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**Prepared remarks of Hermann Grunder, Director, Argonne National Laboratory
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Thank you, Joe [Colvin], for that introduction. It's a great honor to be here, standing in for our Secretary of Energy, Spencer Abraham, who regrets that he is unable to join us here today.

It is also an honor to be here in France, a very fitting and timely choice to host the European Energy Conference 2002. France, after all, is among the world leaders in adopting nuclear energy as the major component of its national energy mix. About three-quarters of its electricity is generated by nuclear plants, and I congratulate France for being so forward thinking in its energy planning.

Secretary Abraham asked me to fill you in on some of the recent developments in nuclear energy in the United States and on our view of the importance of nuclear energy to the world.

First, the United States is very aware of the enormous amount of energy that we will need across our planet in the 21st century and of the responsibility that accrues to the developed nations on behalf of the rest of the world. We have debated at great length the role that nuclear energy must play, considering both the many pluses of the technology and the surmountable challenges.

When President Bush and his administration took office last year, a high priority was to put together a national energy policy to address the long-term issues related to ensuring energy security deep into the 21st century.

One of the central elements of this policy was our plan for a diverse mix of fuels for the 21st Century economy, with nuclear energy as an important element.

As Secretary Abraham recently expressed it, "Forcefully declaring that nuclear power should be part of the world's fuel mix took some people by surprise, but to us it was just common sense."

In addition to debating and defining surrounding issues, the United States has made great strides toward ensuring the role of nuclear energy in the future.

Responding to the leadership of President Bush and Secretary Abraham, the U.S. Congress has approved the geological repository site in Nevada known as Yucca Mountain.

This makes the United States one of only two countries with identified geological repositories. The other nation is Finland.

Yucca Mountain is an essential part of a new paradigm for enabling the resurgence of nuclear energy worldwide.

In a second area, our Department of Energy is very thankful for the efforts of the nuclear industry to make its plants safer and more reliable.

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All of us here are aware of the tremendous progress made by the nuclear industry in the last several decades.

Plants are vastly more efficient than before. They are better run and better managed. U.S. nuclear plants are operating at 91 percent of capacity – and Joe Colvin assures me that the industry sees room to go even higher as plants operating well below that level improve. Output has increased by one-third since 1990. These astonishing outputs have added capacity to the grid – the equivalent of 24 virtual reactors.

This productivity has contributed to making nuclear power the least expensive way to generate electricity. The latest figures from the Nuclear Energy Institute are for the year 2000. They put the cost of generating electricity in the United States with nuclear power at 1.76 cents per kilowatt hour. Coal generation cost three-hundredths of a cent more, a very close second. But electricity from oil costs three times as much as nuclear, and electricity from gas costs three-and-a-quarter times as much.

The improved management practices, not surprisingly, have been accompanied by huge improvements in safety.

These developments go a long way toward convincing the public of the capabilities and safety characteristics of nuclear energy. But we need to work even harder to get across the message that while all energy sources – renewables, hydrogen, fusion, fossil fuels, and others – are important for this century's baseload, nuclear energy is the most promising solution for now and the longer term.

Advancing this story and implementing the next nuclear era are the task of the American and worldwide generators and utilities, such as France's own Electricite de France and Framatome. But governments can help by setting goals and taking actions so industry can achieve them. The Bush Administration is actively pushing forward on nuclear research and development while at the same time trying to simplify the regulatory process.

The Bush administration studied the issue of nuclear energy carefully. It studied the industry, its history, its recent progress, its ongoing research, and its future promise – and came to the undeniable conclusion that there are compelling arguments in favor of nuclear energy. And this applies not just to the United States but to all nations.

It also concluded that it would need to address forthrightly a number of challenges.

As we begin to look at the arguments, we must note that nuclear power is no longer a young technology. It dates back nearly seventy years, to a time when men like Enrico Fermi and Albert Einstein first contemplated the awesome power of the atom. Sixty years ago, that power was used to end World War II, and fifty years ago, engineers and scientists began considering the civilian uses of nuclear power.

It is safe to say that when nuclear energy was considered for civilian uses, the arguments recommending nuclear power were very different from the arguments recommending it today.

Back then, the idea was to move from the destructive to the constructive power of nuclear fission. In the first years of the "Atoms to Peace" program, arguments were put forth explaining how nuclear energy could be mobilized for the fields of agriculture, medicine, and who knew what else the future might hold.

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The possibility that atomic energy might be employed to generate electricity was considered then not so much for the United States and other developed nations, but for the "power-starved areas of the world."

These were compelling arguments then, and they successfully bolstered the civilian application of nuclear energy.

Today, there are additional arguments for nuclear power, which reflect policy imperatives that were either unknown or not well understood at the dawn of the atomic age. Let's look at three of these.

The first imperative reflects our commitment to a clean environment.

Nuclear power plants emit none of the pollutants associated with the burning of fossil fuels. Such plants in the eastern part of the United States have made it possible for many states to meet the requirements of our federal Clean Air Act.

Since the mid-1970s, in fact, nuclear energy has enabled the U.S. to avoid emitting more than 80 million tons of sulfur dioxide and about 40 million tons of nitrogen oxides.

The second imperative is to supply energy that is both abundant and affordable. As many of you know, the Bush Administration has identified hydrogen as being a potential source of abundant and clean energy.

