

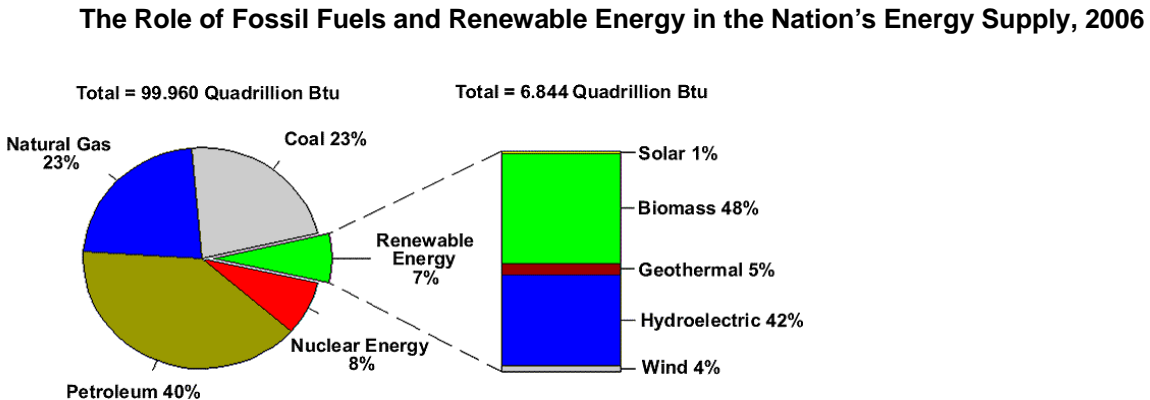
Keeping Our Eyes on the Wrong Ball

Why Acid Rain is the Wrong Template and the 1990 CFC-Tax is Closer to the Mark - and Why Cap-and-Trade Won't Solve the Climate Crisis But Carbon Fees with 100% Rebate Can

By Laurie Williams and Allan Zabel¹ of www.carbonfees.org – Discussion Paper 2/21/09

The single biggest obstacle to solving the climate crisis is the fact that the cost of fossil fuel energy remains relatively low, creating little incentive for conservation or for the scale-up of clean energy. While prices for clean energy have fallen, clean energy remains significantly more expensive than fossil fuel energy. For instance, fossil fuel-generated electricity currently averages between 6 and 10 cents per kilowatt hour, while, depending on its design and location, solar currently averages 2 to 3 times that amount. As we explain here, a cap-and-trade approach (the Acid Rain template), widely presumed to be an appropriate tool for addressing climate change, has several fatal flaws, including the fact that it will not insure a competitive price advantage for clean energy over fossil fuel energy in the near future. As a result, cap-and-trade will not create the incentives for investment in a rapid scale-up of clean energy substitutes. Cap-and-trade keeps our eyes focused on the wrong ball – on maintaining low costs for fossil fuel energy. Instead, our eyes need to be focused on a very different ball (the CFC-tax template) – on changing the relative cost of fossil fuel energy and clean energy, while keeping the energy needed for everyday life and in everyday products affordable for everyone and minimizing economic disruption. Carbon fees with a 100% rebate, delivered monthly in equal payments to all, is the tool that can swiftly and effectively accomplish this goal.

Illustration 1: Fossil fuel energy provided approximately 86% of U.S. energy in 2006.



(See http://www.eia.doe.gov/cneaf/solar.renewables/page/prelim_trends/rea_prereport.html)

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This discussion paper addresses the following issues:

- (a) What is cap-and-trade and how did it become the leading proposal to address climate change?
- (b) Why is cap-and-trade the wrong tool for climate change?
- (c) What are carbon fees with 100% monthly per capita rebate?
- (d) What historical example demonstrates that carbon fees would be an effective market mechanism for climate change?
- (e) What about using a “Renewable Portfolio Standard” to encourage clean energy usage?
- (f) Why isn't it okay to get started by trying cap-and-trade?
- (g) What are other critical measures are needed, in addition to carbon fees with 100% rebate?
- (h) How could we harmonize carbon fees with international trade?
- (i) Are carbon fees with 100% rebate applicable to transportation and other sectors beside electric utilities?
- (j) What actions can ordinary citizens take to be heard on this issue?

1. What is Cap-and-Trade and How Did It Become the Leading Proposal to Address Climate Change?

Cap-and-trade is a program that sets a collective declining emissions limit (“cap”) for particular pollutants from all sources within the program. The idea is to gradually lower the total amount of pollutants emitted from these sources until the environmental goal is achieved (in this case massive reductions in greenhouse gas emissions). The trade portion of the program allows participating sources to lower the cost of reducing their emissions by purchasing permits to pollute from others who may be able to cut back more cheaply, thereby helping to keep the overall costs of the commodities manufactured, in this case fossil fuel energy, as low as possible.

Outside Offsets: An additional concept that has been part of most cap-and-trade proposals for climate change is the idea of outside offsets. Outside offsets mean allowing additional pollution above the cap for sources within the program, if they are able to pay for decreases in the pollutant outside the program. For instance, a coal-fired power plant (a source within the program) could continue emitting CO₂ above the levels that would otherwise be permitted, if the owners of the facility have purchased an offset, such as a reforestation project expected to capture CO₂, i.e., a carbon “sink,” outside the capped sources. In most cases, cap-and-trade proposals for climate change suggest allowing “offset” projects in other countries.

Support for Cap-and-Trade: Many prominent people and organizations have supported cap-and-trade as a next step for addressing climate change. President Obama has said that his administration will seek enactment of a cap-and-trade program to reduce greenhouse gases to

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80% of their 1990 levels by 2050. Although individual state programs may be preempted by a future federal program, the trend toward cap-and-trade is also shown by the California Air Resources Board's 2008 decision to rely heavily on cap-and-trade for reducing California's greenhouse gas emissions. The Western Climate Initiative, a group of western U.S. states and Canadian provinces, anticipates collaboration among its members on a cap-and-trade program. Robert F. Kennedy Jr., of the Natural Resources Defense Council ("NRDC") has said that adopting cap-and-trade to address climate change is a "no brainer" in his forward to "The Green Collar Economy" by Van Jones. In addition, using cap-and-trade for climate change is endorsed by an array of U.S. organizations, including oil companies (BP America, ConocoPhillips and Shell) and environmental groups (Environmental Defense, NRDC and World Wildlife Fund), many of whom joined an industry/environmental coalition called "USCAP," the stated purpose of which is to bring about enactment of a greenhouse gas cap-and-trade program. See USCAP's proposed program at www.us-cap.org.

