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Executive Summary
Tax Reforms to Advance Energy Efficiency
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As the 113th Congress convenes and President Obama begins his second term, "tax reform" is becoming one of the key catchphrases. Both Democrats and Republicans are supporting tax reform and actual work on legislation is likely to take place in 2013. Key elements of reform are likely to include simplifying the tax code in some respects and reducing marginal tax rates by eliminating many credits and deductions. Tax reform provides us with an opportunity to remove barriers to efficiency investments imbedded in the current tax code and to use the tax code as a tool to support energy efficiency in the future more than current provisions do.

Discussions about tax reform are just beginning and given the complexities and many political issues involved, it may take a few years before any reform is enacted. To promote energy efficiency as part of this process, we recommend that policymakers consider the following reforms in a revised tax code:

1. **Refine depreciation periods to more accurately reflect the average service lives of equipment.** Under current law, depreciation periods for many types of equipment are written into the law, and some of these depreciation periods bear little relationship to typical service lives in the field. Particularly egregious are the depreciation periods for equipment in commercial buildings, including heating and cooling systems, lighting fixtures and controls, and roofing systems. Currently, this equipment is depreciated over 39 years, the same depreciation period as is used for a new commercial building. However, lighting, cooling and heating equipment and roof systems typically have lives of 15-25 years, not 39 years. The 39-year depreciation period acts as a barrier to energy efficiency as many businesses will choose to repair equipment when it fails so as to avoid having to write off the un-depreciated value. Since equipment has been steadily increasing in efficiency, encouraging equipment replacement will save energy and also create sales and jobs for equipment manufacturers.

   Likewise, in the case of CHP systems, the depreciation period varies as a function of who owns the equipment and how it is used, even though often the same equipment is used by a variety of owners and for a variety of applications. We recommend that a single service life be selected for all owners, perhaps 15 years.

   Our preferred choice is to delegate the choice of depreciation period to the IRS, with instructions to use depreciation periods that match the average service life of equipment. In this way, Congress gets out of the weeds and this also allows for the fact that technology changes much more quickly than the law can change. If this is not possible, we suggest resetting depreciation periods based on the best data on service lives currently available.

2. **Refine existing energy efficiency tax incentives** to focus on using a market transformation approach to promote energy-saving technologies and practices that have a limited market share today, but where temporary federal incentives can advance these technologies and practices to the point where

they can prosper without federal incentives. Tax incentives first enacted in 2005 illustrate how a focus on advanced technologies can help to transform markets. For example, high-efficiency appliances, heating and cooling equipment, and new homes now have much higher market shares due in significant part to these tax incentives, and in the case of appliances, the original qualification levels are now standard practice and qualification levels have been tightened twice. Going forward, limited federal funds should be provided in four areas:

a. Very high-efficiency appliances, heat and cooling equipment, and windows
b. Very-efficient new homes
c. Efficient commercial buildings
d. Comprehensive retrofits to existing homes

We conducted an analysis on the costs to the Treasury of these incentives per unit of energy saved. Overall, the incentives we examined cost the federal government only $0.28 per million British thermal unit (Btu) saved—more than an order of magnitude less than the cost of the energy resources they save.[1] All of the options analyzed had lifetime costs under $2.50 per million Btu.

3. **Promote capital investment in manufacturing** by using low-cost approaches to spur increases in capital investment. Much of the equipment and production processes in America's factories are decades old and not as efficient as modern equipment and processes in use by many of our international competitors. Modernizing these factories will allow them to better compete in world markets by improving product quality and reducing product costs, including through reduced energy use. As we emerge from the Great Recession, many industrial firms have capital to invest, but a nudge from the tax code could spur substantial additional investments here in the U.S. We suggest three possible tax strategies that could spur investment but with low cost to the federal Treasury:

   a. Provide a low tax rate for repatriation of company profits *provided* these repatriated profits are used to increase a company's capital investments relative to their average capital investments in recent years.
   b. Allow accelerated depreciation on increased capital investments in production capacity, allowing companies to reduce their near-term taxes.
   c. Provide repayable tax incentives for increased capital investments. The credit would be taken on taxes in the year the expenses were made, but then the credit would be paid back to the Treasury in subsequent years.

   We recommend that at least two of these approaches be enacted. The first approach would benefit only large multinational firms, while the second and/or third approach should be included in order to

[1] For example, the Energy Information Administration, in their just-released *2013 Annual Energy Outlook,* estimates that natural gas will average $7.83 per Btu over the 2012-2040 period. See http://www.eia.gov/forecasts/aeo/er/pdf/0383er%282013%29.pdf.

benefit firms that primarily serve the domestic market. A firm would only be able to use one of the approaches.

For the commercial sector, a different approach is needed since much of capital investment is for land and buildings and not for energy-consuming systems. We suggest an option to provide accelerated depreciation for purchases of high-efficiency equipment in the commercial sector.

