



Cute Meerkat family

# ZERO WASTE NEWSLETTER

October 2013

by Paul Palmer PhD

## Zero Waste versus Fossil Fuels

Scientific American makes the argument.

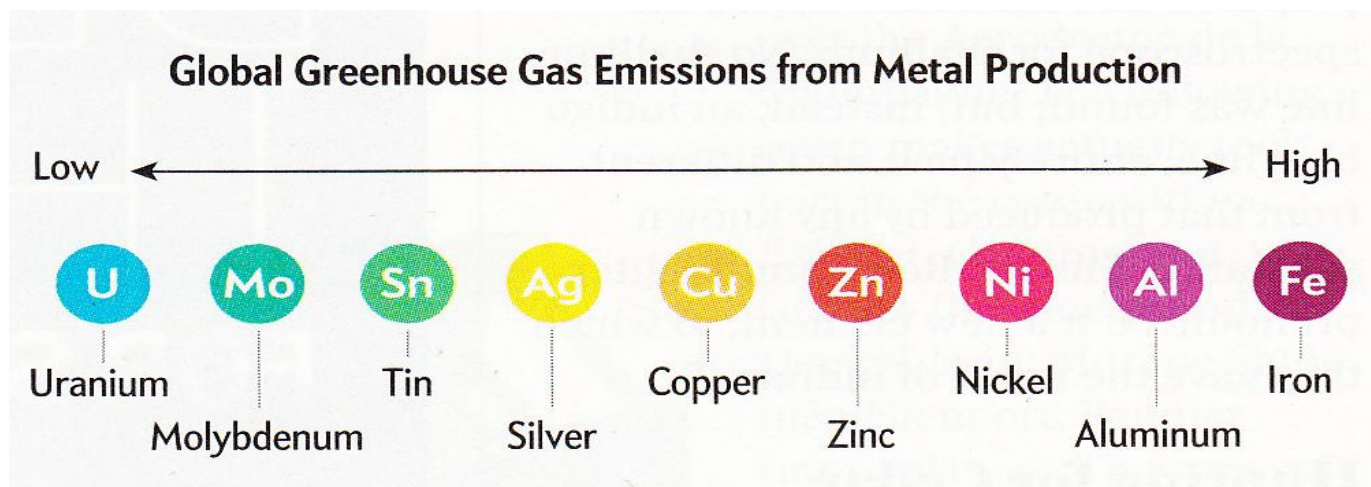
Loyal readers know that I often take off on some article that appeared on the web. In this case I noticed an article in Scientific American magazine for October 2013, at the very end, just inside the back page, looking like a throwaway that the editor just happened to have lying around when the magazine went to press.

### *RENEWABLE ENERGY'S HIDDEN COSTS*

The one page article carries the message that renewable energy production is not as clean-green as it is sometimes made out to be. In fact, as they point out, burning fossil fuels is a knockout winner in the boxing ring of metals usage. Their claim is that if you compare the kinds of metals that are used in building, let's say, a coal burning power plant, or a nuclear power plant, against the metals usage for building solar cells, windmills and maybe their batteries, you will discover that there are tons more greenhouse gases produced in creating the renewable energy metals than in burning coal, oil, methane and uranium.

Wow! Where have we heard a message like that before? I assume this is a scientific article in a science based magazine so any resemblance to fossil fuel industry propaganda is purely coincidental. It must be!

Here is one graph they present for their case:



I'm surprised they left out refined Silicon, Indium, Gallium and Arsenic from specialty solar cells and Barium from superconductors but that's just a quibble. The point they are making is that renewable energy sources use a lot of all the metals on the right side of the graph (the high greenhouse gas side) but coal and oil and nuclear plants don't. Aluminum, for example, is used for all of those frames, supports and struts for solar cells.

I love the way Uranium is shown as producing almost no greenhouse gas in its refining. Nuclear plants that require gigantic domes and containment vessels of concrete don't count, despite concrete production being one of the great producers of carbon dioxide. And transporting Uranium in special casks in special trucks, then storing the byproducts for hundreds of thousands of years? How much energy, presumably from coal burning, will that take? Has anyone totted up the energy requirements so far of dealing with Chernobyl or Fukushima? Were these just emergencies so they don't count? And what about decommissioning these radioactive horrors after they become too weak and exhausted and dangerous to use further? Does anyone even have an idea of how to achieve such dismantling which human development has not prepared us for? What gargantuan expenditures of earthmoving and transportation energy will be required? But somehow that is not to be tacked onto the energy production associated with Uranium mining.

The article calls it greenhouse gas production. I talk about energy usage. Elsewhere in the article the authors point out that burning fossil fuels is still the major source of industrial energy. That is the connection between those two ideas, at least for now. Energy production today still mostly burns coal.

Once again I quibble. Focusing entirely on energy is conventional thinking and that is not the purpose of this newsletter. This is a discussion of metals and Zero Waste theory.

Have you spotted the Achilles heel of their argument yet?

The presentation they are using assumes that all these metals will be designed, produced and used in the wasteful, built for quick discard, inefficient way that "modern industry" designs everything. In their view, the aluminum struts and frames could never be cleverly designed to be reused over and over for hundreds of years. The Silver and Tin could never be incorporated into designs that do not end up in dumps mixed with broken silicon and smashed windmill propellers. When these authors think about metals, they think about building all the devices for a short life followed by a long rest in a dump. And they even call it a landfill, to make it sound appealing. Of course the refining and smelting of metals that will need to be replaced every year, far into the future, would be energy intensive. But it doesn't have to be that way.

