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## The Third Challenge

In his recently announced Global Nuclear Energy Partnership (GNEP), President Bush identified two challenges that could limit the growth of nuclear power – waste disposal and nonproliferation. It was the focus on these two challenges that led DOE to emphasize reprocessing, specifically UREX + separations – a new type of reprocessing that is more proliferation resistant, since this would reduce the quantity and harmful nature of the waste to be disposed of.

Given the current state of the market, this focus on reprocessing may seem a bit strange or out of place, and this is perhaps why this initiative has received a somewhat lukewarm response by the industry. (Some industry participants may go so far as to think that the purpose of GNEP was to re-introduce reprocessing into the U.S. fuel cycle. We do not believe that this is a correct reading, but also think that the government could have done a better job framing GNEP. However, this is better left as a subject for another editorial.)

We would submit that there are three challenges facing nuclear power from the standpoint of the fuel cycle. In addition to waste disposal and nonproliferation, there is the question of the adequacy of the current front-end of the fuel cycle to meet requirements over the next ten or so years. While reprocessing does address the other two challenges, it does little to alleviate this third challenge of the supply woes that utilities currently face.

It is clearly governments' job to plan for the future – to take a longer-term view of things than do individual companies – and thus pay attention to securing the path forward for nuclear power from a fuel cycle perspective is a legitimate and necessary goal. But, the government can be guilty of looking too far in the future, and ignoring the present. For instance, in the recent nuclear deal with India, the U.S. is promising to supply nuclear fuel. We would ask where is it going to get this fuel, and has it considered the impact of introducing more demand into a market where supplies are already extremely tight.

This does not mean that the initiative with India should not be pursued or that the general goal of constructing more reactors worldwide, which is what GNEP is all about, should be abandoned. It does mean that more attention needs to be paid to how the market will be supplied during this transition, which also will determine the base upon which future supply growth will take place. The availability of fuel is the bedrock of the policy for any source of energy, and nuclear power is no exception.

In terms of affecting supply during this transition period, governments play an important role, by virtue of inventory, trade, regulatory, and investment policies, among others. These activities have to be carefully balanced. For instance, inventories can be liquidated to fill supply "gaps," but this activity runs the risk of depressing price and thus depressing the incentive for producers to further expand. Ultimately, it will be expansion of production, and not inventory sales, that will be the source upon which nuclear fuel supply depends.

Likewise, trade policies may be enacted to "support" domestic production or at least domestic companies, but can end up doing a considerable amount of damage if they stymie necessary supply. (We don't necessarily believe that free trade and promoting domestic production are always mutually exclusive, depending on how these subjects are approached.) Since GNEP is a global initiative (at least it has "global" in its name), it is important for all governments to think beyond their parochial needs and determine what is best for the world at large. This is what's being done on the "back end" with GNEP's reprocessing initiative (although there is probably a case of one country pushing its reprocessing technology over another's), but the general idea is how to contain proliferation and waste, to the betterment of all countries.

Perhaps the U.S. government is staying clear of this third challenge because it believes that the market will take care of it. Indeed, there is a belief on the part of some market participants that prices have risen to the point where they should be more than adequate to stimulate sufficient supplies in the future. The corollary to this is that the market should reach an equilibrium soon and prices should stop rising.

However, there is another way of looking at this situation: the market is in the midst of a dramatic transformation, from a point where demand was stagnant and there was massive inventory liquidation (the 1980s and 1990s) to one where demand is growing and inventory supplies are being depleted. Much of this was the result of the integration of the Western and Eastern markets, where the East initially brought supplies to the market but little demand. Now, the East (Russia, China, and India) promises to bring much more demand to the market than supply. In rough terms, the East could go from contributing a net supply of about 50 million pounds to a net demand of around 50 million pounds, a swing of 100 million pounds, by 2025.

This type of transformation is difficult for any market to assimilate, as indicated by the rapid increase in price. If it turns out that the market is grossly undersupplied, a \$100 price would make as much sense as a \$7 price made in a grossly oversupplied market.

At this point, we don't know how big this transformation will be. One of the goals of GNEP is that reactor expansion should be as large as possible, with all of the attendant benefits that nuclear power brings. However, robust nuclear power growth will make this market transformation all the more difficult. In this respect, consideration of the front end of the fuel cycle needs to be incorporated in any general policy if we want to get to where we're going.

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