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Chair

Mr. Leon Benoit

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● (1540)

[*English*]

The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)): Good afternoon, everyone.

We're here today, as you all know, to continue reviewing the state of the nuclear industry in Canada and abroad. We have with us five witnesses and will hear from them in the order listed under orders of the day.

We will probably have to adjourn the meeting at 5:15 because there will be bells for a 5:30 vote and we are a little farther from the House today, so we'll probably require 15 minutes to get there. I have a couple of announcements to make at the end of the meeting, so we'll probably have to end the questioning at about 5:10 p.m.

Let's get right to it. From Cameco Corporation, we have Gerald Grandey, president and chief executive officer.

You have up to 10 minutes for your presentation. I'm looking forward to it. Go ahead, please.

Mr. Gerald Grandey (President and Chief Executive Officer, Cameco Corporation): Chairman, thank you very much and good afternoon.

As you've said, my name is Gerry Grandey. I'm president and CEO of Cameco Corporation. I appreciate the opportunity to speak with you today.

As you may be aware, Cameco is a nuclear energy company based in my hometown of Saskatoon, Saskatchewan. From that base, we operate 11 production sites in three countries. We have exploration properties and customers all across the globe. All of that makes Cameco one of the largest suppliers of uranium fuel in the world.

Our Canadian operations are in the Athabasca Basin in northern Saskatchewan. They include the McArthur River mine and the Key Lake mill, along with the Rabbit Lake mill, which has been in operation for over 30 years now. We also operate the yet to be developed Cigar Lake project, which is the largest high-grade uranium deposit in the world.

We're a service provider to CANDU operators in Canada, Korea, and Argentina. To do that, we have a refinery in Blind River, Ontario, and conversion and fuel manufacturing facilities in Port Hope.

Finally, through our partnership interest in Bruce Power, we are involved in nuclear electricity generation.

Only a handful of companies would describe themselves as nuclear energy companies. Cameco is one of those.

We're also one of the leading employers of first nations people in Canada. Aboriginals and Métis comprise more than 50% of our workforce at our northern Saskatchewan operations. Indeed, a recent study by the University of Saskatchewan found that Cameco, directly or indirectly, is responsible for the employment of one in 20 aboriginal people in the province.

Importantly, in the last two years Cameco has created 1,000 new jobs in Canada, and we anticipate doing the same over the next two to three years.

But our impact doesn't stop with employment. Last year 70% of the services purchased by our Saskatchewan mines were from businesses owned by first nations people, businesses that we helped create over the last 20 years.

Let me speak a little bit about how our actions provide even broader benefits.

I've been in this industry for over 30 years. I believe that now more than ever it's a very exciting time to be in the nuclear industry. Around the globe we see the need for clean, reliable energy, and that need is growing. At the same time, there is a rapidly expanding awareness of the security and environmental benefits of nuclear energy.

We know that nuclear electricity emits no greenhouse gases, and with its low operating costs, it will be even more attractive as the cost of capturing carbon is recognized. This is an issue that will be front and centre at the upcoming Copenhagen Round, but the issue is broader than climate change.

In a study released last week by the U.S. National Research Council, the hidden health and environmental costs of energy production and consumption using fossil fuels in the U.S. were put at $120 billion in 2005. In that study, it was once again confirmed that the life-cycle external costs of nuclear are negligible.

Canada has always played a very prominent role in the international nuclear arena, including the seminal nuclear weapons dismantling deal, in which Cameco is in partnership with the Russians. To date, 15,000 weapons have been dismantled as a result of that partnership. Copenhagen will provide a further opportunity for Canada to lead in the use of nuclear energy to address climate change.

● (1545)

Of course, nuclear energy cannot solve the entire climate problem on its own; however, virtually all of the mainstream analyses by independent organizations show that nuclear energy must be part of the portfolio and that a major expansion of nuclear generating capacity over the next 30 to 50 years is essential.

Today we have concrete examples that reflect this resurgence. In China alone, over 20 reactors are now under construction. The U.S. has broken ground on the first two new reactors to be built in that country in the last three decades.

India is expanding its nuclear capacity, with six reactors currently under construction and a dozen more that are planned, while Taiwan, Russia, South Korea, and Japan also have reactors under construction. Europe has joined the fold with new reactors being completed in Finland and France. The British government and nuclear industry are moving forward with five to 10 reactors in the next 15 years.

From Cameco's perspective, an ample supply of uranium fuel will obviously be needed to help fuel this burgeoning fleet of new reactors. That is good news for Canada, a country blessed with abundant uranium resources. This positive activity means opportunity, but Canada needs to do everything it can to remain a world leader. This means having a supportive government and a regulatory system that is predictable and efficient, while at the same time keeping safety and sustainability fully intact and paramount.

We have a very active and positive relationship with our regulator, the CNSC. This relationship is a constant in our lives, and we welcome the scrutiny that reassures the public about the superb safety and environmental record of our industry.

That said, we ask you, the legislative arm of government, to ensure that the CNSC is well resourced to do its job expeditiously. While the CNSC aptly recognizes some of the business imperatives that we face in a highly competitive world, streamlining the regulatory process is absolutely essential. Put plainly, the more quickly projects are approved, the more quickly we can put people to work, and the more quickly we contribute to the financial health of Canada.

I assure you that in advocating this we're not abandoning or suggesting changes that compromise safety. Rather, if a company like ours is to meet the needs of an energy-hungry world, there needs to be an increasingly efficient regulatory framework that meets the rigours of competition.

While Canada could boast for many years that we were the world's leading uranium production country, regrettably we are about to be passed by Kazakhstan. Other countries are now closing in as well. Canada needs to rise to this challenge and seriously address regulatory oversight and reform.

More and more countries want access to Canadian uranium and nuclear technology, but they are precluded from accessing it until government-to-government nuclear cooperation agreements are in place. These pacts outline the principles that ensure our products and technology are used for civilian power generation and not for military purposes. Accordingly, it is imperative that the Department of Foreign Affairs and International Trade be equipped and encouraged to advance these agreements to allow Canada to capitalize on the many opportunities that exist.

As one of the world's largest commercial producers of uranium, Cameco is ready to meet the need for clean energy as well as the high expectations of citizens who want this objective reached in a safe and environmentally sustainable manner. Clearly, the world needs power, and if Canada and Cameco are to continue to be leaders in this sector, we must all work together.

Thank you very much for your invitation to address you today.

● (1550)

The Chair: Thank you very much, Mr. Grandey, for your presentation.

Mr. Grandey is president and chief executive officer of Cameco Corporation.

We'll now go to the second of our five witnesses, for up to 10 minutes. We have two individuals here from the Canadian Nuclear Association. One is Mr. Wayne Robbins, the chairman of the board.

I understand, Mr. Robbins, that you're going to give the presentation. Also with you is Murray Elston, past president.

Go ahead, please.

Mr. Wayne Robbins (Chairman of the Board, Canadian Nuclear Association): Thank you, Mr. Chairman.

Today I'm here as chairman of the Canadian Nuclear Association. With me is Mr. Murray Elston, past-president and very active member of the CNA.

Through our short presentation, I'll provide a general overview of the state of the Canadian nuclear industry and its contributions to the Canadian economy, employment, and other key segments of our society.

The CNA is a non-profit organization. It was established in 1960 to represent the nuclear industry in Canada and to promote the development and growth of nuclear technologies for peaceful purposes. The association represents the entire spectrum of the nuclear industry, including mining, nuclear service providers, and nuclear electricity production.

With that, I'll walk you through a short presentation. Then Mr. Murray Elston and I will be happy to answer questions.

Starting on page 1, you'll see that the Canadian nuclear power industry has been generating electricity from the reactors for 47 years. We've had 22 CANDU nuclear plants in Canada. In 2008 we generated 14.8% of Canada's electricity. In Ontario it was 53% and in Quebec it was 3%. New Brunswick is normally around 30% for its plant, but it's into refurbishment, and it was down to 6%.

