



Climate Policy and Economic Revitalization

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America faces urgent energy and economic challenges. They're tightly interconnected. The increases in concentrations of CO₂ in the atmosphere pose potentially catastrophic risks to human societies and natural systems because of increasingly extreme weather, ocean acidification, sea level rise, species extinctions and other global impacts. To avoid extreme risks to ourselves and to the rest of the world, greenhouse gas concentrations in the atmosphere must be stabilized at as low a level as possible and certainly no higher than 450 to 500 ppm, implying that within the next decade emissions of carbon dioxide must stop increasing and must fall thereafter by about 3 percent per year over the next 50 or 60 years. This requirement alone implies a sharp break with our past dependence on fossil fuels.

Breaking that dependency is also crucial to our national security. America now imports more than two-thirds of its oil, much of it from countries that are unstable, undemocratic, or unfriendly to us. This situation constrains our foreign policy and also requires a large military presence in the Middle East and elsewhere to defend our energy interests. At home, large central power plants, pipelines, LNG terminals, high voltage transmission lines and other energy infrastructure are all potential terrorist targets. We need an energy system that is more resilient, more decentralized, and more self-sufficient.

Finally, the United States faces the economic challenge of restoring economic prosperity. The present energy system inevitably implies increasing long-term scarcity and increasing economic burdens. Oil imports already account for much of the country's balance of payments deficit that has depressed the exchange rate and eroded our purchasing power abroad. In the future, these burdens will escalate because the costs of finding and producing new supplies are rising. One hundred and fifty years ago, the nascent oil industry found petroleum seeping out of the ground in Pennsylvania. Now, to replace declining reserves, the industry must drill a mile or more under the ocean or in the far north Arctic. The costs of supplying coal from domestic mines are also rising, in part because the best resources have already been mined.

The United States needs a transition away from this dependency and an economic stimulus that will spark a new wave of investment, innovation and employment, creating new industries, new technologies and new job opportunities. Other countries are already embarked on this transition and will take the lead unless the United States rises to the

challenge. So, for example, our share of the solar industry, which was 80 percent 25 years ago, has now fallen to under 10 percent. Economic competitiveness in a new energy era requires a rapid transition. The worldwide global economic depression now severely affecting the U.S economy requires bold and immediate action to address these imperatives.

The Immediate Priority: an Energy Efficiency Stimulus Package

In May 1931 John Maynard Keynes reported from New York that the U.S. banking system was insolvent: “They have purchased great quantities of second-grade bonds which have depreciated in value and their advances ... against real estate are inadequately secured. At any moment bank runs are liable to break out.... All this tends toward a mania for liquidity by anyone who can achieve it.” As happened then, the U.S economy has again fallen into what Keynesian economics described as a “liquidity trap”. Though the Federal Reserve has already driven short-term interests down to near-zero, financial institutions prefer holding cash to lending and longer-term interest rates remain high. Real interest rates are even higher because of falling prices across the economy, depressing business investment and creating risks of a deflationary spiral.

In these conditions, monetary policy has limited power to stimulate the economy. As Keynes recommended in trying to ward off the Great Depression, fiscal policies must be used to raise spending, both by direct government investments and by putting more money into the hands of consumers. As it was then, a fiscal stimulus package is now urgently needed.

Directing a large part of that stimulus toward outlays for energy-efficiency investments makes good sense. Firstly, such investments can be highly cost-effective, saving more money over time than the measures cost, thereby raising disposable income and spending power further. Studies show that at least fifteen percent of total greenhouse emissions can be eliminated at a savings. For example, housing retrofits can lower residential energy costs, helping households meet their mortgage payments. Secondly, many such investments have a relatively large employment impact because of the construction and installation labor involved. Thirdly, focusing the fiscal stimulus on energy efficiency makes a valuable contribution to the reduction of greenhouse gas emissions and the promotion of energy independence.

