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"Climate Change: The Need to Act Now."

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The US government is once again pursuing cap and trade mechanisms. As an economist, I have to say I have no idea why.

Since I am not a climate scientist I cannot opine from more than a lay perspective on whether there is a consensus in the discipline on man-made global warming. Since I am an economist, however, I can say that there exists a wholesale consensus among economists that carbon is not well-suited for cap and trade.

Moreover, existing markets in the US and EU have failed to price carbon at levels that lead to reduced carbon emissions because to do so would be costly to economic growth. The question of "who can issue the permits" continues to drag down the effectiveness of the EU system, and poses considerable problems for the proposed state-level system in the US. There is no plan for investing the proceeds from permit sales in developing clean technology. And existing carbon markets have been prone to fraud, theft, and counterfeiting worldwide. All of this is widely reported and known throughout the world. Jumping in with our eyes closed to such crucial developments exposes US citizens and the US, and world, economies to unnecessary risk.

Below, I review recent evidence on the shortcomings of cap and trade, concluding that we should emulate the historical approach we took to establishing a central bank after the Panic of 1907: take our time and study what works and what does not so that we design an effective system that does not pose unnecessary costs upon our nation.

I. The Price of Carbon on Cap and Trade Markets Has Not Achieved Levels to Restrain Output

Cap and trade does not work for carbon. The reasons for that failure are multi-faceted, but the simple fact is that even existing markets have not priced carbon at levels that restrain output for many years now.

The ETS has suffered from a drastic oversupply of carbon permits for quite some time. In October 2009, Peter Zapfel, assistant to the deputy director general of the environment department at the European Commission, said the oversupply of government allowances is threatening to overwhelm the system. At the time, many newer EU members from Central and Eastern Europe contributed a huge oversupply of credits. These counties have excess credits that numbered roughly five times the number in European market, depressing prices and undermining carbon reduction goals the market was formed to support. [1]

Since then, little has changed. In fact, by January 2013, record low auction bids from utilities, factories and banks led Germany to cancel an auction of European Union emission permits for the first time, ever. Connie Hedegaard, the EU's climate chief, said the cancellation should be a "wake-up call" for those who do not support the plan to strengthen the emissions trading

[1] Financial Times (USA); Date: Dec 7, 2009; Section: Investing in commodities; Page: SR7-6.

system.[2] At the close of trading on Friday, June 13, 2014, EU carbon was trading at 5.71 euro, far short of the 20-euro level needed to prompt industry and utilities to invest in greener energy.[3]

The US is following a similar path by emulating the EU system instead of learning from its problems. Currently there are two markets in US: one in California (California Air Resources Board) and the nine-state Regional Greenhouse Gas Initiative (RGGI) in Northeast. Neither prices carbon at levels that restrict carbon emissions.

Most recently, it was reported that California companies bought all 16.95 million allowances to release carbon emissions at the state's May 16, 2014 cap-and-trade auction. The price for the carbon allowances was $11.50 each, slightly higher than the previous two auctions in February and November, each of which sold allowances for $11.48 each. An additional 4 million permits that can't be used until 2017, of the 9.2 million that were available, sold at $11.36.

Analysts at Thompson Reuters Point Carbon expect prices to hover just above the program's auction floor price of $11.34 a metric ton through 2014. Earlier this year, analysts predicted California carbon prices would remain low through 2020 due to excess permits.[4]

"The price for power plants to emit one ton of carbon dioxide in nine northeastern U.S. states cleared at a record high $5.02 per short ton at the Regional Greenhouse Gas Initiative's (RGGI) 23rd permit auction," the market's administrator said on Friday, June 6, 2014.[5]

The sad fact for politicians is that markets are doing exactly what we economists expect them to do. There is virtually no disagreement among economists that the true cost to society of burning a ton of carbon is greater than its private cost. However, "agreeing that the [social cost of carbon] is greater than zero isn't really agreeing on very much."[6] The market, in fact, is pricing the most likely environmental scenarios, for which temperature increases are moderate and effects are small, putting carbon in roughly the $10 to $40 range.

But that is precisely what markets do. Markets price the "expected" value. If we want to prices to reflect more dramatic outcomes we will have to use a carbon tax. In short, just like in the recent financial crisis, markets are doing what they are supposed to do. Back then, politicians did not like the fact that markets were telling us that a meltdown was coming. Here, politicians do not like the fact that markets pricing the most likely (but not most destructive) scenarios, and they

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[2] EU Carbon Permits Plunge to Record after Germany Cancels Sale," Bloomberg News, Jan 18, 2013. http://www.bloomberg.com/news/2013-01-18/eu-carbon-plunges-after-german-sale-canceled-on-low-bid-prices.html.

[3] Garside, Ben. Reuters. European Parliament votes to cut carbon permit supply. December 10, 2013. http://uk.reuters.com/article/2013/12/10/eu-parliament-carbon-idUKL6N0JP2AT20131210.

[4] "California Carbon Auction Sells All Allowances," Environmental Leader, May 23, 2014 at http://www.environmentalleader.com/2014/05/23/california-carbon-auction-sells-all-allowances/

[5] Northeast pollution permit prices rocket, boosted by EPA, Reuters, June 6, 2014.