As of October of this year, we have 17 reactors in service. We have three reactors being refurbished, those at Point Lepreau and units 1 and 2 at Bruce A. There are 22 reactors licensed, with 17 are in operation.

On slide 2, you'll see the contributions and the profile of the nuclear industry. Nuclear energy is a $6.6 billion industry. It's a very substantial part of our Canadian industry. It contributes $1.5 billion to federal and provincial revenues alone through taxes. In 2008 Canada's nuclear industry generated $1.2 billion in exports.

Over 150 nuclear-related firms are in Canada. Total direct and indirect employment is very large at 30,000 jobs. That's a very substantial amount of employment.

You've just heard our colleague, Gerald Grandey, talk about employment in the uranium mining industry. There are an estimated 5,000 people in the uranium mining industry.

On slide 3, you'll see the economic impact of Canada's nuclear industry. We use 2005 as an example. The total value of electricity generated was approximately $5 billion. GDP creation was about $6.3 billion. The value of uranium exports was $381 million and government revenues from uranium exports were about $100 million.

On slide 4, you'll see that Canada is a world leader in uranium. Mr. Grandey gave a very good explanation of uranium production facilities, the quantities we have, and our access to world markets. The big deposits he talked about in Saskatchewan, at McArthur River and Cigar Lake, are very rich grades of ore for the Canadian companies.

Of note is the fact that electricity generated from uranium worldwide avoids 700 million tonnes of $C0_2$ emissions annually. That's all the contribution of nuclear energy. With the fuel and our production, there is that much in savings of greenhouse gases.

Slide 5 shows the advancements in global health. Canada is a leader in cancer treatment using our cobalt-60 machines. We still produce cobalt for these machines. In North America, there are 20 million medical diagnostic procedures that use radioisotopes.

Over half the world's medical isotopes are produced by Canada by AECL's NRU and are distributed by Ottawa's MDS Nordion. The medical isotopes from Canadian production are used in approximately 60,000 medical procedures worldwide, with 5,000 of those in Canada.

On slide 6 you'll see the contribution of electricity and the different ways of producing electricity in Canada. You'll see that hydro is still our most substantial producer, at 61%, but nuclear is at 14.8%. When you look at this contribution, you see that approximately three-quarters of Canada's generation of electricity is from non-emitting sources.

Slide 7 is about nuclear safety. This is a statistic that we're very proud of. Not one single fatality has resulted from radiation exposure at a nuclear power plant in Canada, and that's in almost 50 years of operation. Our safety record is phenomenal.

● (1555)

We have improved performance in safe production, especially in the electricity branch, and you can see how the performance of our facilities is improving. We're becoming a recognized leader in the industry and the world.

We have a very effective regulator. The CNSC is a very strong and very thorough regulator. It controls the industry very well. On international peer reviews, we participate in the IAEA, the International Atomic Energy Agency. As well, in Canada the industries do extensive benchmarking, both nationally and internationally, to constantly improve our performance.

On slide 8 we look at the environmental performance. This is about the total life cycle. If you look at nuclear power as carbon emissions, you'll see that if you start at coal it's 975 g/kWh of electricity, and that's the total life cycle. If you go down the page, you'll see nuclear at 22 g/kWh, with hydroelectric at 19 g/kWh. As you can see, there are very small carbon emissions from nuclear and hydroelectric power.

On slide 9, community support, the nuclear host communities show very high confidence and comfort with the operations in their municipalities and regions. Existing nuclear host communities are strong supporters of additional new nuclear expansion. As well, communities see benefits in environmental, educational, and community services.

On slide 10, the nuclear future in Canada, Ontario selected the Darlington nuclear site to build two new nuclear reactors. The technology decision has been delayed, but the environmental and regulatory process continues.

In Alberta, nuclear is being considered as a non-emitting source. Saskatchewan is interested in adding value to its uranium industry there. In New Brunswick, there is refurbishment of NB Power's Point Lepreau, and as well, new construction is being considered. At Hydro-Québec, they've announced intentions to refurbish the Gentilly-2 plant.

In summary, nuclear power is one of the safest forms of large-scale electricity generation. The Canadian nuclear industry is a major economic, technological and investment provider in Canada. The nuclear industry is an important part of our future.

Once again, Mr. Chairman, I thank you for the opportunity to make this presentation to you. I hope we've given you a sense of the contribution that the Canadian industry makes to the Canadian economy, the society, and the people.

As one of Canada's key technology and research-based industries, the Canadian nuclear industry will have an important role to play in the future development of the Canadian economy and in the lives of our fellow citizens. From uranium production to electricity generation, as well as medical and consumer-based applications, nuclear has a key role for creating innovation and opportunities in the future.

Thank you, Mr. Chairman.

The Chair: Thank you, Mr. Robbins, chairman of the board for the Canadian Nuclear Association, and Mr. Elston, past-president, for being here today.

We'll go now to our third presenter, from Hitachi Canada Ltd., Howard Shearer, president and chief executive officer.

Go ahead, please, for up to 10 minutes.

● (1600)

Mr. Howard Shearer (President and Chief Executive Officer, Hitachi Canada Ltd.): Mr. Chairman, I thank you and members of the panel for this opportunity to express our views on the state of the nuclear industry in Canada and abroad.

As we approach the end of the first decade of the 21st century, we can all agree that we now have reached a fork in the road concerning nuclear's place in Canada's future. Decisions pending must be made to bring clarity to this role in delivering competitive solutions in energy supply as well as the continuation of the high quality of life that Canadians enjoy and expect to continue.

In fact, I would further state that a stronger vision on a nuclear role is needed, and that from such a strong vision, a clarity of mission and goals will result, with a sense of the actions needed urgently to capture the opportunities for Canada.

Public policy needs, which include a regulatory framework, must be shaped to maximize the benefits while maintaining safety and must be realized from the current nuclear infrastructure in Canada, as must the benefits derived from abroad, where, over the decades, nations have embraced Canadian technology safely, providing improved standards of living for their citizens. Canadian nuclear technology has been operating around the world, unmatched in safety and reliability, while providing electricity at a competitive cost. These nations will no doubt be in the market for more Canadian technology in the near future and will serve as a showcase in securing new opportunities as the nuclear renaissance unfolds.

After a brief introduction of Hitachi, it is my intention to detail: Hitachi's nuclear experience; Hitachi's role in the Canadian nuclear industry, particularly with Atomic Energy of Canada; the need for a vision on nuclear's role in Canada, anchored by CANDU technology; and the positive impact that the execution of such a vision will have on areas such as manufacturing, academia, and medical and high-technology research, development, and deployment.

The Hitachi Group of Companies, with revenues of approximately $117 billion Canadian, consists of approximately 400,000 employees worldwide. In Canada, Hitachi employs approximately 1,000 people and includes two manufacturing operations, one in Saskatoon and the other in Guelph, Ontario. Hitachi has engaged in building and maintaining nuclear plants for over 40 years and, over that period, has participated continuously in the construction of 20 nuclear plants that are currently in operation, with an additional two plants now under construction.

Hitachi was a major partner with Atomic Energy of Canada on the Qinshan plant in China, a highly successful project having the highest capacity factors of any station in China, as well as having been constructed on time and on budget. Currently, Hitachi's role as a member of Team CANDU will bring its vast experience and technology to support any new build alongside Atomic Energy.

A vision is needed whereby policy does not limit nuclear contributions to current needs, but rather embraces the potential applications, such as Canadian technology being one of the potential solutions to climate change, as noted by Patrick Moore, one of the founders of Greenpeace; a vision that enables competitive, carbon-free energy source options; a vision that tries to accommodate a future hydrogen economy; and of course a vision that uses nuclear as a base to support plug-in electric vehicles.

