Good Morning Chairman Levin, Ranking Member Camp, and members of the committee. My name is Dr. Joseph Romm, and I am delighted to address you today about the energy tax code and the clean energy economy. I am a Senior Fellow at the Center for American Progress Action Fund here in Washington, D.C., where I edit the blog ClimateProgress.org.

I served as acting assistant secretary at the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy during 1997 and principal deputy assistant secretary from 1995 though 1998. In that capacity, I helped manage the largest program in the world for working with businesses to develop and use clean energy technologies. I hold a Ph.D. in physics from M.I.T.

I am honored to be given the opportunity to share my findings with you about how many existing provisions of the U.S. tax code directly inhibit the cost-effective commercialization and deployment of clean, homegrown energy, what can be done to remedy this, and how these actions will help jumpstart the U.S. economy and restore our leadership in what will certainly be the biggest job-creating sector of the century.

My new book *Straight Up* delves into the full nature of our current energy crisis problems and its solutions. It explains many of the unintended and uninternalized side effects that our nation's addiction to fossil fuels has on our economy, our national security, and on our environment. All of the findings I will discuss with you today are based on research conducted by me for my book and my blog, or are based on research conducted by my colleagues at the Center for American Progress Action Fund.

In my testimony today, I would like to stress three main points:

**First, strong government action is needed to address our mounting energy challenges.** Our over-reliance on fossil fuels, which harm human health, our billion-dollars-a-day addiction to imported oil, the economic threat posed by peak oil, our declining international competitiveness in energy technologies we invented, and the threat of human-caused climate change present a grave danger to our economy, our national security, and our children’s health and well-being. They are caused in large part by our out-of-date, uncoordinated, and counterproductive energy tax policy framework.

**Second, our existing policy framework, including our tax policy, is inadequate to address the challenges we face.** To address these problems, our nation needs to replace our existing patchwork of energy tax incentives with a comprehensive energy strategy—something we have not had for decades. We urgently need a shrinking cap and a rising price on carbon, which the House passed last year. We also need to eliminate the perverse subsidies hidden in our tax code that perpetuate our energy problems; increase transparency of government spending on energy tax incentives; and make existing tax incentive programs for clean energy more efficient, stable, and forward looking.

**Third, addressing our problems creates a real economic opportunity.** Addressing our energy and climate problems will create immediate and sustained economic growth, by fostering markets and demand for new technologies and new jobs in new industries; by freeing market forces and reducing uncertainty of our investors thereby unleashing a flow of private-sector capital to tackle our nation's energy challenges; and by catalyzing innovation, our nation's first and greatest competitive advantage.

I will elaborate on each of these core points in the testimony that follows.
1. Need for action

The United States sits at a profound crossroads in its energy and economic future.

Continuing the status quo will shackle our infrastructure and our economy for decades to the inexorable rise of volatile imported fuel prices; to outmoded and wasteful methods of production that rob our industries of the ability to compete internationally; and to the increasingly likely prospect of catastrophic climate impacts in a world that is 9°F warmer.

Meanwhile, the path of action will lead us toward economic prosperity and greater international competitiveness by driving demand and growing markets for the technologies of the future here at home; by utilizing America’s greatest competitive advantage: innovation; and by avoiding the need to dramatically reshape our society in response to the imminent and severe consequences of unabated human-caused climate change.

As Larry Summers, director of the National Economic Council, said recently: “Which has a greater danger going forward: that we will, in the name of comprehensive energy policy somehow do too much that will affect energy markets by encouraging efficiency or encouraging exploration, or that we will again miss the opportunity, that we will again not act strongly enough with respect to a gathering storm?”

Here’s what we can expect from a continuation of the status quo:

Cost of energy to increase, in part because of peak oil production

According to the Energy Information Administration’s “International Energy Outlook 2008,” world energy consumption is expected to expand by 50 percent from 2005 levels by 2030. This means energy prices will rise uncontrollably as ever-increasing demand outstrips our planet’s finite and limited supply. As an example, energy prices rose throughout the Bush administration, and the average family spent over $1000 more on energy in 2008 than they did in 2001.

In October 2009, Deutsche Bank’s report, “The Peak Oil Market: Price dynamics at the end of the oil age,” forecast a $175 a barrel oil price in 2016. Dr. Fatih Birol, the chief economist at the International Energy Agency (IEA) said in August, “We have to leave oil before oil leaves us.” The U.K.’s Independent opened its interview of Birol:

Dr. Birol said that the public and many governments appeared to be oblivious to the fact that the oil on which modern civilisation depends is running out far faster than previously predicted and that global production is likely to peak in about 10 years—at least a decade earlier than most governments had estimated.

Similarly, in February 2009, a Merrill Lynch research report warned of steep drops in existing oil production meant that we needed to replace an amount of oil output equal to Saudi Arabia’s production every two years.

A March 2009 McKinsey report concluded, “the potential looms for liquids demand growth to outpace supply creating a new spike in oil prices as soon as 2010 to 2013, depending on the depth of the economic downturn.”

More domestic production will do nothing to stop oil at $150 a barrel—and then $200 a barrel. Last year, the U.S. Energy Information Administration report, “Impact of Limitations on Access to Oil and Natural Gas Resources in the Federal Outer Continental Shelf” analyzed the difference between full offshore drilling (Reference Case) and restriction to offshore drilling (OCS limited case). In 2020, there is no impact on gasoline prices. In 2030, U.S.
gasoline prices would be three cents a gallon lower with full offshore drilling.

