



## Renewables

### Money is not enough - US Energy Infrastructure

James Morin - Truman National Security Project

19 January 2009

**The inauguration of President Barack Obama marks a historic turning point and rightfully provides many reasons for hope in the United States and abroad.**

Just as the election of an African-American as President would have surprised political observers even a year or two ago, so, too, might they be surprised by the attention and potential resources being given to federal energy infrastructure policy.

Washington is now focused on how to address long-term energy problems while immediately injecting massive fiscal stimulus into the economy. While much of the stimulus is slated to go towards other areas, hundreds of billions will and should go to clean energy infrastructure in the form of renewable energy production and energy efficiency.

Looking beyond the spending binge, however, there seems to be less discussion paid to the long term role of the federal government in driving and sustaining the economics and finance of clean energy infrastructure. A timely question to ask is what should the Obama administration do now to support the development of the energy infrastructure that America needs not just over the next two years, but for the next thirty?

There are enormous stakes in this national venture. Energy policy, including how energy is produced, distributed and consumed, has become the collision point for several challenges facing America - each formidable on their own.

National security and a desire to improve America's foreign trade balance have led to widespread interest in reducing petroleum imports. Geopolitical pressures also call for a demonstration of American leadership through earnest efforts to significantly reduce our greenhouse gas emissions. Finally, the increasingly severe economic recession has demonstrated the need for a massive Keynesian stimulus by the federal government, on the scale of US\$800 billion to US\$1.2 trillion.

#### **A massive need for massive capital spending**

At currently proposed levels, the stimulus plan will be the most expensive government expenditure programme since World War II, a fact that has been the source of much criticism.

But the comparisons between the current stimulus and historic wartime Keynesianism are more positively illuminative than their proponents likely intended. The wartime build-up put America back to work while massively retooling almost the entire manufacturing industry to meet the nation's needs.

One might consider the post-war expansion as a dividend on that investment. The current efforts, at least in part, seek to put America back to work through a fundamental retooling of the energy industry into one that consumes less, emits less greenhouse gas and imports less fossil fuels.

As with defence technologies, renewable energy technology deployment will only be profitable initially with governmental help. In the near-term, traditional energy production from coal and natural gas are now and are expected to remain considerably cheaper by the kilowatt-hour than wind, solar, and other renewable sources of energy. This is even truer for emerging technologies such as carbon capture and storage, tidal power and hydrogen-based power.

Beyond that, many consumers will continue to choose to pay a higher monthly electric bill than make a large initial investment in efficiency. Indeed, Lord Stern found that British consumers would not put money into energy efficiency until they could expect a 30 per cent rate of return on the investment. Consequently, realizing US policy goals for renewable energy and energy efficiency will require significant policy tools that improve their economics, both short- and long-term.

While almost universally popular in concept, the renewable energy industry faces several significant obstacles to achieving true economic viability. Each of these obstacles may require a unique policy stimulus to be overcome, and some of the obstacles will require multiple policy impacts.

The first problem is price competitiveness with fossil fuels. New technologies and incentives can alter this balance. Robust federal aid for classic long-term research and development is already in place in the United States. The Department of Energy supplies grants and other assistance to researchers, with appropriations of more than US\$1.7 billion in 2008, and the new administration has promised to increase this scale of investment to more than US\$150 billion over the next 10 years.

Investments in fourth generation biofuels and other technologies promise to eventually reduce the pain to consumers associated with the dramatic reduction in carbon emissions called for by the middle of this century. Even now, though, barriers to implementing many of these new technologies are more financial than technological.

Research and development funding must be complemented by a price stimulus that encourages energy consumers to use the resources wisely. Residential net metering and smart grid technology may help provide such a stimulus, as have the production tax credits and many state programmes.

In the coming years, an even stronger stimulus is likely to come from one or both of two sources. During the campaign, Obama advocated a renewable portfolio standard of 25 per cent of electricity by 2025 - a robust figure, indeed, but the experience in Europe and some American states has demonstrated the very positive impact that an RPS can have on renewable energy projects. Combined with a greenhouse gas cap-and-trade scheme in the United States, these policies are even more likely to level the playing field between clean and traditional sources of energy.

Incentives also must be in place to expand the use of energy efficiency technologies and investments, but it is important to note that gains from such efforts may be offset by other efforts to fulfill climate change and energy independence goals. A potential example is the strain on the grid of electric vehicles plugging in to charge overnight (or during the day).

Aside from competitive pricing, another significant, if less widely discussed challenge to the renewable energy industry relates to long-term predictability of these policy stimuli and the impact that has on the expectations of equity investors and the rates charged by lenders. This is especially important when considering the effects of the credit crunch, risks associated with commercial scale deployment of nascent technologies, the shortages in manufacturing and transmission capacity as well as the sheer scale of the necessary capital expenditures.

Energy projects are invariably capital intensive. Morgan Stanley, for instance, has calculated that simply meeting project energy demands in the United States will require capital

expenditures of more than US\$900 billion over the next fifteen years, without any shift towards renewable energy generation.