[6] Pinkdyck, Robert. "Pricing Carbon When We Don't Know the Right Price." Regulation. Summer 2013 at http://web.mit.edu/rpindyck/www/Papers/PricingCarbonRegulation2013.pdf.

will not do anything else. Either way, markets are telling us the unvarnished truth, whether we like it or not.

II. Announcing a Quantity Target is No Different

One of the hallmarks of the EPA's recent proposal is to establish carbon intensity goals, in effect setting quantity targets rather than price targets that have been the focus of prior carbon abatement mechanisms.

To a monetary economist, however, a quantity target is just the flip side of a price target. Through the history of modern central banking, the US Federal Reserve has experimented with both. For certain periods of time, the Federal Reserve used quantity targets (i.e., M1) and for others, price targets (i.e., the Fed Funds rate). There is no clear evidence that one is superior to the other. In fact, in some periods of history quantities worked fine, while in other prices were superior. Thus, it will be an economic question whether price or quantity is a better target.

It is unclear whether the quantities set are correct, meaningful, or achievable. If they are incorrect, they will be so because they either have no effect on carbon output or they are economically unachievable. If they are unachievable, they will be challenged by the relevant states and, most likely, altered.

The possibility of alteration by Congressional or administrative fiat, however, is precisely the political risk that has contributed price volatility to the EU system. Critics complain that carbon price volatility and the market's exposure to political risk mean the system does not encourage companies to invest in emission reduction, because the goals may be ultimately changed (or firms can lobby for change).[7]

III. Any effective program WILL restrain economic growth

But to begin with, we will first have to set some truly restrictive targets. It is doubtful, however, that meaningfully restrictive targets will arise from Congressional or administrative fiat because elected officials do not like to restrain growth, such decisions will force them to pick winners and losers, and states, industries, and even groups of consumers will have to be chosen.

A. The effects of carbon goals will be uneven

Widespread press coverage already noted the disparity of the goals across states. The Financial Times' Ed Crooks immediately noted that the states with the most demanding targets included

[7] Financial Times (USA); Date: Dec 7, 2009; Section: Investing in commodities; Page: SR7-6.

Arizona, South Carolina, Oregon, and New Hampshire, while states with least demanding targets included Maine, Rhode Island, Hawaii, and Iowa.[8]

Moreover, Crooks noted that there was perhaps a tenuous connection between goals and actual carbon dioxide states will emit.[9] Bloomberg Energy Finance reported that California, Nebraska, Rhode Island can actually increase volume of emissions in absolute terms. Louisiana, Arkansas, Idaho will face the largest cuts.[10]

> *In its ground-breaking "Clean Power Plan" released 2 June, the US Environmental Protection Agency (EPA) proposed to work with 49 states to slash the CO2 intensity of fossil-fuel power generation by 2030. The headlines were simple enough: US plans to cut its emissions 30% from 2005 levels. But* ***what the regulation actually does is lay out a series of (convoluted) state-level targets designed to reduce the carbon intensity of states' power***. [11]

Heightening the probability of political risk and disruptive volatility, "President Barack Obama's plan to cut power plants' carbon dioxide emissions places a widely differing burden on different states, opening the proposals to objections from those that feel they are being treated unfairly." Jacob Hollinger, a former EPA lawyer who is now a partner at McDermott, Will & Emery, was quoted as saying he was "'surprised' by the differences in the demands made of different states. 'The implications aren't totally developed yet, and that is something people should be scrutinising very carefully,'" he said. [12]

My own analysis suggests that the differences in goals among states are also related to politics. In preparing for this hearing, I regressed the goals multiplied by each states' percent of power from coal in 2013[13] (to adjust the goals for existing carbon intensity) on each states' GSP and employment change from 2007 to the most recent quarter, as well as variables related to the Democrat's "political productivity" of each state in the 2012 elections.[14]

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[8] Crooks, Ed. "States feel unequal burden of carbon reduction targets." Financial Times, June 3, 2014. http://www.ft.com/intl/cms/s/2/0ea7fe8e-eb32-11e3-bab6-00144feabdc0.html#axzz34L33dgID

[9] Ibid.

[10] "EPA's Clean Power Plan: 50 Chefs Stir the Pot," Bloomberg New Energy Finance Jun 3, 2014 at http://about.bnef.com/white-papers/epas-clean-power-plan-50-chefs-stirs-pot/

[11] Ibid. [Emphasis added.]

[12] Crooks, Ed. "States feel unequal burden of carbon reduction targets." Financial Times, June 3, 2014. http://www.ft.com/intl/cms/s/2/0ea7fe8e-eb32-11e3-bab6-00144feabdc0.html#axzz34L33dgID

[13] The range of the dependent variable is -0.96 to +0.35, since some states are allowed to increase, overall.