Finally, the peak oil problem is graver than it appears for one simple reason: replacing oil in the transportation sector requires strong government action two decades before a peak because of the time needed to replace vehicles and fuel infrastructure. That was the conclusion of a major study funded by the Bush administration’s Department of Energy in 2005 on “Peaking of World Oil Production.” The report notes:

The world has never faced a problem like this. Without massive mitigation more than a decade before the fact, the problem will be pervasive and will not be temporary. Previous energy transitions (wood to coal and coal to oil) were gradual and evolutionary; oil peaking will be abrupt and revolutionary.

**Fossil fuel dependence threatens our economic security**

- The volatility of the oil market during the last 30 years has cost the U.S. economy approximately $8 trillion.
- The United States currently imports approximately 70 percent of its oil. In doing so, we export tremendous domestic wealth—the United States spent $475 billion on foreign oil in 2008 alone.

**Fossil fuel dependence also threatens our national security**

- Because nearly 40 percent of our oil imports come from potentially hostile or unstable regimes, and 92 percent of conventional oil reserves are in these nations, U.S. dependence on oil weakens our international leverage and undermines our foreign policy objectives.
- Inefficient use and overreliance on oil burdens the military, undermines combat effectiveness, and exacts a huge price tag—in dollars and lives.
- Our energy grid’s inefficiencies and inadequacies pose a threat to our domestic military installations and their critical infrastructure, which are unnecessarily vulnerable to deliberate or accidental incident.

**Fossil fuel dependence harms our health and that of our children**

The U.S. National Academies reported in October 2009:

A major 2009 report by National Research Council examines and, when possible, estimates “hidden” costs of energy production and use—such as the damage air pollution imposes on human health—that are not reflected in market prices of coal, oil, other energy sources, or the electricity and gasoline produced from them. The report estimates dollar values for several major components of these costs. The damages the committee was able to quantify were an estimated $120 billion in the U.S. in 2005, a number that reflects primarily health damages from air pollution associated with electricity generation and motor vehicle transportation. The figure does not include damages from climate change, harm to ecosystems, effects of some air pollutants such as mercury, and risks to national security, which the report examines but does not monetize.

Nearly half those damages were from transportation. Natural gas, which accounts for 20 percent of our nation’s electricity generation and the “vast majority” of heating demands, only costs us a little over $2 billion annually in unseen costs.

These costs almost certainly underestimate the actual health costs of fossil fuels. The NRC estimated the total mortality due to our fossil fuel consumption at 20,000 people each year—10,000 due to coal alone. But the American Lung Association has reported that coal power plant pollution causes 24,000 premature deaths every
year by itself. In addition, ALA has estimates that coal pollution causes more than 550,000 asthma attacks, 38,000 heart attacks, and 12,000 hospital admissions.

A 2008 study by the Columbia Center for Children’s Environmental Health (CCCEH) found:

- Closing coal-fired power plants can have a direct, positive impact on children’s cognitive development and health.

  [P]re-natal exposure to coal-burning emissions was associated with significantly lower average developmental scores and reduced motor development at age two. In the second unexposed group, these adverse effects were no longer observed; and the frequency of delayed motor developmental was significantly reduced.

In November, *The Lancet* medical journal published six new studies that make clear “climate change is the biggest global health threat of the 21st century.” One of the papers followed 352,000 people in 66 U.S. cities. Kirk R. Smith, professor of global environmental health at UC Berkeley and lead author of the paper, said:

- Combustion-related air pollution is estimated to be responsible for nearly 2.5 million premature deaths annually around the world and also for a significant portion of greenhouse warming. These studies provide the kind of concrete information needed to choose actions that efficiently reduce this health burden as well as reduce the threat of climate change.

And that brings me to human-caused climate change itself.

**The science is clear: Climate change is real, fast, and dangerous**

Yes, the 3,000-page review of the scientific literature by the United Nations’s Intergovernmental Panel on Climate Change in 2007 had a couple of “trivial errors” in it, as *The Washington Post* put it.

But as a physicist who writes on climate issues, I’ve read much of the original literature and talked to dozens of the leading climate scientists. The real story was captured in a recent headline in *Scientific American*: “Despite Climategate, IPPC Mostly Underestimates Climate Change.”

The British Royal Academy, the oldest scientific body in the world, and the Met Office, part of the United Kingdom's Defence Ministry, further noted that “even since the 2007 IPCC Assessment the evidence for dangerous, long-term and potentially irreversible climate change has strengthened.”

The basic science is clear. Naturally occurring heat-trapping gases keep the planet about 60°F warmer than it would otherwise be, giving us the livable climate we have today. Since the Industrial Revolution, humankind has spewed vast quantities of extra greenhouse gases into the atmosphere, principally carbon dioxide from burning fossil fuels, causing more and more heat to be trapped. And so it is warming.

National Oceanic and Atmospheric Administration Climate Monitoring Chief Deke Arndt said in October, “The last 10 years are the warmest 10-year period of the modern record. Even if you analyze the trend during that 10 years, the trend is actually positive, which means warming.”

It may have seemed like a cool January in parts of this country, but globally it was the hottest January in the satellite record. And while it may seem counterintuitive, we actually get more snowstorms in warm years.
The Bush administration itself concluded in a major 2008 report, "It is well established through formal attribution studies that the global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases." That study noted we're already seeing more extreme weather events, especially intense precipitation.