Many possible components to a “green” stimulus package have been identified, such as:

- Funding expanded federal, state and local programs to retrofit urban housing and public buildings with energy-efficient weatherization, lighting, heating and cooling;
- Directing a good portion of infrastructure investments toward public transit, commuter rail lines, urban bike paths and other “green” infrastructure;
- Investing in expanded transmission lines and the “smart” grid to promote energy efficiency and greater use of renewable power;
- Using personal tax credits or rebates to encourage the purchase and installation of energy efficient appliances and heating and cooling systems.
- Supporting construction of first-of-a-kind commercial-scale plants using innovative energy technologies, such as IGCC coal plants with carbon capture and storage.

A \$100 billion stimulus package featuring such components as these might create as many as a million new jobs and should be a prominent part of a short-term economic recovery program. Since the groundwork for these programs has already been laid by federal energy legislation passed in 2005 and 2007, as well as by numerous state and local initiatives, spending can ramp up quickly.

Building a Bridge to the Energy Future

This immediate recovery program will not only kick-start the energy transition called for by the Energy Independence and Security Act of 2007 and by President-elect Obama, but will also make the transition swifter and easier. If innovative technologies are scaled up and proven at commercial scale, they will be more quickly deployed. If transmission lines are built soon, then wind, solar, and geothermal energy investments will come on line more quickly. If the “smart grid” is built, plug-in hybrid vehicles will penetrate the market sooner. If bus, urban light rail, and intercity rapid rail infrastructure is constructed now, these alternative transportation choices will be available to consumers when needed. If the short-term recovery program includes facilitating infra-structure investments like these, the economy will become much more responsive to incentives discouraging greenhouse gas emissions. As a result, the increase in fossil fuel prices necessary to stimulate emission reductions will be less and the economic impacts of the longer-term energy transition will be much more favorable. Studies have found that creating a more flexible and responsive economy in this way will significantly improve the economics of an energy transition.

Longer Term Climate Policies for Economic Revitalization

Nonetheless, the transition toward an energy-efficient economy based on non-carbon energy sources will take decades to be completed. Policies must be enacted to sustain that transition in ways that simultaneously help revitalize the U.S. economy. Successful policies will greatly improve energy independence, prevent environmental damages from climate change and air pollution, promote technological innovation and leadership, create massive new investment opportunities, revitalize many mature industries and rural communities, and generate millions of well-paying jobs.

The essential core policy is one that puts a price on carbon dioxide and other greenhouse gases, thereby promoting energy efficiency and rapid penetration of non-carbon energy alternatives while discouraging continued reliance on burning of coal and other fossil fuels. An economy-wide price on greenhouse gas emissions reflecting their damages and threats to the economy will let decentralized market processes identify the most efficient responses by firms, industries and households. It will make innovation and investment in the most worthy of these alternatives highly profitable.

One way to do this would be to place a carbon tax on the sale of coal, oil and natural gas, in proportion to their respective carbon contents. The tax rate would be set to try to achieve the targeted reduction in emissions and would have to rise over time to keep the economy on a trajectory of continuing reduction. There is considerable uncertainty about the carbon tax rate that would be needed, and considerable political reluctance even to propose a new tax when the economy has been in a recession.

Another alternative is to enact a tradable permit system for the carbon content of fossil fuels in the U.S. economy. Under this policy, the roughly 2000 firms that sell coal, petroleum products or natural gas into the United States would have to hold permits issued by the federal government, for all the tons of embodied carbon that they sell annually in their fuels. These permits would be tradable among sellers, traders, fossil fuel users, speculators and other participants in the permit market. Making permits tradable would not only lead to a uniform carbon permit price but would also ensure that the sales of fossil fuels with the highest economic value take place, since those sales would be able to bid the highest prices for permits.

The tonnage of permits issued by the government would decline year-by-year to achieve the fifty to seventy-five percent reduction in carbon emissions necessary over the next half-century. As the supply of permits shrinks, the price of permits will increase. Consequently, the prices of fossil fuels will rise, reflecting sellers' increasing profit margins over supply costs. To reduce permit price fluctuations, permit holders would be able to borrow, lend, and bank permits from year-to-year.

