.

Please Stand Up. The Environmental Community *this*, the Environmental Community *that*. I'll stake my bet on people who work to clean things up, not on those who point at the mess and reject every conceivable solution. Let's raise that communal environmental consciousness to help build on our innate human capacity to use logical trial and error to figure things out. Let's tackle the most difficult social, economic and environmental problems using every technical gizmo in our most amazing Environmental Community toolbox. And I'll proudly go on record right now: I am a walking, breathing, contributing member of the *maintainable* environmental community and I'm committed to making a positive difference. Prove me wrong.

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