Given the high profile of the cap-and-trade idea, it is somewhat shocking to many to find that the analysis supporting this approach is seriously flawed and is rejected by many prominent economists.² A combination of factors led to this disconnect:

(1) The Acid Rain Myth: Cap-and-trade advocates have claimed that the success of EPA's Acid Rain program has proved that cap-and-trade will work for climate change, failing to appreciate the critical differences between the climate change challenge and the acid rain problem. As discussed below, the U.S. chlorofluorocarbon ("CFC") tax to address ozone depletion under the Montreal Protocol provides a much more applicable analogy.

(2) No New Taxes: Many analysts, including Peter Orszag, Director of the U.S. Congressional Budget Office ("CBO"), have recognized that carbon taxes (or fees) would be a more efficient method of reducing greenhouse gas emissions. See Orszag, Nov. 2007, <http://www.cbo.gov/ftpdocs/87xx/doc8769/11-01-CO2Emissions.pdf>. However, many politicians have viewed any new taxes as politically unacceptable to voters, even before the economic collapse of 2008. These evaluations fail to consider the possibility of 100% rebate, the economic advantages of fees with rebates over cap-and-trade for most individuals, and the potential of public education on the policy choice to address this concern; and

(3) Urgency: Favorable analyses of the applicability of cap-and-trade to climate change originated when scientists believed we might have several more decades to achieve an 80% reduction in CO₂. However, recent studies indicate that the current level of greenhouse gases in the atmosphere (385 parts per million ("ppm") CO₂) will lead to dangerous climate change, even if no additional increases occur. Since CO₂ levels have been increasing at approximately 2 ppm per year over the last eight years, many scientists have concluded that the climate problem is

² See Harvard economist, Greg Mankiw's blog at <http://www.nytimes.com/2007/09/16/business/16view.html>.

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much more urgent than they believed it to be earlier in this decade. This evidence suggests we have a much shorter time to a transition away from fossil fuels, especially coal, in order to reduce the risk of runaway climate change and ecological disaster. See the 2008 discussion of climate evidence by James Hansen, et al at http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf. Specifically, Dr. Hansen and his team found: “Continued growth of greenhouse gas emissions, for just another decade, practically eliminates the possibility of near-term return of atmospheric composition beneath the tipping level for catastrophic effects.” (Emphasis added.) Given growing demand for energy world-wide, only strong incentives for conservation and a rapid scale-up of clean energy can stem the continued growth of emissions that Hansen and his team have determined are likely to spell disaster.

While people we admire, people of good faith, great intelligence and real integrity, have supported cap-and-trade, our hope is to explain why moving forward with a cap-and-trade approach creates an unacceptable risk of catastrophic global warming and why there is a much more effective alternative that could become politically feasible with appropriate public education and leadership from President Obama.

2. Why is Cap and Trade the Wrong Tool?

The Acid Rain Myth: As noted above, those who champion using cap-and-trade to address climate change claim that it has been “proven” to work in the U.S. Acid Rain program. See e.g., Bill Chameides of Environmental Defense at <http://gristmill.grist.org/story/2007/2/12/102851/837>. However, this assertion ignores crucial distinctions between the challenges we faced in 1990 with Acid Rain and the challenges we face today with global warming. Most importantly, the success of the Acid Rain program did not depend on replacing the vast majority of our existing energy infrastructure with new infrastructure in a relatively short time. Nor did it depend on spurring major innovation. Rather, the Acid Rain program was successful as a mechanism to guide existing facilities to undertake a fuel switch to a readily available substitute, the low sulfur coal in Wyoming’s Powder River Basin. Existing facilities needed only the addition of a few new railway lines, burner modifications to accommodate lower sulfur fuel, and, in some cases, new or more efficient scrubbers. Little new technology or infrastructure was needed and little was created.³ The goal of the Acid Rain program was to reduce sulfur dioxide emissions, while keeping the cost of energy from coal low. To be effective, climate change legislation must do the opposite; it must

³ See <http://www.bookrags.com/highbeam/dispelling-the-myths-of-the-acid-rain-hb/>.

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gradually increase the relative price of energy from coal and other fossil fuels to create the appropriate incentives for both conservation and the scale-up of clean energy.⁴

Further, the Acid Rain program did not allow any outside offsets and so provides no basis for the widespread assumption that an offset program will help with climate change. In addition, the success of the program was aided by the low, competitive price of low-sulfur coal. According to Professor Don Munton, author of “Dispelling the Myths of the Acid Rain Story” the impact of the program has been overstated:

The potential for a massive switch to low sulfur coal was no secret. Such coal was cheap and available, and it became cheaper and more available throughout the 1980s. Indeed, low-sulfur coal became very competitive with high-sulfur supplied well before the Clean Air Act became law.

See <http://www.bookrags.com/highbeam/dispelling-the-myths-of-the-acid-rain-hb/>.

Accurate Measurement: In addition to cap-and-trade’s focus on keeping the cost of fossil fuel energy low, the program is vulnerable to inaccurate measurements. Unless all cap-and-trade elements, including outside offsets, are limited to systems with accurate emissions measurement, the cap on total emissions is likely be inflated and claimed reductions exaggerated. While the emissions of large electrical generating facilities with continuous emission monitoring systems can be accurately tracked (the Acid Rain program was limited to such sources), many other sources of emissions and offsets cannot be as closely monitored or quantified. Where these less-accurately-measured sources participate, the integrity of the cap-and-trade program is undermined, as is the certainty of the reductions sought and claimed. Most recently proposed cap-and-trade programs do not limit their proposals to sources with accurate measurement.