[14] The theory of political productivity starts with the notion that a state that cannot be won regardless of what favoritism is directed their way is not worth pursuing, as is one that the party knows they will win regardless of what favoritism is directed their way. Thus, swing states are the ones that parties favor, because grants or programs benefitting those states can have the most "productivity" in elections. The method has been applied to examining the distribution of Federal grants and expenditures from the Great Depression to today.

The regression shows that the EPA's goals are inversely related to GSP growth between 2007 and the most recent quarter (in other words, states with higher change in GSP from 2007 to the most recent quarter *less* restrictive goals, punishing states with lagging economies coming out of the recession) and the effect is statistically significant. The EPA's (normalized) goals are positively related to unemployment (states with less of a recovery in unemployment since 2007 have less restrictive goals to meet), though the effect statistically *in*significant at conventional levels. Political productivity for the Democratic Party, however, is positive and statistically significant suggesting the EPA's goals would have benefitted the Democrats in the past presidential election. Assuming 2016 is similar, the distribution of EPA goals among states will benefit them then, too.

B. The unevenness of the EPA's goals will affect state-level jobs and growth

It has been clear from applications, worldwide, that companies that do business in regions in which carbon is priced will build carbon costs into their investment and planning decisions. For instance, Shell Vice President Angus Gillespie has stated publicly that climate policies can cost potential investment projects "hundreds of millions of dollars" and that "there are opportunities we have not progressed because of the $40 a ton" carbon cost estimate that they use internally in their capital budgeting process.[15]

But it is not just energy companies that price carbon costs into their planned investments. At least twenty-eight US companies are known to report the carbon prices that they use for internal capital budgeting, including: Delphi Automotive, Walt Disney, ConAgra Foods, Walmart, Apache Corporation, BP, Chevron, ConocoPhillips, Devon Energy, ExxonMobil, Hess, Shell, Wells Fargo, Cummins, Delta Air Lines, General Electric, Google, Jabil Circuit, Microsoft, E.I du Pont de Nemours, Ameren, American Electrical Power, CMS Energy, Duke Energy, Entergy, Integrys Energy, PG&E and Xcel Energy.[16]

First, note the diversity of those companies, including energy firms like Exxon, consumer firms such as Walmart, and even entertainment firms like Disney. Clearly, carbon costs affect a broad swath of our economy.

But even more interesting is the diversity of carbon prices used by each of those firms. Prices range from $10-$20 at Disney to $60 at Exxon, and a wide variety of prices in between. As previously stated, carbon price volatility has been an enduring feature of the EU market and political risk in the EU and the US continues to contribute to widely disparate views of the price of carbon in the future, as a result.

[15] Climate Rules May Prompt Higher Shell Internal Carbon Price. June 2, 2014. http://www.environmentalleader.com/2014/06/02/climate-rules-may-prompt-higher-shell-internal-carbon-price/.

[16] "Big Oil, Major Firms Plan for Carbon Price," Environmental Leader, December 5, 2013. http://www.environmentalleader.com/2013/12/05/big-oil-major-firms-plan-for-carbon-price/.

C. Economic effects will hit consumers, as well

The broad industry exposure to carbon prices illustrated above will undoubtedly affect consumers, not just in their utility bills but in all manner of expenditures. So far, the impact on utility bills is expected to be modest, but this expectation seems to be based on natural gas prices remaining low.

Further investment in renewables and other energy sources will undoubtedly push up consumer costs.

According to the International Energy Agency, global investment in the energy sector will need to reach $38tn between 2011 and 2035, based on existing trends. Almost $17tn of this will be for electrical power, covering generation, transmission and distribution. Citi analysts said in a report in September that, while renewables are forecast to make up 50 per cent of additional power output capacity by 2035, they will cost $5.9tn, against $3.9tn for conventional sources.[17]

One of the most radical transformations in electrical power is happening in Germany, "where the government has committed to phasing out nuclear power stations and switching to renewable energies within a decade." But new installation of subsidized wind and solar is pushing up electricity prices for consumers. Guaranteed prices for electricity from renewable sources have encouraged investors to build new capacity. The higher prices, however, have come at the expense of consumers in the form of increased energy bills, in order to pay green energy generators an estimated €20.4bn in feed-in tariffs in 2013.[18]

As a result, in October 2013, the country's grid operators raised the mandatory surcharge on units of electricity to a record 5.3 cents per kWh for 2014, up from 3.6 cents. "For a typical household using 3500 kWh per year, this surcharge would rise from €125 to €185. The move is all the more contentious as many businesses are exempted, to protect their international competitiveness." [19]

IV. …but if it doesn't also restrain carbon, it is all pain and no gain…

A. Governments don't have the appetite for restraining economic growth (that's why we have independent central banks)

As a result of such obvious costs, no system has yet to restrain carbon permit issues to levels that meaningfully restrict carbon output. Even though Germany has come around to imposing costs of developing renewable energy sources on individual consumers, carbon prices are still too low

[17] "Green agenda prompts pricing concerns," Financial Times Special Report on Energy, November 5, 2012 at 2.

[18] Ibid.

[19] Ibid.

to restrict output. Thus, Germany's is a pure subsidy-driven plan, not a carbon market-driven plan.