In the past million years, the climate was primarily driven by natural cycles initiated by changes in the earth's orbit, which led to emissions of greenhouse gases, an amplifying feedback that caused rapid warming after long ice ages. As pre-eminent climatologist Wallace Broecker wrote in 1995, "the paleoclimate record shout out to us that, far from being self-stabilizing, the Earth's climate system is an ornery beast which overreacts even to small nudges."

Now we are punching the beast in the face by emitting billions of tons of global warming pollution a year. If we don't act quickly, then, by midcentury, CO2 concentrations in the air will reach levels not seen in 15 million years, when it was 5°F to 10°F warmer and seas were 75 to 120 feet higher, a 2009 study concluded.

Indeed, many studies make clear we risk 9°F warming this century alone. And that isn’t the worst-case scenario; that’s what is projected to happen [if] we stay anywhere near our current emissions trajectory. The plausible worst-case scenario, as the Met Office warned last year, is 13-18°F over most of U.S. and 27°F warming in the Arctic—and it could happen in 50 years. But “we do have time to stop it if we cut greenhouse gas emissions soon.”

The good news is that sea levels don't rise as fast as temperatures, but the bad news is that everywhere you look around the planet, ice is disappearing much faster than expected, including the dynamic disintegration of the great ice sheets on Greenland and Antarctica. Whereas the IPCC had ignored dynamic effects and predicted sea levels might rise perhaps only one to two feet this century if we took no action to reduce emissions, major studies since 2007 put the estimate at 3 to 7 feet, enough to generate 100 million environmental refugees or more.

Other studies warn that the U.S. Southwest could become [a] permanent dust bowl post-2040, with Kansas above 90°F some 120 days a year. A 2010 study in *Nature Geoscience* found that oceans are acidifying 10 times faster today than 55 million years ago when a mass extinction of marine species occurred. We are literally poisoning our oceans. Unrestricted burning of fossil fuels threatens a new wave of die-offs. The title of a recent documentary on ocean acidification put it bluntly: “Imagine a World Without Fish.”

The cost of unrestricted greenhouse gas emissions are nearly incalculable. A 2009 report by the International Institute for Environment and Development found the “net present value of climate change impacts” of $1.240 trillion on our current emissions path. Reducing emissions sharply offered a 6-to-1 savings over trying to adapt.

**The U.S. is falling behind in advanced manufacturing, innovation**

- China is a leading manufacturer of photovoltaic cells, second only to Japan, and it is set to be the world’s leading manufacturer of wind turbines by the end of 2009.
- A March study by the Pew Charitable Trusts, based on data from Bloomberg New Energy Finance, found that China was outspending the United States in clean energy by $34.6 billion to $18.6 billion in 2009.
- The United States had less absolute renewable power capacity than either China or the 25 member nations of the European Union as of 2006.
- The United States was investing far less in renewable energy annually in 2007 than Germany, which has only one-third the population of the United States and an economy that is less than one-fourth our size.
- The European Union committed to having 20 percent of its final energy coming from renewable sources by 2020 and China is working to have 16 percent come from renewable sources by 2020. Sixty-six other countries worldwide have indeed committed to nationwide standards, but our Congress has yet to set any, though the House climate bill did have a relatively weak new standard.
• Cars in China that get about 36 miles per gallon will be required to get 42.2 miles a gallon in 2015—an 18 percent increase over the next six years. European emissions agreements pushed mileage in Europe to about 40 mpg by 2006 and are on track to meet their target of 47 mpg by 2012. America, meanwhile, is aiming for only 35.5 mpg by 2012.

2. Energy tax changes we need
To be competitive in the 21st century, America needs what it has lacked for decades—a comprehensive energy strategy across all aspects of government. This requires creating new energy policies that internalize existing market externalities such as the cost of carbon and reshaping our existing tax incentives, which perpetuate these externalities by distorting the energy market with perverse incentives.

As members of the House Ways and Means committee, you have the opportunity to fix a number of fundamental barriers to clean energy that are limiting its growth, its job creating potential, and by extension the future competitiveness of the American economy. Our energy tax policies must be revised to eliminate perverse subsidies, increase transparency, and streamline and maximize the use of incentives for clean energy technologies that create jobs while benefiting our planet.

Remove perverse tax subsidies
Governments around the world provide some $300 billion each year to subsidize fossil fuels, with the U.S. among the leaders. A great many of these subsidies are obsolete, regressive, and downright perverse.

For example, newly released research by my colleague Richard Caperton shows how the outrageous practice of allowing oil companies to claim "percentage depletion" results in billions of dollars of lost government revenue. The money goes instead toward oil company profits.

Oil companies receive a large amount of government spending through the “percentage depletion” system. Without this subsidy, an oil company would only be able to deduct an amount that equals an oil well’s decline in value, as measured by the amount of oil drained from one of their wells in a year (say, 10 percent of the total amount of oil). This is called “cost depletion.”

Percentage depletion, on the other hand, allows an independent oil company to deduct a percentage of revenue (currently, 15 percent per year for the first 1,000 barrels per day) generated from that well even if that amount exceeds the well’s total value. This means that oil companies take deductions as long as a well is producing oil, without regard to how much, or whether, the well is still declining in value.

