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It is clear from Ernie Moniz' comments that we are dealing with a very complicated, very massive issue. What our speakers haven't told you, because it is so hard to get our arms around, is what the cost of this will all be. At the Department of Energy the cleanup cost of the cold war legacy has been variously estimated, and there appears to be an approximate minimum cost of $200 billion price tag attached to that work. That number simply has to come down or, at a minimum, we have to prevent it from rising. And that cost does not even take into account what the cost of long-term stewardship following remediation, which includes containment and stabilization of much of the contaminant problem that we have in the Department of Energy. I do not see any way that that cost can be brought down or prevented from rising significantly, or accomplish long-term stewardship, in an economical way except through better science and technology.

Now I know that many of you are aware of some of the challenges that face all of us as we conduct research and development on cleanup issues. One of the challenges is the tension between pressures to clean up and moving forward with what we know, and admitting publicly what we do not know. We have project managers who are responsible through regulatory agreements with the state or EPA to clean up a site, and they have to move forward with some belief that they know what the problems and solutions are. And when there is recognition that there is substantial uncertainty in the solutions, both from a scientific and a technical perspective, it is very difficult to admit that. And it is a challenge for us in the research community to work with those project managers to get that which is unknown out on the table, so that everybody can understand the problems and then build a research program to answer the questions. That is a very big challenge for us and we do not do the best job of it.

The second big challenge for us in the research community is being able to have a credible enough story to support a sustainable and credible research program. As many of you know and have reminded me, you cannot have a sustainable research program that bounces up and down by 20%, 30%, 40% from one year to the next. This prevents us from achieving the right kind of research focus that we need, and we have never really gotten that story right yet in the research community. Related to the sustainable aspect of the program is what Dr. Moniz pointed out --

the real challenge is having a balanced portfolio. We do tend to have adequate expenditures in on both ends of the research spectrum, but we have a big gap in the middle. And developing the criteria that tells us what a balanced portfolio ought to look like, and then communicating that to the people who have to grant the resources to a research program, is something that we need to improve upon.

The third challenge is this issue of the state of the science versus state of practice. There is a big difference in doing the research and promulgating the results of the research. And we in the research community do not do the latter very well. That is the reason that there is a difference between the state of the science and the state of practice. And that is incumbent on us in the research community to seek out and talk to the project managers with the problems. It is incumbent on the project managers to reach out and try to get that science.

So in summary, we cannot live with what we are looking at in costs, in schedules, or in safety hazards. We have to change that, and science and technology is probably the only way to do it. But the challenges for us to get there are great. The people represented in this room can be very, very instrumental in helping to do that. As Dr. Moniz was saying, we have new management coming on board. But they're going to need to hear from everybody. They are not going to listen to me and say, "Okay, you tell us this is what you need." They're going to have to hear from the entire community, both the people who hold the problem and the people who are trying to solve the problem. We have over 700 people here today from over 30 different countries. Forty percent of the participants are government. Forty percent are from the private sector, and 20% are from academia. So that kind of a make up, and the kind of interest that you bring to this problem, can be very beneficial. But the challenges are looming for us in the research community to keep providing the kind of science and technological solutions that are needed.