Germany, in fact, cancelled an auction in January 2013 due to record low bids from utilities, factories and banks forced Germany to cancel a sale for the first time. Connie Hedegaard, the EU's climate chief said afterward, "the need to fix the market is getting urgent." Johannes Teyssen, chief executive officer of EON SE, Germany's biggest power utility, said in an interview with Manager Magazin that the EU greenhouse gas trading system is now, "a joke the whole world laughs about." Matthew Gray, an analyst in London at Jefferies Group Inc., opined that some buyers will probably wait for prices to drop further and the commission has limited influence to contain the market's decline. The problem is, when the bloc set the program's cap before 2008, it didn't install a system for dealing with a supply glut.[20]

In December 2013, EU Parliament finally voted to backload (delay) sales of 900 million carbon permits. Matthias Groote, the German Socialist lawmaker who steered the legislation through parliament, argued that, "backloading is not enough. The market is still oversupplied by 2 billion permits, but this buys us time to have a discussion on how to reform it." Still, the proposal caused "fierce divisions within member states, national governments and the European Parliament over fears it will push up energy prices and dent economic growth."[21]

As a result of the decision, the benchmark December 2013 EU Allowance futures ended the trading day at 4.90 euros. Assuming the first allowances will be withheld from the market in the second half of 2014, Marcus Ferdinand, an analyst at Thomson Reuters Point Carbon, "forecast the Dec-14 carbon price will increase by 35 percent compared to this years' (mean) price, to an average of 6 euros." Analysts predicted prices could eventually double due to backloading, but that it would still be years before they rise above the 20-euro level needed to prompt industry and utilities to invest in greener energy. Some EU lawmakers believe the bloc's carbon market will be irrelevant without further reform. [22]

On the March 19, 2014, U.K. Chancellor of the Exchequer George Osborne announce the government would freeze a tax on carbon emissions starting in April 2016 as part of a broad plan to cut consumer energy bills. Consumer energy costs have become a campaign plank, with Prime Minister David Cameron's administration coming under pressure to rein in rising energy costs as a result of Ed Miliband, the leader of the opposition Labour Party, vowing in November to freeze energy prices if he wins the next election in mid-2015. That move prompted the government in

[20] EU Carbon Permits Plunge to Record after Germany Cancels Sale," Bloomberg News, Jan 18, 2013. http://www.bloomberg.com/news/2013-01-18/eu-carbon-plunges-after-german-sale-canceled-on-low-bid-prices.html.

[21] Garside, Ben. Reuters. European Parliament votes to cut carbon permit supply. December 10, 2013. http://uk.reuters.com/article/2013/12/10/eu-parliament-carbon-idUKL6N0JP2AT20131210.

[22] Ibid.

to announce measures cutting green levies by 50 pounds per household a year in December 2013.[23]

As of Monday, June 16, 2014, "the use of carbon markets to curb rising greenhouse gas emissions was dealt a blow on Sunday after two weeks of United Nations talks on designing and reforming the mechanisms ended in deadlock."[24]

At the close of trading on June 13, 2014, the price was 5.71 euros.

B. Arguments abound over who decides the supply of permits, and this new Federal layer will intensify those in the US

Part of the problem in Europe has been jurisdiction over the issuance of carbon permits.

In 2007, the EU executive rejected Poland's national allocation plan (NAP), which set its total emission allocations and outlined how it intended to distribute them to individual factories covered by the scheme. The EU's main objection was that countries like Poland intended to allocate too many allowances. [25]

In September 2009, the Commission's decision was overturned by the European Court of First Instance (the General Court). "The court found that member states alone can take the final decision on the total number of allowances to allocate, and ruled that the EU executive had misused its powers." That decision also ruled on disagreements with Slovakia, the first country to take the issue to the court, and Estonia. All three countries argued that the EU's limits were too low and would hurt their economies. [26]

In 2013, a Superior Court judge in California rejected a private legal challenge to California's carbon auctions. In that action, the California Chamber of Commerce and Pacific Legal Foundation, on behalf of a dozen clients including Morning Star Packing Company and Dalton Trucking, had filed lawsuits in Sacramento Superior Court to block the carbon allowances.[27] While I am not qualified to opine on the legal details, it seems to me that this ruling sets the framework for a similar problem to that of the EU member states where, regardless of the EPA's goals, states' rights to set permit levels may not be able to be challenged.

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[23] Morales, Alex and Rachel Morison. Osbourne Freezes U.K. Carbon Tax on Power to Cut Bills. March 19, 2014. http://www.bloomberg.com/news/2014-03-19/osborne-freezes-u-k-carbon-tax-on-power-to-cut-bills.html.

[24] "U.N. climate talks fracture over future of carbon markets," Reuters, June 16, 2014.

[25] EurActiv. EU, Poland move to settle carbon quota row. April 20, 2010. http://www.euractiv.com/climate-environment/eu-poland-move-settle-carbon-quo-news-461636.

[26] Ibid.

[27] "California Carbon Auction Sells All Allowances," Environmental Leader, May 23, 2014 at http://www.environmentalleader.com/2014/05/23/california-carbon-auction-sells-all-allowances/.

