

The Oil Drum: Campfire

Discussions about Energy and Our Future

Radical Retrenchment - A Reference Model

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Below the fold is a guest essay by longtime TOD commenter DavebyGolly on how our society/population might possibly 'retrench' given the current limitations we are faced with. It is a bit longer than we expect for the Campfire slot, but Dave has good ideas, by Golly. Please submit your own essays (or ideas for same) for TOD:Campfire to TODCampfire@gmail.com or campfire@theoil Drum.com. Guidelines for submissions and content are [here](#).

(**Note: we are working on making the colors and graphics here purtier)

Radical Retrenchment -- A reference model

Nate Hagens and the Campfire format encouraged me to write this, (well, something, not necessarily this.) That I do not provide statistics, graphs, formulas, references, footnotes should not be taken to mean I think them unimportant. They are. But I am essayist (at most). The exercise here is to apply logic to research already done by others. The issue: what ought be done to allow us, our species, to survive the decline and end of the industrial era? When I say ought be done, I mean by society, by government, by popular movements, etc. Although I certainly will do my best to help my children and grandchildren survive, I do not believe they can do well when society is crashing around them. I believe in striving for collective survival, without which individual survival becomes pretty grim. This is, admittedly, an un-American sentiment, if not worse. But the words "radical" and "retrenchment" already arouse suspicions, don't they?

The subtitle "a reference model" is added to show that I am not completely looney. I know that what's envisioned here will be regarded as utopian. It is not the route that will be taken, not soon in any case. But I also believe that it is, directionally at least, the only possible route toward a comfortable survival for the species. And the comfort qualifier is conditioned on its being taken soon. What follows, if one agrees with the presuppositions, is a reference model with which to compare ought with is, in order to prepare ought to do battle with is.

Peak energy

"Radical retrenchment" is a term I've used in many posts at TOD. All here is based on the "strong" version of peak oil, i.e. peak energy - not only is oil peaking, but other hydrocarbons will soon follow, and the alternatives cannot in toto come close to making up the difference. Therefore we are also at peak underground resources, i.e. metals and minerals. In other words, we are in the closing decades of the industrial era.

Not all who accept peak oil accept peak energy. There are many who believe some forms of

alternative energy, singly or in combination, will rescue us from at least a drastically reduced energy budget, and therefore the industrial age can continue if certain adjustments, though possibly large ones, are made. I don't join that debate here although I would like to see it argued more explicitly here at TOD.

The exercise here is to follow the logic of peak energy, should one accept it as I (and many others) do. While I am well convinced of the reality and importance of global warming and the wider ecological catastrophes that are unfolding, I focus mainly on the energy component. I believe there is no great harm in so restricting myself, because the means of redress are very close if not identical, at least in the long run.

Since energy is going into decline and with it metals and other underground resources, our industrial civilization is also going into decline. I say "our", even though this refers to but a fraction of the world's people. The remaining larger fraction has been affected, but deprived of most of the benefits while shouldering a disproportionate share of the costs.

What does this wind-down of the industrial era mean for the species? It means a radical shift in our way of life. It means a shift from dependence on underground resources to aboveground resources. The shift will take place over the coming decades. Underground resources are hydrocarbons, metals, and other minerals, as well as deep aquifers. Aboveground resources are biological resources, life, water aside from that in deep aquifers, and all else that is available without deep digging and lots of energy (clay, rocks, etc).

The aboveground resources are the bulk of what we shall ultimately have available to us. The biological and other cycles taking place on the surface of the earth can provide us resources, for free and forever (on a human time scale), so long as we do not exceed the capacity of nature to renew them. (Although we do not yet know what all or even most of those limits are.) Global warming and other ecological constraints may, of course, significantly modify the capacity of nature to renew a resource.

So we know where we have to end up, at least in terms of the material basis of our existence. And we also know that even in the best of circumstances we cannot go directly there: there has to be a transition.

Radical retrenchment

Although unavoidable, there are two complications. The first: the earth is much impoverished from what it was 100, 1000, and 10,000 years ago. Species diversity, soil, forests, water, etc. are all much the worse, in addition to the underground depletions discussed above. Our population, on other the hand, is much larger. Therefore retrenchment via simply turning back the clock is not an option, or at best a grim one.