4. **Add a price on emissions.** Our present tax system largely taxes things that result from productive economic activity—wages, non-wage income, and corporate profits. An alternative is to collect some revenue from things that produce negative economic effects, such as cigarettes, alcohol, and (as proposed in this report) pollution. In the economics literature, these are now commonly known as Pigovian taxes. Many prominent economists and politicians have spoken in favor of using Pigovian taxes to regulate pollution. We are not suggesting that all revenues be collected from Pigovian taxes, but instead that an increased portion of the current tax burden comes from these taxes. We recommend working from a proposal examined by the Bipartisan Policy Center Debt Reduction Task Force that would set a fee of $23 per ton of carbon dioxide emissions beginning in 2018, increasing at 5.8% annually. They estimate that such a fee would raise about $1.1 trillion by 2025 while reducing emissions of greenhouse gasses to about 10% of 2005 levels. The revenue raised could pay for simplifying the tax code but with lower tax rates. For example, the Bipartisan Policy Center estimates a 2-tier 15-27% income tax rate would cost the Treasury $1.3 trillion over the 2012-2021 period relative to a modified base forecast that includes extension of the "Bush tax cuts."

5. **Consider ways to remove disincentives to energy efficiency investment from the business tax code.** Under the current tax code, individuals pay taxes on their income, and most expenses are not deductible. Exceptions may include interest on home mortgages and high medical expenses, but not energy expenses. Business taxes work differently. Businesses are taxed on their profits and virtually all expenses are deductible, including energy costs, which create several disincentives to energy efficiency investments. First, since energy bills count as a business expense and are subtracted from the total amount of taxable income, the federal government is effectively "paying" 25% of business energy costs, based on the average effective business tax rate of about 25% and sometimes as much as 35% of a business's energy costs (the maximum business tax rate). Subsidizing energy costs enables higher energy consumption. Second, when businesses do invest in energy efficiency, a portion of the energy savings goes to the federal government in the form of higher taxes (e.g., 25% for a business with the typical effective rate of 25%). When the full value of the savings does not accrue to the firm, the incentive to make investments goes down. This is the flip-side of the first disincentive.

   To address this problem we suggest two alternatives. First, the business tax could be shifted from a tax on profits to a tax on revenues. The tax code would be much simpler, the average tax rate could be reduced to about 3.25% (since revenues are much greater than profits), and energy (as well as other expenses) would no longer be deductible. A credit would be provided for taxes paid by upstream suppliers so that the same expense is not taxed repeatedly. This approach is a radical shift that needs further study. A more limited change would be to exclude energy costs from allowable expenses,

except for energy-intensive industries. Just as household medical expenses are no longer deductible except for those with high medical expenses, the same approach could be used for energy. Again, further study is needed.

6. **Eliminate or reduce subsidies that target the fossil fuel industry.** We did not examine these subsidies at length, but several other studies indicate that special treatment for fossil fuel industries cost the federal government around $12-13 billion annually. Broader tax incentives, such as Master Limited Partnerships, are not included in these figures, even though some of these incentives disproportionately benefit the oil and gas industries and other traditional energy supplies. We have not researched this issue in depth, but no discussion of tax reform is complete without at least mentioning that subsidies for traditional energy sources "tilt the playing field" towards increased use of traditional fuels, at the expense of energy efficiency. Most of these subsidies should probably be eliminated or reduced, leaving only subsidies for advanced technologies and practices that could benefit from a temporary federal incentive until they become well established in the market.

These reforms work in synergistic ways. Refining depreciation periods and improving the business tax both remove barriers to efficiency investments in the current tax code. A price on emissions and reducing fossil fuel subsidies help all energy sources to better compete on a level playing field. And tax incentives for advanced energy-saving technologies/practices and for increased capital investment in manufacturing both save energy and help U.S. businesses to be more competitive so they can better compete internationally as well as contribute to a growing domestic economy.

We examined the impacts of three of these provisions (depreciation, energy efficiency incentives, and capital investment) on the federal budget and of the largest provision (energy efficiency tax incentives) on the overall U.S. economy. This first analysis found that these three provisions will actually increase federal tax collections as the extra revenue gained will be about $30 billion more over a 15-year period than the cost of the incentives. This extra revenue is driven by two factors: (a) as energy use is reduced, business profits increase, and a portion of these extra profits are paid in taxes; and (b) a portion of the capital investment provision will be paid out of repatriated profits that would not be available for taxation if these profits remain "parked" overseas.

To estimate the impact of the energy efficiency tax incentives on the overall economy, we used ACEEE's DEEPER input-output model of the U.S. economy. The DEEPER model looks at cash flow in different sectors of the economy and estimates the impact of efficiency investments relative to the investments in conventional energy supplies that are displaced. DEEPER looks both at the investments and the impact of energy savings that are available to be re-spent. Overall, we found that these energy efficiency tax incentives will result in a significant increase in employment—an average of 164,000 jobs over the 2014-2030 period. The job gains start at about 52,000 in 2014 and steadily increase to about 300,000 in the final years. These job gains are driven by both increasing investments in energy-efficient products and services as well as reinvestment of the energy savings. Gross domestic product (GDP) also increases modestly as a result of this provision, with GDP up an average of $8.3 billion annually over the 2014-2030 period. Interestingly, since federal tax revenues are projected to average about 19% of GDP, the macroeconomic

impacts of these tax incentives will increase federal revenue by about $1.6 billion per year *in addition* to the direct benefits discussed in the paragraph above.

If enacted, these reforms could reduce barriers to cost-effective energy efficiency investments and contribute toward increase investments in efficiency. With careful attention to details, the tax code can be an enabler to efficiency investments and not a barrier.

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