C. There is no appetite for using proceeds of carbon permit sales to invest in new technology

Since carbon prices remain depressed, California's quarterly permit auctions will only raise $21 billion for the period through 2020, well below the anticipated $60 billion in revenue.[28]

Sales have raised $396 million for the state so far, and that money was initially intended to be devoted to efforts to lower greenhouse gas emissions by subsidizing renewables and new technologies. Instead, however, Governor Jerry Brown decided to, "lend $500 million from the funds to the California state legislature to plug gaps in the state's budget," The state is supposed to repay the state-run greenhouse gas emissions reduction account at a later date.[29]

Perhaps California can come around. The California Legislature announced Monday, June 16, 2014 that it had approved a $108 billion spending plan for the 2014-15 fiscal year that included, "$250 million for the High-Speed Rail project, along with 25 percent of future cap-and-trade funds…. Lawmakers also agreed to spend $200 million using cap-and-trade revenue on low-carbon transportation projects and $130 million on affordable housing projects near mass transit."[30] Of course, that budget is subject to approval by Governor Jerry Brown. But even if he approves, the on-again, off-again nature of green commitments in California will make it difficult for firms to commit to providing jobs and growth in that sector in the long-run.

Even devoting carbon permit revenues to mass transit, new technologies and renewables, however, has been derided as unjustifiable. "Those most vulnerable to climate change are often least responsible for its causes, and have the fewest resources to deal with its consequences."[31]

> *The revenues could support vulnerable countries' efforts to develop long term plans to deal with climate change, as well as finance pilot projects aimed at minimizing loss and damage…. They could fund the monitoring and forecasting of slow-onset and extreme-weather events, enabling authorities and the public to prepare more effectively for an impending disaster. And the money could cover loss-and-damage risk premiums on individual, local, national, regional, or international insurance policies.* [32]

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[28] "California Carbon Auction Sells All Allowances," Environmental Leader, May 23, 2014 at http://www.environmentalleader.com/2014/05/23/california-carbon-auction-sells-all-allowances/.

[29] Carroll, Rory. California court upholds stat's right to sell carbon permits. November 14, 2013. http://news.yahoo.com/california-court-upholds-states-sell-carbon-permits-234628252.html.

[30] Gutierrez, Melody, "State lawmakers OK $108 billion budget; plan moves to Gov. Brown," June 15, 2014, at http://www.sfgate.com/news/article/California-Legislature-OKs-108-billion-budget-on-5554561.php.

[31] Saño, Naderev and Richards, Julie-Anne, "Carbon Majors and Climate Justice," Project Syndicate, June 9, 2014 at https://www.project-syndicate.org/commentary/naderev----sa-o-and-julie-anne-richards-propose-a-levy-on-fossil-fuel-producers-to-help-those-most-vulnerable-to-climate-change.

[32] Ibid.

Affected individuals, "deserve the world's support – not just moral support, but genuine help in the form of effective, properly funded mechanisms designed to prevent, or at least alleviate, the climate-related hardships inflicted upon them by past and present industrialization." [33]

V. Worse yet, if carbon markets just benefit Wall Street then they just create new interest groups to capture the government and the financial markets

The Interpol Environmental Crime Programme now lists ten classifications of carbon crimes that have already occurred throughout the world and continue to remain a threat.[34] Those include:

- Manipulating measurements to fraudulently claim additional carbon credits (Additionality);
- Sale of carbon credits that either do not exist or belong to someone else;
- False or misleading claims with respect to the environmental or financial benefits of carbon market investments;
- Exploitation of weak regulations to commit financial crimes;
- Tax Fraud;
- Securities Fraud;
- Transfer mispricing;
- Money laundering;
- Internet crimes and computer hacking to steal carbon credits; and
- Phishing/Theft of personal information or identity theft.

Some environmentalists even get it. Friends of the Earth has recognized such crimes and, as a result, advocates a carbon tax rather than cap and trade.[35]

Still, politicians remain preternaturally attracted to cap and trade, even as carbon markets continue to grow and problems continue to mount.

A. Investor Fraud

As carbon markets grow, the carbon fund market has grown, as well. Carbon funds – like mutual funds with stocks or bonds – accept (private or public) investor money to purchase carbon permits. According to the latest survey by Carbon Finance, a carbon market data service published by Environmental Finance, over 2008-09, funds under management grew by 20 per cent to $16.1bn (£9.8bn, €10.7bn). The number of carbon funds and government purchase programs increased from 80 to 88. [36]

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[33] Ibid.

[34] Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[35] Chan, Michelle, "Ten Ways to Game the Carbon Market," Friends of the Earth USA, http://www.foe.org/sites/default/files/10waystoGametheCarbonMarkets_Web.pdf.

[36] "Carbon funds grow despite problems," Financial Times, Dec 7, 2009; Page: SR7-6.