All of the above are essential components that need to be included within a vision for nuclear's future in Canada, a vision that embraces the creation of long-term, high-paying, skilled technology jobs related to IP created by Canadians; a vision that maintains the supply chain synergies that integrate continuous training of workers who can undertake new build support and service functions globally; a vision that develops scientists who will deliver innovations that form the basis for new products while capturing the imaginations of young Canadians in the engineering as well as the physical and social sciences to achieve excellence; and a vision that builds on innovative ideas and the commercialization of new products developed through an integrated academia.

I would be remiss in not highlighting the potential for greater collaboration among educational institutions, which would foster the development of future scientists and be a fertile ground for innovation. Universities such as McMaster University, the Universities of Alberta, Saskatchewan, and New Brunswick, and UOIT are leading examples of this.

● (1605)

Let us also not forget the positive impacts of enhancing U.S.-Canada relations through reliable cross-border energy trade, energy security, and interprovincial trade.

To realize such a vision, nuclear technology must be proven at home to have any chance of acceptance abroad. This is a critical reason why a Canadian new build project is crucial.

While the capital costs of nuclear power are initially high compared to other forms of energy, worldwide, a nuclear power station produces electricity that is consistently competitive with any other form of energy over its life cycle. Policy that reduces or allows clear identification of risks will greatly assist the industry in overcoming the capital cost barrier. Policy also needs to accept the reality that uranium is a finite resource and the recycling of nuclear fuel, as well as the development of new fuel cycles, for which CANDU is particularly well suited, will ultimately be required by all users of nuclear energy.

In casting our sights on the potential that international markets offer, we must never lose sight of the fact that international nuclear projects are very competitive in a way that mirrors the support and coordination of multiple stakeholders, as demonstrated by the recent efforts to host the Olympics. Every major player received and had the backing of their home government, local stakeholders, community, and supply chain.

Domestic policy is critical to global success, whether it be the Olympics or large high technology projects such as nuclear plants. Why should Canada expect differently? This represents the challenge facing Canada. I maintain that such support is crucial if Canada has any chance of getting its fair share of the very real nuclear renaissance.

There is no shortcut or easy way out. Demonstrable support for the industry by government is required so that the private sector supply chain can go forward under strong leadership and clear vision. Customers, domestic and international, need to believe that the Canadian supply chain, supported by strong vision and domestic public policy, will be there in the long term, or they will not engage with Canadian technology. Our vision for the industry must recognize this fact and actions taken must reaffirm this.

Time is of the essence. There are serious consequences for inaction. Successful project execution requires detailed planning and the use of multiple skill sets, skills that are being lost to international competitors or through retirement as decisions drag on.

The commencement of simultaneous multiple global nuclear new builds will drive the competition for resources, both human and material. Delay breeds uncertainty and erodes confidence in our technology, both domestically and internationally, and in our workforce, which may have to seek opportunities in other industries or other countries. Delay undermines our past achievements, which over time are pushed into the background as challenges take centre stage.

Once a decision/policy is set, industry will be able to fully understand the risks and challenges that need to be addressed and will evolve strategies and plans to mitigate such risks and overcome any challenges. Canada has a proud history of achievements despite recent difficulties.

Nuclear, like all high technology, thrives best in an environment that has a stable vision of how it fits into society, both currently and in the future. The critical role of nuclear in health care as a provider of competitive and reliable baseload electricity, and its critical continued contribution as part of the solution to climate change, as well as Canada being prepared for the knowledge-based economy of the 21st century, are all at risk the longer clear and stable policy is lacking.

I thank you.

The Chair: Thank you very much, Mr. Shearer, president and chief executive officer of Hitachi Canada.

Now, from the Society of Professional Engineers and Associates, we have Peter White, president, and Michael Ivanco, vice-president.

Go ahead, gentlemen, for up to 10 minutes.

Dr. Michael Ivanco (Vice-President, Society of Professional Engineers and Associates): I'll be speaking on our behalf for now. We're here to talk about something at the heart of Canada's nuclear industry. In principle, it's the restructuring process that's taking place within Atomic Energy of Canada over the next year.

The Society of Professional Engineers and Associates represents the scientists and engineers who work at AECL, Atomic Energy of Canada, both at Sheridan Park in Mississauga and in Montreal and at client locations around the world. Our members work in the part of AECL that is directly focused on the development and commercialization of Canadian nuclear technology. Collectively, we represent most of the intellectual property associated with nuclear power plant design in Canada.

We care deeply about the future of our company, not only because of our careers, but because we are committed to the continued success of CANDU technology, which has been the pride of Canadian engineering for nearly half a century. In point of fact, our members are highly sought after, not only by other nuclear businesses, but by a variety of other high-tech companies.

If the future of AECL were jeopardized, I have no doubt in my mind that I and every other AECL scientist and engineer could quickly find work elsewhere. However, this is not an outcome we would like to see, nor would it be an outcome to the benefit of Canadians, I believe, and hence we have taken this opportunity to take time out from our day jobs to come and speak with you today.

Let me be clear: we welcome the possibility of a restructuring of AECL. There's clearly the need and the opportunity for improvement in the way the company does business and operates. The stated objective of the restructuring process is to encourage a vibrant and financially healthy CANDU nuclear industry in Canada.

However, like most Canadians, we believe that some form of continued government control is essential to this goal. So, too, is cooperation between federal and provincial governments. We are concerned that other objectives, such as reducing government funding for research into nuclear medicine or changes in arrangements for the production of isotopes, will distract from the need to focus on the success of the CANDU industry in Canada.

In terms of context, this reconsideration of AECL's future is not happening in a vacuum. There is a nuclear renaissance taking place around the world, and it's being fueled by two factors.

As you've already heard, one of those factors is expansion of nuclear power in Asia, particularly in China, India, and some other countries, as well as in England, South America, the United States, and possibly even Canada. The other is the refurbishment of existing nuclear infrastructure around the world.

Business in the coming two decades is in the order of trillions of dollars. Canada is in the enviable position of being one of only five countries that can deliver a turnkey nuclear project anywhere in the world. In the 1970s and 1980s, there were many more countries with this capability; however, because of a hiatus in nuclear construction since the mid-1980s, only a few have survived.

The CANDU reactor, for example, was originally a joint creation of Atomic Energy of Canada, Ontario Hydro, and Canadian General Electric in the early 1960s. By the late 1980s, Ontario Hydro could build CANDU reactors on its own, which it did; it built most of Bruce B and all of Darlington. However, following the breakup of Ontario Hydro into 13 successor companies and the dispersal of this expertise, this ability has been lost. Indeed, the Ontario government is looking only at external parties to build new reactors in Ontario.

A similar story exists in Great Britain. Great Britain was a pioneer in the civilian nuclear power industry and its scientists and engineers designed all of their current domestic fleet. However, now that they need new reactors, they've had to solicit external bids because they can no longer build their own. Indeed, many of their good engineers and scientists came to Canada to work for Atomic Energy of Canada and Ontario Hydro.

Although few Canadians know it, our members have never stopped building nuclear reactors. From AECL projects in South Korea in the early 1990s, then in China, and then in Romania, we've kept our intellectual capital in place and our construction and project management know-how current. This has been critical, since frequent practice—as well as knowledge—is required for nuclear success.

It's important to have integrated capabilities. In order to be able to design and build a nuclear reactor, you need a comprehensive, integrated organization with capability in all fields of engineering, physics, and materials science. You also need technicians and technologists with hands-on capability in all aspects of assembly and construction, as well as field experience.

AECL is currently such a comprehensive organization; however, it has some systematic issues that prevent it from acquiring capital and limitations in the scope of its business that make it difficult to compete with fully integrated companies such as AREVA, the French government-owned nuclear vendor, which has business through the entire supply chain, from mining to reprocessing and reuse of fuel.