Fraudulent Outside Offsets: Most U.S. proposals and the European Union are planning to make extensive use of outside offsets in their cap-and-trade program. The idea is to use outside offsets as a mechanism for keeping fossil fuel energy inexpensive and for encouraging “additional” projects that reduce carbon emissions in the developing world. Research to date on these projects indicates they will be subject to extensive fraud and will undermine pressure for reductions within the capped economies. First, the underlying concept of “additionality” (i.e., the reductions would not have happened without offset funding) is flawed because this key component of the program cannot be proven. The definition of additionality is therefore subjective, inviting intense lobbying by sophisticated, profit-seeking market participants and their consultants, and defeating program integrity in terms of net emissions reductions. Further, since people (and profit-motivated corporations) will always seek the cheapest offsets that they

⁴ While the coal industry has lobbied for support for “clean coal,” sequestration of greenhouse gas emissions from burning coal has not been demonstrated to be safe or permanent and is expected to be costly.

<http://www.carbonfees.org/home/Cap-and-TradeVsCarbonFees.pdf>

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can purchase, there is a race to the bottom, through selection of the most flawed (least additional and measurable) projects, as documented by two Stanford researchers, David Victor and Michael Wara in their research paper available at:

http://pesd.stanford.edu/publications/a_realistic_policy_on_international_carbon_offsets/. In addition, offsets have become a source of negative unintended consequences, such as the production in China of HCFC 23, a potent greenhouse gas which is a by-product of manufacturing HCFC 22. Research indicates that manufacturing of these products may be occurring solely for the purpose of destroying HCFC 23's and selling this activity as a carbon offset. (See http://www.sourcewatch.org/index.php?title=Clean_Development_Mechanism_and_HCFC-23_destruction.) Finally, an investigation into expenditures by the U.S. Congress of carbon offsets indicated that most of the projects were already completed at the time of the purchase, i.e., not additional. See: <http://www.washingtonpost.com/wp-dyn/content/story/2008/01/28/ST2008012800764.html>

Despite these demonstrated problems with outside offsets, the recent proposal by the influential group USCAP for a cap-and-trade program would allow extensive use of outside offsets to achieve reductions. See <http://www.us-cap.org/blueprint/overview.asp>:

“We recommend that Congress should establish a Carbon Market Board (CMB) to set an overall annual upper limit for offsets starting at 2 billion metric tons with authority to increase offsets up to 3 billion metric tons, with domestic and international offsets each limited to no more than 1.5 billion metric tons in a given year.”

Note that this USCAP recommended total for total annual outside offsets of 3 billion metric tons per year would represent almost 40% of total U.S. emissions in 2007 (approximately 7.2 billion metric tons).

Rationing, Manipulation and Price Volatility: Even if the cap-and-trade market were limited to facilities with continuous emission monitors and no outside offsets, the program would essentially be a form of rationing. Unlike a fee or tax, a cap requires Soviet-style preplanning. Program managers would try to choose a level of reductions in fossil fuel emissions that the economy could adjust to without energy shortages. Rolling blackouts/gas station lines could become a reality if demand for fossil fuels exceeds the supply and appropriate clean energy alternatives have not yet been built to fill in for reduced availability of fossil fuel energy. This type of problem occurred in a Los Angeles cap-and-trade program called RECLAIM in 2000 (described below). The program was put on hold for a period of time because, if the cap had been enforced, it would have resulted in a lengthy period of rolling blackouts.

Permits to pollute can easily be subject to gaming and manipulation, creating artificial scarcity that is likely to result in disruptions and unfairness, as initial and future allocations of the

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right to emit are distributed (whether by auction or other means) and traded. A preview of such disruptions was provided by the market manipulations that created the California energy crisis early in this decade. This potential was also demonstrated in a 2008 simulation at the University of California at Berkeley's Haas School of Business, in which students gamed a carbon-trading market for individual gain, leading to scarcity and high prices. (See, article on the UC Berkeley simulation: <http://www.npr.org/templates/story/story.php?storyId=91625716>.)

This potential for market manipulation is likely to contribute to undesirable price volatility. The resulting lack of price predictability in a cap-and-trade system (specifically, the lack of certainty concerning when the price of energy from fossil fuels will exceed the price of clean energy) reduces the incentive for the substantial investments in the new infrastructure and innovation necessary to provide alternative energy at affordable prices. (For additional information on price volatility and the resulting delay in clean energy investment, see the January 2009 study by the Brattle Group described at <http://www.brattle.com/NewsEvents/NewsDetail.asp?RecordID=589>).

Complex Bureaucracy, Lack of Enforceability and Inertia: In addition, setting up a cap-and-trade system will be very complex and time consuming. Once begun, a cap-and-trade program would have a great deal of inertia. It would be difficult to dismantle and would create a variety of interest groups with investments in maintaining the program, however ineffective it proved to be for addressing climate change. Further, the complex system of permits and offsets would be extremely difficult to police. A lack of effective enforcement (virtually impossible for offsets given the murky standards for additionality and plans to allow international trading) will encourage fraud and make the program a sham, while interest groups with a stake in the program fight to maintain and to "fix" it.

RECLAIM and Over-allocation: In contrast to Acid Rain, the Los Angeles cap-and-trade program known as RECLAIM (the Regional Clean Air Incentives Market) failed spectacularly. The program was aimed at reducing ground level ozone. In RECLAIM, despite the presence of accurate monitors and sophisticated regulators, the initial cap was inflated (set too high, also called "over-allocation"), which delayed most emission reductions for approximately seven years. At the end of that time, companies were accustomed to artificially low credit prices and almost no one had invested in emission control. As a result, the market collapsed when prices soared because the gradually declining number of permits no longer exceeded actual emissions. Following market collapse, the necessary control technology was required by regulation. <http://www.law.duke.edu/journals/cite.php?9+Duke+Envtl.+L.+&+Pol'y+F.+231>

European Trading Scheme ("ETS"): Similarly, attempts to design an effective carbon cap-and-trade system have failed in Europe under the Kyoto Protocol--a 1997 international accord to cut greenhouse gas emissions which the U.S. never ratified. In a demonstration of the many

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flaws of the cap-and-trade approach, utilities and other sources have underreported their emissions, purchased flawed offsets, driven up prices, reaped billions in undeserved profits and generally failed to produce promised emission reductions or any significant scale-up of clean energy. While Europe has indicated it can fix the problems it experienced in the first phase of its program, there are many indications that this is a flawed assertion. See analysis of problems with ETS at <http://www.openeurope.org.uk/research/etsp2.pdf> and in a November 2008 GAO report at <http://www.gao.gov/products/GAO-09-151>.