The Joint Committee on Taxation estimates the cost of percentage depletion by calculating the difference between the taxes companies owe under a percentage-depletion system and what they would owe under a cost-depletion system. They call the difference “excess of percentage over cost depletion.”

The result: Oil companies in 2009 were subsidized $1.3 billion at the taxpayers’ expense to deplete our nation’s finite natural resources as quickly as possible, while spewing planet-warming gasses into the atmosphere.

Allowing oil companies to claim percentage depletion over cost depletion means that taxpayers are writing oil companies a blank check on top of their already generous tax breaks to cover the costs of pumping oil out of the ground, which are already above and beyond their already astronomical profits. But excess percentage over cost depletion is just the largest of a long line of handouts our current tax code gives to oil companies, including other tax breaks for oil exploration, purchasing of mining equipment, tax breaks for enhanced oil recovery, and expensing of so-called "tertiary injectants."
Please see the attached table put together by my colleagues at the Center for American Progress Action Fund, which gives an overview of energy tax expenditure programs.
Some argue these subsidies are necessary to facilitate domestic fossil fuel production, and that increasing domestic production will offset imports. However, there is no evidence that these tax subsidies are necessary to make exploring, drilling, and pumping oil economical in the United States. Even George W. Bush acknowledged the strength of market prices in attracting oil investment when he told the American Society of Newspaper Editors in 2005, “I will tell you, with $55 oil we don’t need incentives to the oil and gas companies to explore.”
With oil currently at $80 a barrel—and projected by many experts to return to record levels within a decade—there is no reason to keep spending money so fruitlessly. Bush himself said the following year, “America is addicted to oil.” You don’t break your alcoholism by switching from imported to domestic beer. That goes for our oil addiction especially since we have 2 percent of the world’s oil reserves but nearly 25 percent of its demand.

Yet despite this, the Senate just last month passed a bill that perpetuated even more perverse tax incentives that harm our economy. On March 10th, the Senate passed a tax extenders bill that included tax subsidies for such technology as refined coal facilities, low-sulfur diesel, depletion of oil and gas wells, fuel from coke or coke gas. These companies have received decades of subsidies already, and the time has come to ask them to stand on their own feet and stop relying on taxpayer’s money.

The Obama administration FY 2011 budget would eliminate some of these perverse subsidies. The big five oil companies—BP, Chevron, Conoco Phillips, ExxonMobil, and Shell—made profits totaling $656 billion during the eight years of the Bush administration. In 2009, they made an additional $67 billion in profits (with Shell fourth-quarter profits projected). The last thing these companies need is billions of dollars of taxpayer-funded loopholes. The proposed budget would eliminate tax loopholes, including the counterproductive percentage depletion allowance that would cost $36.5 billion from 2011 to 2020.

The budget notes that, "[it] is counterproductive to spend taxpayer dollars on incentives that run counter to this national priority. To further this goal and reduce the deficit, the Budget eliminates tax preferences and funding for programs that provide inefficient fossil fuel subsidies that impede investment in clean energy sources and undermine efforts to deal with the threat of climate change."

**Stop investing in polluter pipedreams like coal to liquids**

While we clearly have too many existing tax subsidies for polluting fossil fuels, new perverse subsidies are sprouting up all the time. During my testimony on September 5, 2007, before the House Committee on Science and Technology, Subcommittee on Energy and the Environment, I pointed out that government incentives for liquid fuels from coal were a boondoggle waiting to happen.

Coal can be converted to diesel fuel using the Fischer-Tropsch process. During World War II, coal gasification and liquefaction produced more than half of the liquid fuel used by the German military. South Africa has employed this process for decades.

The process is not more widely used today in large part because it is incredibly expensive. It costs $5 billion or more just to build a plant capable of producing 80,000 barrels of oil a day (the U.S. currently consumes more than 20 million barrels a day).

Five to seven gallons of water are necessary for every gallon of diesel fuel that’s produced (and double that if you co-produce diesel fuel and electricity from coal), according to the June 2006 report, “Emerging Issues for Fossil Energy and Water: Investigation of Water Issues Related to Coal Mining, Coal to Liquids, Oil Shale, and Carbon Capture and Sequestration” by DOE’s National Energy Technology Laboratory.

This is not a particularly good long-term strategy in a nation and a world facing megadroughts and chronic water shortages from human-caused climate change. The heavy water demand is one reason chronically water-short China raised the capital threshold for liquid coal projects in an effort to scale back growth.

Worse than the water issue, the total carbon dioxide emissions from coal-to-diesel are about double that of conventional diesel, as the figure below based on EPA data shows (see figure):
Even with carbon capture and storage (CCS), coal-to-liquids still produces more greenhouse gas emissions than regular diesel fuel—and we are two decades away from large-scale commercialization of CCS.

Coal to diesel is a bad idea for the nation and the planet. A 2006 study by the University of California at Berkeley found that meeting the future demand shortfall from conventional oil with unconventional oil, especially coal-to-diesel, could increase annual emissions by 2.0 billion metric tons of carbon (7.3 gigatons of carbon dioxide) for several decades. That is more than current total U.S. carbon emissions and would certainly be fatal to any effort to avoid catastrophic climate impacts.