Nuclear science and engineering are constantly evolving. Improvements can stem from the lab, but are only realized on the ground. Conversely, opportunities and challenges identified through practical experience often require substantial research, development, and testing in order to achieve breakthroughs.

● (1610)

New fuel design, for example, is an activity that is closely integrated between research and engineering sites in AECL. Much of the improvement in nuclear reactor performance worldwide over the last 20 years has been driven by new “high burnup” fuel design. Research and engineering in concert are required for the design of improved fuel; otherwise, development is jeopardized. For example, recent advances in foreign fuel cycles that are creating potentially large business opportunities in Asia for AECL have come about because of close collaboration between scientists at Chalk River and engineers at Sheridan Park.

Therefore, a simple geographical split between research and development, which is in Chalk River, on the one hand, and engineering, which is in Mississauga and Montreal, on the other, will not be trivial and could jeopardize our ability to design, build, and improve our business. It is important to recognize that AECL's commercial business is not simply centred in its engineering sites. There are hundreds of engineers, scientists, and technologists at the Chalk River research site that are an essential part of this commercial business.

Our goal, SPEA's goal, is to ensure that restructuring leads to an enhanced Canadian nuclear industry. A separation of AECL along simple geographic lines could have the opposite effect, something that members of this subcommittee—not to mention potential investors—should be aware of.

There were hard-won gains in efficiency with the last restructuring. In the early 1990s, under then CEO Reid Morden, AECL's engineering company in Mississauga and Montreal and its research company at Chalk River and Whiteshell were combined into one operating unit, with one set of senior management. This step was taken at the time because of a perceived inefficiency of operating two separate organizations that were both integrally required for successful nuclear operation.

While a painful process, over the course of more than 15 years a great many synergies were developed between the research and engineering divisions, to the betterment of both. Reversing the integration through a new division of the company would inevitably lead to higher costs, diverging incentives, and greater difficulty in working on common projects and objectives.

There is no question that the AECL in existence today is a composite of at least several different enterprises. There is, of course, the commercial business, in which we and many at Chalk River work. There is also the production of medical isotopes, the problems in which helped give rise to this committee's review in the first place, I believe. In addition, there is a wing of the company that focuses on basic research, akin to that which happens in any number of government research laboratories across the border in the U.S. and around the world.

Today there are complex links among these different parts of AECL that would not be so easy to sever. Would it be possible to do so? Certainly, but the cost and complexity should not be underestimated. It is notable, and perhaps important for your review, that each of these different parts of AECL has varying track records of success, both in terms of the use of financial resources and in the achievement of objectives. This committee might find it useful to consider how each of these functions should be financed in the future and in fact how they've been financed in the past.

We would suggest that a continued commitment of public resources to research and medical outcomes, for example, would be completely appropriate. At the same time, we would question whether resources should be diverted from the commercial business to fund these other efforts, as has occurred in the past. Such continued cross-subsidization would create a considerable obstacle to the future success of Canada's nuclear industry, which faces tough competition from other companies around the world.

Ultimately, the challenge of completing a successful restructuring is how to improve the Canadian nuclear industry's position in a growing business without destroying our current capabilities. While individual components or businesses within AECL may be perceived as valuable on their own, they cannot be parcelled out neatly without sacrificing the capability to successfully design and build nuclear reactors. Regardless of the potential interest of commercial parties in fragments of the AECL business, selling bits of the company to the highest bidder is not a strategy that will return value to Canada and Canadians.

Our members take pride in AECL's unique capabilities. There are few areas in which Canada can compete on an equal footing with the United States, Japan, France, and Russia, but the nuclear industry is one of these. At any given time, CANDU reactors can be found among the top ten in worldwide performance. For example, from the last operating cycle for which there is complete data, from January 1, 2007 to December 31, 2008, I think few people know that the top two performing reactors in the world out of 440 were CANDU reactors. One was the Candu 6 unit at Cernavoda 2 and the other was Darlington Unit 3.

In terms of lifetime performance, for example, three of the top five reactors in the world are CANDU reactors. We're very good at building power reactors and have built the last seven projects on time and on or under budget, something unmatched in the industry.

● (1615)

Restructuring could lead to a more vibrant Canadian nuclear industry poised to take advantage of great opportunities worldwide. Alternatively, if done badly, restructuring could lead to a decline in our made in Canada technology. We're here to ensure that the former outcome prevails.

Thank you, Mr. Chair.

The Chair: Thank you very much, Mr. Ivanco and Mr. White, from the Society of Professional Engineers and Associates.

We have as our final witness today, here by video conference from Paris, Mycle Schneider, from Mycle Schneider Consulting.

Mycle Schneider, you're last but not forgotten. Please go ahead. You have up to 10 minutes.

● (1620)

Mr. Mycle Schneider (Mycle Schneider Consulting): Thank you very much, Mr. Chairman, for inviting me to give evidence to your distinguished committee.

I would like to give you a brief overview of the world situation of the nuclear industry. The term “nuclear renaissance” has been extensively used, including around the table you're sitting at, and I would like to sum up our analysis that we published in the “World Nuclear Industry Status Report 2009”, as released by the German government at the end of August 2009.

Currently, we have 435 reactors listed as operating in 31 countries. That is nine less than in 2002. These reactors provide about 14% of the world's commercial electricity, which is equivalent to about 5.5% of the commercial primary energy or 2% of the final energy. That's what we're talking about: 2% of the final energy. By the way, these figures on the world scale are very close to the figures for Canada, where the respective figures, I believe, are 15% for electricity, roughly 6% for primary energy, and 3% for final energy.

Over the last two years worldwide, not a single nuclear reactor has been started up. In fact, the last new reactor to start up was the Cernavoda 2 reactor in August 2007—by the way, a CANDU reactor—after 24 years of construction. Since 2007 not only has there has been a decline in the operating units, but also a decline in the installed capacity. This has to be put into perspective with competing technologies. Particularly remarkable is wind energy, which has connected more than 25,000 megawatts to the grid in the last year alone, or even solar photovoltaics, with over 5,000 megawatts.

Now, where are we going from here? According to the International Atomic Energy Agency, 53 units are under construction in 15 countries. But 37 of these units are in 4 countries alone, that is, China, Russia, India, and South Korea. Those countries have not historically been very transparent about the status at their construction sites, so it's very difficult to actually get an idea of whether they're on time and on budget. However, we know enough about half of the units listed as being under construction; most of them encountered significant construction delays. The remaining units started construction within the last five years, which means it's kind of early to judge whether they're on time because they have not reached projected start-up dates yet.

Thirteen out of these 53 reactors—that's roughly a quarter—have been listed there for 20 years or more. I'm stressing this because I think the time factor—and one of the witnesses stressed this before—is indeed crucial. Thirteen units have been listed there for over 20 years. The record holder, by the way, is the Watts Bar Unit 2 that has been listed under construction in the United States since 1972. It's now scheduled to be completed and connected to the grid in 2012. That's 40 years later. Those are long, long lead times.

The average age of the world nuclear reactor fleet is 25 years. There's hardly any experience with operating units beyond 30 years and there's practically none with operating units beyond 40 years. In fact, there are only two reactors currently operating in the world that operated for longer than 40 years.

● (1625)

However, if all the units that are currently in operation reach the age of 40, it would still mean that a very large number of units have to be replaced over the coming years. It would be over 40 units until 2015, or in other words, one every six weeks. There would be an additional 190 units in the following decade, until 2025, which is one every 19 days. This might be interesting to compare with the fact that over two years not a single new reactor was brought online.

A number of massive barriers are in the way for any significant new build scenario. We have looked at them in some detail in the report. Let me briefly mention them.

Of course, first, there are the economic and financial costs. My understanding is that my colleague Steve Thomas will be giving evidence on this in another session of your committee. He was one of the economics and finance experts on the team for the "World Nuclear Industry Status Report".