The second: During the course of civilization man has progressed, at least in accumulating knowledge of nature, in developing science and culture. And the oil age in particular has allowed us a glimpse into the workings of nature that would never have been otherwise possible. In a word, globalization has not been all negative. Global human community, global science, global culture have emerged. There is much that is well-worth preserving. It is indeed vital to do so in light of the impoverishment of the earth mentioned above. This is the only advantage we have over our ancestors who ascended into the industrial era, in contrast to us who are beginning our descent out of it.

What, in this descent, can be rescued from the industrial era, and indeed the ages before it? Although retrench we must, we must also strive to not retrench too much, if at all possible. Global science, culture and intercourse require a certain minimum population level, plus some form of global communication and interchange, even though it does not require the huge volume of physical and electronic goods that currently flow through the global arteries and nerves.

Retrench too much and humanity is reduced to isolated tribes which will not have the natural abundance and hence the potential for upward mobility enjoyed by our ancestors. It will be a dark age with no renaissance. Will it be possible to find a point of retrenchment at which both sustainability is achieved and a global intercourse is maintained? Who knows? But not knowing it impossible, we have to assume and hope it is possible, and strive for it.

The destination

What then must things be like when we have used up all or almost all of the underground resources? Cars are out since steel and other metals are out. Planes and rockets and even trains are out. Motors as we know them are out. Concrete is out. In a word, the fundamentals of our current way of life are out.

Agriculture, of course, must be in. It will have to be diversified and local. Everything will have to be recycled, and that taken from the soil returned to it. Draft animals will replace tractors. Human labor will sometimes replace tractors. Because motors are out, manual labor is back in (not that it ever completely left, as any gardener knows). Other farm animals are in. Trees are in, and forests will be allowed to grow and be replanted.

Will farms be (primarily) individual plots? It doesn't seem likely. It seems far more likely that agriculture will operate directly out of dense small towns. Dense because motorized transportation may be lacking. The bulk of the food for these towns will be grown directly in the surrounding areas. Dense because amenities can be shared, such as libraries, schools, a doctor, etc. Dense because a greater division of labor can be supported, but nothing, of course, remotely approaching what we have in metropolitan areas today.

How will such towns be interconnected? Roads can be built. Canals can be dug. Land and water vehicles can be built. What will power them? Horses or oxen certainly. Motors? One doesn't know. How much metal will still be accessible or left over from the industrial era? More interesting still, to what extent can we find biological replacements for metals? It seems extremely unlikely that we'll ever be able to build rockets out of biological materials. Or even motors.

Energy? Clearly a certain amount can be extracted sustainably - e.g. wood and other biomass. Solar, wind and hydro were around long before the machine age. How much they were independent of metals I do not know. There's no fundamental reason wind and water mills cannot be constructed out of purely biological and aboveground materials (e.g. rocks). And there were draft animals of course.

Communication? This is crucial, because without it, global interchange, culture and science are impossible - another, this time permanent, dark age supervenes. Snail mail has been around a long time, and represents a worst-case scenario. Were it to be the best case, that would represent a considerable regression in tempo, if nothing else. (Not that there is something holy about our

current frenzied pace.) Copper? Fiber optics? Satellites? It's hard to see that these, in ascending order of unlikelihood, will continue being available longer term. Of course there are reflecting mirrors and other such possibilities when and where conditions are appropriate. But the fun of solving such problems as these will belong to later generations.

All in all, the three key items are: 1) a local near self-sufficiency in food staples, and a regional self-sufficiency in a broader range of items; 2) small town density in order to retain a minimal level of specialization and cultural level; 3) communication with the outside world and the global community as best as can be done.

The transition

That, in my view, is where we have to end up if one follows the logic of peak energy. But the oil is not yet gone, and metals are still to be had. Any government (or opposition) proposing a direct leap to the above scenario would be immediately drawn and quartered. There has to be a way of transitioning from where we are to where we must end up. On the other hand, if there is no transitioning, then nature will put us on the fast track, chaotically and disastrously. The longer the delay, the greater the chaos and suffering.

