

Solving the Climate Crisis through Social Change

*Public Investment in
Social Prosperity to
Cool a Fevered Planet*

GAR W. LIPOW

New Trends and Ideas in American Politics

Raymond A. Smith and Jon Rynn, Series Editors

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types of auction fraud and perhaps avoid volatility as well. The limited number of permits still sets a target emission ceiling, while the minimum price may produce reductions below that target. (With a carbon tax, there is no issue of giving permits away, and prices are stable and predictable.) The revenue generated from this permit auction or tax would be divided equally among the population—as is now done with some of the revenue from the Alaska Pipeline.

This rebated carbon price would be progressive because of how emission taxes or fees relate to income (Boyce and Riddle, 2009). The smaller a person's income, the higher percentage an emission tax takes. However, the higher a person's income, the more dollars she pays, even as the tax represents a smaller percent of her income.

Under this system, the very poor would get back more in rebates than they would pay (directly and indirectly) in emission taxes. Prosperous workers and the middle class would mostly break even—the majority receiving a refund trivially higher than their payments, a minority receiving a refund trivially lower. However, the rich would pay many times more in direct and indirect emission taxes than they get back. They would help subsidize everyone else. And the refunds would provide stimulus sufficient to counter any tendency toward creating a recession. Even if elasticity remains low, refunds allow very large price increases without hurting the majority of people or depressing the economy.

Amory Lovins helped popularize another means of full social pricing that is fundamentally not regressive: feebates. He suggests fees on capital equipment that use resources or pollute beyond desired levels, essentially a green tax. Lovins then advocates returning those fees as rebates to those who buy capital equipment using those same sources and sinks at below that level. This only makes sense for comparatively expensive capital equipment where emissions and energy efficiency are easy to compare between products. Automobiles are examples because they are an expensive capital product, and gallons per mile constitute a good standard for comparing the efficiency of one gasoline-powered automobile to another.

CARBON TRADING

The key to understanding carbon trading is to understand the reason why any kind of emission price is needed to begin with. If a simple way to eliminate all GHG emissions existed that could be implemented quickly, without harming most people, then the best policy to advocate would be a

date certain by which such emissions would be illegal. However, because phasing out emissions requires fundamental changes in both physical and social infrastructure, GHG emission reduction will take decades to complete. Thus, we have little choice but to allow continued GHG pollution during those decades, just a little less every year until we reach zero, or nearly zero. After public investment and rule-based regulations reduce emissions, we still have to allocate the remaining pollution we allow.

One way to do this would be to allow people and firms to apply for permission to pollute on a case-by-case basis. Nobody, or almost nobody, advocates this because case-by-case decision making is something regulators do badly. That leaves two choices. Charge a fee to pollute, high enough to reduce the remaining pollution not eliminated by regulation and public investment to a reasonable level. Alternatively, issue permits for the amount of pollution allowed, and either auction them off to whoever will pay the most for them, or give them away to polluters who will use some of the permits and sell the rest to others.

In the vast majority of existing and proposed GHG permit systems, most permits are given away rather than sold. That buys political support from major polluters, but also results in downstream collection (collection at the firm level, rather than the mining, drilling, importing, or refining level) that makes enforcement more difficult and leads to both more honest error and deliberate deceit.

A second problem with permits, even auctioned permits, is carbon trading, especially derivative trading. Derivatives are various means of betting on whether value of financial instruments will rise or fall without actually buying those financial instruments. Derivatives have not been a major problem with past GHG trading schemes because the large schemes failed in various ways that discouraged excessive derivative trading, and the small schemes offered too little volume to attract many traders. A GHG permit-trading system capable of truly lowering GHG emissions to near zero would be high volume, with the price of permits steadily trending upward. That would be very attractive to investors. Demand would probably be high enough to encourage large firms like Goldman-Sachs to offer emission-trading derivatives in the form of index funds.

An index fund is simply a side bet, like betting on football with a bookie. If Goldman-Sachs accepts many bets that emission prices will rise, then Goldman-Sachs is wagering that emission prices will fall. Like any other bookie who has accepted too many bets on a single outcome, Goldman-Sachs will mitigate their risk by buying (directly or indirectly) actual permits as a hedge. The process of hedging index funds helped drive up food

prices in 2008 to the point where people in Haiti were eating mud. It probably contributed to the roller-coaster ride that oil prices took during George W. Bush's second term. It was a major factor in the U.S. savings and loan bubble that burst in the 1980s, the U.S. high-tech bubble that burst in the 1990s, and the housing bubble that caused a worldwide crash in 2008. Creating a large market in emission permits with steadily rising prices and unlimited access for investors will produce financial carbon bubbles. These carbon bubbles will create volatility in the value of clean technology that will make it almost impossible for that clean technology to compete with dirty emission processes.