Mark Nicholls, editor of Environmental Finance, who published the survey noted that, "thirty-eight of the 88 funds listed are governmental carbon purchasing vehicles, or are run by multi–laterals either for governments or emitting companies, or a combination…. The majority of the remainder are open to institutional investors." "Of the 12 funds that were launched since the 2008-09 edition, only two were governmental or multilateral; the rest were private sector vehicles." [37]

The returns can be lucrative. "The European Carbon Fund, run by French bank Natixis and one of the earliest run to generate a cash return, says that based on its net asset value at the end of 2008, the fund has generated an annual return of 27.8 per cent since its inception in April 2005."[38]

The problem is that such returns quickly attract fraudulent schemes.

Interpol reported that in 2009 and 2010, an Australian investment firm ran an aggressive telemarketing strategy advertising false connections to legitimate organizations and environmental standards. Potential investors were offered a high return investment opportunity in carbon credits. The firm is estimated to have defrauded Australian victims of $3.2 million.[39]

The FTAlphaville warned of a firm called "Enviro Associates" that was selling voluntary carbon credits for investment purposes, all the while warning that:

> *Voluntary Carbon Credits were not designed to be purchased for investment purposes; for that reason Carbon Credits (VERs) are not for all specifications of Investors due to its high risk and undeveloped market landscape and uncertainty…*
>
> *Individuals should be aware if they are purchasing for speculative means that there is little or no liquidity at present in the market which in turn would affect your ability to sell/exit from a holding at this time. This may change in the future.*[40]

Enviro Associates claims to be a "clearing member" of Gemmax Solutions, a payments and clearing service. Britain's Financial Conduct Authority warns, however, that:

> *Several unauthorized firms promoting and selling carbon credits are telling investors that carbon Neutral Investments Limited (CNI) or Gemmax Solutions, firms authorized by*

[37] Ibid.

[38] Ibid.

[39] SCAMwatch, WesternField Holdings Inc. Carbon Credit Investment Scams, http://www.scamwatch.gov.au/content/index.phtml/itemId/781866. See also David Fogarty, Firm Accused of Carbon Scam May Face Legal Claims, REUTERS, Mar. 26, 2010, http://uk.reuters.com/article/2010/03/26/us-carbon-investment-fraud-idUKTRE62P19020100326_, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[40] Murphy, Paul. A carbon comedy. October 15, 2013. http://ftalphaville.ft.com/2013/10/15/1666352/a-carbon-comedy/.

us, will handle money in their investment. We believe this is done to suggest investors will be protected as though they are dealing with an authorized firm. But this is incorrect.[41]

Without investor protection and regulatory oversight, carbon schemes continue to proliferate.

Britain's Financial Services Authority summarizes warnings to investors about carbon frauds and emphasizes that they do not regulate carbon credits in the same manner as shares of stock.[42] Still, investors flock to these green "investment" opportunities.

In November 2013, Britain's FSA reported that it had shut down nineteen companies in the past fifteen months for bilking roughly 1,500 investors out of 24 million pounds ($38.7 million) through selling carbon credits to individual investors.[43]

The UK Insolvency Service said the firms mainly targeted the elderly with high pressure sales techniques and promises of hefty returns of more than 40 percent. "Salesmen played on peoples' keenness to 'do their bit' to save the environment while making an investment at the same time," the Service said in a statement. [44]

The FCA in September released the findings of a survey of 125 carbon investors, showing not one had made any money from investing in the credits.[45]

The watchdog said some 183 carbon firms have been put under investigation since 2011 and has listed many of them on its website.[46]

In the US, carbon schemes have prompted several States Attorneys General, including those of California, Vermont, Arkansas, Delaware, Maine, Mississippi, Oklahoma, Illinois, Connecticut and New Hampshire, to back efforts by the Federal Trade Commission to investigate consumer fraud in the carbon offsets market.[47]

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[41] Ibid. See also, BBC World News. Oct 12, 2012. 'Misleading' carbon credit claims by Enviro Associates' http://www.bbc.com/news/uk-england-hampshire-20265034.

[42] Financial Services Authority. Carbon credit trading. May 5, 2012. http://www.fsa.gov.uk/consumerinformation/scamsandswindles/investment_scams/carbon_credit.

[43] Szabo, Michael. UK watchdog says investors lost 24 million pounds in carbon credit scam. November 6, 2013. Reuters. http://www.reuters.com/article/2013/11/06/us-britain-carbon-fraud-idUSBRE9A50L020131106.

[44] Ibid.

[45] Ibid.

[46] Ibid.

[47] See for example, "States seek fraud protection for carbon offset market," 25 Jan 2008 at http://www.ens-newswire.com/ens/jan2008/2008-01-25-091.asp.

B. Corporate Fraud

Clean Development Mechanism (CDM) projects generate carbon credits based on the extent to which the project resulted in fewer emissions than would otherwise have occurred. Dan Welch, of The Guardian, wrote, "Offsets are an imaginary commodity created by deducting what you hope happens from what you guess would have happened."[48]

Companies, therefore, have an incentive to either inflate the estimate of emissions that would have occurred without the project or claim that the project will reduce emission by more than it actually does.