The second severe barrier is the manufacturing bottleneck. One has to take into account the fact that there is currently one provider for some of the large forgings components, particularly for components like reactor pressure vessels for units like the EPR, the European pressurized water reactor, and that is Japan Steel Works, which is, as the name indicates, in Japan.

In my personal opinion, the most serious problem, and a barrier for any kind of substantiated renaissance, is the skilled workforce gap. This is a situation that all nuclear industries around the world have to confront. Already around the table we've heard of some of the problems. It's by no means significantly better in a country like France, which is confronted with an aging workforce and where roughly 40% of the utility's operating force will be eligible for retirement by 2015. That's a very major challenge for management.

Also, in most countries, public opinion remains overwhelmingly critical toward nuclear power.

Finally, we have the have the traditional issues. We have the proliferation risks that have not gone away, the nuclear safety issues, and the radioactive waste management problems.

A new analysis provided by the Swiss think tank Prognos for Germany's Federal Office for Radiation Protection, which was released on October 14, 2009, confirms the analysis of the "World Nuclear Industry Status Report". I would recommend that the committee have a closer look at the results. I'll give you just a couple of lines on it. The scenario envisages a decline in nuclear reactors around the world, by 22% until 2020, and by 29% until 2030, as compared to the base situation in March 2009.

I believe that nuclear power currently is in competition; rather, there are decentralized, small, hyper-efficient renewables such as micropower and combined heat and power, and not primarily with coal or gas plants. I think this is a kind of conservative thinking that is still around and is not future oriented.

Climate change challenges need an affordable and fast response. Nuclear has been shown to be very expensive and by far the slowest option to curb greenhouse gas emissions. The cheapest and fastest remains efficiency.

● (1630)

If Canada, for example, had a per capita electricity consumption corresponding to the average EU consumption, it could very easily phase out not only fossil fuels but nuclear power as well. An interesting analysis recently published by Amory Lovins from the Rocky Mountain Institute shows that efficiency, renewables, and micropower have by 2 to 20 times more carbon mitigation per dollar invested than nuclear power does, and that 20 to 40 times faster.

Thank you.

The Chair: Thank you very much, Mr. Schneider, from Mycle Schneider Consulting.

We've heard the presentations and we'll go directly to questioning. The first round is for seven minutes each. We'll start with Mr. Regan from the official opposition.

Go ahead, please.

Hon. Geoff Regan (Halifax West, Lib.): Thank you very much, Mr. Chairman.

Let me start by asking Mr. Schneider how he sees the world making up for the kind of capacity in nuclear power production that he has referred to.

Do you see this happening through economizing our use of energy or through other kinds of energy production? What's your forecast?

Mr. Mycle Schneider: First of all, Mr. Chairman, as an energy analyst, I believe the term "forecasting" should be prohibited, because all we can do as analysts is provide scenarios. It is up to the politicians to make choices on the basis of scenarios. This is not to avoid your question, but it makes a significant difference in the perspective of scenarios.

All the credible climate change mitigation scenarios call for a substantial reduction on the demand side. So far, no country has brought in such a policy. This is the most crucial point to address.

Hon. Geoff Regan: Let me ask you about isotope production. I understand that both the Netherlands and the U.S. have indicated their intention to build new reactors that would produce medical isotopes. Are you aware of this? Do you think it will mean that Canada will lose its leading role in that area?

Mr. Mycle Schneider: Our analysis has not extended to isotope production. However, there are a number of initiatives around the world for reactors that could generate radioactive isotopes for medical use. I am willing to provide you with the data after this session.

Hon. Geoff Regan: Thank you.

Mr. Ivanco, Mr. John Cadham, a doctoral fellow at Carleton University who has authored a study on the Canadian nuclear industry, recently said that privatization would be the death of the CANDU. What's your view on that?

Dr. Michael Ivanco: It depends on how it's done. If you could restructure or privatize in a way that keeps the core design capability and the development capability together, there is no reason in principle why that would happen. When privatizations were done in the past—AECL in the late eighties would be a good example—they took the bits of the company that made money, privatized them, and left the rest. If you break up AECL, you'll lose the ability to design reactors, which will be bad for everybody around the table.

Hon. Geoff Regan: Can you describe a kind of restructuring that would not cause those problems?

Dr. Michael Ivanco: I'm a technical person, not a businessman.

Hon. Geoff Regan: If you can't separate the commercial part of AECL from the research part, which is what you're telling us, I'm trying to figure out what other kind of restructuring there could be.

Dr. Michael Ivanco: I'm saying that you can't do it with a simple geographical split. It would have to be done with surgical precision, and I haven't seen that in anything I've read so far. Maybe people are doing that behind the scenes, but I'm certainly not aware of it. People generally refer to the engineering sites in Mississauga and Montreal as the commercial part of the company, but it's much, much more complex than that.

● (1635)

Hon. Geoff Regan: Thank you.

Mr. Grandey, I'll turn to you, if I may. We've heard from Mr. Schneider about the average operational life. He says it's 40 years, while I believe I've seen 25 somewhere. What do you foresee in terms of things that might change this and that might increase the operational life of electricity-producing reactors?

Mr. Gerald Grandey: Frankly, I was a little surprised at the figure. Looking at the 104 plants that are operating in the U.S., it's very true that they have a 40-year licensed life, but well over half of the 104 now have applied for a 20-year life extension. The utilities operating these reactors that are operating at 90% capacity factors are planning to have the reactors operating for at least 60 years.

As well, the industry itself is now beginning to look at going 20 years beyond the 60, so when you make assumptions about phasing out reactors.... Also, the technology in Europe is no different. It is derivative of Westinghouse or GE technology that was built in the U. S.

In regard to those investments, there's a great incentive, because they are operating so well and because a very high level of safety is maintained by the regulators, to move them to 40 years, then to 60, and who knows beyond that, as long as materials and the material sciences can hold up.

Hon. Geoff Regan: What is your view on the restructuring? How do you think it should happen, if it does at all?

Mr. Gerald Grandey: Are you speaking of AECL?

Hon. Geoff Regan: Yes.

Mr. Gerald Grandey: I would observe that AECL is absolutely crucial. Since we're a one-third owner of Bruce Power, it is absolutely crucial to the future of the refurbishment efforts that there be an organization with the technical capability, the know-how, and the knowledge to address what will be critical for Ontario and Canada, and that is the life extension of these units. Of course, Bruce Power, in doing the refurb, is adding 25 to 30 years to that life.

In looking at it, I'm certainly aware of a report that has now been lodged with NRCan and is going to suggest paths forward. All I can say is that the survival of AECL in some form is essential in order to provide the technical know-how and the construction capability.

Hon. Geoff Regan: Thank you.

Mr. Robbins, will privatization be the death knell of the CANDU?

Mr. Wayne Robbins: I'd have to leave that up to AECL to answer. From an industry perspective, certainty with AECL is our concern. We have to understand where the industry is. We have a lot of investment. We have a lot of technology. We have a lot of information that AECL possesses and we really have to make sure that's maintained going forward.

CNA does not have a position on AECL because it is a strong member of the CNA. We'd have to leave that.

The Chair: Thank you.

Your time is up, Mr. Regan.

From the Bloc Québécois, we have Madam Brunelle for up to seven minutes.

[*Translation*]

Ms. Paule Brunelle (Trois-Rivières, BQ): Thank you, Mr. Chair.

Good afternoon, gentlemen. Thank you for being here today.

Mr. Grandey, I have some things I am wondering about. We have heard about nuclear energy, but not about the cost of disposing of nuclear waste. The committee will have to consider a major bill. I am wondering about the cost of insurance, for your respective companies, in the event of a nuclear accident.

My question is very simple: if we take all these factors into account, is nuclear power economically viable?

● (1640)

[*English*]

Mr. Gerald Grandey: It is a question that is often asked. I talked in my opening remarks about the nuclear industry having internalized these so-called environmental effects that people refer to as external costs. In many countries with substantial nuclear programs, like the United States and Canada, the generators of nuclear waste deposit cash into a fund that is intended to pay for the future disposal of the waste generated.

