

Chapter 2 – Priorities: What Needs To Be?

There is a strong argument to be made, and is made in this chapter with an excerpt by Scott Gilmore, that society has never had it better. That said, if one has the courage to begin discussing among friends and neighbors the energy, environmental or economic challenges that are nipping at a fine standard of living, enjoyed by a small minority of the planet, one is likely to gain an appreciation fast, that people do not want to hear anything other than that their standard of living is going to get better; let alone be at severe risk, especially due to have to adjust to less energy availability rather than more. Prioritizing risks and what needs to be addressed, if we get that far in the conversation with family, friends and neighbors, is no easy matter. All too few have thought through how if one pulls at the threats of energy – the master currency everything is intricately interwoven. As Peter Senge illustrated so well in his book *The Fifth Discipline*, how we think systemically about these things and get to the root of this nexus of interconnected problems is essential? One simple example he provided is hacking the leaves off dandelions does not reduce the dandelion population, should we want to. The dandelion has to taken it out by the root...Monsanto would argue do it with a herbicide, some would counter do it by digging out roots but still others would ask - are dandelions really a priority or should we appreciate this hardy flowers medicinal properties and fine contribution to helping keep bees from going extinct? The ultimate point is, we need to know, what are our real problems/risks, how to prioritize addressing them and determine how we can systemically get to the root of truly high priority problems. So, in an endeavor to get at fundamental roots we begin by quoting below two fine essays, which counter each other in interesting ways, to help us define, what are the fundamental priorities?

Of Two Minds – Two Articles To Contemplate

Life Is Good – Scott Gilmore, Macleans Magazine, January 2015

Though fixated on threats, humans have never been better off

By almost every objective measure, 2014 was the safest, healthiest year in human history...

First, the world has seldom been more peaceful. The number of wars has continued to decline sharply since the Second World War, and the number of civil wars has dropped by 40% since 1990. These conflicts are becoming less lethal too. In the 1950s, the average civil war would kill 86,000 people. Today, it is 3,000. Expand the timeframe and things look even better. In the Middle Ages, 15% of people would die violently in some sort of warfare. Now, even if we take into account war-related disease or famine it is far less than 1%...

There has never been less poverty. In Canada the number of people living on low incomes has never been smaller. Globally, the number of people living on low incomes has never been smaller. Globally, the number of people living on less than \$1.25 a day has dropped from 52% to 21% over the last 30 years. During a similar time frame, hunger has dropped by 40%.

There are 78 million fewer child labourers than there were just 14 years ago, a reduction of one-third.

Our societies have never been healthier. The number of democracies has blossomed, from only 11 in 1900, to over 80 today. There are fewer autocracies. In 1976 there were over 80. Only 22 remain. Crime is down. In the 1970s, for example, 50 out of 1000 Americans were victims of violent crime. Now it is less than 15. In Canada, crime rates are the lowest they have been in 50 years. Other social indicators, like global literacy rates? Never better. In the last 40 years the number of people who can read has climbed from 57% to 95%.

What about our own health? In the Middle Ages, ironically, very few people actually lived to middle age. Now, the global average is 70 years and climbing, while in North America it has already reached 80. Child mortality has fallen by half since 1990. Malnourished children? Dropped by 25% in the last decade...

For virtually every indicator, it's the same thing: Good News. The numbers are almost tediously positive. This is the Golden Age. For you, your family, everyone you know and everyone else around the planet, there has never been a better time to be alive.

But it does not feel that way, does it? Your mind is likely filled with thoughts of recent terrorist attacks, racial tensions and economic crisis. Unfortunately, we are trapped in this pessimistic quagmire by both our brains and our smart phones. In evolutionary terms, we have only just climbed out of the trees, and our bodies are still wired to survive in the wild. As Dan Gardner, the author of *Risk: The Science and Politics of Fear*, has eloquently written, our natural fight or flight instincts persist. When we were foraging on the savannah, the sight of one of our own being eaten by a lion scorched a lesson in our brains: fear lions. Now, the TV images of terrorist attacks on the other side of the ocean produce the same reaction. Our minds cannot help themselves. Stories and images influence us far more than numbers.

Which brings us to the second problem: information technology. Humans have never been exposed to as many of these stories and images as we are now. From the moment we wake up, a flood of radio reports, newspaper columns, TV dramas, Twitter links and Buzz feed lists wash over us. Once you needed to personally watch someone in your clan teach you a lesson about not petting lions. Now, there are 496,000 YouTube videos of lion attacks viewable from the phone in your pocket. It is no wonder we remain nervous wrecks.

This creates a perverse dilemma, which may actually lead to our own demise as a species. When we fixate on visceral but unlikely threats like terrorism or child abductions, we ignore the intangible but genuinely dangerous risks such as climate change. Sadly, our political class has discovered this bug in our code, and happily exploits it. Cynically they know the miniscule threat of Ebola carriers is more important to you than the inevitable threat of climate change.

The Lesson of Greece <http://charleshughsmith.blogspot.ca/2015/02/the-lesson-of-greece-only-collapse.html>

When the illusion that the Status Quo can fulfill all its promises to everybody dies, the Status Quo starts the terminal slide to effective collapse. http://www.peakprosperity.com/blog/91704/greece-exposes-global-economys-achilles-heel?utm_campaign=weekly_newsletter_165&utm_source=newsletter_2015-02-06&utm_medium=email_newsletter&utm_content=node_link_91704

Of the many lessons we can learn from Greece's difficult path to rejection of debt-serfdom, the most important is perhaps the most obvious: no real change is possible until the Status Quo can no longer fulfill its promises, i.e. it effectively collapses.

The collapse of the Status Quo has two distinct features: the process is highly variable, and the process affects the social classes in different ways.

The process of collapse is neither sudden nor smooth. Things do not necessarily cease to function overnight; rather, the decline to *effective collapse* operates much like energy states in physics: systems decay and then drop to a lower energy level, where they are stable until further decay causes the next drop to an even lower level.

