

Roundtable with Senator Voinovich and Senator Carper
Nuclear Renaissance: Challenges and Opportunities
Associated with Spent Fuel Recycling

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Prepared Remarks (3 minutes) of Steve Fetter
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I'd like to begin by saying that I welcome an expanded contribution from nuclear power, both here and abroad, as a means of reducing carbon emissions. Of course, it is essential that this be done in a manner that is safe and does not increase risks of nuclear terrorism or proliferation.

The safe disposal of nuclear wastes is an important issue, but I do not believe that reprocessing will be desirable in the near future, or even foreseeable future. Virtually all of the reactors we have today or will build in the next few decades are light-water reactors, which will not benefit from reprocessing and recycle.

First, it will continue to be significantly cheaper to fuel those reactors with low-enriched uranium and to store the spent fuel, rather than to reprocess the spent fuel and use the recovered plutonium for mixed oxide fuel. If reactor operators had to pay the full costs of reprocessing and recycle, I am confident that they would not choose this option.

Second, this type of reprocessing and recycle—which is the only type that is practiced today or possible in the near future—offers little or no waste-disposal benefit. Although it is often argued that reprocessing reduces the volume and mass of wastes requiring geological disposal, these gains are due almost entirely to removing the uranium, which is very mildly radioactive. The capacity of the Yucca Mountain repository is determined not by the volume or mass of the waste, but by its heat output of the waste, and current reprocessing has little effect on the long-term heat output.

The Department of Energy's Advanced Fuel Cycle Initiative has developed proposals for advanced processes that would separate all of the transuranics, which would then be fabricated into fuel and be burned in a fast reactor. In this case, the long-term heat output of the remaining wastes could be substantially reduced, but a geological repository would still be needed, and so the licensing of Yucca Mountain should remain a priority and funds should not be diverted from this essential project. Much more research and development is required before we will

know whether this scheme is feasible or practical. It will require safe and reliable fast reactors that are no more expensive than current light-water reactors, and the development of new fuels that can achieve high net burn rates of transuranics.

But whatever one believes about the merits of reprocessing, I hope we can all agree that it makes no sense to do it before a use has been identified for the separated materials. To move forward prematurely would result in large expenditures that could have been deferred for many years, and the accumulation of large stocks of separated plutonium. Indeed, this is precisely what has happened in France, the United Kingdom, Russia, and Japan, which together have accumulated 200 tons of separated plutonium from civilian spent fuel—more than twice as much as exists in all of the world's nuclear weapons.

Finally, there is no need for quick decisions. Spent fuel can be stored in dry casks for very long periods of time—50 or 100 years—safely, securely, and inexpensively. My recommendation is to promote the long-term storage of spent fuel. The future of nuclear power will be much clearer several decades hence, and we will know a lot more about the technical and economic feasibility of advanced reprocessing and recycle, and international agreements that would ensure that these technologies, which can be abused for weapons purposes, do not spread to additional countries.