

The Oil Drum: Campfire

Discussions about Energy and Our Future

What "Lower Consumption" Means

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The following is a guest post by Dan Allen, a high school teacher in New Jersey. Previously on TheOilDrum, Dr. Allen wrote [The Speech Obama Needs to Give](#).

Note from the author: *As a high-school teacher, I wanted to give my thoroughly-industrial, suburban-NJ students a more detailed peek at their upcoming post-industrial future. I felt the need to challenge their prevailing mindsets regarding our resource-depletion predicament: the "shorter showers & change the light-bulbs" crowd, the "engineers will surely come to our rescue" folks, and the "problem? -- what problem?" people. This essay and the before/after comparison chart that follows are part of my ongoing (unsanctioned) attempts at doing so.*

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WHAT LOWER CONSUMPTION MEANS

by **Dr. R. Daniel Allen**

Most of the kids have a good laugh with the before/after comparison chart, and I laugh along with them. The contrasts between the present and (likely) future presented in the chart are striking to the point of unbelievability to them, and their reactions are honest and humorous: "So, Dr. Allen, where can I buy this mule I'll need?"

But I also laugh with some sadness and a touch of fear; sadness that prudent suggestions to prepare for a difficult future are still regarded as a joke; and fear for a possibly much darker future I don't think they yet comprehend -- a fear that we might not be able to pull this off.

Note that this is directed at high school kids as part of my ongoing series of "important side notes" to the regular Chemistry curriculum. Even though topics such as EROEI and the "net energy curve" are very relevant to this discussion, I have not introduced them yet in this essay for the sake of simplicity. For these topics, I highly recommend many related posts on www.theoil drum.com by Ugo Bardi, Charles Hall, and David Murphy, as well as the references

Executive Summary: The fevered frenzy of Industrial Civilization's resource consumption appears to have finally reached its apex and begun its decline in this, the first decade of the twenty-first century. A closer look at the physical realities of resource extraction reveals that the resource situation is, in fact, terminal for our high-consumin' civilization. Resource depletion is a *predicament* requiring adaptation to an entirely new low-consumption paradigm, rather than a *problem* to be solved with technological or social solutions. As a country, we need to start the conversation about what a lower-consumption, resource-poor society would look like, and begin the appropriate preparations.

The Insatiable Hunger of Industrial Civilization

Over the past 150 years, the relentless combination of exponentially-increasing population and exponentially-increasing per-capita (*i.e.* per-person) consumption has significantly depleted a wide-range of resources necessary for the continuation of our modern Industrial Civilization. These include both non-renewable resources (ex: fossil fuels, metal ores, phosphate fertilizers, etc.) and theoretically-renewable resources that are being abused to such an extent that they are becoming essentially non-renewable on useful timescales (ex: fisheries, topsoil, freshwater, etc.).

Pick any of these key resources and the annual extraction rate data will likely show an exponential increase from the mid-1800's to the present. Ask scientists about the resource and they will tell you the bad news: the annual extraction rate curve is near, at, or past the point of collapse. Ask conventional economists or politicians and they will tell you the good news: *"Everything's going to be OK; the market will take care of it; It always has."*

So who do we believe? Taking a quick look past the rhetoric, the situation becomes clear -- alarmingly so for those who wish the industrial party to continue, as well as for those who fear we are not properly prepared for what follows.

The Easy Stuff's Gone

As modern Industrial Civilization built momentum, the easiest resources, the "lowest hanging fruit," were logically picked first: the high purity coal, metal ores, and phosphate-bearing minerals at or near the surface; the light, sweet crude oil and gas that burst at great pressure from shallow wells; the huge, dense schools of protein-rich fish that practically jumped into the boats; the deep-rich top-soils that required minimal inputs to produce bountiful crop yields.

While the ease of extraction and high quality of these resources gave us a great confidence as a civilization, ever-increasing consumption rates actually became ingrained as a necessity for the continuation of our industrial economies. As this consumptive frenzy gained momentum, however, these once-easy resources became "high graded;" meaning that as the easiest stuff was skimmed off every year, the resources that remained were of increasingly lower quality.