Large price fluctuations counteract the ability of emission prices to drive behavior changes. Consumers and businesses alike normally are more concerned with current than future expenses. Increased uncertainty further discourages focus on future costs. And managers, reluctant to invest in pollution prevention, will usually take advantage of volatility to project the lowest reasonable permit prices.

Carbon trading requires a fair degree of precision in measuring carbon emissions, not only at the global but also at the local and even factory, campus, or neighborhood level. Current carbon measurement systems rely on bottom-up numbers, derived mostly from fossil fuel consumption numbers. Problems with this include the fact that based upon varying degrees of incomplete combustion in various processes, total emissions can vary drastically even between processes using similar fuels. Fossil fuels also vary. Not every lump of coal is the same as every other lump of coal. Every gallon of diesel fuel is not the same as every other gallon of diesel fuel. Nor is 100% of fossil fuel use captured in even as sophisticated a system as the European Union Emission Trading Scheme (ETS). Euan Nisbet wrote about the importance of supplementing bottom-up carbon measurement with top-down national and local measuring in his 2007 *Nature* article "Earth Monitoring: Cinderella Science" (Nisbet, 2007, 789–790). Recent investigations have shown that the discrepancies between bottom-up measures can be as high as 100% (Carbon Detectives, 2010). Even adding top-down measure to bottom-up ones may not reduce various types of error below 10% for fossil fuel-generated carbon dioxide (Dolman, Valentini, and Freibauer, 2008). Non-CO₂ emissions are subject to even greater errors at local levels and CO₂ emissions from biological sources greater still. A measurement error of 10% is larger than the size of the most radical proposed annual reduction rate on the international table. A measurement error of 3% would still be larger than the yearly rate of reduction proposed in the late 2009 Waxman-Markey bill. Not only is this an argument against emission trading, it is still

another reason why even a carbon tax should be reinforcement rather than the main policy driver of change. So-called command-and-control means are much more suited for making changes when the means are easier to measure than the ends.

Offsets

The very worst feature of carbon markets is probably offsets, where a polluter pays someone else to reduce pollution rather than doing so itself. An example from the Kyoto Clean Development Mechanism (CDM) illustrates this. HFC₂₃ is emitted when Teflon is produced, and as precursor to certain refrigerants and is 10,000 times stronger as a global warming agent than CO₂. India and China are major Teflon and refrigerant producers that currently regulate neither HFC₂₃ nor other GHG. However, manufacturers in India and China began capturing and incinerating HFC₂₃ and documenting that they had done so. This allowed them to produce Certified Emissions Reduction (CER) certificates. Major polluters, for instance, coal-powered electricity plants in Scotland, then bought these CER certificates and used them as permission to continue polluting.

As a result, Teflon and refrigerant plants in China and India expanded production to run factories 24 hours a day and optimized their factories to maximize HFC₂₃ production. In effect, they became HFC₂₃ production and incineration facilities. Teflon and refrigerant precursors became a secondary source of profit: a side effect of generating CER certificates. Increased HFC₂₃ production combined with continued burning of coal in Europe to increase global GHG emissions (Wara, 2006, 26–31). The European Union Emissions Trading Scheme decided in early 2011 that they would no longer accept credits from HFC destruction and comparable industrial gas offset after April 2013 (Willis, 2011). Such credits will continue to be valid until that date. As of November 2011, almost half of CER certificates approved under CDM were generated from HFC projects (Climate and Sustainable Development United Nations Environment Programme Risoe Centre on Energy, 2011).

The HFC scandal is only one of many that have occurred in the CDM system over the years. Offset supporters often respond to such scandals by saying, “Wait for the great new projects.”

Much of the carbon trader vision of the future centers upon Reduce Emissions from Deforestation and Forest Degradation (REDD) offsets. Forest destruction and degradation cripple one of the great carbon sinks of the planet and contribute greatly to the climate crisis. A program to

reduce such destruction and degradation is critical. Unfortunately, the approach favored by REDD advocates is an offset path. Construct a business-as-usual (BAU) scenario for degradation and deforestation. Pay poor nations, or in some cases large corporations, for destroying less forest than the BAU story.

