



Los Alamos Study Group

Nuclear Disarmament • Environmental Protection • Social Justice • Economic Sustainability

The Crisis at Hand, the Emergency Mode, and the Need for Full-Scale Mobilization

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What is the purpose of our life in this world? Why are we here? What is the goal of our work and all our efforts? What need does the earth have of us? It is no longer enough, then, simply to state that we should be concerned with future generations. We need to see that what is at stake is our own dignity. Leaving an inhabitable planet to future generations is, first and foremost, up to us. The issue is one which dramatically affects us, for it has to do with the ultimate meaning of our earthly sojourn....our inability to think seriously about future generations is linked to our inability to broaden the scope of our present interests.

Encyclical of Pope Francis, “Laudato Si: On Care of Our Common Home”

There are many ways to enter the healthy “emergency mode” we need. As the old gospel song says, there are twelve – which is to say *many* – “gates to the City.”

We can pour efforts into building renewable infrastructure and the new or transformed institutions we need. We can educate ourselves and others. We can protect vulnerable people, species, and places. We can resist the empire of violence in all its forms, stop its predations one at a time, and in the process change ourselves and our society.

We have to do all these.

What do we mean by the “emergency mode,” and why is it essential? Why do we need “full-scale mobilization?”

The “emergency mode” is what all healthy people and groups switch into when there is a life-threatening crisis. As Margaret Salamon writes at her excellent web site, theclimatepsychologist.com/,

Emergency mode occurs when an individual or group faces an existential threat, accepts that there is a life-threatening emergency and reorients by:

- Adjusting their hierarchy of priorities so that solving the emergency is the clear top priority;
- Deploying a huge amount of resources toward solving the crisis; and
- Giving little priority to personal gratification and self-esteem enhancement for their own sake, and instead seeking them through engagement with the emergency. People seek to “do their part” to solve the crisis and build their skills to contribute more effectively.

There is no greater crisis, in all of human and post-Cretaceous ecological history, than the climate crisis we face today. That crisis is wrapped up with parallel crises of capitalism, resources, and war – just to identify three strands in the Gordian knot we face. Like Alexander, we need to cut the knot, not just pick at it.

A healthy response to the emergency we face means taking appropriate action and staying connected – with reality and to each other. Dysfunctional responses include endless distractions, despair, and any of the numerous policy fantasies available to us at little cost.

What many people don't understand is just how rewarding the emergency mode can be. Salamon quotes Mihaly Csikszentmihalyi, who pioneered study of what he called "flow states:"

Being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one... your whole being is involved, and you're using your skills to the utmost... The best moments in our lives are not the passive, receptive, relaxing times... The best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile.

When applied to our human and ecological responsibilities this experience is not some attempted transcendence *out* of the world, or a hobby, or a sport. It is transcendence *into* the world, the path of maturity and fulfillment since time immemorial.

As Salamon rightly says, people very much *like* being "'in the zone,' utilizing their entire capacity, whether they are playing sports, performing musically, studying intensely, or responding to an emergency." "It is," someone said, "the church of what is happening now." Nanao Sakaki sings,

Farming the ancient way
Singing with coyotes
Singing against nuclear war—
I'll never be tired of life.¹

Salamon points out that the "emergency mode," like the normal mode, is contagious. "We must," she points out,

exit normal mode and abandon the gradual policy advocacies and enervated emotional states that accompany it. Instead, we must seek to restore a safe climate at emergency speed. To accomplish this, the climate movement must lead the public into emergency mode. First we must go into emergency mode ourselves, and then communicate about the climate emergency and need for mobilization with clarity, dedication, and escalating assertiveness....

In order to lead people into emergency mode, it is critical that the emergency threat is paired with an emergency solution (whenever it is available). First and easiest, the climate movement must fully adopt the language of immediate crisis and existential danger. We must talk about climate change as threatening to cause the collapse of civilization, killing billions of people, and millions of species. These horrific outcomes await us during this century, possibly even in the first half of it if things truly slip out of control. This is not a matter of "protecting the planet for future generations" but protecting our own lives and those of the people we care about. We are in danger now and in coming years and decades. The climate crisis is, far and away, our top national security threat, top public health threat, and top threat to the global economy.

As if this weren't enough, there are even more reasons to "get with the program."

As it turns out, the very gradual reform of our present energy-hogging, climate-destroying arrangements is not just an "enervated" approach that won't work. It is also not *possible*. It won't *happen*. We are not just facing a climate crisis, by itself. We are facing a multifaceted environmental and social crisis, a crisis in war and peace, a crisis in democracy, and more. There are thresholds in all these we do not want to pass, thresholds after which recovery could be difficult – and full-scale energy transition, impossible. We must therefore mobilize while we can, before the emergency comes to us as an overpowering storm.

One critical aspect of our predicament involves oil. Just by itself, without considering other problems, our oil dependence is bringing an early end to "business as usual."

No, we are not running out of oil. That's not the problem. We are running out of oil acquired *cheaply enough in terms of net useful energy*. Our economy grows on *energetically-cheap* oil. This kind of oil is now in the rear-view mirror, a momentous fact. It means real economic growth is over. The catch is that our economy as it is currently organized must grow in order to function at all, because of debts.

