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The importance of nuclear energy in future, major uranium deposits of the world and Pakistan

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The Nuclear Energy Outlook, issued in October 2008 on the 50th anniversary of the OCED Nuclear Energy Agency (NEA), responds to the renewed interest in nuclear power. In 2008, the International Energy Agency (IEA) projected that with current government policies, total primary energy and electricity demand will increase respectively by more than 50% and 90% by 2030, and that the great majority of energy supply remains a key issue.

Nuclear energy is an established technology, offering a reliable option to address these issues. More efficient use of energy, renewable resources and storage are important components of the response to these key issues, but no option should be overlooked. Nuclear energy is part of solution, the size of its contribution will depend as much on the capabilities of governments and the nuclear industry to address society's concerns about safety, waste disposal and proliferation concerns, as it will on its economic competitiveness. In 2008, installed nuclear generation capacity of around 372 GWe and annual production of 2700 TWh supplied about 16% of the world electricity. Using authoritative electricity demand estimates for 2030 and 2050, the NEA elaborated its own scenario of nuclear energy development. Designed to illustrate possible future contributions of nuclear energy to global supply the outcome is a range of 4300 to 10500 TWh worldwide in 2050.

The supply of uranium is required to support nuclear energy. Natural uranium resources are widely distributed around the world, including in key countries where geopolitical risks are limited. Its cost represents only a few percent of total cost of generating electricity at nuclear power plants and therefore uranium price volatility is not as major concern for nuclear power plant owners and operators as is for fossil fuel alternatives. Maintaining strategic stockpiles representing several years' consumption is also relatively easy and economic.

World identified uranium resources (5.45mt U at US$ 130/KgU, or US$50/Lb U3O8) are adequate to meet projected future high case nuclear power requirements until 2050, providing that mine production is increased significantly. Supplying uranium requirement beyond this date will require the identification of additional resources. However, recent market turmoil and declining uranium spot prices, the opaque nature of uranium market, increased regulatory requirement, scarce specialized labour and fluctuating costs of raw materials makes the process of developing mines, already demanding significant amounts of time, expertise and expenditures, increasingly more challenging. Considerable effort will be required to bring about the substantial increase in mine production required to meet future NEA projection. In addition of these challenges, uranium producer must continue developing and implementing best practices globally in order to improve public perception of uranium mining. Doing so will be necessary to

develop currently identified resources to their full potential as well as to expand the existing resources base.

In Pakistan the energy mix contains 2.30% nuclear energy. The government of Pakistan has planned to increase nuclear energy from present 380 mw to 8800 mw by 2030. Mineral sector has finalized a plan to establish more then 6000 ton of Reasonably Assured Resources (RAR) of uranium by 2011 to fulfill the 1/3 requirement of fuel. Three fifty tons of yellow cake will be required annually to achieve the target of 8800 mw. At present there are two Nuclear Power Plant (NPPs) which produce 380mw of electricity, 80 mw by KANUPP and 300 mw by CHASNUPP-1. For these NPPs the Pakistan Atomic Energy Commission mineral sector is partially fulfilling the requirements of uranium. Keeping in view the distribution of world uranium deposits, further efforts should be made to explore new uranium deposits to meet the future needs.