My discussion of the transition will be somewhat US-centric because that's what I know (well, sort of). The present is, of course, a long, long way from where we must end up. But just because of that, just because there is so much waste in the US, the first steps in transitioning here could, in principle, be relatively painless.

Start with our small towns. Most are dying, many are already dead. The surrounding agriculture is industrial monoculture, as anyone who flies across the country with a window seat can see. A good first start would be, beginning with some, to rebuild them, repopulate them densely, with few or no cars, reconnect them and their population to agriculture, rediversify the agriculture and re-introduce light industry connected to local and regional needs. The global market economy is currently crashing (you may have read) and there is little likelihood (you may dispute) it can return to what was formerly regarded as normalcy. Therefore the people who repopulate these small towns will be stepping, to a significant extent, outside the global market economy. There will have to be training, there will have to be guidance, there will have to be experiment. Agriculturally savvy people will need to lead the way. But there will be motivation to make it work in light of what's happening in the outer economy and its legions of unemployed.

The small dense towns are the link to the future. Making this initiative work, working out the kinks - there will be plenty - is vital and ought to be a leading component of any rational government policy to combat the unfolding meltdown. Money spent here will pay and will allow people to survive. A policy of simply and only putting millions of people on the dole with nothing to do, no hope, waiting for capitalism to need them again, can only lead to disaster. Popular movements that simply replicate the demands of the depression era will only compound disaster.

The suburbs must be reconcentrated, densified, the larger ones perhaps broken up into several small towns. Building on the fringes must be stopped. Those edifices already at the fringes must either be moved or cannibalized for reconstruction in the center. Land must be returned to gardens, parks, etc. Car use must be reduced and restricted to the periphery. No one should need walk more than several blocks for all their basic needs. But those blocks they must walk.

The interstates need to run rail lines down their median strips both for passenger and freight. In

the shorter term, buses should replace cars, and truck trains replace individual trucks on the interstates. Yes, some infrastructure repairs are required, but not an entire redo to continue the auto age. Some interstates, some bridges may well have to be abandoned and cannibalized.

Most airports and air traffic should (not so) gradually shut down. They will anyway, but it should be done in a planned way.

The larger cities need to become carless, and where not dense, densified else emptied and returned to open space, occupied by parks and gardens. There will be less and less for people to do in the big cities. With the expansion of the non-global-market economy in the small towns, the parasitic paperwork of the big cities will become ever more superfluous, and shrink. The cities themselves will therefore need to gradually shrink overall, and perhaps reconcentrate in multiple centers in the case of those that sprawl.

In this process there will need to be a lot of cannibalizing of existing infrastructure and buildings. Much of what we have is geared to the car and truck culture, and suburban sprawl. The cities are filled with modern pyramids, monuments to oligarchs. They too, over the coming decades, will need to come down and be cannibalized.

The cities, in the longer term, cannot survive as large as they are. They will need to be a steady movement, over decades, from the large cities, to dense small towns. And, as we've already said, the suburbs also need to become dense small towns.

Conclusion

In the transition, all needs to be focused on the goal, and on staying ahead of the depletion curve in getting there.

I end, though not abruptly, with a few miscellaneous observations.

Commuting. Currently, every weekday there are long ribbons of slowly moving cars streaming into and out of the major cities during rush hours. Commuting needs to be reduced steadily and firmly. There needs to be encouragement of job swaps, home swaps, carpooling, vans, and anything else that can contribute to rapidly winding down this madness.

Cities. What role will cities have in the post-transition, post-industrial era? One could cite Athens, Babylon and other cities that existed prior to the industrial era. But the post-industrial era will differ from the pre-industrial. Large agricultural surpluses were available to the Romans for expropriation. And the latifundia were slave-based. Because of the earth's depleted condition, because of the large population, the post-industrial agriculturalists will not be slaves - in order to make a go of it, they will have to use the science and knowledge gained from the industrial era just to survive. It is also unlikely that a new Rome will be able to survive by appropriating surpluses from surrounding regions, much less the world.

