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"United States Initiatives in Energy and Global Change"

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Minister Aasland, distinguished guests, ladies and gentlemen. I wish to thank Ambassador Strømmen for inviting me to speak on this occasion, and President Meserve for the hospitality of his venerable Institution. The United States values its long collaboration with Norway, and is also very proud of the role private-sector organizations like the Carnegie Institution play in the intellectual life of American society. This conference symbolizes these two themes – international collaborations and private sector partnerships – that lie at the heart of our nation's policies on energy and global change.

If policy is to be more than words on paper, it must accommodate the realities that shape human aspirations and constrain human enterprise. Among these realities are the laws of nature and the uneven distribution of global resources, including what might be called "social resources" such as education and effective government. United States policies on energy and global change aim to respond to real challenges with realistic measures. Before I describe some of these, let me recall for this audience that our energy economy has been global for many years and indeed energy is at the heart of the U.S.– Norway economic relationship. Norway is the 10th largest supplier of crude oil to the United States, and the 4th largest non-OPEC supplier. Crude oil and petroleum products account for about 70% of Norway's total exports to our country. And about 60% of U.S. direct investment in Norway is in the offshore petroleum sector. In the future I expect the dimensions of our relationship with Norway to expand as the unusually rapid environmental changes in the Arctic attract the attention of science, open new trade routes, and enable the utilization of hitherto inaccessible natural resources. The northern-most parts of each of our countries are much closer than the distance from Washington to London, and technology is shrinking that distance year by year.

The arctic ice between us is disappearing much more rapidly than anyone predicted, and whatever physical mechanisms are responsible for the difference between observed and anticipated conditions, they are not included in the global models climate scientists have used to predict future temperatures and average world climate parameters. In particular they are not included in the technical reports of the International Panel on Climate Change released earlier this year. I mention this at the outset to emphasize that significant changes in global conditions are occurring now and there is no doubt they will continue to change during much of this century. The great value of the scientific work collected and summarized in the IPCC reports is the amassing of evidence that human economic activity is contributing to global changes in climate and other environmental conditions such as the chemistry of the upper layers of the

world's oceans. While there is controversy about the significance of such human impact, we must accept that we are responsible for making our environment diverge more rapidly than it would otherwise from the conditions to which modern civilization has become, as it were, acclimated. And whether the consequences of such a divergence are *on the average* good or bad, or whether it proceeds at a slow or rapid pace, we know from experience that large scale climate changes impose a cost on societies. I am in no position to estimate how great that cost might be, but plausible scenarios argue strongly for action to change the human behaviors whose scale has grown so large as to affect the processes of the natural environment.

Therefore we have two tasks – and "we" includes all humankind. One is to act wisely to accommodate our ways of life to the global changes already occurring and likely to continue to occur at an accelerating pace for the foreseeable future. The other is to change behaviors now that will make it more difficult to accommodate environmental change in the future. Both tasks need to be engaged simultaneously. The first task, accommodating to change, would be easier if societies everywhere were at the same level of economic and social development. That they are not is a significant barrier not only to adjusting to changes already taking place, but also to the changes in economic behavior that will be required to reduce the production of greenhouse gases, the most worrisome human contribution to climate change. Globally uneven economic development is one of those realities that places strong conditions on effective environmental policies.

It is, or ought to be, common knowledge that modern economies are strongly linked to energy. For a given pattern of energy technologies the energy use of a nation increases with its gross domestic product. Economic growth implies increased energy consumption. And the scale of energy requirements for modern economies is such that satisfying them is a dominant factor in national policy and international relations. Humankind's greatest impact on the environment is a consequence of that huge demand for energy. This is another reality that environmental policy must face up to. Energy policy is inextricably linked to environmental policy. On the global scale of human-influenced climate change, the energy policies in question are global. That second task of changing behavior to lessen potential adverse impacts of future climate change implies an initiative to transform the global pattern of energy technologies.

Whatever incentives we choose to advocate or employ to change this behavior – taxes or caps and trades, or subsidies, or regulations, or something else – in the final analysis we are talking about how people everywhere generate and use energy. We are talking about choices of fuels, and the technologies for producing and using them in electric power generation and transmission, transportation, and manufacturing, and in countless end-uses in everything from household lighting and appliances to super-computers and agriculture. Without new options the current pattern of energy technologies – the pattern that is producing the greenhouse gases that are affecting our environment – will persist and expand in scale. The challenge of human-influenced climate change is not one only of changing behavior, it is also one of creating technological alternatives that permit behavior to change without severely impeding the improvement of living standards throughout the world.

Climate change is not the only driver for energy policy. Energy security has been an important factor in U.S. energy policy for decades. These two factors, environmental impact and

security, do not always drive policy in the same direction, but there is significant overlap. During the current Administration, the U.S. has pursued new energy technologies that would address both issues. With respect to greenhouse gas emissions, the idea is to follow a path that includes short, medium and long term actions. Early actions included the President's 2002 goal to reduce the greenhouse gas intensity of the U.S. economy by 18% in ten years, a target that we now know will be met with an ample margin. The intensity is an important measure because it is sensitive to energy technology. An example of an early longer-term action was the decision to rejoin the international nuclear fusion project known as ITER, from which the U.S. had withdrawn in 1999. This is indeed a very long term venture, and it will not produce results in time to address emissions significantly during the first half of this century.

