ANNEX 2

Update of the Nuclear Illustrative Programme in the context of the second Strategic Energy Review

1. CONVENTIONS ON NUCLEAR LIABILITY

The Conventions were linked by a Joint Protocol adopted in 1988 and based on the concept of civil law, sharing common principles. Compensation levels under the Paris Convention were increased by the Brussels Supplementary Convention to €360 million, including the contribution of the State concerned (up to €210 million), and with the remainder covered by the pooled resources of the Convention's members. Amending protocols signed in 2004 broadened the definition of 'nuclear damage' to include environmental damage and economic costs, and increased the liability amounts to €700 million for operators, €500 million for the installation state and €300 million for the collective state contribution. These amendments have not yet been ratified.

The amended Vienna Convention, which entered into force in 2003, sets the limit of the operator's liability at €360 million[1]. In 1997 the IAEA Diplomatic Conference adopted a Convention on Supplementary Compensation for Nuclear Damage (CSC), still not yet in force, to which all States may adhere, irrespective of other conventions, defines additional amounts to be provided through contributions by States Parties.

Several EU Member States have legislation in line with international conventions and where set, liability levels vary. In Europe there are also two mutual insurance arrangements[2] supplementing commercial insurance pool cover for nuclear operators.

2. INFORMATION ON NUCLEAR FUEL CYCLE

2.1. Uranium

EU mines produce only 2 to 3% of the natural uranium supplied to EU utilities, but considering secondary sources of supply, such as depleted uranium, reprocessing of spent fuel and the use of plutonium in the form of mixed-oxide (MOX) fuel, import dependency for the raw material is less severe (85 to 90%).

While there are no major known uranium resources on EU territory, several EU companies are active in uranium mining outside Europe, in Canada, Kazakhstan, Niger, Australia, and Namibia. Several EU countries (Slovakia, Hungary, Portugal, Sweden, Finland, and Spain) have limited uranium reserves that could be extracted at higher prices, but currently only two small mines are operating, one in the Czech Republic and another in Romania. Globally, potential for significant mining expansion exists in Australia, Canada, Kazakhstan and Russia.

Since uranium is widely distributed in the earth's crust, increasing production is more a question of economics (whether the ore grade is high enough to justify extraction), and the time – usually 5 to 15 years – necessary to bring new production online, including EU companies where possible. Increased exploration over the past few

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1 EU-15 has ratified the amended Vienna Convention, but of the EU MS having joined since 2004, only Latvia and Romania have ratified it; others are only covered by the Vienna Convention under which the liability amount is €50m.

2 The European Mutual Assurance for the Nuclear Industry (EMANI), founded in 1978 and the European Liability Insurance Industry (ELINI) created in 2002. ELINI members comprise most EU nuclear plant operators, which have contributed approximately €50m at the end of 2007 towards the creation of a fund of €100m as third party cover. EMANI's funds are about €500 million.

years has led to a 17% increase in estimated uranium resources worldwide from 2005 to 2007[3]. Therefore the currently identified resources should be sufficient for a long period. New exploration can reasonably be expected to further increase the identified resource base. Additional uranium could be obtained from phosphates or even from sea water, albeit at much higher production costs.

2.2. Conversion

About 60% of Western capacity for uranium conversion is in North America and only 40% in Europe (whereas for enrichment the situation is the opposite), which creates some logistical issues. While the security of supply for conversion services is currently not a major concern, some capacity expansion in Europe would be welcome to achieve a better geographical balance in the market and to have some flexibility in case of a technical disruption in production.

A new conversion facility is under construction in France, with commercial production scheduled to start in 2012, with other possible expansions being considered by the industry. Since uranium conversion is a straight forward chemical industry process, it is easier and faster to add conversion capacity according to demand than to open a new mine or an enrichment plant.

2.3. Enrichment

The EU enrichment industry has more than a third of the global capacity. Capacity expansions are ongoing in Europe (in the UK, Germany and the Netherlands by Urenco), and Russia, and new centrifuge plants are being built in France (by Areva) and the US (by US and EU companies) to replace existing gas diffusion plants. Once gas diffusion plants are phased out, global capacity will not necessarily increase. Instead, flexibility will decrease, since centrifuge plants are usually run at full capacity (with no spare capacity) and new modules are built according to demand.

A recent survey by the Euratom Supply Agency (ESA) on EU enrichment requirements pointed out that the EU enrichment industry can meet the demand until around 2013 by which time capacities need to be increased. Otherwise, there could be some risk of undersupply in the period 2013-16. Over the medium term (2020), the EU and global capacities should be able to respond to increased demand for enrichment services, since centrifuge enrichment facilities can be expanded relatively quickly.

2.4. Fabrication

The market for fuel fabrication for Western type reactors is well supplied. For Russian design reactors (VVER fuel) in the new Member States and 2 reactors in Finland there is a real concern about the lack of alternative suppliers. A 100% dependency on one supplier in any segment of the fuel cycle is a risk for security of supply. Power plant operators should pursue a prudent procurement policy, by diversifying as much as possible their nuclear fuel procurement.

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[3] Source: ***Uranium 2007: Resources, Production and Demand*** (known as the Red Book), NEA-IAEA. The amount of conventional uranium resources which can be mined for less than USD 130/kg are now estimated to be about 5.5 million tonnes, up from the 4.7 million tonnes reported in 2005.

For mixed oxide (MOX) fuel, production capacity may need to be increased if spent fuel reprocessing and plutonium disposal continue to become economically more attractive, which may lead to increased demand for these services.