I ask you to remember that it doesn't go into the atmosphere or the water. It is a solid, very controllable, very manageable, and minuscule amount of waste. In fact, all of the waste generated in the 50-year history of this industry in Canada would fit within a hockey arena. You're talking about a very small amount of waste.

So, one, we've paid for it, and two, every country and think tank that has looked at this issue—and this includes Canada—has come to the conclusion that geological waste disposal is the answer. The difficulty the industry has routinely had, posed by the critics, is what political jurisdiction is going to accept it. That's been a very intractable problem, whether it be in Canada or the United States.

Technically, it's not an issue. It's paid for already from cash in a specially designated escrow fund. As I say, we have now internalized, including in the mining industry, the waste we generate. We've internalized the external costs that other industries, other forms of electricity generation, have not.

[*Translation*]

Ms. Paule Brunelle: You are telling me that it is economically viable and the cost per kilowatt-hour of electrical energy is acceptable and profitable for a company. It is profitable to produce electricity with nuclear energy. It seems to me that the costs were much higher than with hydroelectricity, for example.

[*English*]

Mr. Gerald Grandey: I'm not familiar with hydro, but in the U. S., the amount of money being put into the waste fund is one mill per kilowatt hour, which is a very small part of the electricity charge, so it has almost no impact on the economics of generating electricity from nuclear energy.

Likewise, another issue that is often talked about is tearing down the plant at the end of its life. That has been done in a number of jurisdictions and has been demonstrated to be very manageable in terms of the economics of the life cycle of power production. In Canada, the amount we pay into the fund is also quite small compared with the other costs that are incurred in generating nuclear electricity.

[*Translation*]

Ms. Paule Brunelle: You said something that bothered me. You said the regulatory system had to be rationalized so it would meet the rigours of competition. When I hear that, I think that our regulations are too stringent. Should we allow you more latitude? Why are you telling us this? Can you give me some examples?

[*English*]

Mr. Gerald Grandey: I preface my remarks by saying that I do not suggest that the standards of performance be any less than they are. Today when we make a discovery in Canada of a uranium ore body that we would like to advance and turn into a commercial project, it takes a minimum of 10 years to get through the delineation, the pre-permitting, and ultimately the licensing.

This is an industry where we have a special regulator. I talked about the CNSC. We also have a provincial regulator so we have overlap and duplication between the two. Then you have the interplay with the Canadian Environmental Assessment Act, CEAA. In addition to that, there are several other federal agencies that always get engaged, such Fisheries and Oceans. The combination of all of those coming together ends up taking us years and years to get through the regulatory process.

In the meantime, competitors are quite able to live up to the standards of their country, which may be less or equal to ours, but because the process is streamlined and because the country has made it a priority to move these projects forward, it puts Canada and Cameco at a tremendous competitive disadvantage. What this means is that our high-grade deposits that would be quite economic are standing behind those in South Africa, Kazakhstan, Namibia, and Australia, because they can move through the system much more quickly than we can.

● (1645)

[*Translation*]

Ms. Paule Brunelle: Mr. White, you talk a lot about research and development, and about how important it is. You are engineers. If the Chalk River reactor could not be started up again, what would your solution be? Do you consider that to be a threat to research and development in Canada?

[*English*]

Mr. Peter White (President, Society of Professional Engineers and Associates): Yes. The Canadian nuclear industry requires a source of neutrons to do its research. There's no question about that. The country would have to consider what investment it wants to make to have that source of neutrons.

The Chair: *Merci, madame Brunelle*.

We'll go now to the New Democratic Party, to Nathan Cullen, for up to seven minutes.

Go ahead, please.

Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP): Thank you, Mr. Chair.

Thanks to our witnesses.

Mr. Robbins, I want to start with you. With regard to the picture painted of the benefit of the nuclear industry—Mr. Grandey was also pointing this out—to the Canadian economy and for the Canadian public, has there ever been a study done, to your knowledge, to determine what the equivalent in terms of economic input would have been for the country if equal subsidies had been given to other industries or similar energy-producing industries?

It's sometimes difficult for us as committee members when we hear how strong it is and how fantastic it is but without having any comparison. Has there ever been an economic comparison that you've been made aware of?

Mr. Wayne Robbins: Thank you, Mr. Cullen.

I don't recall any study we've had on the Canadian economy that's comparable to the nuclear study, so I couldn't give you any facts on that right now.

Mr. Nathan Cullen: That's all right. Mr. Shearer used the analogy of the Olympics, in terms of Canada going out.... I thought it might be an unfortunate one in terms of the cost overruns, the massive subsidies, and the controversy over the project in Vancouver.

Mr. Robbins, to your issue, on your slide of the nuclear future in Canada, Ontario is now potentially off the books or is delaying its request in asking Ottawa for some billions in subsidies in order to do the build. Alberta is looking at a greenfield build, which the industry itself says is very difficult to do. In these contexts, brownfield builds are much easier. Saskatchewan is at the speculative stage. New Brunswick's refurbishment of the Lepreau is delayed and is costing a million dollars a day in electricity costs to the people of New Brunswick. It's not necessarily a great assessment.

One of the challenges I've been having in listening to the testimony on the state and health of the nuclear industry in Canada in this so-called global renaissance is that somewhere around 130 build contracts are out there—the number varies—either in the process of.... None of them that we're aware of is using CANDU technology.

Also, we seem to have a vicious cycle going on with the way the government has approached this privatization process. This is my question to you. They've announced that they want to privatize. This has created a level of uncertainty. There are no new contracts as everybody waits to see what the structure of the privatization is going to be—and there's a question I want to bring to Mr. Ivanco in a second—which I would assume affects the price the Canadian taxpayers are going to get for their investment in AECL. That's as a starter.

This cycle continues in this realm of uncertainty. I don't understand how the industry can seem so rosy. We don't have folks banging on our doors wanting us to build them reactors. The one place, Ontario, that looked as though it was willing to do it is only willing to do it if all taxpayers across Canada subsidize the build.

I know that part of your job is as a supporter of the industry—that's your enthusiasm—but I'm finding difficulty in squaring the circle for that enthusiastic feeling about where the industry in Canada stands right now.

Mr. Wayne Robbins: Thank you, Mr. Cullen.

As far as Ontario is concerned, the energy minister, Mr. Smitherman, actually supported nuclear. He saw that nuclear has a very valuable spot in the energy mix going forward.

When we went through the selection process, it really came down to the bids. At that time, he wasn't prepared to carry on, as he was uncertain of the bids, but it wasn't lack of support. He based it on the performance of the nuclear reactors we have in operation. Darlington has been mentioned as having very good performance right now. It's recognized not only in Canada but in the world.

● (1650)

Mr. Nathan Cullen: Can I ask you something about that bid process?

Mr. Wayne Robbins: Yes.

Mr. Nathan Cullen: It's been brought to our attention that something different about the Ontario call for proposals was that they wanted all of the costs put into the bid, which is a bit unusual. They wanted the full lifetime costs.

I see Mr. Grandey nodding.

Did that, in your perspectives, affect the way AECL went through the bidding process with Ontario and with this having to be delayed?

Mr. Wayne Robbins: You'd have to talk to the government. I was not involved in the bid process or the IO process for the selection. I really can't comment on that, not being privy to the government's inside information.

The Chair: Mr. Elston indicated that he'd like to respond to Mr. Cullen, if that's all right.

Go ahead.

Mr. Murray Elston (Past President, Canadian Nuclear Association): Thank you very much, Mr. Chair.

Mr. Cullen, a couple of things are important for us. It would be wrong for people to think that the entire investment made by the Government of Canada over the several decades would have to come back in response to a bid of restructuring.