The administration and we in the scientific community envision a day when hydrogen powers a variety of stationary and moving users of power, from cars, light trucks, and 18-wheelers to office parks, factories, and shopping malls. While this vision will take several decades to implement, work is underway. We already have fuel cell technology that can use hydrogen and a wide range of hydrogen compounds to produce electricity.

One of the challenges of reaching that day is cleanly and efficiently producing hydrogen gas – one of the things nuclear energy promises to do. Work that we and others are doing on the next generation of nuclear reactors – Generation IV – represents some of the world's best thinking about this potential, and will make the vision of a hydrogen economy a reality.

The third imperative surrounds the issue of climate change. It should be obvious that an energy source capable of supplying a significant proportion of the world's power with no greenhouse gas emissions should be at the center of this debate. Yet many of the fiercest enthusiasts for Kyoto are the most ferocious opponents of nuclear power.

As Secretary Abraham eloquently put it, these opponents "somehow miss the reality that nuclear power has the same type of benefits touted for renewable energy sources, along with the added virtue of being extraordinarily economical."

The secretary was not criticizing renewable energy. Indeed, our Administration is aggressively pursuing such technologies. He was pointing out that the arguments for clean power ought to be applied fairly.

The greenhouse gas question ... concerns about the cleanliness of our skies and waterways ... dependable supplies of energy. In each of these areas, nuclear energy is a relevant consideration.

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In February, Secretary Abraham announced the ambitious initiative called Nuclear Power 2010. The goal of this initiative is to have a new nuclear power plant on line in the United States by the end of this decade.

Nuclear Power 2010 involves the government and the private sector working closely together to explore sites that could host new nuclear plants ... to demonstrate the effectiveness of key Nuclear Regulatory Commission processes designed to make licensing of new plants more efficient and predictable ... and to conduct research needed to make the safest and most advanced nuclear plant technologies available in the United States.

Some half dozen promising technologies have been identified. We expect the industry – encouraged by the competitive process the Bush Administration intends to establish – to coalesce around the most promising nuclear technologies. There are already one or two nuclear plant designs close to meeting the economic requirements of the market and the Administration will consider supporting the certification of these designs and their application in a "one-step" licensing process.

The Department of Energy and the U.S. Government fully understand that such a process will be a key incentive for the nuclear industry. Proving that "one-step" licensing works will be crucial to removing a major risk of investing in new nuclear power plants. And, of course, we appreciate that a more stable stock market and perhaps governmental loan guarantees will help the industry to find the necessary capital.

Indeed, U.S. industry, through the Nuclear Energy Institute's "Vision 2020" plan, has expressed its belief in the possibility of building an additional 50,000 megawatts of commercially competitive nuclear power over the next 18 years.

On another level of risk, we recognize the issue of liability. A system must be in place that guarantees compensation for victims of nuclear accidents, and it must be clear to all parties what the parameters of that liability are. The President and both houses of Congress have agreed to extend legislation – called the Price Anderson Act – which provides the framework to guarantee industry-funded compensation in the event of injury.

And with all this said, we must not rest in our quest to improve nuclear technology. There are a number of other actions we can take to help in the development of advanced nuclear technologies, both near term and long term.

In the short term, we plan to work with both industry and our international partners to conduct the research needed to ensure that advanced gas reactor technology can be considered a real option in the United States.

We are already working with the Nuclear Regulatory Commission and industry to pave the way for such novel technologies, which may open the way for the economic, commercial-scale production of hydrogen to power the world in the future.

But being aware of the longer term, we expect to invest heavily in advanced nuclear technology to power the future beyond just the next few years.

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We propose to look beyond development of current light water reactors to initiate Generation IV high-temperature gas-cooled reactors and liquid-metal-cooled fast reactors to address 21st century energy needs.

The nuclear community has recognized the need to develop this next generation of nuclear reactors for several years. While the second and third generation reactors we've relied on for several decades are adequate for today's purposes, a new era awaits. It is an era of nuclear energy marked by enhanced safety, improved waste reduction, better economic performance, and, perhaps most importantly, improved physical security and proliferation resistance.

The Advanced Fuel Cycle Initiative is a direct response to our concerns. It emphasizes closed fuel cycles that reduce the volume, toxicity and long-term storage risk of nuclear waste as well as reducing the stocks of plutonium and other minor actinides. It is intended to reduce the cost of waste repositories and to extract more than 98 percent of the energy value currently remaining in spent fuel. Making use of this fuel will extend the world's resource base by several orders of magnitude.

Generation IV nuclear energy systems involved in this initiative will be able to recycle the most troublesome constituents of spent nuclear fuel. By vastly reducing the toxicity and the lifetime of highly radioactive waste to be disposed of, the systems will cut from more than 10,000 years to less than 1,000 the length of time during which a repository is subject to stringent controls. This will enhance the efficacy of Yucca Mountain and other repositories.

And along the way, the potentially dangerous materials needed for weapons will be part of the fuel rods and in a form that makes them inaccessible. This will go a long way toward safeguarding us from the perils posed by terrorists and renegade nations.

Thus, moving to Generation IV will benefit electricity generation, diminish the problems of waste disposal, and increase the world's safety.

As President Bush's energy policy makes clear, the 21st century economy is hard to contemplate without a significantly expanded role for nuclear energy.

We must prepare now to test the technology options that promise the safest and most proliferation resistant energy generation along with the best opportunities to minimize waste.

And we must educate the people of the world to understand the minimal risks and enormous benefits offered by nuclear technology, both tomorrow and today.