Pension payments provide a ready example. The pension payment is reduced, and the recipient tightens his/her belt and gets by. The next reduction (either outright or via inflation) forces drastic changes in consumption, and subsequent reductions reduce the pension to a supplement that cannot possibly support a retiree, much less their family.

The pension is still issued, but the promise of a pension that could support a household at a modest level of consumption has collapsed. Though the system for issuing pensions still exists, it no longer fulfills the original purpose. [Signals: London School of Economics, UK pension deficit hits record high \\$560 billion in January](#)

In this sense, the collapsed pension system becomes much like the *phantom legions* of the late Roman Empire: the paymasters and officers still received the legion's pay, but there were no real soldiers; the legion was a bookkeeping entry in a skimming operation, not a fighting unit.

The financial Aristocracy (i.e. the kleptocracy) in Greece avoided much of the pain of debt-serfdom. I addressed this in [Greece at the Crossroads: the Oligarchs Blew It](#) (January 27, 2015).

The powerless classes were stripmined first. Bamboozled into voting for the Kleptocracy in previous elections, the powerless lower classes felt the brunt of austerity for the simple reason the kleptocracy knew there would be no blowback, as long as a few shreds of swag were being distributed.

“Who needs direct repression when one can convince the chicken to walk freely into the slaughterhouse?” —Philosopher Slavoj Žižek

This highlights the critical role of *complicity* in maintaining a corrupt, venal and parasitic kleptocracy: the passivity and silence of recipients of social welfare are bought very cheaply, as these classes will fear the loss of the miserable coins tossed to them.

This fear is a potent form of *financial terrorism*: any resistance or protest might trigger the loss of the reduced social welfare benefits, and so the powerless *choose to remain powerless* rather than rise up and take the risk of bringing down the parasitic kleptocracy.

The *statist bourgeoisie* (a.k.a. state-funded upper middle class) were the last to lose faith in the kleptocracy, for the simple reason that their share of the swag was sufficient to maintain the facade of middle-class comfort. It was also enough to sustain the illusion that the kleptocracy's abject kow-towing to the Lords of the European Central Bank (ECB), the European Union (EU) and the International Monetary Fund (IMF) would magically become a winning strategy for Greece, rather than a one-way ticket to permanent debt-serfdom.

When the kleptocracy lost a significant percentage of this top 20%, they sealed their fate. When the state apparatchiks, institutional functionaries, professionals, small business owners, etc. finally lose faith in the Status Quo, the Status Quo is doomed, though it can stage a rear-guard action by brutally suppressing this class (see Venezuela for an example of this doomed defense of a failed Status Quo).

In the U.S., the top 10% are doing very well, the next 10% are getting enough to sustain the illusion that they may yet recover their former status and wealth, and the bottom 80% have been bought off with social welfare or the promise of social welfare. Some variations of these percentages are in play in Europe, China, Japan and the emerging economies that haven't already imploded.

When the illusion that the Status Quo can fulfill all its promises to everybody dies, the Status Quo starts the terminal slide to *effective collapse*.

Unfortunately, no real change in the social order or power structure can occur until the effective collapse of the Status Quo has taken down everyone but the kleptocrats, their high-ranking apparatchiks and the piteously delusional.

Food and Fuel Imports Drive Structural Imbalances and Debt/Currency Crises

In a podcast, Chris Martenson mentioned [this chart](#) of imported energy by nation. Note that the nations with crushing structural debt loads (the so-called PIIGS—Portugal, Ireland, Italy, Greece and Spain) also happen to be major importers of energy.

What does this have to do with Greece's debt crisis? Let's go back to the key driver of Greek debt—imports that far exceeded exports, not occasionally but structurally, year in and year out. Money was borrowed to pay for those imports, interest accrued on the loans and then austerity was pressed on the debtor nations by the lenders as a means of extracting interest on the rising debts.

If a nation does not generate a significant percentage of its own energy and food needs, or export enough goods and services to offset its imports of energy and food its status quo is always in dire jeopardy, throughout history [read more »](#)

As big as the debt predicament is all by itself, it is not even the most important way in which we have been living beyond our means.

"One of the most important numbers you can have tucked away is "10."

There are ten calories of fossil fuel energy locked away in every calorie of food that hits your plate in modern times. Because of this, what we've really been doing as a species is pulling stored energy out of the ground and eating it.

Perhaps we can do this for a very long time, but not forever. If we think about that energy in the ground as a non-interest-bearing bank account left to us by a quite successful and generous grandparent, then we've been drawing down the principal balance of that account ever since we got possession of it.

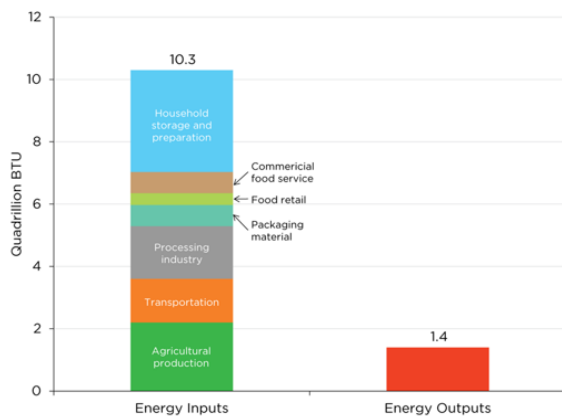


Figure 2.7. Energy inputs and outputs in the US food system.

Source: Center for Sustainable Systems, University of Michigan, "U.S. Food System Factsheet." Pub. No. CSS01-06 (2015).

The second most important number is "22."