**Increasing transparency of tax expenditures**

Part of the reason why these companies can get away with such absurd subsidies is because of a fundamental lack of transparency in the tax expenditure system. In 2007, the federal government doled out $6 billion in direct spending on energy and $10 billion in additional under-the-radar tax spending not subject to congressional or even agency oversight or review. In the official budget, there is no itemized listing of the trillion dollars in tax expenditures of which this $10 billion in energy subsidies is a part. The only way to find the expenditures is to check a supplemental volume to the budget, known as Analytical Perspectives.

Altogether, less than 40 percent of total energy industry spending gets officially counted as “government spending” in the federal budget, and this number is shrinking as tax expenditures continue to balloon out of
control. Between 1999 and 2007, government spending on energy subsidies doubled in size, with almost all of the increase coming from fossil-heavy tax expenditures, which are largely hidden from public view.

To remedy this, new transparency measures are required. My colleagues Richard Caperton and Sima Gandhi put forth the following set of prudent suggestions:

- Tax expenditures need to be held to the same standards as other government spending. This means Congress should clearly state the goals of expenditures, should contain sunset provisions so that they expire and are re-evaluated, and should require periodic reviews of their effectiveness. Any safeguard that is designed to prevent wasteful spending should also be applied to tax expenditures.

- Congress should provide a rationale for each tax expenditure. When Congress decides to provide financial support to an industry through either a tax expenditure or direct spending, they should state why the chosen method is better than the other.

- Congress should hold agencies responsible for budgeting tax expenditures. Agency budget requests that are sent to Congress should include the tax expenditure spending programs that support their policy areas. Just as agencies are required to explain and report on their direct spending request, they should perform the same exercise on each tax expenditure within their purview. This exercise would hold agencies responsible for explaining how all forms of government spending it uses support its policy areas, and it would empower Congress with the ability to cohesively examine how spending streams work together.

- Congress should adopt standard practices for reviewing tax expenditures. A good start would be to ensure that each expenditure is covered by a requirement that the Joint Committee on Taxation, the Congressional Budget Office, or the relevant agency report on the expenditure’s history, size, and effectiveness.

**Streamline and maximize beneficial subsidies that level the playing field**

No industry should be permanently reliant on subsidies. That goes double for industries, like fossil fuels, that have the lion’s share of the market and many unmodified cost to Americans’ health and well-being. On the other hand, there are situations where energy tax expenditures can be used to promote the social good, by incentivizing investment in clean energy technologies.

**Production tax credit**

One example would be the “new technology credit.” This is also known as the “production tax credit”, or PTC, and is found in Section 45 of the tax code. As my CAPAF colleagues explain in their new report:

The credit is given to wind generators—as well as to other renewable energy technologies, such as biomass—and is currently worth roughly 2.1 cents for each kilowatt-hour of wind power generated. For each kilowatt-hour of electricity generated by a wind turbine, the company that owns that wind turbine gets a 2.1 cent tax credit.

To put this in perspective, a medium-sized wind turbine can generate 2 million to 3 million kwh per year, and the average price of electricity sold in the United States is 9.44 cents per kwh. So if a company has a wind turbine that generates about $250,000 in revenue, it will receive a PTC subsidy of $55,000. This subsidy will, in a typical case, increase the company’s after-tax profits by $20,000, which means investors...
have a higher rate of return than they would without the subsidy…

The Joint Commission on Taxation estimates the production tax credit for wind at $700 million in 2009. Unlike percentage depletion, the PTC does have a commonly understood goal: to increase the amount of electricity generated from renewable resources, including wind power.…

Also, unlike with percentage depletion, three different studies show that the PTC influences behavior. First, we can conduct a “natural experiment,” the results of which are illuminating. Researchers in a laboratory experiment often compare the effects of two different scenarios, one of which is the “control” and one of which has been modified, to determine the effect of the modification. In a “natural experiment” researchers find instances where a policy or similar factor changes and compare the before-change and after-change scenarios to determine the change’s impact.

The PTC has expired and been renewed several times in recent years, giving us a good “natural experiment.” Each time the PTC expires, we observe that investment in wind generation declines. Then, each time the PTC is renewed, investment in wind generation picks back up. The chart below indicates five different observation points between 1999 and 2006.…

But Gilbert Metcalf, an energy economist at Tufts University, has conducted a more sophisticated econometric analysis of detailed data on wind facility investment that accounts for the possibility of this sort of “gaming” of the system and other factors that could explain the ups and downs of wind investment. His conclusion is unequivocal: “[T]he data suggest that much of the current investment in wind can be explained by the production tax credit for wind.”

**Cash grant in lieu of investment tax credit (ITC)**

The investment tax credit is found in section 48 of the tax code. It subsidizes certain renewable energy technologies. My CAPAF colleagues note:

Under the ITC, some renewable energy projects are eligible for a tax credit for a percentage of the initial capital investment (up to 30 percent depending on the technology). The American Recovery and Reinvestment Act, however, temporarily allows project developers to receive a cash grant from the U.S. Treasury for the same amount. Companies that receive the cash grants are no longer eligible for the tax credit.

The rationale behind the change was that companies that most needed the tax credit had no tax liability to reduce. In order to provide subsidies to these companies, the government needed to use direct spending instead of tax expenditures. This change essentially turned a tax expenditure into direct spending without changing the total amount of government spending.…

The American Recovery and Reinvestment Act provides a “natural experiment” to show how transparency differs with tax expenditures and direct spending. Certain renewable energy projects are eligible for an ITC under section 48 of the tax code. Depending on the type of project the developer can get a tax credit for as much as 30 percent of their capital investment. ARRA, however, temporarily changed this to allow developers to get a cash grant from the U.S. Treasury in lieu of the ITC.

