Your majesty, ladies and gentlemen, it is a pleasure to participate in this seminar.

Time is short, but I want to outline the main issues among energy, water, climate and infrastructure as we see them at the International Energy Agency.

There is no longer any doubt that our energy system is contributing to climate change. Yet what goes around comes around: the changes in climate resulting in part from our dependence on fossil fuels will cause hardship for the global energy system in the decades ahead. While policy makers and others must redouble their efforts to mitigate climate change, they must at the same time start planning and investing to avoid acute disruptions in energy supplies – both from extreme climate events and from those related to gradual change.

A big concern centres on the availability of water for energy production. Water is used:

- in power generation, primarily for cooling thermal power plants;
- in the extraction, transport and processing of fuels; and
- in irrigation to grow biomass feedstock crops.

Severe droughts and warm temperatures could easily lead to supply disruptions as power generation facilities are unable to stay cool, hydraulic fracturing for gas and oil dries up, and corn and soy harvests fail.

This is not far-off science fiction: there are already examples of major disruptions in the energy sector due to extreme weather or sudden changes in water availability or temperature.

- In India in 2012, a delayed monsoon raised electricity demand and reduced hydropower output, causing blackouts that lasted several days. This event affected more than 600 million people.
- Since 2000, heat waves have undermined cooling procedures at nuclear reactors in Europe and the United States, forcing operators to cut production or shut down completely – sometimes for weeks at a time. We saw this earlier this summer in Scandinavia as a result of exceptionally hot weather. Two Swedish nuclear plants –
Oskarshamm and Forsmark – had to reduce output because warm sea water temperatures limited their ability to cool down.

More gradual changes will also present important challenges. For example, recent IEA analysis shows that the demand for residential cooling could be 16% higher in 2050 as a result of temperature increases. This need for increased cooling will present important energy supply challenges, even right here in Sweden.

At the IEA, we are paying more attention to these challenges. It is not hard to see why: our agency was created to foster energy security – the uninterrupted availability of energy sources at an affordable price. For much of our 40-year history, we focused on more traditional aspects of energy security, especially security of oil supplies for our members. But a new era is dawning. Regardless of our future emissions path, the change in temperature that we currently face based on historical emissions will pose important threats to energy infrastructure and challenges for the energy system as a whole.

We have started to incorporate into our analyses the impact of climate change on energy demand. We have looked at impacts on cities, identifying the importance of coordination among different levels of government. We have looked at the implications for the electricity sector, where we need to integrate more fully climate risk assessments into the business models. We have produced a detailed analysis of the global energy sector’s use of water resources. We are also working with governments and other stakeholders to share experience on best practices and policies from countries that have already responded to infrastructure challenges. This fall, the IEA is organising an international forum to support the development of robust energy resilience policies.

We must move quickly. We must stay focused on mitigating climate change. At the same time, however, we must harden our energy infrastructure and improve our energy management practices to foster energy systems that will be resilient in the face of the increasingly disruptive and destabilising impacts of climate change, especially in the context of water. To enhance our energy security, governments, the private sector and researchers must work together to identify solutions before we need them. Because we will need them.

Importantly, we must avoid a fragmented approach that provides solutions to only one part of the equation. Forums such as this – which connect the dots between energy, water, climate and infrastructure – are vital to achieving the holistic, integrated outcome that we need.

Thank you.