In the past 22 years, half of all the oil ever burned in human history has been burned. Maybe we've got another 22 years of oil to burn, or 44, but there's not an infinite amount. What is abundantly clear is that the oil we burned over the prior 22 years

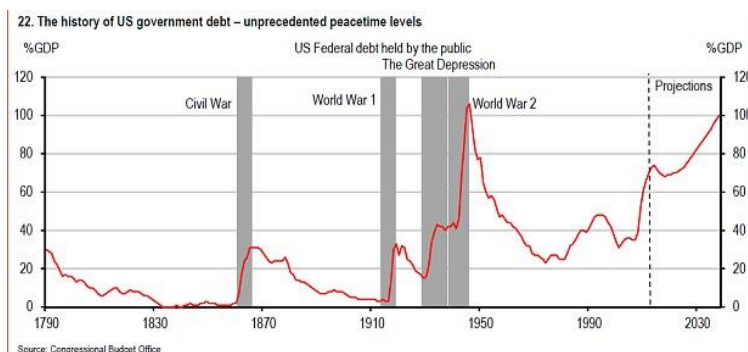
was incredibly cheap compared to the stuff we are going to burn over the next 22 years. Cheap in terms of money, yes, but what I really mean is cheap in terms of the energy required to get it up and out of the ground and off to market.

If we view our fossil fuel energy bonanza as a once-in-a-species allotment, we've chosen to use that allotment to grow, grow, and grow some more. The predicament that lurks within that approach is that we have lived well beyond our means; there's no more room to run in a direction that permits both growth and prosperity to co-exist" states Chris Martensen. As Chris Martensen framed it in the *Crash Course*, growth and prosperity each exist as function of surplus, with surplus energy being the most important form of surplus of all. Once there is insufficient surplus to fund both growth and prosperity, then one will steal from the other and a happy status quo begins to unravel.

The prediction that resulted from that observation was that we would default into growth, because that is the easiest thing for humans to do -- and that is what we track (via GDP, employment, etc.), so that is what we get. You get what you measure.

The rest of the prediction was that prosperity would suffer.

As we scan across the world and note that every single culture is chasing growth, whether that is in Greece, China, Europe, South America, the US, Mexico, Canada, or Japan, each country is trying desperately to get growth back on track, or at least pretend that reports of growth are real.



To take the U.S. as an example, we've even managed to eke out a bit of economic growth in recent years, at least as far as our statistics can be trusted. But look at what it has cost us in terms of deficits and debts, and then look at the actual results.

Coming out of the above seemingly wide-ranging subject matter, is there really a root interconnected, causal problem? And if so, how on earth do we derive priorities? Certainly, some items must hold a higher priority than others because it is overwhelming to attempt to address it all at once. We will start with the premise that energy, the master currency for all species, is a key root issue and continue to expand on why we start with energy, as we go.

It has long been argued that there is no doubt that inexpensive fossil fuels enabled the industrial revolution (oil is currently still selling for less than mineral water) and indeed lifted the living standards of most. It has enabled a great many to live like the kings and queens of the middle ages and there is a huge amount positive to say about that, without doubt.

Given that we live on a finite planet, almost no one argues that oil, gas and yes even coal, for that matter, are not also, indeed, finite. Of course, we remain in huge arguments as to where we are on the curve i.e. production is ramping up and will continue to, thus, currently lower prices (\$100/B oil and \$8/GJ natural gas), or we, in fact, did plateau in worldwide oil production in about 2005 and may indeed see imminent declines (albeit we had a brief reprieve with shales). I am in the latter camp.

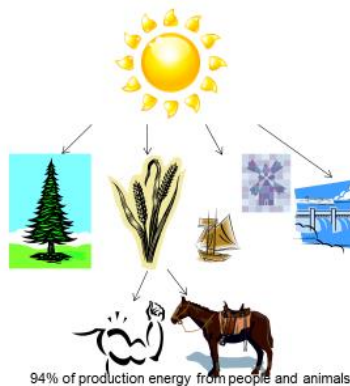
I would not argue for a second, that renewables are not helping. Renewables are indeed essential. What percentage they can, in fact, contribute and by when, until new commercially available innovations come to bear, remains a subject of great debate. I will simply net it out, for the moment, restating, renewables still find it hard to compete with energy dense, ancient stores of sunlight, which are fossil fuels. Thus it seems evident to me that energy has begun to regain its large traditional share of expenditures, an upward price trajectory that energy has been on since the late 1970's; perhaps for energy to regain the large share of overall expenditure, that energy has held for most of history, prior to harnessing fossil fuel. These upward energy price pressures and energy scarcity issues ripple to cause many ailments in the economy. It should not be overlooked, one of the things that serves to keep energy prices reduced is customers being so fragile that even a small energy price increase causes them to go broke and thus reduce energy demand and thereby curtailing GDP growth.

The world population, enabled by fossil fuels, ballooned from always less than 1 billion up to the late 1800's to 7 billion and growing. Globally, births remain outpacing deaths by 267 births, every minute, compared with 107 deaths per minute up to 2019.

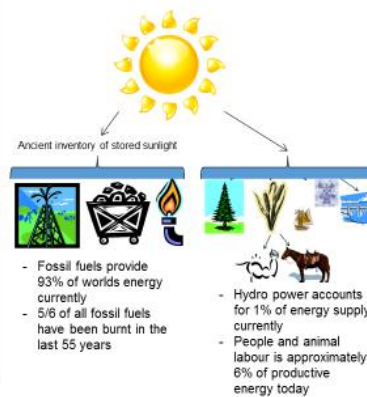
In the seventeenth and early eighteenth centuries, the amount of net energy available was low and dependent largely on the food surpluses provided by farmers and ultimately the sun. At that time, only 10 to 15 percent of the population was not involved in energy production (read food production). As extraction of coal, oil, and natural gas increased in the nineteenth and twentieth centuries, society was increasingly able to substitute the energy from fossil fuels for manual or animal labor, thereby freeing an even larger proportion of society from direct involvement in energy production. In 1870, 70 percent of the U.S. population were farmers; today the figure is less than 2 percent, and every aspect of agricultural production now relies heavily on petroleum and natural gas. The same is true in other sectors: Currently, less than 0.5 percent of the U.S. labor force (about 710,000 people) are directly involved in coal mining, oil and gas extraction, petroleum refining, pipeline transport, and power generation, transmission, and distribution.