Of course, this will open the door for all sorts of game playing. Consultants can make a case that logging will be profitable in an area where it would be a money loser. An opportunity opens to pay timber companies not to clear cut forests they would not have touched in any case.

Dr. Alain Karsenty, an economist at the Center for International Cooperation in Agronomic Research for Development, points out that baselines that are *not* just game playing are almost impossible to construct because they depend on unpredictable factors like meat prices, timber prices, and political decisions (Karsenty, 2008, 443–457). How much carbon a forest and the soil beneath it will contain in the future is difficult to predict. Changes from baseline are similarly difficult to calculate. Even if we can get a good snapshot of carbon content in a forested area at a given point in time, forests are dynamic. Carbon content will vary from season to season, month to month, and in many cases day to day. There is no fixed baseline. We are measuring changes in an already-changing system. The baseline for a forest is a story about how forest carbon would have changed if we had not instituted whatever subsidy is being financed.

Experimental REDD offsets are already a scandal (Hall et al., 2010). REDD offsets on a large scale are a future scandal in the making. Trying to regulate something messy, imprecise, and dynamic by dividing it into neat precise uniform financial instruments is asking for scandal and failure.

Beyond individual scandals, offsets are inherently scandalous. Offset providers claim to reduce GHG pollution in a sector or nation where GHG are not regulated. These claims are validated by comparing actual emissions with what might have been. A consultant constructs a BAU scenario to compare to reality. Nobody earns certificates for reducing emissions, even in projects where emissions are reduced. CER offset certificates are based primarily on how convincing a story the consultant told about an alternate path that reality might have taken. Offset money is a prize for literary fiction.

The Paradox of CDM

Anyone who thinks BAU scenarios are more than storytelling should try applying this methodology to CDM itself. Offsets were added to the

Kyoto treaty at the last minute, during the end of the 1998 negotiations, in what proved a failed attempt to gain U.S. ratification (MacKenzie, 2007, 29–31). In the absence of U.S. intervention, imagine a clean development fund with no offsets, rather than a CDM. The signers of the Kyoto treaty originally intended to include just such a fund. Thus, a treaty without CDM is a reasonable alternative scenario to consider.

Would eliminating offsets have harmed reduction efforts in the Global South? Most likely there would have been a protocol for reducing emissions from industrial by-products that could be eliminated at a low cost, such as HFC, nitrous oxide, and methane. Leaving aside the previously discussed counterfeit nature of much HFC₂₃ disposal, around three-quarters of the CER certificates issued under CDM are from such low-cost initiatives, as of November 2011 (Climate and Sustainable Development United Nations Environment Programme Risoe Centre on Energy, 2011).

Most likely a protocol tackling these high-impact industrial GHG would have proceeded on a national or sectorial basis, not factory by factory, or landfill by landfill. Either it would have funded subsidies to governments in exchange for regulations, or it would have made agreements with entire industries. In either case, pollutants would have been reduced across whole sectors. Just this protocol alone would have reduced GHG emissions far more than the entire CDM system has claimed to date, probably at a lower cost (Wara and Victor, 2008, 11–17). Instead of trying to reduce emissions one factory or landfill at a time, aid would have been used to subsidize increased regulation, or voluntary industry-wide process changes that affected whole sectors.

This is a paradox of the CDM methodology. Anyone who accepts the type of analysis used to justify individual projects will find that same type of analysis can discredit the system under which these projects are created. Those who reject this as a basis for discrediting CDM on grounds that it is a just-so tale about what might have been are also rejecting a core methodology upon which the CDM offset system depends. The

“ . . . the additionality screening process has been widely criticized as ponderous, costly, and ineffective. Environmentalists press for stricter screening, investors for more streamlined procedures. The current system may combine the worst of both worlds: high transaction cost with substantial nonadditionality. A growing consensus views determination of additionality as quixotic at the project level.”

The Challenge of Low Carbon Development (Chomitz et al., 2010, 72).

Independent Evaluation Group (IEG) of the World Bank, in dense jargon, pretty much admits that just-so stories are a poor way to measure emission reduction.

