

When I was young, Yankee Stadium had ~70,000 seats. It seldom sold out, and almost any kid could afford the cheap seats. Capacity was reduced to ~57,000 when the stadium was remodeled in the 1970s. Most games sell out now, and prices have gone up.

The new stadium, opening next year, will reduce seating further, to ~51,800. This intentional contraction is aimed at guaranteeing sellouts, increasing demand, allowing the owners, in pretty short order, to hike prices to double, triple, and more. The owners know that scarcity will fatten their wallets, even though it reduces the number of sales.

This is more than a bit distasteful, as it discriminates against the lower middle class. Nevertheless, it should be a great stadium and as long as the owner is footing the bill without public subsidies for the stadium itself, we may have little grounds for complaint.

The reason that I draw your attention to this practice is that fossil fuel moguls are intent on hoodwinking the entire planet with an analogous scheme.

The basic trick is this: fossil fuel reserves are overstated. Government “energy information” departments parrot industry. Partly because of this disinformation, the major efforts needed to develop energies “beyond fossil fuels” have not been made.

The reality of limited supply forces prices higher. Eventually, sales volume will begin to decline, but fossil fuel moguls will make more money than ever. They will continue to assert that there is plenty more to be found, aiming to keep the suckers (that’s us) on the hook. Indeed, they could find somewhat more in the deep ocean, under national parks, in polar regions, offshore, and in other environmentally sensitive areas. They don’t need much to keep the suckers paying higher and higher prices.

Oil “reserves” suddenly doubled when OPEC decided that production quotas would be proportional to official reserves. These higher reserves are, at least in part, phantom. Coal “reserves” are based on estimates made many decades ago. Closer study shows that extractable coal reserves are vastly overstated, which is consistent with present production difficulties and rising prices. The presumed “200 year” supply of coal in the United States is a myth, but it serves industry moguls well.

Conventional fossil fuel supplies are limited, even if we tear up the Earth to extract every last drop of oil and shard of coal. Tearing up the Earth to get at those last drops, even though Exxon/Mobil proudly advertises that they are drilling to the depths of the ocean and going to the most extreme pristine environments, is, for us, as insane as the smoker who trudged four miles through a raging storm to buy a pack of Camels to feed his nicotine addiction.

It would be possible to find more fossil fuels, and extend our addiction and pollution of the environment, should we be so foolish as to take the path of extracting unconventional fossil fuels such as tar shale and tar sands on a large scale. That choice cannot be left to the discretion of industry moguls. The planet does not belong to them.

Basic fossil fuel facts (about reserves) must be combined with basic climate facts described in the paper “Target Atmospheric CO<sub>2</sub>: Where Should Humanity Aim?”. That paper has been submitted to Science and is available in arXiv, the permanent archive for physics preprints. The main paper is at: <http://arxiv.org/abs/0804.1126> and the Supporting Material is at: <http://arxiv.org/abs/0804.1135>

Our conclusion is that, if humanity wishes to preserve a planet similar to the one on which civilization developed and to which life on Earth is adapted, CO<sub>2</sub> must be reduced from its present 385 ppm to, at most, 350 ppm. We find that peak CO<sub>2</sub> can be kept to ~425 ppm, even with generous (large) estimates for oil and gas reserves, if coal use is phased out by 2030 (except where CO<sub>2</sub> is captured and sequestered) and unconventional fossil fuels are not tapped

substantially. Peak CO<sub>2</sub> can be kept close to 400 ppm, if actual reserves are closer to those estimated by “peakists” (people who believe that we are already at peak global oil production, having extracted about half of readily extractable oil resources).

This lower 400 ppm peak can be ensured (assuming phase-out of coal emissions by 2030) if a practical limit on reserves is achieved by means of actions that prevent fossil fuel extraction from public lands, off-shore regions under government control, environmentally pristine regions, and extreme environments. The concerned public can influence this matter and it is important to do so now – time is short, the industry voice is strong, and climate effects have not yet become so obvious to the public as to overwhelm the disinformation of industry moguls.

A near-term moratorium on coal-fired power plants and constraints on oil extraction in extreme environments are important, because once CO<sub>2</sub> is emitted to the air much of it will remain there for centuries. Our paper describes ways in which improved agricultural and forestry practices, mostly reforestation, could draw down atmospheric CO<sub>2</sub> about 50 ppm by the end of the century. But a greater drawdown by such more-or-less natural methods does not seem practical, making a long-term overshoot of the 350 ppm level, with potentially disastrous consequences, a near certainty if we stay on a business-as-usual course for several more years.

If we choose a different path, which permits the possibility of getting back to 350 ppm CO<sub>2</sub> or lower this century, we will minimize the chance of passing tipping points that spiral out of control, such as disintegration of ice sheets, rapid sea level rise, and extermination of countless species. At the same time we will solve problems that had begun to seem intractable, such as acidification of the ocean with consequent loss of coral reefs.

A fundamental point is that, in any event, we must move beyond fossil fuels reasonably soon. The underlying reason is that a large fraction of CO<sub>2</sub> emissions remains in the air for many centuries. Thus the upshot: we must move to zero fossil fuel emissions. This is a fact, a certainty, a lead pipe cinch. So why not do it a bit sooner, in time to avert climate crises? At the same time, we halt other pollution that comes from fossil fuels, including mercury pollution, conventional air pollution, problems stemming from mountain-top removal, etc.

Breaking an addiction is not easy. But we may now be at a point analogous to that of the smoker who told me about trudging four miles through rain to get a pack of Camels – when he got back to his motel he threw the pack of Camels away and never smoked again.

Fossil fuel addiction is much more difficult -- an epiphany to one person cannot solve the problem. This problem requires global cooperation. We must be on a new path within the next several years, or, our paper shows, it becomes implausible to reduce CO<sub>2</sub> below the dangerous level this century. Developed countries, as the cause of most of the excess CO<sub>2</sub> in the air today, must lead in the steps needed to develop clean energy and halt CO<sub>2</sub> emissions. Yet it is hardly a sacrifice: ‘green’ jobs will be an economic stimulus and a boon to worker well-being.

A major fight is brewing – it may be called war. On the one side, we find the short-term financial interests of the fossil fuel industry. On the other side: young people and other beings who will inherit the planet. It seems to be an uneven fight. The fossil fuel industry is launching a disinformation campaign and they have powerful influence in capitals around the world. Young people seem pretty puny in comparison to industry moguls. Animals are not much help (don’t talk, don’t vote). The battle may start with local and regional skirmishes, one coal plant or other issue at a time, but it will need to build rapidly – we are running out of time.

P.S.: Do not fall for the moguls’ dirtiest trick – ‘green’ messages spewed to the public. That is propaganda, intended to leave the impression they are moving in the right direction. Meanwhile they hire scientific has-beens to dispute evidence and confuse the public. How will you be able to tell if they ever “get it”? When they begin to invest massively in renewable energies, when they become truly energy companies aimed toward zero-carbon emissions.