This temporary change has led to several significant outcomes. The primary result is that developers no longer have to be profitable to take advantage of the tax credit. Previously, developers that didn’t have significant tax exposure—which most developers don’t since their projects have yet to make money—had
to identify a “tax equity partner” to take advantage of the tax credit. This “tax equity partner” would contribute money to the project and, in return, get to use all the available tax credits. But as fewer companies had tax exposure due to the economic downturn, fewer “tax equity partners” were available, making the tax credit less useful to developers.

ARRA’s transition to a cash grant in lieu of the ITC has made financing renewable energy projects easier in the absence of a lively tax equity market.

**Eliminating passive versus active credit limitations for renewable energy**

A report put together by Lawrence Berkeley National Laboratory showed that there are many ancillary benefits to issuing cash grants in lieu of an ITC, such as the elimination of the owner-operator and power-sale requirements, which limit freedom of project developers to do financial innovation and find efficiencies, as well as exemption from the Alternative Minimum Tax. I quote from that report here:

Quantitative analysis of these ancillary benefits may also inform the development of a policy agenda for community wind, by revealing which of these benefits are most valuable to the sector.

For example, further analysis of the 10.5 MW project highlights the importance of the 30% cash grant – and especially the relief that it provides from passive credit limitations – for passive investors in community wind projects. Specifically, choosing the 30% ITC over the PTC does not provide much value to passive investors, because the passive credit limitations require all tax benefits (including the PTC or ITC and depreciation deductions) to be carried forward – potentially for many years—until they can be fully applied against the project’s own tax obligations. This delay reduces the present value of these tax benefits. Only if the project elects the 30% cash grant, which is not subject to the passive credit limitations, does it realize the full potential of wind’s temporary ability to choose among these incentives.

Passive investors have not played a significant role in most community wind projects built in the United States to date—perhaps precisely because of the negative impact of the passive credit limitations on the value of the PTC. But if community wind is going to penetrate the broader wind market to any significant degree going forward, it may need to increasingly look to passive investors to finance that expansion. In this light, seeking to extend the very limited window of opportunity for the 30% cash grant—which singlehandedly removes the largest impediment to the participation of passive investors in community wind projects—may be a logical top policy priority for the community wind sector. Alternatively, exempting the PTC and ITC from the passive credit limitations could provide similar relief, though without the other benefits provided by the receipt of cash rather than a tax credit.

The members of this committee should investigate this potentially fruitful and inexpensive way of promoting investment in community clean energy.

**Manufacturing tax credit**

One of the most critical things we can do to foster domestic clean energy industries in this country is realize that demand-side incentives for electricity production is not enough. While incentives that target utilities to encourage them to invest in clean energy infrastructure are an essential component of a comprehensive strategy, they are not enough. You cannot build a market out of demand alone, you must also create incentives for supply. That is why Congress was wise to implement the Section 48C Manufacturing Tax Credits for investments in manufacturing facilities and production capacity for the clean energy equipment and technology.
However, the program, passed under the Recovery Act, was limited to $2.3 billion, and was oversubscribed by nearly a 10-1 ratio. My colleagues at the Center for American Progress have advocated for an expansion of the program, and Vice President Biden in December 2009 announced the administration’s plans to add an additional $5 billion to the program, leveraging, an additional $15 billion in private capital.

Congress should recognize that each and every opportunity to create incentives for homegrown manufacturing of clean energy technologies are opportunities to grow our economy and make our industries more competitive internationally. Each opportunity should be nourished, and this program should be expanded to provide a stable flow of incentives for a fixed period of time, maybe 5 or 10 years, and then sunset.

**Energy recycling, and combined heat and power**

The transition away from fossil fuels, though inevitable, will not happen overnight and does not need to. Indeed, the House climate bill envisions the transition occurring over the next four decades. During that time, there are many steps that we can take through the tax code and elsewhere to dramatically increase the efficiency with which we use and conserve our finite supplies of fossil resources.

One way would be to expand the use of efficient combined heat and power, one of the simplest and cheapest steps we can take to reduce fossil fuel dependence while reducing emissions and creating jobs. Combined heat and power is a way of recycling energy. Power plants that produce steam, heating, cooling and other industrial facilities can tap into otherwise wasted heat flows to also provide electricity for free. This can increase the energy efficiency of industrial facilities by 50 percent or more, but currently, these technologies receive meager incentives from the government, with industrial energy recycling receiving no incentives whatsoever, and combined heat and power receiving only 10 percent investment tax credit capped at the first 15 megawatts.

A letter signed by the Center for American Progress Action Fund and more than 60 companies and organizations states:

I urge Congress to pass Rep. Inslee’s **H.R. 4144**, which would remove the credit’s limitation to smaller projects by applying it to a project’s first 25 megawatts. We also ask that Congress pass Rep. Tonko’s **H.R. 4751**, which would provide a 30-percent investment tax credit for highly efficient CHP projects (those with efficiencies above 70 percent) and recycled energy.

According to the Oak Ridge National Laboratory, a large-scale expansion of CHP could provide 20 percent of U.S. generating capacity by 2030, generate $234 billion in new investment, and create nearly 1 million new highly-skilled, technical jobs throughout the U.S. CO2 emissions could be reduced by more than 800 million metric tons per year, the equivalent of taking more than half the current U.S. passenger vehicles off the road.