As you've seen, we're a $6.6-billion industry. We put taxes to a total of $1.5 billion per year into the federal and provincial coffers. As a result, it's fair to say that the industry is already, through their 30,000 jobs, putting a pretty good return into the economy. So firstly, that's a concern I want to make clear to the committee: there is value already.

Secondly, and quickly, I think Mr. Schneider made the case for why it's a critical element for the Government of Canada to ensure that AECL is available to pick up the work that is looming ahead for the nuclear industry worldwide. He's not wrong to say that there will be a requirement to renew some of the existing reactors, but the strategy, certainly for us at Bruce Power—I now work at Bruce Power—has been to refurbish existing reactors to extend their lives so that we can continue to generate.

Also, as you heard from Mr. Grandey, there is the same sort of strategy to renew the machines in several other countries. That work is there and it would help create more jobs for Canadians and in fact provide AECL with a platform for doing more commercial work internationally.

Mr. Nathan Cullen: If I may, I'll go to Mr. Schneider next.

Mr. Schneider, the appealing thing about your testimony is that you're one of the few witnesses looking at the global scenario and how Canada's nuclear industry fits into it.

To my question about why so few of the bids out there, the current calls for proposals, are for receiving a CANDU reactor, is there something in the way that our reactors are built? From this side, we've talked about how great the reactors are and how they perform very well and are very safe. With all those factors, you'd think that the U.S., Europe, and Asia would be picking up our reactors first and foremost, but they're not.

We're trying to study the health of the nuclear industry right now in Canada. Why is Canada absent on so many of these bids?

Mr. Mycle Schneider: I think there are other examples, historically speaking. If you look at the first-generation reactors developed in France, you'll see that they were gas graphite reactors. They didn't survive the first generation because the company that actually orders is not the company that has developed and built these reactors. They were designed by the atomic energy commission, but the ordering entity was Électricité de France.

The bet EDF had been making at the time was to say that it's impossible to go against a wave that is internationally in favour of light water reactors. That is, in terms of lessons learned, in terms of technological advances, it would be impossible. It was a very controversial decision in France. It was by no means a straightforward decision to buy Westinghouse technology. Don't forget that until 1984, I believe, the French reactors were actually reactors built under Westinghouse licence. Only afterwards were they franchised, if I may say so.

You have the same picture in the U.K. The U.K. tried to develop its own reactor technologies and failed because they had to confront competition that was just overwhelming.

I think that today the Canadian industry has basically missed the train of trying to catch up with other builders on this wave of light water reactor technology, which has basically conquered the industry worldwide.

● (1655)

The Chair: Thank you, Mr. Schneider.

Thank you, Mr. Cullen.

We'll go now to the government side, to Mr. Allen, for up to seven minutes.

Mr. Mike Allen (Tobique—Mactaquac, CPC): Thank you, Chair.

Thank you, folks, for being here today.

I have a few questions. I'm going to start with two and we'll see where we go from there.

It seems to me that in the long-run success of nuclear energy in Canada as well as the world we have to focus on three things. One, can we build and operate these things economically, which includes any refurbishment that we have to do? Two, how are we going to staff them? Three, how are we going to deal with the waste management aspects of it?

Given Mr. Cullen's comments a minute ago, Point Lepreau obviously is a challenge. AREVA is having some challenges in Finland with its project.

I'd like to ask Mr. Grandey from Cameco this question, as well as Mr. Shearer and some of the folks from the Canadian Nuclear Association. What are some of the key success factors? We know that quite a number of these projects have been built on time and on budget. What are some of those key success factors? It would seem to me that it's not all about technological knowledge; you need to have someone who can manage the project to get these done. With all due respect, some of our technological people couldn't run a hen over a manure pile—

Voices: Oh, oh!

Mr. Mike Allen: —so if that is the case, what do you see as some of the key success factors? I'd just like to understand what some of the key success factors are so we can start ensuring that we get some of these built on time and on budget.

Mr. Howard Shearer: If I may respond, Hitachi, as I mentioned, has built 20 reactors and are now in construction on another 22. Some of the critical elements include methodology of construction, which I think the new ACR design will incorporate, because Hitachi has worked very closely with Atomic Energy to utilize its "lessons learned" experience. We certainly participated in Qinshan with the first introduction of the modularization technology in support of AECL's build. So I think that for the whole ideal of the methodology of construction, modularization is one key element.

The next element is training and skilled trades. I think Canada can certainly be proud of its workforce in the skilled trades, but this is a continuous experience. It's important to recognize that training, training, training, etc., becomes very crucial. A policy that focuses on continually maintaining the training of skill sets, for example, and also continued training, is very important.

I'd say there is a third one, which is certainly the ability of organizations to fundamentally invest in the infrastructure necessary to facilitate building, whether it's in terms of site development.... I'm talking specifically about pre-engineering, about the proper engineering being done from a design perspective and from a site preparation perspective ahead of time.

I think these are very important in terms of being successful in a project and Hitachi has built its projects on time and on budget.

Mr. Mike Allen: Mr. Grandey.

Mr. Gerald Grandey: I would certainly echo that. I will come back to a theme that I developed earlier, that is, making sure that the regulatory framework is suited to the construction or the refurbishment—but certainly the construction—of the next generation of reactors. You do have that component, which is leading the complications in a number of the new build projects.

Finally, I think there's one other thing, and it may have been inherent, and it is that the industry has to adhere to the highest standards of quality management throughout the supply cycle and the construction of new power plants.

As Mr. Schneider said, we haven't built reactors in any big way in about two decades, so if you put it in context, the new generation of reactors that we're building are first of a kind, and we are learning all the lessons that one would learn—and relearning some—when one embarks upon the construction of something relatively new.

With the construction going on in India, China, Europe, and ultimately the U.S., we will get through that first-of-a-kind issue and make it much more modular and routine.

● (1700)

Mr. Murray Elston: A couple of things that are actually happening in Canada are of assistance to us going forward. The refurbishments, which first began at Pickering and are now at Lepreau and with us, are helping to rebuild a capacity in the industry that had tailed off, quite frankly, over the course of a few decades as the building stopped. There were contributions, obviously, to the export markets, but being able to have a supply chain that is geared up is an important element, along with the training, which was mentioned earlier.

In a sense, this is kind of the silver lining for some. With the bad economy that we have seen, there has been a conversion of some precision businesses from one field of endeavour, particularly the auto sector, looking into the nuclear industry as a place to put their high degree of manufacturing skills and tolerances. So there are places now where the capabilities that we need as an industry, those precision places, can now be found and developed. That will help us meet some of the very big challenges, one on the skilled labour side and then secondarily, hopefully, the material provision and "in time" type of supply for new build as well.

Mr. Wayne Robbins: From the industry side, I've seen a lot of projects over the years and it always comes down to the fundamentals, as we've talked about. It's the planning side. Make sure you're ready. The scope, the duration, and the initial cost estimates: those are fundamentals and those are critical for initial project successes.

On the things we're looking at—the learnings from the industry, the benchmarking, the tooling that we're fabricating up—all these mockups ensure success. It's that longer-term planning and getting ready to go before you start the project.

The Chair: Thank you, Mr. Allen. Your time is up.

We have only a few minutes left, so if we could have two minutes from each member in the order for the second round of questioning, we'll be starting with Mr. Tonks.

Mr. Alan Tonks (York South—Weston, Lib.): Thanks, Mr. Chairman.

Thanks to all of you for being here.

I have just one question, then. We had testimony the other day on the technological shortcomings of the CANDU ACR reactor with respect to the negative power coefficient and inherent shortcomings that would make it not only difficult to use, given the arguments, but, in an engineering capacity, unsafe.

Without having heard that testimony, I guess it's difficult for you to reply, but generally from an engineering perspective, on the CANDU technology, we had the MAPLE issue, which seems to be proof of some sort that there are technology issues that have not been met. What's your response to that? I think the committee would like to know and have a comfort level.