What remains now, of course, at our currently-advanced stage of depletion, are resources that are much more expensive, of much lower quality, and much more difficult to extract. These are the low-purity metal ores thousands of feet underground; heavy crude oil and gas laced with toxins that must be coaxed with great effort from beneath thousands of feet of ocean, rock, and salt; sparse schools of lower-quality fish requiring monstrous nets and huge ships for their economical

extraction; and the nutrient-depleted, thinned-out top-soil requiring significant inputs to obtain reasonable yields.

The Difficult Stuff's Too Difficult

Let's assume to a very rough (but not entirely unreasonable) approximation that half of all theoretically-extractable resources have been depleted as we begin the 21st century – fossil fuels, metal ores, phosphate fertilizer, fisheries, etc. The industrial consumers say, “Wow, that still leaves half remaining to be extracted. We still have another 150 years of fun. Party on!” There are, however, two key problems that will undermine their (understandable) exuberance.

First, due to much-increased population and per-capita consumption rates, we are burning through these resources at a significantly faster rate than at the start of the first 150 years. Even if the second half of the resources were easily obtained, they would be likely be gone in a matter of a few decades. Secondly, the first half of the resources was the cheap, easy half. What remains is so increasingly difficult to access that it would require actual extra-terrestrial energy inputs for their complete extraction – *i.e.* it's not gonna happen. Not even close.

Here's the dark irony of our resource predicament: The low-quality, difficult half of the resources that remain require an infrastructure for their extraction that can only exist in the presence of the high-quality, easy half of the resources -- the ones that no longer exist. Please read that again.

In other words, a relatively large percentage of the low-quality, difficult resources that remain will likely never be extracted. The age of cheap, easy, high-quality resources to power the current version of Industrial Civilization is over, and the age of expensive, difficult, low-quality resources to power a future version of Industrial Civilization will simply never occur.

Our beloved Industrial Civilization, this pinnacle of human ingenuity, this shining beacon of light in an otherwise backward Universe, (this destructive monster killing the biosphere) is just about out of fuel. It's time to get out and start walking.

Lower Consumption Is the New Higher Consumption

So what does all this “bad” news mean for our everyday lives?

The short answer is that we can expect a rather drastic *involuntary* reduction in resource use in the not-too-distant future, gradually worsening, and extending into the distant future. This coming resource supply-reduction may well proceed in a stair-step fashion -- unexpected drop, period of stability, unexpected drop, period of stability...etc, giving repeated temporary illusions of “the bottom.” The steady erosion of the resource pipeline will not only utterly cripple our growth-requiring Industrial economy, it will send ripple effects through every facet of our formerly-industrial lives, changing them almost beyond belief.

We will not only have less and less of the “primary” extractable resources available to us every year -- less oil, less coal, natural gas, less phosphate fertilizer, less metals, etc; but we will also have less and less of the “secondary” resources that the primary resources make possible: less electricity, less nitrogen fertilizer, less water treatment, less transportation, less computers and electronic communication, etc.

Again, it's important to state here that not only will this decline be involuntary, it will not be

preventable by any combination of political, social, or technological solutions. It will simply occur, and we must simply respond to it.

How we respond, of course, will make a great deal of difference as to whether our predicament becomes disastrous or just very difficult. Moral guidance will be greatly needed throughout. The varied fields of Ecology, Biophysical Economics, Permaculture, and Natural Systems Agriculture (among others) have much to teach us about adapting to our changing resource situation, and we certainly should listen to them. *(Note to Obama: Please contact the Post Carbon Institute. Invite Wendell Berry over for a beer. Heck, Derrick Jensen too.)*

Also realize that there are many important facets of our lives which need not decline in the upcoming future – indeed, they may even increase: personal connections with our families, communities, and the natural world; block parties and potlucks; tag-football and pickup-basketball; joking around and shooting the breeze; love in our hearts, etc. In other words, it’s quite possible we just may find a lot more important and fulfilling things than we’re losing.

Much is still up to us.