Encouraging the adoption of these efficient job creating, energy-saving, and emissions reducing technologies would drive innovation and reduce our dependence on fossil fuels.

**More strategies**

I have made the case that production tax credits, cash grants in lieu of investment tax credits, and manufacturing tax credits are all effective means of leveling the playing field and giving clean energy technologies the opportunity to compete. But why stop there?

The entrenched status quo of fossil energy, as noted earlier, enjoys special tax breaks and benefits for everything, from depleting our nation’s oil reserves to exemptions from capital gains for coal investments to expensing of
refining equipment, as noted in the table attached above. By granting these special benefits to fossil technologies and not to clean energy technologies, Congress has distorted the market and inhibiting investment, innovation, and job creation.

Capital-intensive clean energy sources have a different cost-profile than expense-intensive fossil energy, which, given [the] current tax policy makes them artificially more expensive than fossil energy. According to the National Renewable Energy Laboratory:

For example, if a conventional fossil power plant were required to purchase all of its fuel up-front and the fuel were treated as a capital investment from a tax and financing standpoint, the cost of power would be more than double. If this up-front capital investment penalty could be eliminated, [clean energy, in this case concentrating solar thermal] could compete directly with the most advanced and efficient fossil fuel technologies.

Why not allow renewable energy companies to deduct 100 percent of their capital expenditure on land and equipment for clean energy development, the way that fossil companies can currently deduct their spending on imported fuels as business expense?

In addition, there are several other existing clean energy tax incentives that need to be extended. These include:

- Clarifying the rules for the Residential Energy Conservation Subsidy Exclusion (26 USC § 136) to ensure that residential solar thermal or solar electric projects are eligible. As of now, there has been no ruling by the IRS on what exactly constitutes an "energy conservation measure." This should be made as broad as possible to encourage all clean energy technologies.
- Extending the Residential Energy Efficiency Tax Credit (26 USC § 25C) beyond its current deadline at the end of 2010 so that homeowners can plan about the best time for them to upgrade their homes.
- Extend the Residential Renewable Energy Tax Credit (26 USC § 25D), which provides a 30 percent investment tax credit to homeowners installing solar thermal, solar electric, geothermal heat pumps, hydrogen, or small-scale wind power at their primary residence. Broaden this tax credit to also apply to Commercial properties.
- Strengthen the Modified Accelerated Cost-Recovery System, or MACRS, and Bonus Depreciation (2008-2009) programs (26 USC § 168, 26 USC § 48), by reducing the current five-year depreciation path to 1 year. Or, alternatively, expand bonus depreciation to 100 percent. These alternatives have the same end effect.

We must replace the currently entrenched status quo of permanent tax-incentive life support for old and dirty energy technologies with smart, targeted incentives for cleaner technologies and more efficient practices. But we must also avoid repeating the mistakes of the past: creating permanent subsidies so that the industry does not learn to stand on its own two legs and become competitive internationally. While I argue for a fundamental shift in tax priorities away from fossil and toward clean energy and efficiency, I also believe that such a shift should come with a transparent and predictable sunset plan, to ensure that we are not creating industries that are permanently dependant on federal handouts the way our current energy system is.

Once we have in place a shrinking cap and a rising price on carbon dioxide emissions, then subsidies should be phased out for most major energy technologies once they achieve a significant market share.

**3. Benefits of action**
Clean energy jobs are here

The clean energy economy is already producing jobs in a variety of industries and occupations across the country.

- More than 750,000 jobs at more than 70,000 individual firms already exist in industries related to expanding clean energy production, increasing energy efficiency, reducing greenhouse gas emissions, eliminating waste and pollution, and conserving water and other natural resources.
- These jobs require a wide diversity of education and skills—about 490,000 (65 percent) are in engineering, legal, research, consulting, or government administration sectors; about 197,000 (26 percent) are in renewable power generation, construction, systems installation, and manufacturing sectors.
- Clean energy industries have produced these 750,000 jobs without sustained policy attention or investment. In contrast, the well-established traditional energy sector employs only 1.27 million workers, even after decades of government subsidies.

Clean energy industries are seeing high growth rates

Green jobs consistently post incredible growth rates and are poised to expand on a massive scale.

- A June 2009 report from Pew Charitable Trusts shows that clean energy jobs grew by 9.1 percent between 1998 and 2007, while total jobs grew by only 3.7 percent.
- Another report shows that the renewable energy industry grew more than twice as fast as the overall U.S. economy.
- And according to the 2009 Green Collar Jobs report from the American Solar Energy Society, renewable energy and energy efficiency industries can create 37 million jobs by 2030 as long as policymakers support their development.

Investing in clean energy creates new high-quality, local jobs

Investing in clean energy jobs produces exceptional returns in terms of employment possibilities.

- After decades of intermittent support for renewable, Congress finally gave multiyear support to the wind tax credit. At the same time, more than half the states have embraced a renewable electricity standard. These two sustained boosts have helped increase the share of domestically manufactured wind turbine components in U.S. wind farms from under 30 percent in 2005 to over 50 percent last year.
- A 2009 study by the Political Economy Research Institute at the University of Massachusetts-Amherst in partnership with the Center for American Progress found that investing $150 billion in clean energy produces a net gain of 1.7 million new jobs and reduces the unemployment rate by 1 full percentage point, from the current 9.4 percent down to 8.4 percent. It also creates pathways out of poverty by expanding job opportunities to low-income working Americans, with roughly 870,000 out of the projected 1.7 million clean energy jobs accessible to workers with high school degrees or less.
- A 2004 study done by the nonpartisan Perryman Group in Waco, Texas in conjunction with the Apollo Alliance found that a $300 billion investment in a clean energy future would create over 3.3 million new jobs, spread across every state in the country.