We're talking about Canadian technology against the platform that exists. We don't want to underestimate or minimize that platform in any way, but if we're internationally developing a technology against the arguments that have been used, what's the likelihood that we'll have success if it's not a safe technology?

Mr. Peter White: The CANDU technology is some of the safest technology in the world because it is developed on "defense-in-depth" technology. Yes, the CANDU 6 has a positive void coefficient that can cause a power pulse, but the shutdown system has been designed in such a way that it can handle it. It's designed for it.

They have two independent shutdown systems, which other reactors don't have. The ACR has been designed to have a negative power coefficient or void coefficient. This will also increase safety, but it doesn't make it any safer than a CANDU 6. They are both very, very safe reactors. The design criteria on them is to make sure they can handle the design basis accidents that have been put forward by the regulator, which are very onerous accidents.

● (1705)

The Chair: Thank you, Mr. Tonks.

Mr. Trost.

Mr. Brad Trost (Saskatoon—Humboldt, CPC): Thank you, Mr. Chair.

Today most of the questions have been about AECL, the CANDUs, etc., but I was wondering if some of the witnesses could briefly comment on—how should I put this?—the smaller issues, the niche issues, the ones that are not directly related to AECL and CANDU.

Here's what I'm wondering about. What are the other opportunities and challenges involving the Canadian nuclear industry that the committee should be looking at, specifically those that are not related to AECL, CANDUs, and all those problems? Are there other issues we should be looking at? You're going to have to be very brief. I know that Cameco's going to want to say something and I'm sure tart a couple of other witnesses will.

The Chair: Perhaps you can give very quick answers. We have a minute and a half.

Mr. Gerald Grandey: Very briefly, I want to make the first point that, irrespective of the future of CANDU technology, Canada has an absolutely robust and wonderful nuclear industry that is competitive worldwide. That needs to be paid attention to.

To come back to the issues, you create agencies and then never look at their performance. Oversight needs to be there so that when it slows down, becomes too bureaucratic, or there are too many agencies in the soup, Parliament can do what it should be doing, which is to correct the system to make it more efficient.

Mr. Murray Elston: I think one big area is still putting money into the research and development side of the industry, the university side. AECL is a big part of that. I know you didn't want me to talk about it, but there is a huge number of linkages between that site and our universities going across the country. That's one point.

Second, I think a determination of exactly where the carbon policy in the country goes is an important element for nuclear. Obviously, that is of huge interest to us, because we think that we can be a contributing factor to helping the country and the economy meet the requirements that are being laid out ahead of us. But as with everything, I think certainty is really going to be a big help with that.

Next, I think we need to understand that the industry is larger than just one organization. We have a huge number of parts of the industry that provide all the way from medical assistance to diagnostics for other industries—it's not just medical—to the areas of competing internationally for various parts for other businesses. We're pretty broad-based and we need a good strong economic performance at home to help us reach out and do our business abroad.

Finally, the other point is to help us in some export markets where developments are possible. With India, for instance, there are now certain arrangements that have been made with the national government in India. Safeguards have been worked out that would permit a number of our industry members to trade actively in India. Large markets could help us add even more to the GDP here at home.

Those are three quick items.

The Chair: Thank you very much, Mr. Trost.

We'll go to Monsieur Guimond for a couple of minutes for a question or two.

[*Translation*]

Mr. Claude Guimond (Rimouski-Neigette—Témiscouata—Les Basques, BQ): I have a very brief question for Mr. Elston and Mr. Ivanco.

There is talk of restructuring AECL and of privatization. In future, what role should the federal government play in the nuclear industry?

[*English*]

Mr. Murray Elston: For me, it's important that the government know there is a continuing role for the federal government no matter what the format is of its next step for restructuring. That is clear in any of the international markets that you study, particularly the countries that have domestic technology.

If you were to go to the CNA website, for instance, you would see a report there by SECOR. I think it was finished in about August of 2006, but has been on the site for some time. It identified what each country had done to assist their local industries. You will find that there was an active policy involvement, an understanding of energy requirements going forward, and an understanding as well that it was more than just the industry, which was coming from the government's positive public policy support for it.

It was, in fact, the development of innovative and imaginative research. It was the development of women and men taking leading roles internationally in science, in research, and in teaching. And then as well, it was the marketing of products abroad. There was a very strong presence by the government itself in helping the various elements of those national industries to reach out and market externally.

All of those items would be critical for the federal government, no matter what style of restructuring might be considered by Ottawa.

● (1710)

The Chair: Thank you.

Merci, monsieur Guimond.

Ms. Gallant, you have one minute. This has to be really short. We have four minutes.

Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC): Thank you, Mr. Chairman.

Canadian technology for nuclear reactors is the only technology that can use naturally occurring uranium as its fuel; all others require weapons-grade uranium as a fuel source. We also use heavy water as a moderator, as opposed to other countries that use combustibles like graphite. If Canada were to adopt nuclear technologies other than CANDU, how would the supply chain, especially as it applies to fuel, be impacted in Canada?

Mr. Gerald Grandey: For facilities that I talked about earlier that Cameco operates in Ontario, 80% of our output goes to light water reactors in the United States, Europe, and the Far East, and 20% of our output goes to the CANDU units, which, as you said, use natural uranium.

I want to correct one thing you said. Light water reactor technology does not use weapons-grade uranium. It is far, far lower in terms of its enrichment level at 5% or lower, compared to weapons-grade uranium, which is at 95%. The two are completely different.

If light water technology expands and comes to Canada, the supply chain that we are engaged in won't change a whole lot. We'll still be supplying our customers operating CANDU reactors and those using light water reactor technology, the same customers that we supply today.

The Chair: Thank you very much, Ms. Gallant.

Thank you all very much—

Mr. Regan has a point of order.

Hon. Geoff Regan: I wonder if Mr. Anderson can confirm whether the minister is able to come on Monday and for how long. Also, is anybody else coming?

The Chair: I'll be bringing that up. I was going to dismiss the witnesses first, but I can do that right now.

The minister has indicated that she can come before us on Monday and only on Monday. She has, I think very generously—and you would know this, Mr. Regan, from being a minister in the past—offered two 45-minute segments. She'd be here for the two 45-minute segments, an hour and a half, for presentations and questions.

I did try to discuss this with both vice-chairs. We contacted Mr. Cullen's office, although I didn't talk with him, but Mr. Tonks indicated it would work for him. Monday seems to work, so if it's okay with the committee, we will have the minister on Monday for two 45-minute segments.

Hon. Geoff Regan: Will there be nothing in the last half hour?

The Chair: In the last half hour we can discuss, but she can't be here.

Hon. Geoff Regan: Is there any reason that we have to divide it in two?

The Chair: Well, the thing is, we're dealing with this issue of the nuclear industry, both domestic and international, and then we also are going to be dealing with Bill C-20. The minister wants to deal with both issues.

Hon. Geoff Regan: Mr. Chairman, surely we could decide as members what we want to ask about. Wouldn't that be reasonable?

The Chair: That works whether it's broken into two segments or not.

Hon. Geoff Regan: Okay.

The Chair: As you know, when a minister comes, the line of questioning allowed is extremely broad. That will continue. That's one of the issues I wanted to bring up.

The other issue is—

Go ahead, Mr. Shory.

Mr. Devinder Shory (Calgary Northeast, CPC): Can you relieve the witnesses first, please?

The Chair: We have to leave right now anyway, Mr. Shory.

There's one other thing. For Bill C-20, which witnesses would the members like? I'd like you to have a prioritized list by Friday. It is very important for you to give a prioritized list to the clerk by Friday.

Thank you all very much for coming, gentlemen, and for your video conference, Mr. Schneider.

Again, everyone, I do appreciate your input. There were excellent questions and excellent presentations.

We have no further business. The meeting is adjourned.

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