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Studies put climate change issues in context

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This is the latest installment in our Signs of Sustainability series, organized by Sustainable Tompkins. Visit them online at www.sustainabletompkins.org.

Sustainability means more than global warming and climate change. The Sept. 24, 2009, issue of Nature summarized a study drafted by Johan Rockström of the Stockholm Resilience Centre and co-authored by 28 internationally known scientists.

The article is entitled: "A safe operating space for humanity." (It also appeared in a longer and more detailed form in the journal Ecology and Society Vol. 14, No. 2,) The big idea in that article is that humans as a species, and then human civilization, developed within a narrow range of variation in the values of nine critical components of the earth's life support system:

Climate
Biodiversity
The phosphorous and nitrogen cycles
Ocean acidification
Stratospheric ozone
Freshwater
Land use
Aerosol (not enough data to set limits)
Chemical pollution (not enough data to set limits)

Based on available data at the time, the authors estimated that we have already crossed the boundaries—gone out of range—for three of the nine components: climate, biodiversity loss and the nitrogen cycle. They urged additional monitoring of all nine components, interactions among them and the exploration of mitigating actions.

In the meantime, climate change has developed into a widely perceived planet-wide emergency. As reflected in the December 2015 conference in Paris, a general worldwide consensus has emerged that tackling climate change is the top priority.

This does not necessarily leave out the other eight limiting factors for maintaining human civilization. Fortunately, reducing CO2 emissions—the main approach to slowing climate change—will probably result in beneficial effects on some of the other components.

These interactions are sometimes called positive synergies. Biodiversity loss and ocean acidification would be slowed and perhaps other components would experience positive indirect effects.

But how much C02 do we need to cut back, how can we do it and what will it cost? What's the big picture?

In 2015 Robert Pollin, of the Political Economy Research Institute at UMass Amherst (not to be confused with famed journalist Michael Pollan), produced a framework accessible to the ordinary reader in, Greening the Global Economy (MIT Press). Here are a few of his major facts and arguments.

As of 2012, total greenhouse emissions annually (mostly CO2) were approximately 45 billion metric tons. The Intergovernmental Panel on Climate Change (IPCC) estimates that to stay within the 2 degrees Celsius (3.6 F) limit, total emissions of greenhouse gases will need to fall 40 percent by 2035 to 27 billion tons annually and by 2050 by 80 percent to 9 billion tons.

We are currently not on track to meet those goals. The BAU—Business As Usual—scenario raises total emissions in 2035 to 54 billion tons; that is, moving massively in the wrong direction.

Pollin offers several basic points to take into account in designing a successful program:

Population growth will occur during this 20-year period, reaching 8.7 billion by 2035 (current world population is 7.4 billion).

Economic growth must continue or expand for any climate control project to succeed politically.

There should be a mix of energy efficiency investments and investments in clean renewables, including wind, solar, geothermal, big and small hydro and low-emissions bio. These clean renewables currently supply less than 1 percent of global energy consumption.

Energy efficiency investments will bring faster returns and greater impact in the next 20 years than will investments in clean renewables. This should be reflected in the investment decisions.

Both energy efficiency and new renewables investments will generate more jobs than comparable investments in fossil fuel burning energy development.

The benefits of the investments need to be widely shared among all people and in all nations.

The program should drive up living standards among the poorest people in the poorest nations, that is, climate adjustment must include climate justice.

Workers in the fossil fuel industry should receive training for new jobs and/or various kinds of government support for their families and communities.

Emissions in some of the wealthiest and most energy-consumptive nations and regions will have to drop more than in poorer countries with already lower CO2 emissions profiles.

Natural gas (including fracking), nuclear power and Carbon Capture and Sequestration (CSS) are not viable options for achieving the IPCC target for 2035.

Large-scale public investments will be required.

Surprisingly, perhaps to some, worldwide investment in energy efficiency and clean renewables is already 30 percent of what is needed annually to achieve the 2035 IPCC goal.

How will all this happen? Pollin argues that "the overall policy environment" will be the key to the success of the project. Watch for a summary of The Pollin Plan in a future SoS installment.

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