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Briefing Note

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Where is the U.S. energy market today?

Policymakers in the United States are spending a great deal of their time during this election year discussing energy production strategy. And although energy has always been a politically emotive issue, it has become an even more significant debating point among both parties as they focus on the different opportunities and challenges presented by the well-established as well as the relatively nascent energy production sectors of the US market.

This complex and sometimes confusing debate is further complicated because the U.S. does not have a specific "National Energy Plan". Each administration sets forth its policy goals, but those generally do not have the force of law (unless embodied in various Energy Policy Acts). The reality is that the U.S.'s current "plan" is a laissez-faire, market-based approach, which has created an energy supply system that responds to price signals – but not much else.

Such an approach is also likely to create a certain degree of uncertainty over which of the sectors in the U.S.'s diverse energy market are likely to be given priority over the coming years.

In this article, we analyse some of the most significant issues in each of the main sectors in the U.S. energy market to assess the prospects for each one.

Electric generation

In the current "unbundled" U.S. power sector, generation is driven by short-to-medium-term economics, rather than integrated planning, as was the case in the past. Without strong government incentives and subsidies (or a mechanism to properly price carbon fuel externalities, which is, in effect, a political non-starter), most renewable energy projects cannot compete on price with natural gas-fired generation, given very low prices created by the abundance of shale-based supplies (see section entitled "The Shale gas revolution").

Thus, of the 222 GW of projected new generation in the U.S., 58 per cent will be gas-fired, with 258 new gas plants to be built between 2011 and 2015. Natural gas generation, which is currently about 25 per cent of total generation, is projected to rise to 30–40 per cent.

Generation from renewable sources

U.S. renewable generation has been the beneficiary of subsidies, incentives and set-aside programs. These have included Production Tax Credits, "1603" grants in lieu of tax credits, U.S. Department of Energy loan guarantees to provide cheaper-than-market financing and the critical requirement that utilities, within a given state, purchase a portion of their generation from "green sources" (generally known as the Renewable Portfolio Standard, or "RPS", which varies from state-to-state). However, a number of these incentives have either already expired, or will soon do so, and there is increasing consumer push-back against the higher cost of green power. Thus, the question is whether these renewable sources of generation will still be developed and installed, if they must stand on their own economics and compete against the low prices of natural gas.

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We consider some specific sources of renewable energy:

- **Wind** – Installed wind power can compete with fossil generation in some markets in the U.S. (e.g., Texas), but without Production Tax Credits, tax grants, Department of Energy Loan Guarantees and other incentives, the installed cost will rise.
- **Central solar** – Although large-scale solar stations have been built and additional ones are under construction, it is to be seen whether they can be built without subsidies. The U.S. Government is supporting such projects indirectly by making available large tracts of Federal land in the West. But, as with all intermittent sources of generation, the concern remains whether such a large project needs to be off-set by other generating sources (often, using fossil-fuels) to ensure reliability.
- **Distributed solar** – The promise of "rooftop" solar is developing on two separate tracks – residential installation on a "solar lease" basis that has no up-front charge, but collects a monthly rent from homeowners set just below projected utility costs (with back-up power from that utility), and large-scale installations on "big box" buildings, such as warehouses and military installations. The U.S. Department of Defence is interested in making its installations more self-sufficient, so it is likely that rooftop solar and inside-the-fence solar arrays may play a large role as part of any such plan, with higher cost being justified as a national security expense.
- **Biomass** – As it has since the 1978 Public Utility Regulatory Policies Act was passed, biomass will continue to be a niche market in the U.S. and is not expected to play as large a role as it does in Europe. The idea of growing plants to burn to make power does not strike people as very "green", unless the project is replacing a coal-burning facility. The amount of burnable biomass waste is often perceived to be problematic.

