NAME
Sven Kullander

TITLE OF PRESENTATION
Energy Resources and Waste in a Northern Seas Perspective

ABSTRACT OF PRESENTATION
The world is facing a challenging period for its energy supply due to limited resources of fossil fuels and concerns about their "CO2 wastes" which affect the climate. Even with the most ambitious investments in alternative energy sources, the fossil fuel share of global energy, now at 80%, will by mid-century still remain above 50% according to a study at the Royal Swedish Academy of Sciences. In the EU, the energy policy is focused on improving the security of supply and to mitigate climate change by reduction of CO2 emissions. The Nordic countries are unique in a European context since their indigenous energy production covers their own needs and since the CO2 emissions are comparatively small. Norway and Denmark have North Sea oil and gas, Norway and Sweden hydropower, Sweden and Finland nuclear power as well as a substantial portion of the EU forest bioenergy and Denmark wind power. In view of the anticipated increase of intermittent wind power and solar power, Nordic hydro power and hydro storage will become increasingly demanded by other European countries for maintaining the power grid functioning. For the same reason, a future European power grid need to be built with the Nordic power grid as an important node. Nuclear power will be important for the base load power and thorium and uranium, available on Nordic territory, may become accessible as a future fuel. The management of radioactive waste is a key issue of the nuclear fuel cycle. The European Academies Science Advisory Council (EASAC) together with the EU Joint Research Council currently explores solutions on European radwaste management which will profit from Swedish and Finnish experience. EASAC also studies the complex problem of capture and storage of CO2. Pioneering work on the storage of CO2 in the Sleipner field in the North Sea provides useful information on the longevity of the stored CO2. Finally, in the Northern seas there are several other options that may be of future importance: wave power, oil and gas in the Arctic, and uranium from the sea water. The Northern seas region will contribute to a more secure and a less polluting European energy future in many different ways.

BIOGRAPHICAL NOTE
Sven Kullander is a Professor em at Uppsala University. He started his research in 1961 at the Enrico Fermi Institute in Chicago and has continued his career at CERN Geneva and Uppsala University. He was also a guest professor at the Max Planck Institute in Heidelberg and at Osaka University. He published more than 200 scientific papers in nuclear and particle physics, accelerator techniques, advanced instrumentation and energy. He held the chair in high energy physics at Uppsala University between 1979 and 2001 where he was director of its synchrocyclotron laboratory, Head of the Department of Radiation Sciences and Dean of the Faculty of Science and Technology. He was a member of the CERN Council, the CERN Research Board and the Swedish Natural Science Research Council where he was responsible for physics and mathematics. He is a member of several learned societies among them the Royal Swedish Academy of Sciences and its Physics Class. In 2000 he was awarded the Uppsala University Bjorken prize for his work related to the nuclear quark structure. He has been the Chairman of the Energy Committee at the Royal Swedish Academy of Sciences from 2004 and from 2010 the Vice President of the European Academies Science Advisory Council (EASAC) where he also serves as the chairman of EASAC's Energy panel. Address: Energy Committee at the Royal Swedish Academy of Sciences, Stockholm, Sweden. sven.kullander@kva.se