Conventional fission nuclear power appears to be the only existing greenhouse-gas-free energy source that can be scaled up to the immense volumes required to replace existing fossil fuel power sources. Realizing the promise of nuclear fission power will require strategies for preventing nuclear weapons proliferation and for dealing with long-lived radioactive components of the spent fuel. Federal budgets for related nuclear energy research and development have increased substantially in recent years, and the U.S. has formed a Global Nuclear Energy Partnership that seeks to address the challenges of spent nuclear fuel, eliminate proliferation risks, and extend the technology to other countries. The Energy Policy Act of 2005 included important authorities for the Department of Energy to mitigate some of the risk associated with constructing new nuclear facilities, and as of last month seventeen U.S. companies have indicated they intend to submit as many as 21 license applications to the Nuclear Regulatory Commissions which could lead to the construction of 32 reactor units – a 30% increase over the existing 104 reactors operating in our country.

In recent State of the Union messages, President Bush has launched a multi-component Advanced Energy Initiative and a goal to reduce U.S. gasoline consumption by 20% over the next ten years. This "Twenty-in-Ten" initiative contemplates a mandatory fuels standard that would require an equivalent of 35 billion gallons of fuel from renewable sources by 2017 and reforming the Corporate Average Fuel Economy (CAFE) standards for cars and extending the current light truck rule. The Advanced Energy Initiative covers a wide range of low or no-carbon energy technologies including bio-fuels, solar, wind, nuclear and clean coal. Details of all these programs may be found on the Department of Energy website.

The President introduced many of these initiatives in the context of energy independence, but it is clear that these are the kinds of innovations in energy technology that will be required to address climate change as well. It is not enough, however, to develop these technologies for our own energy economy. The global climate initiatives launched under U.N. auspices will require every major economy to adopt new patterns of energy production and use, and that means lowering the barriers to exchanges of energy technology, and increased coordination of energy policies among nations.

The U.S. has established numerous programs to engage other countries in these initiatives. When I asked my staff to gather information on U.S. activities and international collaborations to promote the development of GHG intensity-reducing technologies and practices, they returned a list with 32 separate items. This audience is familiar with many of

them, but I was surprised at the extent of these activities. Among those in which Norway participates are the Carbon Sequestration Leadership Forum, the International Partnership for the Hydrogen Economy, and the Climate Change Technology Initiative. But there are many others, some of which represent opportunities for further collaboration between the U.S. and Norway. The FutureGen Initiative aims to establish the feasibility of a near-zero-emission coal energy system by 2015, the Asia-Pacific Partnership on Clean Development and Climate focuses on expanding investment and trade in cleaner energy technologies, goods and services in key market sectors. Then there is the International Methane to Markets Partnership, the Clean Energy Technology Export Initiative, the USAID Climate Change Program, the Renewable Energy and Energy Efficiency Partnership, the U.S. Climate Technology Cooperation Gateway, and the International Renewable Energy Program. This list is not exhaustive. Other programs not specifically targeted to energy and climate issues provide important supporting infrastructure for climate research and policy formation. The Group on Earth Observations, for example, launched here in Washington in 2002 and now including more than 70 countries, is making rapid progress in facilitating the sharing and applied usage of global, regional and local data from satellites, ocean buoys, weather stations and other surface and airborne Earth observing instruments. The aim is to provide access to an unprecedented amount of environmental information, integrated into new data products and services benefiting societies and economies worldwide.

The existence of so many opportunities for international partnerships with the U.S. related to climate change and energy technology was an important consideration in the initiative announced by President Bush at the meeting of G8 leaders earlier this year. Last month the President hosted the first meeting of Major Economies on Energy Security and Climate Change, whose purpose is to urge a new path forward to reduce greenhouse gas emissions in a way that does not undermine economic growth or prevent nations from delivering greater prosperity for their people. The goal is to establish a new international approach to energy security and climate change in 2008 that will contribute to a global agreement by 2009 under the UN Framework Convention on Climate Change. I want to emphasize that this is not an effort to replace or displace other international initiatives but to complement them with tools that will be necessary in any case to achieve widely shared policy objectives. Important aspects of this initiative include:

- The convening by next summer of a meeting of heads of state to finalize a long-term goal for reducing GHG emissions and to establish strong and transparent systems for measuring progress.

- Each nation will design its own separate strategies for making progress toward this long term goal. The strategies must be environmentally effective and measurable and reflect each country's different energy resources, different stages of development, and different economic needs.

- President Bush has proposed the creation of a new international clean technology fund to help developing nations harness the power of clean energy technologies.

All these initiatives are directed toward securing the cooperation and participation of nations whose economic practices contribute to global environmental change. They are action-

oriented, designed to affect practice, and not simply legal or financial instruments without technical content. The U.S. is making enormous investments in energy and climate related research and development and wishes to see these investments yield future benefits for all people.

I wish to congratulate the organizers of this “Transatlantic Science Week” for putting together an excellent program, and extend my thanks once again for inviting me to speak to these important issues.

Thank you.