Wealth / Energy In Historical Perspective

All of history up to 1900

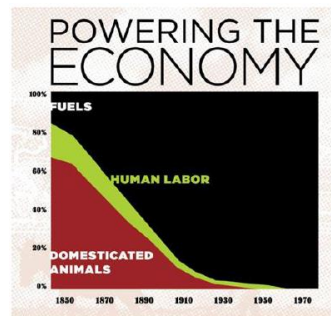


Since 1900



Machine	Horsepower
Man pushing a lever	0.05
Ox pulling a load	0.5
Water wheels	0.5-5
Versailles water works (1600)	75
Newcomen steam engine	5.5
Watt's steam engine	40
Marine steam engine (1850)	1,000
Marine steam engine (1900)	8,000
Steam turbine (1940s)	300,000
Coal or nuclear power plant (1970s)	1,500,000

Source: Cook [33]



The sawtooth rise of energy prices since the late 70's has had a way of becoming dire, and then seemingly OK, and then dire and so on. As many energy analysts show, it is indeed these underlying master currency energy costs, that cause us to be witnessing an economy that will not grow, despite an unprecedented amount of worldwide debt, astounding and unprecedented low interest rates even though they are being raised in 2022 and central banks globally printing money, as never before, and yet struggling to stir the GDP genie.

So the MacLean's contributor, Scott Gilmore, is led to argue that politicians have discovered and are exploiting in mass, "a bug in our code" that enables them to "happily exploit" and thus avert addressing the biggest threat, in his mind, which is climate change. For the record, I wonder and worry about climate change especially to the degree that it is manifested by burning fossil fuels and heavily deforesting the planet, etc. to make way for 7 billion people. Of course, that too is a subject of great debate. The second article does a very good job at getting at the systemic issues that might motivate politicians and other leaders, using Greece as the example, of many that could be chosen. Let us agree that it has been before Covid the best of times and politicians of every ilk are charged with averting the worst of times, or even less good of times. What are politicians to do, when the majority are not willing to understand what will it really take to avert urgent matters? Arguing that it requires no lifestyle change or austerity is nothing short of foolhardy and arguing for lifestyle reduction is political suicide; at least until the masses

agree, it is necessary. Can the few politicians that agree, we are well into or approaching the end of cheap energy, talk about it? Come back to zero tolerance for reductions to life styles and therefore such suggestions being political suicide, and one begins to realize, the masses make it impossible to even talk about, let alone address the elephant squashing the economy and that is - the end of cheap energy. So yes, this leads, for lack of any politically savvy alternative, to turning to whatever will wag the dog (masses), and history shows, insane wagging repeats over and over. Any leader or politician worth a grain of sand, knows ultimately, the power resides with the people. Placate them with whatever you must, because history shows in spades, if the masses decide not to abide, all is lost for some period. By way of extreme recent examples, note all the weapons and technology thrown recently at Afghanistan, Iraq, etc. which has shown when it goes badly, often the resulting outcome is nothing better than tribal anarchy. How does tribal anarchy rhyme with history repeating? Growing anarchy seemingly does little to grow world economies. But sorting through all this, connecting the dots, distilling the hype from data that matters, is not at all what the masses do well, if at all. Nay it is the minority capable and prone for this. And it is difficult as hell! So on the current score board of profiting, the 1% have like never before. It has not just been a recession since 2008, it has been a robbery! See <https://www.fastcompany.com/90754699/the-pandemic-created-a-new-billionaire-every-30-hours-as-millions-are-set-to-fall-into-extreme-poverty>

As the second article points out, waiting for a critical mass to voluntarily sign on to reducing their lifestyle (also often called austerity), be it the 1%, 10% or masses, is likely not the realistic course of the future, that politicians will lead. It is not impossible of course, but extremely difficult especially, when we are nowhere close to agreeing on what we need the masses to sign on to! Is the threat; how to address peak energy, climate change, ISIS, environmental issues, over indebtedness, all of the above; let alone what to do about it. No, the folks paying attention likely try to build a cocoon, distract or wag the dog with all sorts of things (e.g. ISIS), or create a NSA surveillance so the masses hopefully can't rise up against an ultimate "let them eat cake" stance. Some will call it a conspiracy, but likely, I surmise, it is not all that much more than group think - a small, knowing group panicked by the fact that everything tried, is currently not working well and knowing maintaining the status quo is essential to maintain their status and lifestyle. With ultimate power always being with the masses, competency can only be effective, if the masses are willing to listen, willing and able to understand (huge challenge here) and follow. The masses today are indeed bombarded with information technology. They are inundated with disagreeing information and utterly starved for understanding, as is most of the 1% and most of the politicians. Heck, I think I have gained an inkling in 50 years of life and gruelingly hard study and I do not think for a moment I have much more than an inkling. Hopefully, an inkling is better than not a clue.

The March 2015 issue of National Geographic calls it "The Age of Disbelief" and do a wonderful job of summarizing the challenge as follows:

"Even for scientists, the scientific method is a hard discipline. Like the rest of us, they're vulnerable to what they call confirmation bias – the tendency to look for and see only evidence that confirms what they already believe".

As Peter Tertzakian stated on June 17, 2015 "Environmental degradation is a major force, like energy security and scarcity that can lead to a "break point" a periodic shift, alteration of wholesale change in where we get our energy and how we use it. We are in the midst of such a break point, which in business terms means a battle for market share between the purveyors of primary energy, clean or otherwise. Each percentage point of primary source market share is worth hundreds of millions of dollars a year. The stakes are enormous so what's upon us is the mother of all market share battles. Yes, renewables have been making impressive gains recently, but it's folly to assume, among other things, that established players are going to cede their share willingly – especially as demand is supposedly moderating."