Additionality is jargon for comparing real emissions after some action to what would have happened to emissions without that action. In practice, that means comparing emissions from a project to a just-so story about what might have been. As the last sentence of that IEG paragraph hints, carbon traders hope to fix CDM by aggregating offsets above the project level. They want to approve types of projects and anyone meeting the criteria for a project type then gets carbon credits. Or they want to create a just-so story about future emissions from an entire sector and issue carbon credits if that sector pollutes less than what the scenario projects. However, there is no reason to believe determining additionality for project categories will prove more possible than for individual projects. Buyers and sellers have the same incentives for aggregated projects as for individual ones. If the steel industry has a chance at free money to prevent pollution, they have every incentive to exaggerate how much they will pollute if they do not get that free money. Aggregated categories open the same opportunities for game playing as individual projects, with added potential for manipulation around whether projects fit particular categories.

CDM in Nations with Caps

One solution sometimes offered is a version of CDM for nations who have agreed to limit the carbon they produce. In all international forms of carbon trading, if a nation emits less pollution than it is entitled to, by treaty it can sell excess permits. In the proposed CDM version of this, firms or sectors achieve additional reductions below what the treaty requires on a project or sector basis and sell offset certificates based on this. Instead of a complicated multistep international procedure, the nation in which the reductions occur guarantees that these reductions are additional to those required to meet its treaty obligations. By certifying such an offset, the nation reduces the amount of pollution it and its inhabitants are allowed to emit. If an offset turns out to be fraudulent, the nation who certified it is on the hook to lower pollution elsewhere. Some economists, including some left economists, love this because the nation certifying the offset has an incentive not to certify counterfeit offsets. In economic jargon, the proposal is incentive compatible.

EU responses to the HFC scandal provide a concrete example of what is wrong with this. We already described HFC offsets as legalized counterfeit carbon permits and the EU's banning of such permits (along with others offsets based on high global warming potential industrial gases) after mid-2013. However, no existing permits will be canceled before then, and new CER offset certificates can be issued based on HFC projects between 2010 and mid-2013. Originally, many EU lawmakers wanted to cancel existing permits (Point Carbon, 2010). China threatened to simply release its entire stock of HFC₂₃ into the atmosphere if that happened, and the EU backed off, not only not banning existing HFC offsets, but allowing new HFC offsets to continue to be sold for two and a half years (Pearce, 2010).

Destruction is easier than creation. Nations will always have some way to massively pollute quickly, forests they can destroy, industrial gases they can vent. And nations, like individuals, will react against something being given them and then taken away more strongly than not getting that same thing in the first place. The HFC case illustrates pretty well the likely response to any attempt to force a nation to honor this type of guarantee.

The whole idea of nations having intents and incentives is misleading. Heads of states will choose political appointees to head agencies. Those heads of state may well be out of office by the time a scandal breaks, and in any case can blame problems on subordinates. Subordinates can reap rewards upon moving to the private sector if their policies are generous rather than rigorous, even if they leave under a cloud of scandal. The people inside the agencies have to respond to bosses who probably are not looking for rigorous enforcement and might hope for future employment in sectors that create projects that are more exciting and more lucrative than acting as certifiers and regulators. If we focus on people, rather than mythical nations, there is no reason to believe this will be more incentive compatible with real emission reductions than any other form of CDM.

Can Carbon Trading Be Fixed?

Neither offsets nor the other flaws discussed are inherent in carbon trading in the abstract. In the abstract, permits can be 100% auctioned, with none given away. In the abstract, regulations can be put in place to minimize the role of traders and derivatives in a carbon market. In the abstract, carbon trading does not require offsets. The abstract is a beautiful place, but none of us live there.

Consider the world's only large-scale binding carbon trading regime, the Kyoto European Trading Scheme. In its earliest years, emissions rose under the ETS, as emission prices fluctuated wildly. It was widely acknowledged that price volatility was a problem, but only minor steps were taken to fix it. When emissions actually began to drop slightly for covered entities, the triumphal blaring of ETS advocates saying "see it works, it works" drowned out critics pointing out that all sorts of regulations (including feed-in tariffs for utilities) were contributing to the drop. And then after the 2008 crash when the damaged EU economy resulted in an emission drop far greater than the trading scheme required, the same ETS advocates scrambled to explain that yes, some of the drop was due to the downturn, but ETS still contributed something.

What has never happened under Kyoto is any implementation of any fixes that would make carbon trading work better. No serious mainstream advocacy has backed eliminating CDM and other Kyoto offset schemes, or making fundamental reforms to them. (I do not believe CDM is fixable, but presumably CDM supporters do.) No serious efforts have been made to set a price floor on ETS permits.

