

US Energy Policy: *A Changing Landscape*

In testimony before the Senate Finance Committee and adapted here, Phil Sharp describes unexpected developments in our energy markets.



The energy sector is undergoing a profound transformation, both in the United States and globally. Technological advances, new discoveries of fossil fuel reserves, and changed economic and demographic projections have prompted a dramatic reshaping of our view of the energy future. What does this mean for energy policy in the United States? Or, perhaps more accurately, what does this mean for the many layers of different, often overlapping, and sometimes contradictory policies that constitute “energy policy”?

First, it presents whole new set of

opportunities for both economic growth and “greener” production, along with a new set of risks. And as these opportunities and challenges emerge, they should be addressed with a serious dose of humility. Our understanding of the energy picture has changed over the past 10 years, and there’s no reason to expect our current worldview to be any more durable than our prior ones. Additionally, energy markets are vast, influenced by many factors, and, for most fuels, global in nature—making them very difficult for government policy to effectively redirect.

Our Changing Energy Picture

In the last decade, we have witnessed dramatic changes in America's energy makeup:

- » A raft of new technologies has entered the marketplace in virtually every sector of production, distribution, and use.
- » Dramatic new supplies of natural gas from shale formations are being produced.
- » Our dependence on foreign oil has declined significantly as a result of added oil production, improved vehicle efficiency, and a major increase in ethanol use. The expectation is for imports to continue declining.
- » Carbon dioxide emissions are in decline not only as a result of the economic slow-down but also because of heightened efficiency and a change in our fuel mix, especially in the electric sector. The expectation is that our emissions growth ahead will be modest.

These changes were driven by several factors: major price increases in oil and natural gas, entrepreneurial activism, decades of private and public energy research, and government policies.

The price of natural gas spiked at the



and to improve efficiency.

We have witnessed major price swings several times over the last four decades and each time have seen major changes in consumer, investor, and government behavior. Invariably, arguments arise over how the government might be able to

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beginning of the decade, and oil followed a few years later. As with past price rises, consumers and investors find ways to produce more and use less of the higher-cost fuel, and governments respond with new efforts to advance alternatives to oil

prevent the big swings up—or even down. Given the size of these markets, government policy is very unlikely to prevent such volatility; certainly, our previous experience with oil and natural gas price controls was not a good one. History suggests we should



A plant in West Burlington, Iowa, produces corn ethanol, a fuel that is increasingly replacing oil from foreign sources.

stop pretending we have solved the volatility problem or believing there is a simple solution if the government would just adopt it. Unexpected swings in basic energy prices are here to stay.

Another factor is entrepreneurial risk-taking. Incentivized by high prices and government policy, some entrepreneurs defied the conventional wisdom about what is possible. This was particularly the case with respect to shale gas development. For years, the common perception was that the gas trapped in shale could not be economically extracted, and it was not until smaller companies took on the risky, ultimately profitable investments that the major companies began pursuing this resource. Such risk-taking also has been important in the development of wind, solar, and other renewables as well as efficiency technologies

Also contributing to the changing energy picture are decades of private and public research on a host of technologies, includ-

ing solar, wind, auto efficiency, advanced vehicles, digitization of the electric grid, and advanced nuclear reactor designs. Alongside this research, state and federal governments have instituted a variety of policies that promote market adoption of more efficient technologies and practices as well as renewable and alternative fuels—from the Production Tax Credit, initially adopted in 1992, to various state renewable portfolio standards in the electric sector.

The Unexpected

Forecasting market and technological developments is a very uncertain business: many defy views that were widely held at the beginning of the decade. The dramatic rise in natural gas and oil prices, the development of shale gas, the marketing of hybrid vehicles, the reduction in oil imports, the decline in carbon emissions, and the licensing of a new nuclear plant are but a few examples.

In many respects, these developments of the last decade are very positive, but the picture is also marred by the terrible explosions at the Macondo Well in the Gulf of Mexico and at the nuclear reactors in Fukushima. These were painful reminders that the scale of our energy operations entails major risks. And with respect to global warming, neither our government nor much of the international community has yet found a strong path forward.

Perhaps the most significant development of the last decade is the new natural gas supply. Already it is generating major economic benefits for the nation. At the same time, it generates a number of uncertainties and challenges. Industry and government must work through a number of issues—water pollution and scarcity, air pollution, and methane leakage—to assure responsible development. This is a widely held conviction, articulated by the secretary

of energy's task force led by John Deutch (who serves on RFF's Board of Directors) and by the National Petroleum Council's study, *Prudent Development*. Meanwhile, the public discussion has been exceedingly stormy, making it difficult for many citizens to sort out the real risks from unfounded fears.

How fast this major new resource will develop is not altogether clear, nor is what kind of price volatility to expect, given the limited experience with developing and marketing this resource. Already we see shrinkage in shale gas production as the excess supply has driven down gas prices and drillers have focused on more lucrative tight oil wells and gas wells with associated

liquids.

The new gas supply is creating significant adjustments in planning and investment for virtually all other major fuel sources. The near-term impact of lower natural gas prices has been to change the way electric utilities are using their current generating capacity—using more gas and less coal. In the longer run, the supply picture is changing the calculations used by utility companies and state regulators to assess new facilities and the various trade-offs among coal, nuclear, renewables, and natural gas.

With respect to greenhouse gases, there is dispute over how much methane leakage occurs in the course of current development activities and to what extent this can be



A pump jack extracts oil from shale that was drilled using hydraulic fracturing in the Southern Texas Eagle Ford Shale Formation.

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mitigated. The larger question is of natural gas's impact in replacing other fuels in our energy mix. To the extent, for example, that it replaces coal in our electric generation, it is clearly beneficial with regard to carbon dioxide emissions, so long as methane leakage is minimized. To the extent that it replaces nuclear or renewable sources, it is likely to increase the carbon intensity of our energy mix—though it also has the potential to work well with renewables in managing the problem of intermittency with wind and solar and enhancing the use of those sources. RFF experts are examining some of the major issues associated with natural gas in a multi-year initiative, *Managing the Risks of Shale Gas: Identifying a Pathway toward Responsible Development* (see page 19 of this issue for the latest results of this project).

The Possibility of Significant Tax Reform

Congress has adopted a host of recent energy policies to grapple with some of these issues, most notably the so-called comprehensive energy bills in 2005 and 2007 and the stimulus package of 2009. Not since the 1970s has there been as much effort by the US government to reshape our energy markets as in this last decade. And now Congress is gearing up for a major overhaul of the tax code, which potentially can affect the advancement of technologi-

cal research, market adoption of various fuels, and our approach to climate change.

The challenges of attempting a tax-code overhaul of a magnitude as great as or greater than last achieved in 1986 are considerable: How to address the critical need to get America's fiscal house in order? How to reshape the code to better support economic growth in a highly competitive world? How to address the conflicting views over what is fair?

Many reformers advocate simplification, elimination of most of the deductions or tax preferences, and rate reductions. On paper this may add up, but in practice it is considerably more difficult. To achieve significant reform that focuses on economic progress and efficiency, Congress may want to consider some version of a carbon tax with revenues dedicated to cutting other taxes that impede economic growth.

A carbon tax has several features that make it an attractive option from an economic perspective and, from a political point of view, a potential avenue to enable the transformation of the tax code:

- » It is a policy that fits well with market economics.
- » It could generate revenue that, if recycled into the economy by cutting so-called distortionary taxes, has the potential for contributing to economic growth rather than being a depressant.
- » It has many design options that make it



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