Zero Waste theory is replete with special principles and design features – some clever, some obvious, some universal - that allow all products to be redesigned so that they will be reusable in various ways for far into the future. Even devices that are undergoing speedy technological development can be redesigned away from the dance of the dump. Whining about the speed of technological change is just a lazy way to avoid thinking about resources and the human footprint. Not all such designs are trivial or simple but by embedding new product designs into new assumptions about social usage, lifetimes can be extended far into the future. Read more at the Zero Waste Institute website.

By relying on trivial, conventional, wasteful and disgraced methods of using metals, these authors have managed to subtly insert the idea into the minds of readers that there is a tragic

flaw in renewable energy production. They have not explicitly ignored the daily consumption of fuels and spewing of carbon dioxide that is inherent in burning fossil fuels – that is too obvious to challenge – but they have instilled a little doubt in the mind of millions of readers who are just scanning quickly. “Maybe these renewables are not everything they are cracked up to be” is the subliminal or overt message. Yet the message itself comes at the expense of ignoring the Zero Waste approach to production. Do that – ignore Zero Waste – and these authors may actually have a point. If you perpetuate stupidity in design, you perpetuate stupidity in energy production. But embrace Zero Waste, embrace intelligence, and the contradictions vanish. Zero Waste theory is a web of intelligence applied to production and usage, not just some tweak here and fix there.

## *OCEAN BIOTA ARE ONE OF THE RESOURCES THAT ZERO WASTE APPLIES TO*

On the main ZW Institute website, I point out that resource wasting is a universal of environmental thought. Environmental thinking mostly comes down to the elimination of the way we waste the magnificent largesse of this planet we were handed. Fish for example. In this chilling TED presentation, [http://www.ted.com/talks/jeremy\\_jackson.html](http://www.ted.com/talks/jeremy_jackson.html), an oceanographer reports on the effects of overfishing, pollution and climate change in destroying the fish stocks of the ocean (see note). He ends by asking if we are capable of responding to the selfishness and greed that are the cause of the ocean's destruction and “deadzonification”. This video is a setup for the one that follows and enlarges on it that delivers the Zero Waste punchline. At [http://www.ted.com/talks/enric\\_sala.html](http://www.ted.com/talks/enric_sala.html), another oceanographer pleads for new business models that can turn around ocean destruction. He provides the answer himself when he reports on the startling increases in fish stocks that can result in the distant neighborhoods of “No Take” fishing reserves. These reserves are so effective at providing protected breeding grounds that for many miles around, fish stocks are markedly enhanced, leading to astounding increases in fishing revenues and tourism. As always, Zero Waste is directly translated into new business models based on conservation and these two TED presentations develop the theme in a way that I have not seen previously.

*Note: Along the way, Jackson puts the overhyped Pacific Gyre of circulating plastic into proportion. Because it is visible and on the surface, it became a pop environmental cause celebre, even though intelligent Zero Waste planning could easily cure it. In contrast, what he calls the really scary part is the physical, chemical and oceanographic changes that are taking place from overfishing, turning the ocean into overlapping dead zones.*

## NEVER ANY LACK OF SUPPORT FOR TECHNOFIXES

Hardly a month goes by that there is not some gee whiz article on the web about the Pacific Gyre which refers to the collection of floating plastic that collects in a central vortex of the Pacific Ocean. There are stories galore about the sheer size – many miles in diameter – and about the cute turtles and birds that eat or wear the plastic pieces and end up dying from it. In the midst of all the handwringing, you will search in vain for a single story about effective actions that could eliminate this environmental assault. The closest you can come is a story about banning plastic bags but very little of the Gyre consists of bags anyway. Zero Waste theory, which requires products to be intelligently designed for long life and known fates would eliminate the Gyre and all the other insane collections of once-used products (dumps, recycling centers) but nothing is allowed to interfere with the freedom of manufacturers to pollute the planet any way they want to for quick profit.

Therefore it is always galling to read still one more article on some bright eyed youngster /entrepreneur who for the thousandth time has figured out the bleeding obvious, namely that he can design some ocean based vessel to collect all the plastic and bring it home for recycling. The press never tires of gushing over what a brilliant idea this is. There is always astonishment that still one more person has come up with the same old tired way of solving a “problem” not by solving it but by cleaning it up after it's too late. Much the way that recycling works. These are called technofixes and they are the universal way that problems are attacked in our society. The problem is that existing devices, operations and methods have cadres of committed persons and companies that are already making money and supporting politicians. You can only regulate them slightly, but you can't shut them down. However, you can create a whole new industry to “clean up” problems, leading to still more profits and more political contributions. Everyone wins, except for all the rest of us.

This month's genius is called Boyan Slat who has founded the Ocean Cleanup Foundation which of course gets support for building his prototype ocean sweeper which looks much like the one that was proposed three months ago by the last fairhaired boy. How could it not? You run a vessel on the ocean that scoops up floating plastic. How many designs could there be for such a simpleminded idea? But the memory of the press is about a week long. So they quote his high sounding plans, and speculate on the huge effect he will have on pollution, on conservation, on plastics use and marine cleanliness. They merrily repeat his unfounded assertions that all the plastic will be beneficially reused on land, without inquiring into why anyone would want a bunch of mixed plastics, contaminated with salt water, all different colors and resins, with the molecular integrity broken down by long exposure to the sun. The complete absence of intelligence and planning in manufacturing goes right over their heads. This month's prolix effusion can be found at: <http://inhabitat.com/19-year-old-student-develops-ocean-cleanup-array-that-could-remove-7250000-tons-of-plastic-from-the-worlds-oceans/>

Did you notice? 14.5 BILLION POUNDS, right there in the URL. Talk about unabashed chutzpah!

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