¹ Nanao Sakaki, "Break the Mirror."

Only a fraction of the energy in each barrel of oil does useful work for society as a whole. Still less supports new investment. A large and increasing fraction goes to maintaining the oil industry, including finding and producing more oil and providing everything employees need. Without paying those bills, the oil industry would cannibalize itself. It is starting to do that right now.

A significant fraction of each barrel is wasted as heat. Mr. Carnot, in 1820, told us the theoretical maximum efficiency we could achieve in any engine.

The rest of the barrel – if anything is left – supports growth. We are scraping the bottom of the *net* oil barrel.

Any complex oil-based capitalist economy needs to be supplied with oil obtained very efficiently. That isn't happening, and it will never happen again. We have pretty much run through all the easy oil.² Tight "oil" produced by fracking (mostly it is too light to be called oil, *sensu stricta*), and bitumen from oil sands, really don't pay for themselves. The rest of society subsidizes these industries, in net useful energy terms.

The upshot is, first of all, that we have to leave oil before it leaves us, and second, we can't count on economic health henceforth. We certainly can't tolerate the vast misallocations of money, energy and attention embodied in our global empire, not even considering all its other risks and costs. That empire currently costs in the neighborhood of \$5,000 per household per year. What fraction of that should we bill to the oil industry?

We don't have the luxury to gradually build out solar, wind, tidal, and geothermal generation facilities until we have substituted all these more or less "cleaner" energy sources for the dirty ones we have, from either the climate or the oil perspectives. We don't have time.

There's also another problem. It takes energy – in our case mostly fossil fuel energy – to transform infrastructure. It takes energy to make renewable energy hardware and install it. The faster we go and the greater the scale of transformation, the more greenhouse gases we spew.

This isn't to say that we shouldn't undertake the transition! We must do it, and as quickly as possible! But at the same time we must *simplify our society's wants*, and not just our own, so as to *complete* the necessary transition *as soon as possible*.

In this transition we must protect those who, even now, are being thrown under the bus. "*Will this help the poor?*" is the first test of any sound policy, as Gandhi taught us.

To make this concrete, consider photovoltaic (PV) systems. The energy return on energy invested (EROEI) for PV installations has been estimated variously but appears to lie in the general vicinity of 10.³ Assuming this, to produce 25 kilowatt-hours (kWh) of electricity over the life of a system requires investing roughly 2.5 kWh of energy up front to make, transport, and install the system's components. Supposing a system life of 25 years, that 25 kWh of PV electricity will come in at a rate of about 1 kWh per year. But it will cost 2.5 kWh of energy in the year it is manufactured and installed. Of this, roughly 2 kWh will be fossil fuel energy. Thus in its first year of operation we get 1 kWh of renewable energy, costing 2 kWh of fossil fuel energy the previous year. Under these assumptions we don't break even until the end of the second year of operation.

Suppose we double PV installations every year, which is the kind of rapid build-out we need to address climate change. We end up *increasing* greenhouse emissions *every year* during the transition. Net progress in reducing greenhouse gas emissions only starts when rapid build-out ends.

This front-end problem applies to all aspects of renewable energy and energy efficiency. Electric cars? They're a net energy and climate sink for the first years because their tremendous embedded costs. Electric cars aren't

² To read more about this "thermodynamic trap," see Louis Arnoux, "Some Reflections on the Twilight of the Oil Age," at <http://cassandraleacy.blogspot.it/2016/07/some-reflections-on-twilight-of-oil-age.html>.

³ Charles Hall estimated "2.5" in 2008 (which included the total installation but is seven years old and therefore too low, given how costs and therefore energy investment per watt have dropped); see <http://www.resilience.org/stories/2016-05-27/the-real-eroi-of-photovoltaic-systems-professor-hall-weighs-in>. Bhandari et. al. got "11-12" in his review of 232 studies, apparently for panels and inverters only and not installation and other soft costs; see [http://astro1.panet.utoledo.edu/~relling2/PDF/pubs/life_cycle_assesment_ellingson_apul_\(2015\)_ren_and_sustain._energy_revs.pdf](http://astro1.panet.utoledo.edu/~relling2/PDF/pubs/life_cycle_assesment_ellingson_apul_(2015)_ren_and_sustain._energy_revs.pdf).

the future standard, though we will need some. Electric bikes, which use 1% of the resources of cars, might be. That's the direction we are headed, like it or not. Small remains beautiful.

Does it need to be said that nuclear energy, with its great dangers and tremendous embedded fossil fuel costs and greenhouse gas commitments, provides no magical solution either? That is the kind of information its huge price tag is whispering to us, if we would only listen.

We just can't replace all the fossil fuel sources we have now with renewable energy. We can replace some of them, a small fraction as it turns out, and that will have to be enough. We've already used up our safe allowance of greenhouse gases, and we've used up the cheap oil. The arctic is melting and its ocean absorbing more heat from the sun; our forests are succumbing to beetles and fires and releasing their stored carbon; in a dozen other ways the capacity of earth's ecosystems to buffer and absorb our pollution has been exhausted.

For our own well-being and dignity then, let's work together and build a truly just, sustainable future, while we can.

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