Government-ensured price ceilings and floors could also be enacted to ensure even greater price stability. Should permit prices reach a ceiling price, the government would step in to sell additional permits. Should prices fall beneath a floor, the government would purchase permits. Certain and predictable permit prices would facilitate needed investments in new technologies. If the ceiling were set too low, however, then government permit sales might compromise the trajectory of emission reductions. This makes the decision regarding the ceiling price crucial to maintaining the proper trajectory. Another option by which the long-term emission reduction target could be maintained would be to stipulate that permits sold at the ceiling price would be "borrowed from the amounts to be made available in later years. In any case, both the trajectory and any price stipulations would have to be flexible enough to respond to new information about climate change and control costs.

This policy regime is known as an upstream cap-and-trade system. Like the cap-and-trade systems in use for other environmental problems, it allows market decisions to decide how and by whom emissions will be reduced cost-effectively. The system could be expanded to reward those who bring about permanent, verifiable and additional reductions in carbon emissions in agriculture and forestry or who sequester carbon permanently by allotting them valuable permits that could be exchanged in the permit market. Another method for expanding the system would be for the government to establish a reverse auction using general revenues for soliciting bids for the most effective projects. Such a separation of offsets from carbon pricing would maintain the overall integrity of the cap and trade system. This system can also be linked through trading with carbon cap-and-trade regimes now in operation or under construction in other countries, in order to promote even greater cost-effectiveness.

As fossil fuel prices rise over supply costs, permits to sell them will become increasingly valuable, worth in the aggregate \$100 - \$150 billion at the outset and rising over time. It would be a grave economic mistake to allow energy companies to realize windfall profits of this magnitude by awarding them free permits. These windfalls would benefit company shareholders while consumers pay higher energy prices. Giving free permits to

energy-intensive industries or other constituencies in response to lobbying or parochial political motives would also sacrifice important national economic objectives. Lobbying for potential Congressional earmarks and hand-outs based on these permits is already in high gear. The hundreds of billions of dollars generated by the right to sell carbon fuels should be captured by the government and used effectively to revitalize the economy.

In order to capture this value, permits should be auctioned, as is done with offshore oil leases and the use of the electromagnetic spectrum. Doing so will ensure that the most efficient fuel sources are able to operate and will provide significant new revenues to the federal government. These revenues could be used for a number of useful purposes, or for less useful purposes. They could be used to offset economic impacts by reducing other tax rates, especially of highly distorting taxes that impose large deadweight losses on the economy. They could be used to compensate low-income households for their increased energy costs through increases in the earned income tax credits or other refundable tax credits for low income households. They could be used to fund research and development of high-priority energy technologies, such as carbon capture and sequestration. They could also be used to help finance high priority energy infrastructure investments. When the economic recession is past, they could be used in part to reduce the federal budgetary deficit that will have been created.

What should be done with auction revenues?

All these uses of auction revenues would promote an efficient transition or ease the burden on lower-income households or both but other, less useful, ways of using auction revenues have been proposed. One such proposal advocates that auction revenues should be distributed equally to all individuals or households by mailing out government rebate checks every year. The supporting arguments are that it gives each American an equal stake in the common good of climate, that it solidifies public support for adoption of a cap-and-trade system, and that it more than compensates lower income household for the increased living costs they would experience from higher energy prices. However, distributing auction revenues equally to all households would sacrifice important opportunities to revitalize the economy and to improve the economic standing of lower income households. Other suggested approaches are better on all counts.

If a policy goal is to ensure that climate policy does not disadvantage lower-income people, there is no reason to distribute a significant share of the revenues to higher income individuals. Revenue recycling through changes in the tax code could be designed to target benefits on lower and middle income taxpayers by reducing income tax rates at the lower brackets, leaving those at the top brackets unchanged. Alternatively, social security and other payroll tax rates could be reduced, since liability for such taxes is limited to the first hundred thousand or so of taxable income and many lower-income individuals who have no income tax liabilities do pay social security taxes. The earned income tax credit regime could be extended. Any of these approaches would recycle auction revenues more progressively to individuals and households facing economic challenges by omitting payments to wealthier households.