Much of this section has made the case that carbon trading has no policy advantage over other means of emission reductions. Carbon trading's political edge lies specifically in its appeal to powerful actors with political influence. That appeal arises from the flaws that, in the abstract, are not integral to it. Giveaways, downstream permitting, speculative bubbles, and offsetting all provide huge profits to financial interests and major polluters. These problems are not a bug, but a feature. Eliminate those, and carbon trading will have as much trouble gaining the support of powerful interests as any other type of climate legislation. Look at how marginalized Peter Barne's proposal has become, even when championed by the bipartisan team of Democrat Maria Cantwell and Republican Susan Collins. Eliminating some of the flaws in carbon trading eliminates its political viability as well.

Another political point is that too much focus on winning a carbon price weakens our ability to win other more urgent components of climate change policy. Political energy is finite, and policy priorities affect political priorities. Consider the history of U.S. climate legislation in 2009 and 2010. The Waxman-Markey American Clean Energy and Security Act (ACES) legislation began by weakening renewable energy standards to get the bill out of committee. Then, as part of the deal to push it all the way through the House, the provisions that would have controlled derivatives to prevent carbon bubbles comparable to the housing bubble

at the core of the 2008 crash were weakened. Provisions that would have subjected biomass to scrutiny to try to ensure they were not worse than fossil fuels were mostly eliminated.

In the Senate, Kerry-Lieberman weakened regulatory provisions even further. The final post-Kerry-Lieberman compromise attempt was an offer to trade EPA regulatory authority for a cap on utilities and on no other pollution source. Even this bill died.

Might cap-and-trade still have popular appeal compared to other policies? Surveys show that public investment and rule-based (command and control) regulation are far more popular than any form of carbon pricing. In the United States, 70% to 80% of the population support renewable standards, building efficiency standards, auto efficiency standards, and business efficiency standards. More than 60% still support them even when told that auto, consumer product, and energy costs will rise if they are implemented.³

Surveys comparing carbon taxes to cap-and-trade as a means of putting a price on emissions report mixed results, with both cap-and-trade supporters (Geman, 2009) and carbon tax supporters (Steinhauser, 2009) able to point to favorable results. This discrepancy can be resolved. Both carbon trading and carbon taxes poll poorly once the U.S. public realizes that either will raise direct and indirect energy prices (Rabe and Borric, 2010, 12).

The popularity of public investment and regulation could have let advocates push through a climate bill. This would not have been a matter

3. The public shows around 80% support for both renewable energy and auto efficiency standards (Rabe and Borric, 2010, 14, 17).

Toward the end of the 2008 presidential election, surveys showed that more than 60% of both Obama and McCain supporters favored renewable energy and business efficiency standards even if they raised the prices of energy prices and consumer products (Knowledge Networks of Menlo Park California, 2008, 4–5).

About 71% of the population of the United States supports tighter efficiency rules for automobiles, even if that costs them money (World Bank and PIPA, 2009, 16).

Public support for public investment is harder to measure because polls on the subject are conducted less often. However, there have been some polls on rail. Back in 2006, a Harris poll showed that about 70% of the United States would like to see rail get the largest share of transportation growth compared to car and airplanes, and the 70% of the population also thought this should be funded by local, state, and the federal government rather than private enterprise (Harris Interactive, 2006).

In November 2008, rail won a very important poll—actual voter initiatives and bond issues. About 70% of transit initiatives on the ballot won, for a total of \$75 billion in spending (Conkey and Glader, 2008, A6).

of bipartisan appeal. In spite of Cantwell-Collins bipartisan sponsorship, I strongly suspect that if the pure deal-making approach applied to cap-and-trade had been used, it would not have received a single Republican vote if it had advanced from committee.

A command and control climate bill could have been pushed through by appealing to the public. Every step of the way when a Republican or moderate voted against it, supporters could have made a loud public fuss about the opponent as a job killer, someone who did not care about the economy. They could have made voting against the bill a basis on which opponents could lose elections. Of course, that would have required a grassroots movement much larger than the elite environmental coalition that supported Waxman-Markey and Kerry-Lieberman.

We can conclude that while carbon pricing is a necessary part solving the climate crisis, it cannot be the core policy or the main focus of political energy. For carbon pricing to play a constructive role, it needs to be reinforcement for public investment and rule-based regulation. Any form of carbon pricing that is constructive needs to avoid or minimize carbon trading and include zero offsets.