In order to constrain firms from mischaracterizing their projects, the CDM mechanism requires third-party validation and verification before a project receives carbon credits. Third-party verification is carried out by Designated Operation Entities (DOEs) certified by the CDM Executive Board.

Even independent third party auditors, however, may be susceptible to bribes or collusion to manipulate the results.

According to Transparency International, bribery is most common at the project approval stage. "Although kickbacks to officials have not been reported, a Russian agency reportedly asked for direct monetary payments. In South-east Asian countries, it is fairly common for developers to invite the authorities to workshops (with attractive per diems) before submitting projects for approval. In China, it is not uncommon for project developers to invite experts reviewing their projects to dinner."[49]

But even independent verification agencies are not immune to manipulation. In 2008 and 2009 respectively the UN temporarily suspended two independent organizations – Norwegian company Det Norske Veritas and Swiss firm SGS – after "spot checks found flaws in their methodologies."[50] Investigations showed that both companies had approved projects without sufficient review.[51]

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[48] Dan Welch, The Guardian June 16, 2007.

[49] Corruption and the Private Sector, Transparency International, 2009, at 44, available at http://www.transparency.org/whatwedo/pub/global_corruption_report_2009.

[50] At the time these two companies were dominating the validation/verification market. For further information see Michael Szabo, DNV Suspension Another Jab at Battered CO2 Scheme, Reuters, Dec. 2, 2008, http://www.reuters.com/article/2008/12/02/us-carbon-dnv-idUSTRE4B04K120081202, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[51] Danny Fortson, Carbon-Trading Market Hit as UN Suspends Clean-Energy Auditor, THE TIMES, Sept. 13, 2009, http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article6832259.ece; James Murray, DNV Wins UN Authorisation CDM Project Approval, Business Green, Feb. 16, 2009, http://www.businessgreen.com/bg/news/1804681/dnv-wins-un-authorisation-cdm-project-approval, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

"The UN inspection found one company had a flawed review process, inadequate preparation and training of their auditing staff, and an overall failure to assign auditors with the proper technical skills. The other was suspended after an inspection raised concerns about staff qualifications and the quality of its internal reviews."[52]

In a follow-up review in 2009, the five largest DOEs' validation processes were scored on an A-to-F scale. None received a score higher than a D.[53]

C. Permit Fraud

1. Counterfeiting

There are many example of fake or invalid carbon permits being sold to unwitting buyers.

In one infamous and convoluted example, in March 2010, the Hungarian government took possession of two million carbon credits which had been surrendered to them by Hungarian businesses.

The rules of the EU-ETS allowed the Hungarian government to legally sell these carbon credits to others because Hungary anticipated being below its Kyoto Protocol target. However, the EU rules prevented these credits from being re-used within the EU.[54] Thus, Hungary sold the carbon credits to Hungarian Energy Power, "with restrictions that they were ineligible for use in Europe and notified the European Commission of the sale."[55] "Hungarian Energy Power then sold the credits to a British trading company, which resold them to a firm in Hong Kong. The Hong Kong firm, however, then put those same recycled carbon credits on BlueNext, a Paris carbon exchange[56], where a number of European brokers and banks purchased them not knowing the carbon credits had already been used in Europe."[57]

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[52] Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[53] Mark Schapiro, Conning the Climate: Inside the Carbon Trading Shell Game, Harper's Magazine, Feb. 2010, at 36, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[54] See http://www.euractiv.com/climate-environment/hungarys-sale-co2-credits-worrie-news-368250, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[55] Catherine Airlie, BlueNext Arranges 'Swap Back' of Recycled CO2 Credits After Trading Halt, BLOOMBERG, April 14, 2010, http://www.bloomberg.com/news/2010-04-14/bluenext-arranges-swap-backs-of-recycled-co2-credits-after-trading-halt.html, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[56] Wrong Sort of Recycling, The Economist, Mar. 25, 2010, http://www.economist.com/node/15774368, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[57] Danny Fortson and Jonathan Leake, Hunt for 'Rogue Trader' Over Recycled Carbon Credits, THE TIMES, Mar. 21, 2010 http://www.timesonline.co.uk/tol/news/environment/article7069741.ece, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

When BlueNext discovered the credits were ineligible for use in the EU, the exchange "immediately suspended trading sending the spot price for CERs spiraling downward."[58]After shutting down for three days to isolate the problem credits, BlueNext facilitated "swap backs,"[59] in which the sellers bought back the credits. Prices rose to their previous levels when trading reopened.[60]

While the European Commission has now closed the loophole that allowed the credits to re-enter the EU-ETS,[61] the episode highlights the importance of "strong regulations for monitoring the transfer of carbon credits through several foreign exchanges, particularly cross-checking between those exchanges."[62]

2. Theft

Carbon permits are also the target of hackers. A hacking attack in November of 2010 resulted in the theft of 1.6 million carbon credits (valued at €23.5 million) from the Romanian registry account of Holcim Ltd., the world's second largest cement-maker."[63]Holcim immediately posted the identification numbers of the stolen credits on its website and law enforcement efforts between Romania and Liechtenstein were able to track and return 600,000 of the stolen credits.[64] Still, while the unique identification number of the carbon credits allowed them to be tracked, not all the credits could be returned to Holcim. As it turned out, some "jurisdictions required the holder to return the stolen credits to the legal owner at the holder's loss, while other jurisdictions allowed the buyer to keep them, with the original owner carrying the loss."[65]

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[58] The Wrong Sort of Recycling, The Economist, Mar. 25, 2010, http://www.economist.com/node/1577436.