Conclusion on Cap-and-Trade: A cap-and-trade program for climate change focuses on keeping the price of fossil fuel energy low. Even a cap-and-trade program that did not include offsets or facilities without accurate monitoring (most plans include both of these components) will only have an indirect impact on the relative price of fossil fuel and clean energy. This lack of price predictability makes analyses of when clean energy investments will become profitable very uncertain, thereby delaying crucial investments in clean energy technology research, development and infrastructure scale-up. In addition, the integrity of cap-and-trade programs is vulnerable to over-allocation, poor quantification of emissions, invalid offsets, market manipulation and a lack of enforceability. Finally, in a cap-and-trade system, prices are raised and resources are drained by the profits and costs of brokers, traders, certifiers, lawyers and investors in carbon offsets, all of whom develop a vested financial interest in maintaining the program.

3. What are Carbon Fees with 100% Monthly Per Capita Rebate?

Even if you accept our conclusion that cap-and-trade is virtually certain to fail, you may reasonably wonder whether there is a better alternative. Many economists, former EPA Administrator Ruckelshaus, the former Director of the Congressional Budget Office Peter Orszag and the CEO of ExxonMobil agree that carbon tax (or as we prefer to call it “carbon fees”⁵) is a better alternative, with many advantages in transparency, fairness and likelihood of effectively reducing emissions. See Congressional Budget Office report dated February 2008 at p.VIII, (“A tax on emissions would be the most efficient incentive-based option for reducing emissions and could be relatively easy to implement”) <http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf>. See also article re: Exxon CEO, Rex Tillerson, speech favoring carbon tax at: http://money.cnn.com/news/newsfeeds/articles/djf500/200901081511DOWJONESDJONLINE000878_FORTUNE5.htm.

What are Carbon Fees? Carbon fees are amounts that would be paid when fossil fuels enter the economy. These fees would be charged when oil, gas or coal are imported or extracted

⁵ While the debate has not been framed this way to date, we use the term "fees" and "rebate" rather than the terminology of "taxes" and "dividend," because we believe these terms may more accurately convey two important points to the general public. First, a "fee" is generally a charge for doing a specific activity (here using destructive fossil fuels), and when fees are collected, they are generally used for a specific purpose, not just dumped into the general revenue fund. Similarly, a "rebate" is more familiar to the general public as a return of funds previously spent than the concept of a "dividend."

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from the ground. We think that the term “fees” rather than the “tax” is most applicable because this is not a charge on income or property, but rather a targeted charge on a substance that is doing a major environmental damage. Since other taxes and fees are often applied at the point of importation or extraction, the additional cost of tracking and imposing carbon fees on fossil fuels should be relatively low.

What is the Purpose of Carbon Fees? The purpose of carbon fees is to insure that, within a set time period, the price of fossil fuel energy exceeds the price of clean energy from sources such as wind and the sun. Only an absolute commitment to insuring that the price of fossil fuel energy will exceed the price of today’s clean energy alternatives will insure the substantial level of investments in the panoply of possible clean energy technologies that are needed to rapidly transition away from fossil fuels and to do so in a way that is fair to all.

Over What Period of Time Would Carbon Fees Be Phased In? In our example below (Illustration 2), we show carbon fees being phased in over a period of ten (10) years. This is a time frame that has been mentioned by Al Gore and other leaders as workable for weaning the U.S. economy from fossil fuels. However, fully phasing in carbon fees does not require a cessation in fossil fuel use. (See article “Gore Pitches 10-year plan” <http://www.msnbc.msn.com/id/25718230/>.) It would only be the time within which even costly solar projects would have a price advantage over fossil fuels. Citizens would continue to receive monthly payments for the average amount of fossil fuel fees paid in the prior month, allowing them to continue to afford the average amount of fossil fuel fees paid by everyone.