And so, paid by energy sponsors/advertisers, the prestitutes give abundant attention to naysayers, professional controversialists, and table thumpers denying peak energy, its massive effect on the economy and espousing miracle inventions just around the corner to solve it all. The prestitutes would have you believe that science is full of shocking discoveries made by lone geniuses overnight. Not so. The (boring) truth is that it usually advances incrementally, through the steady accretion of data and insights gathered by many people, over many years.

But of course, it's not just the fossil fuel sponsors peddling a story, so too the renewable sponsors and advertisers support a message, not all of which by a long shot, is remotely accurate. Messages are common that say it will be easy, fast and affordable to kick the fossil fuel habit when the data tells us clearly otherwise. Read up on Germany's work in these matters for but one example. Clearly Germany is a global leader in championing green energy and yet despite all the huge government subsidies still about 81% of Germany's energy needs come from coal, oil and natural gas despite having amongst the most expensive electricity in the world (\$0.30-0.40/kWh)!

Such sponsored lobbyist is compounded by the "science communication problem," as it's blandly called by scientists who study it, which has yielded abundant new research into how people decide what to believe – and why they so often don't accept the scientific consensus. It's not that they can't grasp it, according to Dan Kahan of Yale University. In one study he asked 1,540 Americans, a representative sample, to rate the threat of climate change on a scale of zero to ten. Then he correlated that with

the subjects' science literacy. He found higher literacy was associated with stronger views – at both ends of the spectrum. Science literacy promoted polarization on climate, not consensus. According to Kahan, that's because people tend to use scientific knowledge to reinforce beliefs that have already been shaped by their worldview.

Americans fall into two basic camps, Kahan says. Those with more "egalitarian" and "communitarian" mind-set are generally suspicious of industry and apt to think it's up to something dangerous that calls for government regulation; they're likely to see the risks of climate change. In contrast, people with "hierarchical" and "individualistic" mind-set respect leaders of industry and don't like government interfering in their affairs; they're apt to reject warnings about climate change, because they know what accepting them leads to – taxes (to be spent who knows how) and/or regulation to "limit emissions".

In the U.S., climate change somehow has become a litmus test that identifies you belong to one or the other of these two antagonistic tribes. When we argue about it, Kahan says, we're actually arguing about who we are, what our crowd is. We're thinking, people like us believe this. People like that do not believe this. For a hierarchical individualist, Kahan says, it's not irrational to reject established climate science: Accepting it might get him thrown out of his tribe.

Meanwhile the Internet makes it easier than ever for all sides to find their own information and experts. Gone are the days when a small number of powerful institutions – elite universities, encyclopedia's, major news organizations, even National Geographic – served as gatekeepers of scientific information. The Internet has democratized information, which is a great thing. It has also made it possible to live in a "filter bubble" that lets in only the information with which you already agree.

As the Economist (owned by the Rothschild's who made much of their early family fortune initially in fossil fuels) suggest in their Feb 2015 issue: "The business world is divided between optimists and pessimists...In this new age of confusion all signals are mixed and all trends contain countertrends. The old models are breaking down but no new models are taking their place: central bankers are printing money without generating inflation (or at least that's what they would have us believe) and digital entrepreneurs are revolutionizing productivity without revolutionizing economic growth.



How should the public respond and what should their priorities be? Pierre Naterme, the CEO of Accenture, argues that they need to be willing to rethink or dump some of their most basic assumptions. Too many of them are still 'using an equation that is no longer valid'. A new report from Oxford University's SAID School of Business contains a revealing quotation from one company boss: 'Michael Porter used to talk about 'sustainable competitive advantage'. There is no 'sustainable' anymore. Almost half the companies on the Fortune 500 list in 1999 have fallen off it since". I put forward though a simple statement that says - those with a sustainable energy advantage might well avoid this accelerating trend.

The book, Small is Beautiful, stated in 1973 - "The cardinal error of our whole industrial way of life is the way in which we continue to treat irreplaceable natural capital as income. 'Fossil fuels are merely a part of the "natural capital" which we steadfastly insist on treating as expendable, as if it were income, and by no means the most important part. If we squander our fossil fuels, we threaten civilisation; but if we squander the capital represented by living nature around us, we threaten life itself.' Hence the continuing absurdity of human societies pinning all their hopes on achieving exponential economic growth, of measuring success solely in terms of increased GDP, and of ignoring the social and environmental 'externalities' of contemporary consumerism... And what can we do now, while we are still in the position of 'never having had it so good'? To say the least – which is already very much – we must thoroughly understand the problem and begin to see the possibility of evolving a new life-style (which may have a quite a lot in common with life styles before say 1850), with new methods of production and new patterns of consumption: a life-style designed for. To give only three preliminary examples: in agriculture and horticulture, we can interest ourselves in the perfection of production methods which are biologically sound, build up soil fertility, and produce health, beauty and permanence. Productivity will then look after itself. In industry, we can interest ourselves in the evolution of small-scale technology, relatively non-violent technology...Few people will be easily convinced that the challenge to