[59] Catherine Airlie, BlueNext Arranges 'Swap Back' of Recycled CO2 Credits After Trading Halt, BLOOMBERG, April 14, 2010, http://www.bloomberg.com/news/2010-04-14/bluenext-arranges-swap-backs-of-recycled-co2-credits-after-trading-halt.html, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[60] The Wrong Sort of Recycling, The Economist, Mar. 25, 2010, http://www.economist.com/node/15774368, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[61] EU Closes Carbon Emissions Trading Loophole, Utility Week, April 21, 2010, http://www.utilityweek.co.uk/news/news_story.asp?id=148910&title=EU+closes+carbon+emissions+trading+loophole, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[62] Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[63] Catherine Airlie, EU Carbon Dioxide Emissions Permits Stolen from Romanian Unit of Holcim, Bloomberg, Dec. 1 2010, http://www.bloomberg.com/news/2010-12-01/romania-s-holcim-says-eu-carbon-permits-stolen-from-its-account.html, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[64] Emissionshandelsregister, Recent News: Million EUAs Stolen from Romanian Registry, Dec. 2, 2010, http://en.emissionshandelsregister.at/service/recent_info/items/news127.html, in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[65] Catherine Airlie, EU Carbon Dioxide Emissions Permits Stolen from Romanian Unit of Holcim, BLOOMBERG, Dec. 1 2010, http://www.bloomberg.com/news/2010-12-01/romania-s-holcim-says-eu-

In another high-profile incident, the European Union's emissions trading system was shut down for a week after cyber-thieves stole emissions allowances worth €7m ($9.4m) from an account in the Czech Republic, while criminals also hacked into trading accounts in Austria, Poland, Greece and Estonia. "The Commission proposed tighter security measures in 2010 after discovering that hackers had broken into the registries where allowances are stored," but member states have repeatedly claimed they cannot afford the improvements. [66] It is easy to imagine a similar situation arising in US markets where states would have to bear such unexpected costs.

VI. Conclusion and Policy Recommendations

Economists agree, cap and trade does not work for carbon. So why do politicians continue to pursue such mechanisms? It seems to me that while some paint "climate deniers" as a problem in Congress, an equally troubling problem is "cap and trade failure deniers." Perhaps politicians think that adopting a "market" based solution will get them off the hook for tough decisions on carbon tax rates. But, unfortunately for the rest of us, doing so only exposes the US economy to new sources of fraud, theft, and risk of loss while raising energy prices WITHOUT reducing carbon output.

In fact, the conclusions of the House of Commons, Energy and Climate Change Committee, "The EU Emissions Trading System," Tenth Report of Session 2010–12, Volume I, 17 January 2012 (at 129), summarize my testimony as well, if not better, than I can write on my own:

> *Some proponents of the ETS suggest that the main flaws are rules that have been designed inadequately or have been badly applied, and could be reformed. We suggest that the failings are of a structural nature. The ETS is a market in a commodity that has been created by legislative fiat. The European Commission is both the supplier and the regulator of carbon as a commodity, a situation which has made the ETS particularly susceptible to rent-seeking behaviour. This should come as no surprise, since the history of emissions trading is littered with evidence that it helps companies and governments to pre-empt and delay making the structural changes necessary to address climate change.*[67]

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carbon-permits-stolen-from-its-account.html; Macken, Ken, Strengthening Credibility in the EU ETS Following Security and Fraud Related Incidents 2-3 (June 2011), at p.5, conference paper available at http://inece.org/conference/9/papers/Macken_Ireland_Final.pdf, , in Interpol Environmental Crime Programme. Guide to Carbon Trading Crime, June 2013.

[66] Chaffin, Joshua. Cyber-theft halts EU emissions trading. January 19, 2011. Financial Times. http://www.ft.com/intl/cms/s/0/27ee8cb0-2401-11e0-bef0-00144feab49a.html?ftcamp=rss#axzz34XaYYLnS.

[67] For more on CDM, see Tamra Gilbertson and Oscar Reyes (2009) Carbon Trading: how it works and why it fails, Uppsala: Dag Hammarskjöld Foundation, Ch 1 and 2.

This crucial task of reducing carbon emissions needs to be handled with care, lest we merely repeat the mistakes already experienced by established markets. We can't afford such setbacks.

Extending the analogy with central banking, members of Congress should remember that the National Monetary Commission studies central bank functions around the world for seven years before concluding upon the design of the US Federal Reserve System, having experienced two failed central banks before it. Let's take our time now and research existing carbon abatement mechanisms before embarking upon another two (or more) failed schemes that will enrich interest groups while continuing to allow carbon to grow as a national, and global, problem.

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