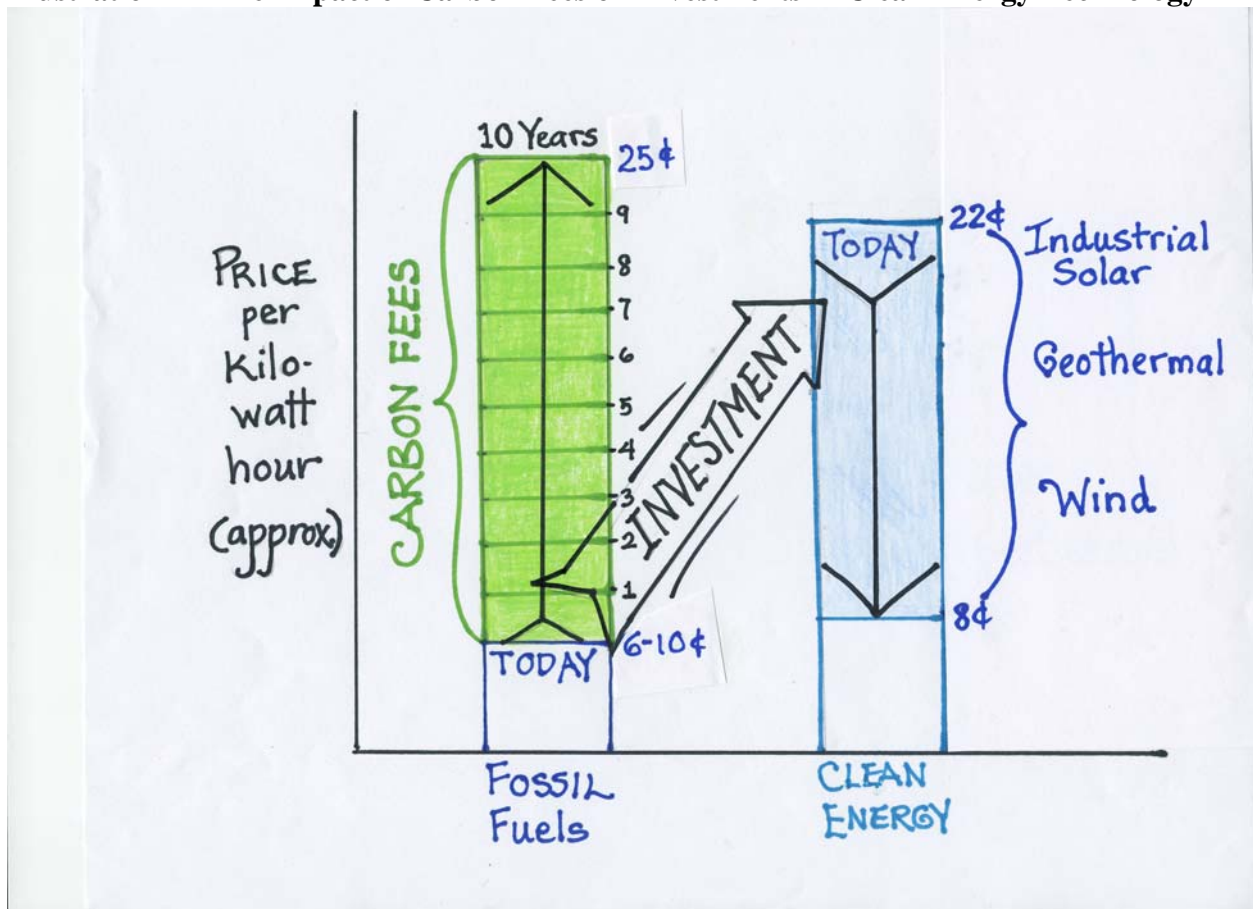
What Would Carbon Fees Be Used For? Our proposal is that one hundred percent (100%) of all carbon fees collected when fossil fuels are first introduced into the U.S. economy would be returned in equal monthly payments to all adults (a smaller share for children). The purpose of returning the entire amount to all adults is two-fold. First, this rebate would ensure that everyone could afford the average amount of fossil fuels introduced into the economy and that no one would suffer unfairly during the transition to a clean energy economy. Second, the monthly payments would create an incentive for conservation, as everyone would be very aware of the amount of their monthly payment and would be working to insure that they spent no more than that amount on fossil fuels. Because low-income people generally use less energy (but spend a bigger proportion of their income on energy), equal rebates would insure that lower income families would still be able to afford the fossil fuel energy they need. Finally, receiving equal monthly payments would help reinforce a collaborative spirit, a sense that all of us are working together to reduce the risks of damage to our climate from fossil fuels.

Some people may believe that a portion of carbon fees should be used for the other critical measures described below. We are not strongly opposed to this but believe that the goal of cushioning the transition away from fossil fuels for individuals should not be compromised. In addition, we believe that regional adjustments in the amount of the fossil fuel rebate may be appropriate to reflect greater dependence on fossil fuels in certain regions at this time and, as a result, greater stress during the transition.

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How would Carbon Fees help Clean Energy Development? Carbon Fees would help clean-energy development by giving prospective investors certainty in two areas. First, investors would be confident that every unit of clean energy available at the end of the ten-year time period would be more affordable to consumers than any unit of fossil fuel energy. This would mean that, while investors would not know which clean energy technology or firm would be most successful, they would know for sure that any firm able to actually produce such energy would be able to compete successfully with all existing fossil fuel energy products. This should rapidly insure that there is no additional investment in fossil fuel projects such as new coal-fired power plants or new exploration to develop shale oil.

Illustration 2 - The Impact of Carbon Fees on Investments in Clean Energy Technology



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What Historical Example Demonstrates that Carbon Fees Would Be an Effective Market Mechanism for Climate Change?

The Montreal Protocol - William Reilly: At the same time that the Acid Rain program was enacted, in 1990, the United States used a very different approach to create additional economic incentives for the scale-up of substitutes for ozone depleting CFC's pursuant to the Montreal Protocol. William Reilly, the EPA Administrator, noted the crucial facts in his opening statement at the second meeting of parties to the Montreal Protocol:

“On January 1, 1990, a new tax went into effect in the United States, a tax on the manufacture of CFCs. This tax exceeds in value the cost of CFCs themselves and it will rise steeply in the years ahead, raising \$400 million in new revenues this year, and raising \$5 billion over the next five years. **This added cost of CFCs sends a powerful signal: it says bring on the substitutes fast! And it reduces the comparative economic advantage CFCs would otherwise enjoy over the more expensive substitutes.** This tax on CFCs has already caused the United States to reach the agreed targets for reduction earlier than required.” (<http://www.epa.gov/history/topics/montreal/04.htm>) (Emphasis added.)

As this experience with the CFC tax demonstrates, a carbon fee or tax can help reach agreed targets for reductions quickly.⁶ The entire economy will be stimulated by the rush to develop the most cost-effective substitutes for fossil fuels. This CFC tax example, rather than the Acid Rain example, is the appropriate model for the problem we face today with climate change. The difference is that, given the enormous cost and scope of the transition to clean energy, a monthly per capita 100% rebate will be needed to keep energy affordable for everyone, while still sending the critical message with respect to the relative price of damaging as opposed to non-damaging sources of energy.