- **Geothermal** – Where the geology supports it, these types of projects have been successfully developed in the U.S. There was a flurry of projects under the U.S. Government subsidies (and RPS requirements) noted above, but whether they will continue to make sense on a stand-alone basis is yet to be seen. There is always the risk that the amount of geothermal gas and fluids at a given location are not as great as was first predicted, jeopardizing continued operation.
- **Demand Side Reduction (DSR)** – The "Negawatt" clearly makes sense to anyone who has studied energy futures, but the pricing incentives for DSR are limited. While consumers can save money by shutting off light bulbs and the U.S. Government has passed laws mandating energy-saving devices, programs are just beginning that compensate electric utilities for selling less power. Indeed, the most effective promoter of DSR seems to have been the recent recession, causing electric demand to drop throughout the country. Given that a smart phone could potentially use as much electricity as a refrigerator (taking into account cellular transmission and data servers), and given Americans' fascination with all such devices (to say nothing of electric cars), personal consumption of electricity is, in reality, likely to grow rather than decline.

Nuclear power

Post Fukushima, the "nuclear renaissance" in the U.S. has retreated to the Dark Ages. Only one or two new nuclear projects will be developed by utilities that can absorb the costs in rate base (e.g., Southern Companies' Vogtle Project and Scana Corp's V.C. Summer Project). Future projects (and handling of spent fuel) will be impeded by post-Fukushima safety requirements and there remains no long-term solution for nuclear waste in the U.S., other than on-site storage. It is important to note, however, that the largest impediment to "new nuclear" in the U.S. is not safety or environmental concerns, but cost. While a number of utilities continue to pursue licenses for new nuclear projects to

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maintain optionality, few can justify US$13–15bn for such a project with a cost of $5,339/kw, against $978/kw for a gas-fired project.

Electric transmission

Electric power transmission development and restructuring remains a high priority in the U.S. because the system here was never designed (as in countries such as the Russian Federation or Brazil) to move vast quantities of bulk power across long distances, but rather to provide "emergency" services at the border of self-sufficient utilities. Despite strong regulatory pushes to create more independent transmission (e.g., Federal Energy Regulatory Commission Order No. 1000 and incentive rate treatment for new projects), construction of high voltage and extra high voltage transmission lines remains blocked by environmental, health and NIMBY (Not-In-My-Back-Yard) concerns, as well as lessened demand, caused by the recession.

The Shale gas revolution

Unless severely restricted by environmental concerns, continued development of "non-conventional" hydrocarbons, located in shale and produced by hydraulic fracturing and horizontal drilling techniques, will dramatically change the U.S. energy construct. Of particular note:

- In 2011, the U.S. produced more natural gas than the Russian Federation; this change from shortage to adequate levels of supply occurred rapidly – over approximately six years;
- Because of current supply levels and an unusually mild winter, domestic natural gas prices are at 10-year lows of below $2.00 per MMBtu;
- A number of projects designed to import liquefied natural gas (LNG) – as little as five years ago – have now applied for authority to add gasification capacity and export LNG. The possibility that this move could cause domestic prices to increase or create national security issues has already caused politicians to propose limiting such export authority;
- New pipelines and storage facilities are being developed to bring new shale supplies to major markets, adding supply alternatives to traditional Continental Divide, Gulf Coast and off-shore supplies, the latter being somewhat constrained by post-Deepwater Horizon environmental and safety requirements;
- While less developed than natural gas, some shale formations are "liquid", yielding oil and natural gas liquids;
- With electric vehicles (powered by gas-fired generation projects), natural gas vehicles and more shale oil, the U.S. could achieve its long-desired goal of transportation energy self-sufficiency, but at a cost (and U.S. consumers are very politically sensitive to fuel costs).

The last word – "Politics"

Finally, one should recognize that in an election year, such as this, major legislation or new governmental programs are unlikely. Until sometime after the next administration takes office in January, 2013, (and assuming the Executive and Legislative branches are not so split as to paralyze future action) the markets will continue to be the driver of U.S. energy policy. As has happened before, developments in international markets and geopolitical events (e.g., Iran) could change all of the above very quickly and dramatically.

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