man's future cannot be met by making marginal adjustments here or there, or, possibly, by changing the political system...As nothing can be proved about the future – not even about the relatively short-term future of the next thirty years – it is always possible to dismiss even the most threatening problems with the suggestion that something will turn up. There could be simply enormous and altogether unheard-of discoveries of new reserves of oil, natural gas, or even coal. And why should nuclear energy be confined to supplying one-quarter or one-third of total requirements? The problem can thus be shifted to another plane, but it refuses to go away...An attitude to life which seeks fulfilment in the single-minded pursuit of wealth – in short, materialism – does not fit into this world, because it contains within itself no limiting principle, while the environment in which it is placed is strictly limited. Already, the environment is trying to tell us that certain stresses are becoming excessive. As one problem is being 'solved', ten new problems arise as a result of the first 'solution'. As Professor Barry Commoner emphasizes, the new problems are not the consequences of incidental failure but of technological success...Here again, however, many people will insist on discussing these matters solely in terms of optimism and pessimism, taking pride in their own optimism that 'science will find a way out'...Permanence is incompatible with a predatory attitude which rejoices in the fact that 'what were luxuries for our fathers have become necessities for us'...infinitude can be achieved only in the spiritual realm, never in the material...people who live in highly self-sufficient local communities are less likely to get involved in large-scale violence than people whose existence depends on world-wide systems of trade... Trade in the pre-industrial era was not a trade in essentials, but a trade in precious stones, precious metals, luxury goods, spices and – unhappily – slaves. The basic requirements of life had of course to be indigenously produced...Even today, soothsayers are still at work suggesting that there is no problem. During the 1960s, it was the oil companies who were the main dispensers of bland assurances, although the figures they provided totally disproved their case. Now, after nearly half the capacity and much more than half the workable reserves of the western European coal industries have been consumed, have they changed their tune? It used to be said that OPEC – the Organisation of Petroleum Exporting Countries – would never amount to anything, because Arabs could never agree with each other, let alone with non-Arabs; today it is clear that OPEC is the greatest cartel-monopoly the world has ever seen. It used to be said that the oil exporting countries depended on the oil importing countries just as much as the latter depended on the former; today it is clear that this is based on nothing but wishful thinking, because the need of the oil consumers is so great and their demand so inelastic that the oil (energy) exporting countries, acting in unison, can in fact raise their revenues by the simple device of curtailing output (or not curtailing it when shale oil dictates to do so, to keep market share). There are still people who say that if oil prices rose too much (whatever that may mean) oil would price itself out of the market; but it is perfectly obvious that there is no ready substitute for oil (energy) to take its place on a quantitatively significant scale, so that oil, in fact, cannot price itself out of the market." Were these notions, ahead of their time, wisely proactive or still to be ignored? Will there be a time we wish we had been proactive?

I am not without hope or suggestions for intelligent responses. I believe it is much better to light a candle than curse the darkness.

Five Intelligent Responses Regarding Energy:

1. Promote energy literacy – we need to understand the problem to enable pursuing effective solutions
2. Pursue energy efficiency as aggressively as possible – urgency is needed. Adopting cogeneration is one such key initiative [Commercial Building Owners and Managers Will Invest Nearly \\$960 Billion in Energy Efficiency Retrofits](#)
3. Pursue all that we can with renewables ASAP
4. Adopt local urban permaculture food production ASAP

Raw materials

The revenge of Malthus

A famous bet recalculated

THE surge in commodity prices over the past decade has revived an old debate. Will mankind's insatiable demands exhaust the planet's finite resources? Or will human ingenuity lead to the more efficient use of existing raw materials and the discovery of new sources of supply?

The last, big commodity boom occurred in the 1970s. That coincided with the rise of the ecological movement, many of whose members saw the rise in prices as a sign that growth in the developed world was unsustainable. This led in 1980 to a bet between a prominent ecologist, Paul Ehrlich, author of "The Population Bomb", and Julian Simon, an economist at the Cato Institute, a free market think-tank. The two camps were dubbed the Malthusians (after a British economist who forecast that population would outstrip food supply) and the Cornucopians, thanks to their belief in endless abundance.

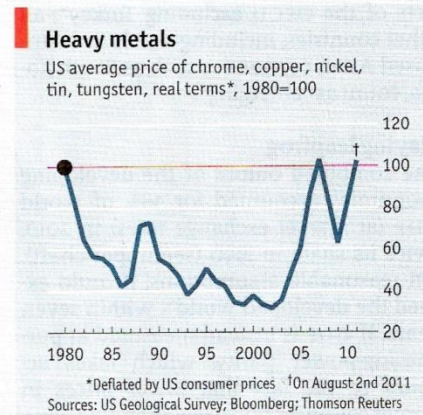
Faced with a challenge from Mr Simon, Mr Ehrlich selected five metals—copper, chromium, nickel, tin and tungsten—whose prices he thought would rise in real terms over the following ten years. Mr Simon bet that prices would fall. It is clear in retrospect that Mr Ehrlich showed bad timing, since the late 1970s saw a cyclical zenith for commodity prices. But Mr Simon also had history on his side: real commodity prices fell steadily throughout the 20th century.

Mr Simon duly won the bet. The economic boom of the 1980s and 1990s also contradicted Mr Ehrlich's wilder claims—that a billion people would

starve to death and that, by 1985, America would be trapped in an "age of scarcity".

But what if Mr Ehrlich had taken up Mr Simon's 1990 offer to go "double or quits" for any future date? All five have risen in price since the rematch was proposed. Furthermore, Jeremy Grantham of GMO, a fund-management group, points out that Mr Ehrlich would have won the original bet were it recalculated today (he is still alive; Mr Simon died in 1998). An equally weighted portfolio of the five commodities is now higher in real terms than the average of their prices back in 1980 (see chart).