4. What About Using a Renewable Portfolio Standard to Encourage Clean Energy Usage?

Cap-and-trade advocates have suggested that we can cure the problem of inadequate incentives for clean energy development by mandating it through what is called a “renewable

⁶ While some Scandinavian countries and British Columbia have experimented with carbon taxes on some portions of their fossil fuel usage, no country has yet attempted to implement carbon taxes or fees in the way described in this paper. The Montreal Protocol/CFC tax example is the closest parallel we have found. For brief discussions of the Scandinavian efforts see: <http://www.metronews.ca/toronto/Live/article/118877>; http://www.cbc.ca/news/canadavotes/realitycheck/2008/09/the_scandinavian_carbon_tax_ex.html

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portfolio standard” (“RPS”). This means that utilities are required to purchase a certain percentage of their energy from clean energy sources, thereby creating a market for these products and hopefully causing a scale-up in clean-energy infrastructure. Approximately 25 states have already adopted such programs (<http://eetd.lbl.gov/ea/ems/reports/lbnl-154e-ppt.pdf>). However, as demonstrated by the testimony of Cliff Chen, Senior Energy Analyst for the Union of Concerned Scientists, before the California Senate Energy, Utilities and Communications Committee in February 2008, the RPS has had disappointing results to date in California. While the three investor-owned utilities in California have dutifully contracted for required levels of new renewable energy power, very little of this power has actually come online. Inadequate price incentives have been a major factor in the slow pace of adding clean technology to the mix of sources for California’s electricity. Some other states have had more successful programs; however, the total amount of electricity from solar, wind and geothermal technologies has remained very small, below 2 percent nationally. While a properly designed renewable portfolio standard can be helpful to create a market for clean energy technologies, it is unlikely to create the rapid transition from fossil fuel energy to clean energy that is critical to averting an unacceptable risk of climate catastrophe. Finally, RPS programs are not necessarily applicable to transportation and manufacturing of CO₂ (see discussion below of how carbon fees could be part of the solution for those sectors).

5. Urgency or Wouldn’t It be helpful to Just Get Started by Trying Cap-and-Trade?

Many people are aware that climatologists have concluded additional impacts from warming are now inevitable. However, what is less well recognized, but is highlighted in James Hansen’s recent letter to President-Elect Obama, is the true urgency of the climate crisis (http://www.columbia.edu/~jeh1/mailings/20081121_Obama.pdf). Recent modeling by James Hansen and his colleagues has demonstrated that sustainability of a habitable climate, similar to the one we have known over the last 10,000 years, requires us to reduce atmospheric CO₂ from its current level of 385 parts per million (“ppm”) to 350 ppm or below. To call this task challenging, given continued world-wide burning of fossil fuels and forests, is obviously a serious understatement. Hansen notes that, while changes in forestry and agricultural practices may be used to reduce CO₂ in the atmosphere, the benefit of these changes may be limited to about 50 ppm. His conclusion is that, because of the long life of CO₂ in the atmosphere, if we exceed 400 ppm for more than a very limited time, it may be impossible for us to return to levels of CO₂ below 350 ppm, even if we cut carbon emissions to minimal levels in the future. With levels of CO₂ climbing approximately 2 ppm each year since 2000, this indicates we may have relatively few years left to accomplish rapid reductions in greenhouse gas emissions. Hansen, *et al*, state, “If the present overshoot of this target CO₂ (i.e., 350 ppm) is not brief, there is a possibility of seeding irreversible catastrophic effects” (http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf). Given the complexity of creating a cap-and-trade program and the lengthy period of time necessary to implement it, selecting cap-and-trade may condemn us to passing points of no return.

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6. What Are Other Critical Measures in Addition to Carbon Fees with 100% Rebate?

While carbon fees with 100% rebate are a critical tool for rapidly transitioning away from fossil fuel usage, it is insufficient without a variety of supporting measures. These measures include a ban on new coal-fired power plants without safe and permanent sequestration. It is also critical to create better transmission lines that can efficiently carry clean energy from where it is produced to where it will be needed. This project is often called creating a DC (direct current) backbone. As noted below, it will be necessary to address international issues, including carbon-fee-equivalents for imports and working to create incentives for other countries to adopt similar carbon fees. It will be important to help people who are transitioning from jobs in fossil fuel energy to retool and to train more people for new industries. In addition, subsidies may be important to encourage new industries to move to communities that are experiencing economic dislocation because of the transition away from fossil fuels. Another critical issue, addressed in California's 2008 AB 32 Scoping Plan, is energy efficiency standards for both housing and devices. Additional measures should also include improved forestry and agricultural practices to sequester carbon, white roofs to reflect additional energy back into space and subsidies to encourage (see <http://features.csmonitor.com/innovation/2008/10/03/how-white-roofs-shine-bright-green/>). Taken together all of these measures could allow substantial energy conservation and a relatively smooth transition to a clean energy economy.

A List of Other Critical Measures that would be Needed to Complement Carbon Fees with 100% Rebate

1. Ban on new Coal Fired Power Plants without Safe and Permanent Sequestration (none have been built to date),
2. Energy Efficiency Standards to insure that the buildings and devices of the future are more energy efficient,
3. Carbon-Fee-Equivalent Tariffs on imported goods from countries without similar carbon fees or taxes, in order to keep a level playing field for U.S. goods within the U.S,
4. Job Training to help people who are transitioning from the fossil fuel industry and others to join the clean energy economy workforce.
5. DC Backbone and Smart Grid - Efficient transmission lines to take clean energy from where it is produced to where it is needed and a smart grid to efficiently direct power to where it is needed.
6. Forestry and Agricultural Practices that help reduce greenhouse gas emissions and retain carbon in forests and fields.
7. White Roofs to increase reflectivity and send more energy back into space.

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8. Clean Energy Research & Development redirecting subsidies given to oil and gas to clean energy research and development grants to universities and other suitable programs.
9. Subsidies to Encourage New Industries to move to communities experiencing economic dislocation because of the transition away from fossil fuels.