Science and technology. Much of the knowledge we have acquired during the oil age in particular may turn out to be irreplaceable, one-time and nonrenewable. It seems unlikely that the 22nd century will be building mammoth particle accelerators and sending satellites to the planets. Our experimental knowledge of the very large and the very small may well be coming to an end. Future astronomers and physicists may be restricted to working with the data we have already accumulated, plus whatever more is gathered in the coming few decades. Conservation of

this heritage will be at least as important as the service performed by the Arabs in preserving classical Western knowledge.

Dark ages. Biological based technology. Charles Mann, in his 1491 discusses pre-Columbian technology and contrasts it to the metals-based technology of the West. The silk worm provided a key ingredient in early Chinese industry. Bamboo and hemp are two more examples. And of course wood. There are many more. I think that this whole topic will become of ever great interest.

Metals. How long can metals last if recycled? Which of them can and cannot be recycled? This will greatly affect the length of the transition period and will affect the ease if not the possibility of continuing rapid global communication and intercourse. Metals, unlike hydrocarbons, are not consumed. They can play a role long after the hydrocarbons are gone. A farseeing policy would attach great importance to the conservation and recycling of metals.

Conserving the ultimate resources. Since the ultimate resources are the soil, the water, the air, it is important to not further degrade them in the transition. This means not opening new mines, not drilling new wells, not destroying new habitats in the pursuit of extending the oil age. It means restricting ourselves to the existing mines and wells where the damage has already been done, and keeping ahead, i.e. retrenching ahead of the depletion curve of these existing mines and wells.

Two sets of books. In the transition (at least) two sets of books need to be kept - one financial, one physical. I believe that it is only in the last few decades that people have started keeping track of global physical resources. Physical resources have generally been of concern only after having been filtered into a price, a valuation. We can see the wide disconnect this has lead to, with oil having dropped from \$147 to below \$40 per barrel at the same time that the amount in the ground is diminishing at the rate of few per cent a year, and production at major fields declining at almost 7 per cent a year. Where pricing of major resources get so far out of kilter, there needs to be intervention to bring markets and physical resources into line. These rents should be invested in retrenchment.

The fatuity of the economists is bottomless. They speak of credit evaporation, fiscal stimulus, bailouts, lowering interest rates, restoring liquidity and all such things. Never, never, never do they speak of the physical world and its limits. Seventy years ago they could get away with it, because money, then, could suck resources out of the ground. But that was because they were still plentiful, with no end in sight. Now the end is in sight for those who care to look.

Population. Population must be and will be reduced. How? There's nature's way and there's the humane way. The humane way is to reduce reproduction. I believe that small towns based on agriculture will partially solve this problem. Because such entities will be self-sufficient in most basics, resource constraints will press upon them directly and sensibly. Over-consumption of resources will punish them. Therefore I feel that population, along with other resources, will be managed directly. Population is very much a regional and even local issue. Some areas of the earth will sustain a much larger density than others.

Money. What role will money play? Barter, which precedes and leads up to money historically, will play a major role. So too will local currencies, and perhaps regional currencies. It seems unlikely there will be a global currency (such as the dollar or even gold). Much less will there be global capital and investment flows.

World government. Some express fear of a world government, imagining some entity similar to the Stalin government at the height of the Soviet Union. This is a groundless fear. There will be no material basis for such an entity. Nor will there be flotillas of B-series bombers and troop transporters spreading benevolence around the globe. We will be lucky to have established global consultative bodies, where information and experience can be exchanged. Such bodies will highly dependent upon providing concrete value to their supporting communities in order for their existence to be tolerated. The same would be true of regional bodies.

War. War is becoming unaffordable even as we speak. That hasn't stopped it yet, and there may well be one more global conflagration in the winding down of the industrial era. But the end of war is already in sight. Things are not as they were. The earth is much depleted. It will take great effort, skilled and scientifically informed effort to eke out a living, and to extract and appropriate surpluses will be meaningless. The underground resources, those for which the current wars are being fought, will have been long since been depleted.

Alright then, blast away!



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