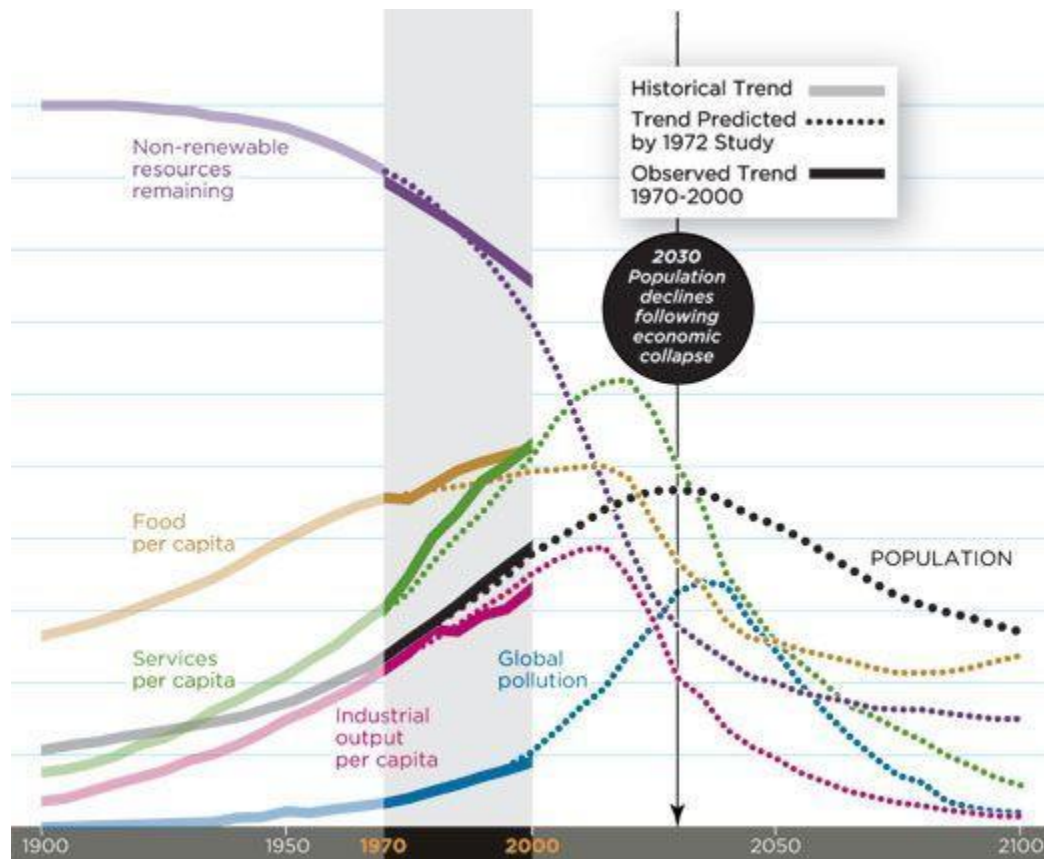
The Cornucopians might argue that today's metals prices are due to the buoyancy of demand in the developing world rather than any cataclysmic shortages in supply. But the Malthusians might retort that man's famed ingenuity has not stopped prices from rising in real terms over an extended period. Place your bets.



In 1980, *Science* magazine published an essay by an economist named Julian Simon titled "Resources, Population, Environment: An Oversupply of False Bad News." Its first line struck squarely at what its author saw as the prevailing but mistaken idea that the world faces an increasingly serious population problem: "False bad news about population growth, natural resources and the environment is published widely in the face of contrary evidence." "For example," Simon went on to say, "the world supply of arable land has actually been increasing, the scarcity of natural resources including food and energy has been decreasing, and basic measures of US environmental quality show positive trends." He literally went on to say "A long-run positive effect of additional people": literally, the more of us, the wealthier we can be. As Simon understood the matter, there are no limits to

growth, because (as he put it in the title of his book published the same year), humans are “the ultimate resource,” capable of technological innovation and invention, which will forever let them do more with less and find substitutes for anything that might run low.

“The point of 1972’s seminal Limits to Growth, which Simon saw as tragically mistaken: if we believed the Club of Rome Report, we would forgo economic growth that could (indeed, was the only thing that could) bring about greater human welfare” states **Eric Zencey** in his important book **The Other Road to Serfdom and the Path to Sustainable Democracy** See <https://www.zerohedge.com/geopolitical/decline-now-inevitable-dennis-meadows-limits-growth> for a 2019 Club of Rome report update.



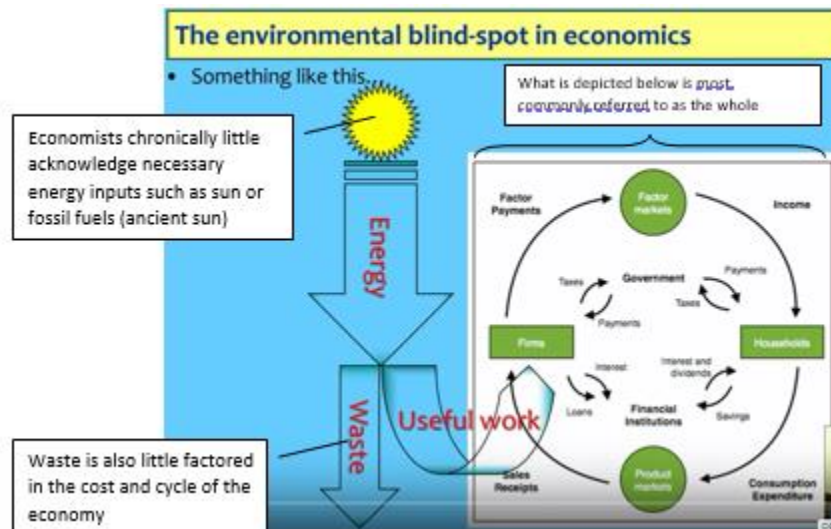
“Perhaps in retrospect historians of our era will credit Simon with making the infinite-planet assumptions of our perpetual-growth, free-market economy explicit and obvious and therefore more clearly subject to disputation and correction. But the exhumation of those premises came at considerable cost: whatever impetus there had been in 1990 for forward-looking policies on population, renewable energy, and limiting resource throughput by increasing the efficiency of our use of them was stymied. Thanks to Simon’s efforts, discussion of what to do about the consequences of the economy’s increasing ecological footprint was replaced by argument about whether or not anything needed doing at all (and it remains all too often the case still today).” states **Eric Zencey**.

Of the few who analyze such history a significant number take it all as a reaffirmation of Simons bet thesis, which supposedly should never be bet against. Simon’s victory in the famous bet was taken to affirm his broader thesis: that with economic growth, every day and in every way (except, of course, for some temporary bumps and glitches—the expectable result of a free and open system) things were getting better and better. Simon summarized that optimism in a brief piece published in the San Francisco Chronicle’s editorial pages in 1995: The real prices of food and other raw materials are lower than in earlier periods, a trend of increased natural-resource availability rather than scarcity. It has not been trending that way at all since 2005 though!