7. How Could We Harmonize Carbon Fees with International Trade?

Carbon fees obviously pose several issues for U.S. trade and U.S. manufactures. The easiest to address is keeping U.S. goods competitive within the U.S. By imposing carbon-fees-equivalent charges on goods entering the U.S., we can prevent countries that have not imposed similar costs on fossil fuel usage from having a negative impact on U.S. manufacturers trying to sell goods within the U.S. These carbon-fee-equivalents on imported goods could be added to the monthly rebate to help U.S. citizens.⁷ This, however, would not necessarily solve the problem of keeping U.S. goods competitive overseas. Other factors, however, would allow us to overcome that obstacle. One factor is that clean energy prices in the U.S. are likely to drop rapidly as we enjoy economies of scale up from building larger clean energy facilities and as competition between clean energy technologies (solar vs. wind) and among firms within a particular clean energy field (different solar firms) drives prices down. Second, other countries might recognize that they might want their citizens to benefit from these fees rather than having this portion of the purchase price go to U.S. carbon fees. Finally, the U.S. could use a variety of other tools to encourage other countries to adopt similar measures. See economist Robert Shapiro's paper on an internationally harmonized carbon tax at: http://www.sonecon.com/docs/studies/climate_021407.pdf. While some negative impacts on U.S. trade could remain a factor, these impacts appear likely to be small compared with the harm likely to result from uncontrolled climate change. Fees that spur massive investments in clean energy technology are likely to result in innovation, making the U.S. a world leader in the field of clean energy and reinvigorating our economy.

8. How Could Carbon Fees be Applied to Transportation and Other Sectors besides Electric Utilities

The discussion above applies most directly to electrical generation and does not directly address how to approach transportation, manufacturing and other sectors that contribute greenhouse gases and/or carbon sinks, including agriculture and forestry. Carbon fees in combination with regulations and subsidies, however, may be an appropriate combination for dealing with these other sectors. For transportation, a combination of a gradually phased in gasoline carbon fees, along with regulations (for instance requiring all new cars sold into the

⁷ See Design of a Carbon Tax, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1324854.

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U.S. economy after a certain date be plug-in hybrids) may be appropriate. Car batteries and charging equipment could be required to be built to a uniform standard, allowing drivers to plug in their cars at home under normal circumstances but also allowing batteries to be quickly switched at service stations when required, e.g. for longer road trips. Similarly, a combination of carbon fees, regulations and subsidies may be used to address emissions and needed carbon sinks in manufacturing, agriculture and forestry.

9. What Actions Can Ordinary Citizens take to be Heard on this Issue?

Given the huge momentum that cap-and-trade has developed, it is critical for every concerned citizen who believes this decision deserves additional scrutiny to communicate with their elected representatives, friends, neighbors and colleagues. President Obama has made it easy for citizens to share their concerns at <http://www.whitehouse.gov/contact/> where citizens can send short questions, comments or concerns (up to 500 characters). Our website at www.carbonfees.org includes a sample letter to representatives and a link to a website that provides contact information for writing to all of your state and federal representatives. The website we have used allows you to enter your zip code and locate your representatives (see: <http://beavoter.org/congressorg/issues/basics/?style=comm>). In addition, some surveys have indicated that many people are afraid of carbon taxes or fees, even with rebates. Our belief is that the issues of urgency, effectiveness, and relative cost to consumers of cap-and-trade v carbon fees with 100% rebate have not been effectively explained to the public. We encourage you to help your friends, families, neighbors and colleagues understand these issues as the most pressing ones we face, even at this time of economic crisis.

Conclusion

While the recent debate on how to rescue the economy has tended to overshadow the debate on climate change, as many people have noted, the economic crisis has provided an opportunity. It has made it clear that massive investments must be made to stimulate the economy. The question is how to make those decisions wisely. Carbon fees with 100% rebate has the advantages of costing the government very little, returning all proceeds equally to everyone to fund continued spending on energy, and creating huge incentives for climate-saving changes. The fact that little government spending would be needed to scale-up clean energy technology would leave more room for any stimulus package to focus on the other necessary measures, such as funding for green-jobs training and a new comprehensive system of efficient transmission lines.

Nevertheless, many people have concluded that the choice to go forward with cap-and-trade has already been made and that carbon fees with 100% rebate will be found to be politically unacceptable. Given what is at stake, we hope that this paper will inspire you to delve more deeply into this issue and to participate in the discussion. Feel free to question any aspect of this

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paper and to let us know your questions, concerns and suggestions at williams.zabel@gmail.com or (510) 390-4224. Thank you!

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Please see two additional illustrations below:

Illustration 3 – Why Clean Energy Prices Fall as a Result of Carbon Fees

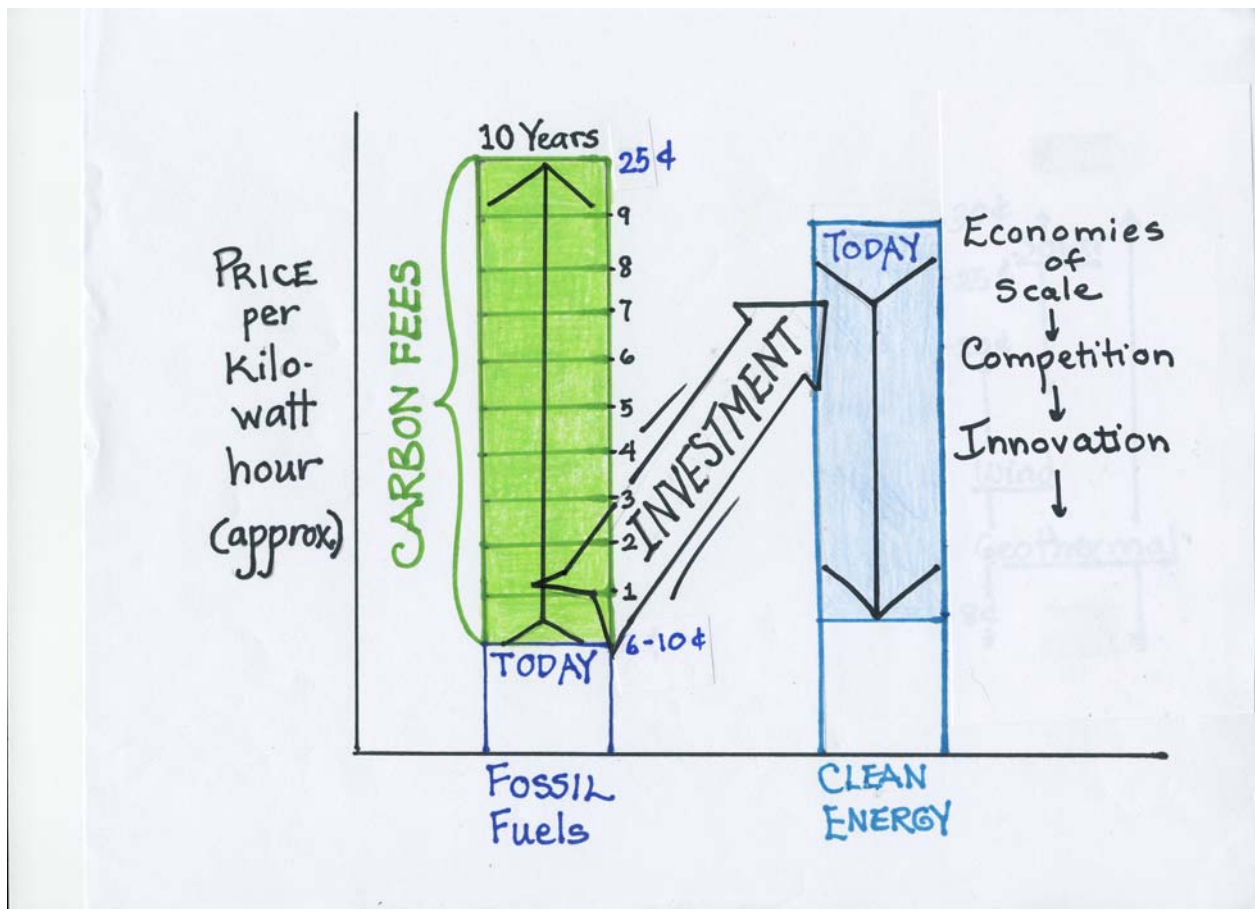
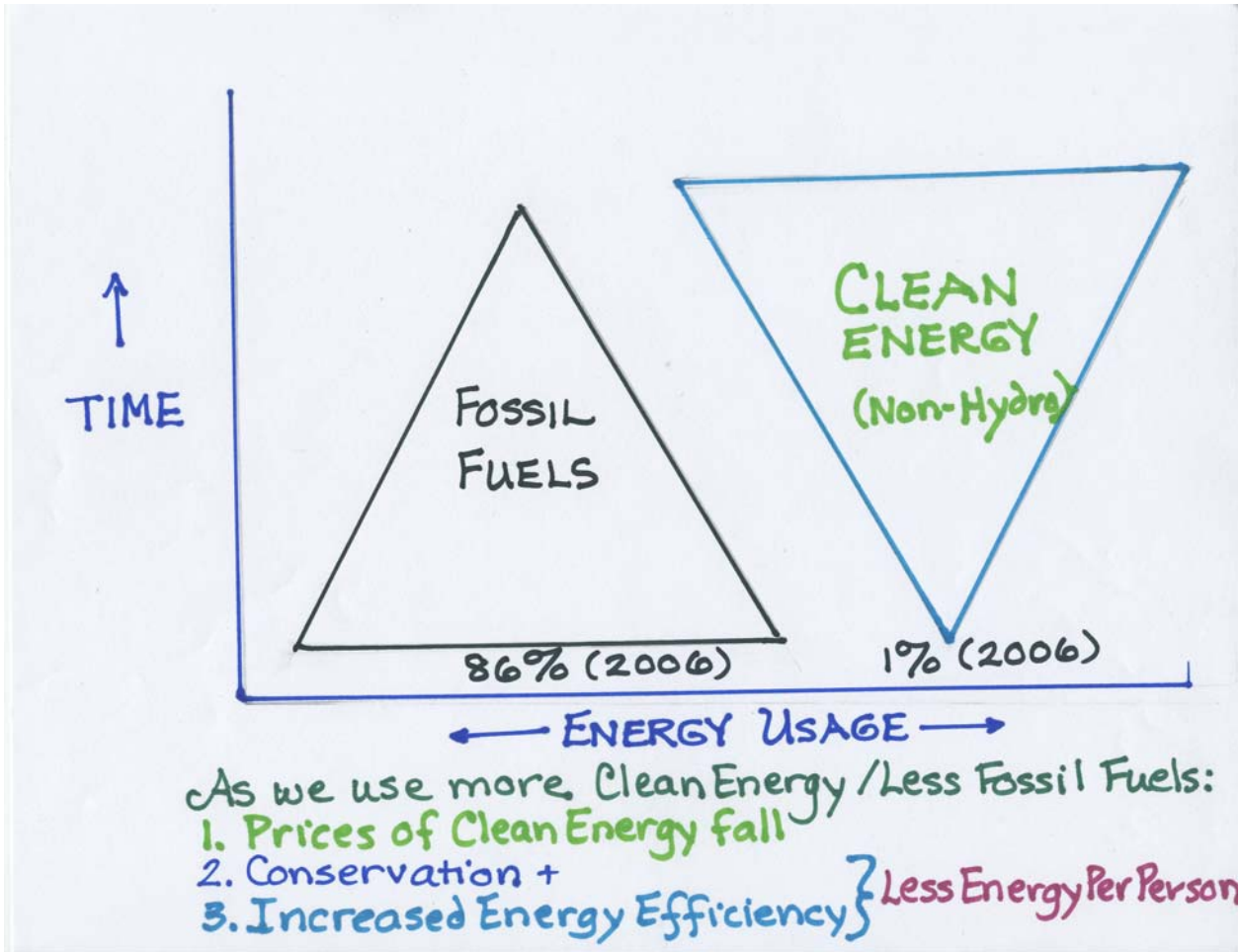


Illustration 4 – Why Energy Will Remain Affordable -- Even as Clean Energy Gains Market Share



As we use more clean energy and less fossil fuels, monthly fossil fuel rebates will eventually shrink. As shown above, however, there are 3 reasons why energy will remain affordable: (1) clean energy prices will fall (see Illustration 3), (2) incentives for conservation will continue, and (3) increased energy efficiency of new devices and buildings will lower costs. The last two factors will result in less energy used per person.