Clean energy is more labor intensive than fossil fuels
Wind and solar photovoltaic industries offer at least 40 percent more jobs per dollar than coal, while optimized clean energy investments among a number of industries would create over three times as many jobs as investing in carbon-based energy industries.

• The clean energy sector produces more jobs per dollar than the fossil fuels industry because a larger share of clean energy expenditures go to manufacturing, installation, and maintenance—far more labor intensive than the extraction and transportation sectors that comprise most fossil fuel jobs.

**Clean energy’s potential is still untapped**

We have barely tapped the country’s potential for new energy production, even with all the gains the United States has made in transitioning to a cleaner energy economy.

• The wind energy industry has tapped less than one-half of 1 percent of wind’s potential generation in the United States.
• The four states with the highest potential wind power generation capacity—North Dakota, Texas, Kansas, and South Dakota—are estimated to have a total potential of 4,500 billion kwh, which is enough to power the entire country.
• The United States Department of Energy estimates that if 5 percent of the nation’s energy comes from wind power by 2020, rural America could see $60 billion in capital investment. Farmers and rural landowners would derive $1.2 billion in new income, and see 80,000 new jobs created over the next two decades.

**Clean energy jobs can help rebuild the middle class**

Clean energy jobs provide employment in numerous sectors throughout the economy and for people of diverse backgrounds and skill sets, but many exist in the manufacturing and construction sectors—traditionally "middle-skill" sectors offering entry into the middle class for workers without four-year college degrees.

• From 2007 to 2008, new construction of residential buildings was down a staggering 39 percent and commercial building construction was down 17 percent.
• Roughly 30 percent of jobs generated by clean energy investments will be in the construction industry. The Renewable Energy Policy Project concludes that a national renewable electricity standard of 25 percent by 2025 could produce over 850,000 new manufacturing jobs at existing manufacturing firms across the country.
• These jobs are evenly distributed across the country.
• Clean energy investments generate jobs that cannot be outsourced throughout multiple sectors such as construction, installation, and transportation.

**Investing in clean energy will save Americans money in the long term**

• **Savings:** The American Council for an Energy-Efficient Economy issued an analysis in July 2009 estimating that H.R. 2454 could save American consumers approximately $750 per household by 2020 and $3,900 per household by 2030.
• **Efficiency:** A recent report issued by the Political Economy Research Institute at the University of Massachusetts and the Center for American Progress finds that as little as $2,500 invested in energy efficiency retrofits could lead to cost savings to consumers of 30 percent annually on average.
- **Renewable electricity:** According to the Union of Concerned Scientists, a renewable electricity standard to generate 25 percent of the nation’s electricity from renewable energies by 2025 would create nearly $65 billion of consumer savings in electricity costs by 2025.

- **Green Bank:** The creation of a Green Bank to help fund the transition to a clean energy economy could provide favorable financing of renewable resources and allow investors a return on their capital. This will help keep costs low for consumers while making renewable energy competitive with current electricity prices.

### Conclusion

Our energy problems and their solution are all interconnected. Sen. Lindsey Graham (R-SC) said in January, “The odd thing is you’ll never have energy independence until you clean up the air, and you’ll never clean up the air until you price carbon.”

We need a serious price on carbon to have any chance of solving our interrelated problems of energy dependence, peak oil, clean energy competitiveness, clean air, and global warming problems. Until we have a shrinking cap and rising price for carbon, though, we need to use our tax code to correct existing market failures and to put clean energy on a level playing field with fossil fuels. To give businesses more certainty, clean tax credits should be extended for several years. At the same time, we need to stop subsidizing dirty energy.

In the conclusion to my book, *Straight Up*, I ask, “Is the global economy a Ponzi scheme?” This richest of all human generations has figured out how to live off the wealth of future generations. Investors (for example, current generations) are paying themselves (for example, you and me) by taking the nonrenewable resources and livable climate from future generations. To perpetuate the high returns that rich countries have been achieving in recent decades, we have been taking an ever greater fraction of nonrenewable energy resources (especially hydrocarbons) and natural capital (fresh water, arable land, forests, fisheries), and the most important nonrenewable natural capital of all—a livable climate. The next few years will determine whether or not we are all Bernie Madoffs.

The nation is going to wean itself from fossil fuels in the coming decades and adopt clean energy. That is a certainty. But the question of our time is will we do it fast enough? And will be beat the other major countries in Europe and Asia, especially China, who are racing to be the leaders in this most important of all job creating industries?

Humanity has only two paths forward at this point. As President Obama said in April 2009, “The choice we face is not between saving our environment and saving our economy. The choice we face is between prosperity and decline.” Either we voluntarily switch to a low-carbon, low-oil, low-net water use, low-net material use economy over the next two decades or the post-Ponzi scheme collapse forces us to do so circa 2030. The difference between the two paths is that the first one spares our children and grandchildren and the countless generations untold misery and gives us a serious chance at creating millions of clean energy jobs.