The major air and water pollutions in advanced countries have been lessening rather than worsening stated Simon in 1995 (but really we off shored most of this to places like China and their air and water quality are abhorrent). Every measure of material and environmental welfare in the United States and in the world has improved rather than deteriorated and all long-run trends

point in exactly the opposite direction from the projections of the doomsayers Simon would say. So Infinite-Planet Theory prevailed and became the foundation of globalized economic practice.

However, in reassessing the famous bet in 2008 Katherine Kiel and colleagues in the Department of Economics at Holy Cross used the same data tables used for the bet but asked a different question: how did the prices of those metals fare in all possible ten-year periods for which we have data? From 1900 to 2007, there are ninety-eight such ten-year intervals, and in their analysis, Ehrlich and company would have won in 61.2 percent of those intervals, with an average return of 10.5 percent—a good deal greater than the return Simon got for the years 1980–1990. “The story that the Ehrlich-Simon bet really tells is not that natural resource scarcity does not exist, but rather that in any gamble it is always better to be lucky than good. Simon happened to place the bet during one of the 38.2 percent of years since 1900 during which he would have won.” The most recent trend, visible since the late 1990s, is up: Simon would have won a ten-year bet in only four of the ten start years in that decade. And in the new millennium, so far Ehrlich is nine-for-nine.



A surprising confutation of Simonism comes from within the investment banking industry: in April 2011 the manager of a major hedge fund registered a carefully reasoned argument that resource prices, trending up, would never come back to the low levels we’ve known in the past. Jeremy Grantham, the head of GMO LLC, a hedge fund with \$100 billion under management, published a letter to investors for the first quarter of 2011 headlined “Time to Wake Up: Days of Abundant Resources and Falling Prices Are Over Forever.” He set out not to prove or disprove Simon, or to rerun the infamous bet, but to predict markets in order to make money. His newsletter reports his analysis of the volatility in the prices of key natural resources: how big, exactly, are the swings, as measured against average variability over time? He found that sharp increases in the prices of significant commodities since 2002 fall well outside the standard deviation. For iron ore, the rise has been 4.9 times the standard deviation, a result (Grantham tells us) that has a 1 in 2.2 million chance of being “normal” variation. More likely, he warns, it signals a new and different reality. For coal, copper, corn, silver, sorghum, palladium, rubber, and so on, the odds are not as long, but still pretty sizable: 1 to 48,000; 1 to 17,000; 1 to 14,000, and 9,000, and 4,000. Grantham concludes that a basic, deep-seated trend of increasing prices has reasserted itself. A fundamental and increasing scarcity lies beneath the statistical noise—the price spikes and troughs that characterize price history, including ups and downs created by speculation and subsequent “market corrections,” including the downward pressure on prices created by increase in the rate of flow we extract from fixed and finite stocks.

Our ability to increase that rate of flow depends, ultimately, on the amount of energy we dedicate to extraction and the technological efficiency with which that energy is used. Based on a review of human energy use that reaches back to when wood was our primary fuel, Grantham concludes that we have entered a new era: we are on the cusp of what he calls the Great Paradigm Shift, “one of the giant inflection points in economic history”—the moment, he warns, that lies at “the beginning of the end for the heroic growth spurt in population and wealth caused by . . . the Hydrocarbon Revolution.” To put it clearly: the enormously favorable energy return on energy invested (EROI) of coal and oil drove down prices of minerals and other extracted commodities over the past two centuries, as thermodynamically cheap energy was used to extract ever larger flows

from finite stocks; with the passing of Hubbert's Peak, the prices of extracted minerals have begun to increase. Of course, volatility always has been and will continue to be in the mix.

The growth model has no techno-fix

"Perhaps the limits of technology can be most easily understood when clarifying exactly what is expected of technology in terms of achieving sustainability. The global development agenda, as expressed in the Rio+20 declaration, is that all nations should seek 'sustained growth' (UN 2012) in GDP as a path to sustainable development. But what degree of efficiency improvements would be required to make sustained global growth 'sustainable'? When one does the math on this question, it becomes quite worrisome that technology can make the growth model 'green'. Consider the following arithmetic:

Throughout much of the 20th century, developed economies achieved around 3% growth in GDP per annum, meaning that they doubled in size roughly every 23 years. This has become something of a reference point for signifying politico-economic success, so let us assume that when the United Nations talks of growth it means continuing levels of growth that have been experienced in recent decades. Furthermore, for social justice reasons, let us assume that the aim of development is ultimately to bring the poorest parts of the world up to the living standards enjoyed by the developed world...If this global development agenda were to be achieved over the next 70 years, how big would the global economy be relative to the existing economy?

The figures are confounding, to say the least...If we assume by 2080 the world population is going to be around 10 billion (UNDSEA 2012) and that this population has caught up to developed world standards, then the global economy would be around 80 times larger, in GDP, than the size of the developed world's aggregate economy today.

Needless to say, ecosystems are trembling under the pressure of one developed world at the existing size...

At this stage the techno-optimist may wish to interject and insist that in this scenario, we can expect that there would be efficiency improvements (and a proliferation of renewable energy) such that the impact of global growth would be less than projected above. For example, a recent study (Wiedmann et al, 2013) shows that with every 10% increase in GDP, the material footprint of economies only increased by 6%. But based on that estimate of decoupling, we would still need 48 planets of biocapacity. Accordingly, even if these figures are overstated by an order of magnitude, the point would remain that efficiency gains could not possibly be expected to make the projected amount of GDP growth sustainable. To think otherwise is not being optimistic but delusional.

Regardless, with understanding and dealing with realities, we think there are intelligent responses available that will enable those with such understanding to enjoy a good quality of life. And that is very much what this book looks to contribute to. Likely part of that intelligent response should be not to seek to make the growth model sustainable, but to seek sustainable models. That needs to be our top priority.

"If we do not change direction, we are likely to end up where we are going"

"Something is environmentally or ecologically sustainable (resilient) when it protects, restores, or regenerates the environment and society rather than degrades it." Agenda for a Sustainable America, John Dernbach