Distributing rebate checks to all households also forgoes opportunities to reduce serious economic inefficiencies created by the present tax code. Using auction revenues to support tax reform could have economic benefits that offset much or all of the economic impacts of higher energy prices. For example, the unpaid personal income tax liability is estimated to be at least 20 percent of personal income tax revenues. The percentage is probably as large for the corporate income tax and social security taxes. The amount of tax revenue lost through evasion is probably almost \$500 billion per year, more than 60 percent of all federal non-defense discretionary spending. Even a fraction of those lost revenues, if reclaimed, could easily pay for federal programs to accelerate an energy transition.

Tax evasion is sensitive to marginal tax rates: the amount of tax evaded would fall by one to two percent for each one percent reduction in the tax rate. Using auction revenues to replace tax revenues foregone by cutting marginal tax rates would improve tax compliance substantially. Tax evasion is relatively common on incomes earned by the self-employed, by independent contractors and by workers who receive payments in cash or tips. The consequence of all this evasion is that, in order to make up the revenue lost, tax rates must be higher on incomes on which taxes cannot be evaded, such as wage and salaries subject to withholding. These higher rates create a significant drag on regular employment. A reduction in marginal tax rates would reduce this problem and stimulate employment.

Not only would reductions in marginal tax rates reduce evasion, they would reduce uneconomic distortions that are largely motivated by tax avoidance. For example, the tax deductions for mortgage interest payments distort household's decisions whether to buy or to rent housing. The higher the marginal tax rate, the greater is the value of the deduction and the greater the incentive to buy housing and to finance the purchase largely through borrowing. This distortion has drawn people who would be considered marginal buyers into the housing market and has contributed to the current wave of mortgage defaults. Lower marginal tax rates reduce the value of such deductions and their power to affect decisions.

Similarly, the higher the rate of payroll taxes, such as social security and Medicare taxes, the greater is the incentive for employers to hire workers as independent contractors, or temporary and casual workers. Contingent workers in these categories already constitute about ten percent of private employment, a rising share. Most such workers would prefer regular employment if it were available. For contingent workers, training, productivity gains, and permanence are sacrificed, with a real cost to the economy. Also, by remaining outside the social security system, they force up payroll tax rates on covered wages and salaries, putting an additional burden on employment.

Reductions in marginal rates of business taxes would also promote economic gains. For example, corporations use transfer pricing to shift profits to subsidiaries in overseas tax haven jurisdictions and then delay repatriating such profits back to the United States. Investment, employment and income within this country are therefore reduced. Lower corporate tax rates reduce incentives for businesses to use these tax avoidance mechanisms. Since both the personal and corporate income tax codes are riddled with

various exemptions and deductions, the incentives for engaging in distorting tax-avoiding and tax-evading behaviors are strong. Reducing marginal tax rates would result in significant efficiency gains.

Along with the benefits of less tax evasion and avoidance, reducing marginal tax rates generates other economic efficiency gains. These potential gains spring from the tax-generated gaps between the costs of labor to employers and the after-tax rewards to workers and from the gap between the cost of funds to investors and the after-tax rewards to those who supply their savings. These tax-generated gaps reduce employment and investment. The higher the marginal tax rates, the greater are these gaps and the greater the economic losses. Using auction revenues to keep federal revenues steady as marginal tax rates are reduced can make a significant contribution to economic revitalization. Distributing auction revenues in lump-sum rebates to all households forgoes this opportunity.

Economic analyses of these issues find that using auction revenues in support of tax reforms can offset much of the economic impacts of higher energy prices. Indeed, some careful economic studies find that the entire impact could be offset, leading to a so-called “double dividend”. One dividend is the reduction of greenhouse gas emissions and other consequences of fossil fuel dependence; the other is a more equitable and efficient tax structure that promotes more rapid economic growth. Introducing a short-run recovery package aimed at energy efficiency and an economically efficient longer-run climate policy can achieve both environmental and economic goals.