What Lower Consumption Means

The following chart is meant to give a brief flavor of our coming lower-resource future. A quick read down the left column gives a pretty good overview of our current Industrial society, in all its fast-paced, consumptive glory.

I’ve been told by my students that the right column reads seems suspiciously Amish-like. That’s really not an accident -- the Amish generally lead a much less consumptive lives. Whatever you happen to think of their social structures, the physical lifestyles of the Amish will probably gradually become the lifestyles of a majority of the population.

Another accusation I get is that I’m predicting the 21st century will increasingly resemble the 18th century. I respond with this: if that’s what the Laws of Thermodynamics and the finite material limits of the Earth dictate, I don’t see how we have a choice.

Let’s try to make the best of it.

<i>NONE/LESS OF...</i>	<i>REPLACED WITH...</i>
Cars & trucks	Bicycles, walking, electric scooters, horses, & mules
Airplane travel (domestic & international)	Infrequent long journeys by trains and boat
Power boats, barges, ocean liners, cargo ships, & super tankers	Sailboats, row-boats, canoes

Supermarket food shopping	Home gardens & local farmers markets
V a c a t i o n s (domestic & international)	"Stay-cations" to local beaches, rivers, lakes, forests; Sunday's at the creek
Restaurant & fast food meals	Cooking at home & family meals
E l e c t r o n i c gadgetry (TVs, computers, ipods, cell phones, DVDs, etc.)	Entertaining friends at home, block parties, visiting among neighbors,
H o l l y w o o d movies & CDs/downloads of your favorite bands	C o m m u n i t y theater & neighborhood concerts by local artists & musicians
Power tools	Hand tools
Electricity on demand	Partial/multi-day electrical blackouts & limited-use electricity restrictions
Electric light bulbs	Candles & early bedtimes
Universities & colleges	Community colleges & trade apprenticeship
L a r g e grade-schools & high-schools	S m a l l community schools & home-schooling
Huge farms in California & Midwest supplying our food	Small farms <i>everywhere</i> (even in suburbs & cities) supplying our food
Oil/gas/electric home-heating	W o o d stoves, passive solar, insulation, sweaters, blankets, & long underwear

Air conditioning	Shade trees, swimming holes, cool drinks, & sleeping on your porch
Hot showers	Cold showers, luke-warm baths & solar water heaters
Running water	Cisterns & hand pumps
Swimming pools	Swimming holes; local rivers, lakes, & oceans; dipping your head in a bucket
Parking lots	Bike racks & hitching posts
Skyscrapers & huge office buildings	Bat habitat & salvage projects
Refrigerators & freezers	Root cellars, smoke-houses, drying racks, ice-houses, & salt barrels
Credit card, loans, & debt in general	Cash, bartering of goods, trading work
Skiing & snowboarding	Sledding, snowball fights, ice-skating
Budweiser, fine wines, & mixed drinks	Home-made wine, beer, hard cider, & moonshine
One-family households	Extended-family or multi-family households (<i>i.e.</i> Grandma's comin' home...and so is Uncle Bob)
Divorce & re-marriage	Gritting it out (& hopefully working it out) with support of extended family

Clothes shopping	H a n d - m e - d o w n s , m e n d i n g , m a k i n g
Not knowing (or barely knowing) your neighbors & little interaction with them	I n t i m a t e l y k n o w i n g y o u r n e i g h b o r s & r e l y i n g o n t h e m f o r y o u r s u r v i v a l
Terrorist threats (<i>i.e.</i> trying to grow commerce in an increasingly hostile global political climate)	C l i m a t e t h r e a t s (<i>i.e.</i> trying to grow your food in an i n c r e a s i n g l y u n p r e d i c t a b l e p h y s i c a l c l i m a t e)
Overweight & obese people	M a l n u t r i t i o n & "j u s t e n o u g h"; l e a n & s k i n n y p e o p l e
High-fructose corn syrup & table sugar	H o n e y & f r u i t
Putting out recycling & garbage	R e - u s i n g <i>everything</i> & f i x i n g s t u f f
Police protection	N e i g h b o r h o o d - w a t c h g r o u p s



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