

Greening the Global Economy

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From the book jacket . . .

- “ . . . a roadmap to carbon reduction that drastically reduces fossil fuel consumption by combining energy efficiency with an increased reliance on renewable energy sources. . . . Dramatic reductions do not require great economic hardship or personal discomfort.” – Mara Prentiss, author of *Energy Revolution: The Physics and the Promise of Efficient Technology*
- “. . . a must read, cutting through current debates with a positive agenda: it is possible to reduce carbon emissions in a way that expands employment opportunities and improves living standards, even in developing and low-income countries.” –Jayati Ghosh, economist, New Delhi

The Global Green Energy Challenge

- Annual global emissions in 2012: 45 billion metric tons of GHGs
 - 30 billion tons from burning coal, oil, natural gas
 - 3 billion tons from bioenergy sources (e.g., ethanol)
 - 4 billion tons from producing energy (methane & NOx)**82%**
 - 6 billion tons from agriculture (methane & NOx)
 - 2 billions tons (other sources, e.g., cement, land use changes)
- 18%**

Climate Stabilization Requirements: Science (IPCC-based)

- Annual global emissions 2012: 45 billion metric tons of GHGs
- Stabilization requires much lower totals:
 - 40% cut in 20 years to 27 billion metric tons of GHGs
 - 80% cut in 40 years to 9 billion metric tons of GHGs
- **Focusing on fossil-fuel generated CO₂ emissions, reduce global totals from 33 billion metric tons in 2012 to 20 billion tons by 2035.**

Climate Stabilization Requirements: Justice and Political Realism

“... There is no reasonable standard of fairness that can justify working people and the poor sacrificing opportunities for rising living standards to achieve climate stabilization. In addition, any climate stabilization program that would entail reducing mass living standards will face formidable political resistance.” (p4)

Pollin's Basic Proposal

Reducing annual global GHG emissions by 40% in 20 years can be reached “if most countries—especially those with either large GDPs or populations--devote between 1.5 and 2 percent per year of GDP to investments in energy efficiency and clean, low-emissions renewable energy resources.” (p4)

Plausible? Yes, in principle, since . . .

- “. . . Energy efficiency investments, by definition, generate savings in energy costs.” (Typically, a 3-year payback.)
- “. . . For most clean renewable energy sources, the average costs of providing energy are now at rough parity with fossil fuels.”

Target vs. Current investment levels in energy efficiency and clean renewable energy

Target: 1.5% -- 2.0% of annual global GDP;
i.e., \$1.3 trillion -- \$1.7 trillion annually.

Current: 0.4% -- 0.6% of annual global GDP;
i.e., \$377 billion -- \$527 billion annually

Bottom line: **We're about 30% toward the target.**

Jobs generated through spending \$1 million on clean energy vs. fossil fuel production

	<u>Clean Energy Jobs</u> per \$1 million	<u>Fossil Fuel Jobs</u> per \$1 million
Brazil	37.1	21.2
China	133.1	74.4
India	261.9	129.1
U.S.	8.7	3.7

Bottom line: More “bang for the buck” with clean energy jobs.

Jobs generated through spending 1.5% of GDP on clean energy vs. fossil fuel production

	TOTAL Clean Energy Jobs Created with 1.5% GDP	NET Clean Energy Jobs (subtract FF jobs lost)
Brazil	925,000	395,000
China	11.4 million	6.4 million
India	12.0 million	5.7 million
U.S.	1.5 million	650,000

Labor “Superfund” idea of Tony Mazzocchi:
U.S. labor/environmental leader

“Paying people to make the transition from one kind of economy—from one kind of job—to another is not welfare. Those who work with toxic materials on a daily basis . . . In order to provide the world with the energy and materials it needs deserve a helping hand to make a new start in life. . . . There is a Superfund for dirt. There ought to be one for workers.”

4 policies to get from here to there

- Create large and stable clean energy markets
 - establishing a social price on carbon is crucial here
- Provide cheap and accessible financing
 - example: Germany's state-owned development bank
- Understand alternate forms of ownership in the energy sector other than corporate and state-owned models which dominate
 - example: 100% community-owned renewable supply in rural Germany
- Examine consequences of clean energy at scale upon import and export balances of individual countries

Risk, Ethics, and the Politics of Climate Stabilization

- Clean energy investments as climate change insurance
 - moves discussion away from hopelessly pursuing “scientific certainty” to assessing options based upon probabilities
- Global fairness: U.S. should not only cut GHG emissions by 60% by 2050, but help other countries meet their targets as well.
- If the science is right, 60-80% of remaining FF reserves need to be left “unburned.” This is a \$3 trillion write-off--\$150 billion/year over 20 years. Small, though, in comparison to \$16 trillion loss to homeowners in collapse of real estate bubble in 2008. Divestment efforts are laudable, but need to spur *re-investment* in renewables.