A low carbon emissions scenario will require increased expenditure of US\$197 billion over the next ten years in the wind industry alone, according to the Department of Energy. But when viewed over a longer period, such investments can be a good bargain - particularly one that assumes escalating fossil fuel costs and sustained incentives from the government to maintain their relative advantage.

This is also true for investments in energy efficiency as groups such as the American Council for an Energy Efficient Economy calculate that by 2030 the annual capital spending needed to fully realize the potential of energy efficiency may be more than US\$700 billion.

### **Who Should Bear Carbon Policy Risk?**

What concerns many potential sources of project capital is that it is not clear that federal policy and fuel prices will remain strong enough to sustain these economics throughout the length of their investment, which, depending on the individual project, may require five to thirty years to offset the increased initial costs.

History provides investors and lenders good reason to take pause.

In the wake of the energy crises of the 1970s, President Jimmy Carter sponsored the creation of the Synthetic Fuels Corporation (known generally as SynFuels). In a now-familiar concept, the federal government would finance the development of energy independence through as much as US\$88 billion in loan and price guarantees, purchase agreements, and joint ventures. Needless to say, this new industry did not materialize - only one coal-to-liquid fuel project ever came into fruition.

Several phenomena were responsible for the demise of SynFuels. One was placing too much emphasis on a single technology - a lesson that should guide policymakers as they structure new proposals. The drop in oil prices was especially damaging. During the 1980s, the price fell to US\$12 a barrel - well below the US\$92 a barrel forecasted as necessary to make synthetic fuel economically competitive.

Another arguable impact was the Reagan Revolution. A year into its creation, the Reagan administration changed attitudes about government-funded forays into the marketplace and curtailed support for the already troubled enterprise.

For sustainable energy these latter risks are still present. The drop in oil and gas prices has already impaired the economics of many projects. The political climate is promising now, but no one can predict how it will look in two, let alone 30 years. This year's back-and-forth with tax incentives hardly inspires confidence. Congress today cannot bind the hands of a future Congress, making "carbon policy risk" a real danger to firms investing and lending heavily to clean energy projects. Recognition of that risk, in turn, demands a premium, which, in turn, impacts the financial competitiveness of individual projects.

The government has many potential avenues of assuming some of this carbon policy risk. Federal insurance or direct loan programmes might be able to do so, though scale and dexterity might be a challenge. Ironically, perhaps the most powerful way for the government to bear this risk and ensure affordable access to capital is through the securitization model that is cited as a significant contributing factor to the current economic crisis.

In 1938, the Federal National Mortgage Association (Fannie Mae) was created to foster a secondary market for home mortgages. Over the next 70 years, Fannie Mae, Freddie Mac, and the Federal Home Loan Banks and eventually private sector banks helped to create a vigorous liquid market for mortgage securities throughout the country, making it possible for a strong mortgage candidate in Kentucky to access the same credit at the same price as a

similarly qualified candidate in New York. These government-sponsored enterprises performed exactly what as intended, enabling US\$5.3 trillion to flow into housing finance, providing widespread access to long-term loans for homes, driving up homeownership (and home prices). These institutions also bore the risk of long-term interest rate fluctuations, while making 30-fixed mortgages broadly available in the United States on a scale never approached in other countries.

Ginnie Mae, the government-owned and operated sister to Fannie Mae and Freddie Mac, that deals only in commercial paper guaranteed by the Federal Housing and Veteran's Administrations, has seen its balance sheet grow by more than a third in the last year - serving as a last bulwark against the total collapse of the US residential housing market as Fannie Mae, Freddie Mac and the Federal Home Loan Banks were battered by defaults on subprime mortgages.

Instead of an outright rejection of the principle of government support for liquidity, the lessons of the credit crisis may more appropriately be a study in flawed corporate governance. Moreover, it is important to note a fundamental distinction between housing and energy. While housing is a basic human need with inherent long-term demand, the need for greenhouse gas emission reductions is intangible. Rather those reductions are a utilitarian social good that require valuation through government-directed commoditization. But a commodity created by government to promote the social good is inherently more dependent upon government and government-supported liquidity in its marketplace.

## **Conclusion**

With a panoply of sustainable energy loan guarantee programmes already in place through various agencies, the decision to give supply side assistance to debt financing has already been made. Regardless of the final form chosen, it is increasingly clear that the federal government will need to take advantage of its scale and permanence to provide investors the confidence they need before making massive capital investments in energy efficiency and renewable sources.

Raising our eyes from the current wrangling over the stimulus package to the next thirty years of economic prosperity, energy sustainability and independence, strong efforts must be taken immediately to get the economy moving and to create the infrastructure necessary for this radical transformation.

Simply throwing money at the problem, however, will not be enough. The government must employ numerous avenues to encourage investors, utilities and consumers to make wise choices in the way energy is produced, distributed and consumed in the United States. The incoming administration needs to create and continue to support a sustainable policy for sustainable energy.