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Quarterly Uranium Market Report

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Overview

On November 10 the Commission released the Communication "Energy 2020 - A strategy for competitive, sustainable and secure energy" which defines the energy priorities for the next ten years and sets the actions to be taken in order to tackle the challenges of saving energy, achieving energy market integration, boosting technological leadership and strengthening the external dimension of the EU energy market. On the basis of these priorities and actions presented, the Commission will come forward with concrete legislative initiatives and proposals within the next 18 months.

Regarding nuclear, the Energy 2020 strategy entrusts the European Commission with the task of developing initiatives aimed at encouraging partner States to make international nuclear safety, security and non-proliferation standards legally binding and implemented worldwide. This will be feasible via an enhanced cooperation with the IAEA and the conclusion of Euratom cooperation agreements with partner states.

In addition, the International Energy Agency (IEA) released its latest flagship publication in November. The New Policies Scenario of the "World Energy Outlook (WEO) 2010" interprets governments' intentions as measures taken and projects global energy consumption to increase by 36% to 16,750 Mtoe by 2035. Energy demand coming from China and India would play a major part in the increase in global energy consumption in future years. Fossil fuels would keep their leading position as supply source in the global energy consumption; however, the share of renewables in total primary energy would double from 7% in 2008 to 14% in 2035. It is expected that the global share of the nuclear energy would increase from 6% to 8% in 2035, in accordance with anticipated life extension policies and reactor new build plans. The largest nuclear expansion plans are coming from China (with at least 110 GWe of new nuclear capacity), India, US, Japan, Russia and Middle East.

Another development during the last quarter was that the European Commission launched the European Sustainable Nuclear Industrial Initiative (Esnii) which will support three Generation IV reactor demonstration systems: a sodium-cooled fast reactor called Astrid proposed by France; a gas-cooled fast reactor called Allegro supported by Central and Eastern Europe; and a lead cooled fast reactor called Myrrha that is proposed by Belgium.

In December, two far reaching actions were taken with the view to contributing to global non-proliferation. The IAEA Director General (DG) was authorized by the IAEA Board of Governors to create an IAEA Low Enriched Uranium (LEU) Bank. The LEU Bank will be owned by the IAEA, and have a budget of US$ 150 million, donated voluntarily by the Nuclear Threat Initiative (US$ 50 million), the United States (US$ 49.5 million), the European Union (US$ 32 million), the United Arab Emirates (US$ 10 million), Norway (US$ 5 million) and Kuwait (US$ 10 million). The planned US$ 150 million would be enough for 60-80 tonnes of LEU, that is for one full core for 1000 MWe LWR or 3 annual reloads. However, no decision has been taken yet on the location of the planned fuel bank. Furthermore, on December 17, the Russian reserve was inaugurated at the International Uranium Enrichment Centre in Angarsk (Russia). It is made up of 120 tonnes of LEU, including 40 tonnes of 4.95% LEU. These two fuel banks could be used by States having civil nuclear energy production if normal LEU supplies are disrupted for reasons not related to technical or commercial considerations. In both cases, the decision to supply LEU to a country will have to be made by the DG of the IAEA.

Developments in the Member States

BULGARIA: Bulgaria has not accepted the € 2.4 billion increase in the price that Russian vendor Atomstroyexport is claiming, due to construction delays, for the construction of the twin VVER-1000 units at Belene NPP. The price commonly agreed upon in January 2008 was € 3.9 billion.
CZECH REPUBLIC: The Czech Nuclear Safety Authority has granted CEZ a further 10 year-operation license for the first unit of the Temelin NPP (the original 10 year-license expired on October 11). Furthermore, CEZ postponed its decision on a nuclear tender to 2013.

FRANCE: The French Nuclear Safety Authority has issued a further 10 year-operating license to EDF’s Tricastin Unit 1 (955 MWe PWR), which becomes the first reactor in France to have undergone three subsequent ten-year safety reviews.

GERMANY: A law was passed in December providing for further extension of nuclear power plants operating lifetime. Depending on whether they started operating before or after 1980, German nuclear power reactors will be allowed to continue running for another 8 or 14 years, respectively.

ITALY: A nuclear safety agency, responsible for supervising NPP selection, construction and operation in Italy, has recently been created, as an essential step towards integrating nuclear power in Italy’s energy strategy. According to government estimates, the country could start building new nuclear plants as early as 2013, while nuclear could generate a quarter of the country’s future energy production.

LITHUANIA: Regarding the failed tender to build a new plant destined to replace the Ignalina nuclear station, Lithuanian officials confirmed that a new deadline was not set for further negotiations with potential investors.

POLAND joined the OECD Nuclear Energy Agency (NEA) in November and is currently preparing the launch of its nuclear program, as administrative and policy provisions in this respect have already been submitted for approval to the Polish Council of Ministers. The government envisions establishing the necessary legal framework by mid-2011, with plans for building of 6,000 MWe capacity at two sites (among which Zarnowiec, north of Gdansk).

UNITED KINGDOM: On October 18 the latest Energy Policy Statement, including the foreseen support to new reactors over the next 10-years was presented to the Parliament. At the same time, the sale of the 1/3 share that the government holds in Urenco (as a joint venture, alongside the Dutch government and German companies RWE and E.ON) is also being considered, with a view to using the revenue thereof for investments in a new green investment bank promoting low-carbon technologies.

... and worldwide

CHINA According to official statements, China aims at reaching a nuclear capacity of 112 GW by 2020, so as to keep the pace with the unexpectedly fast nuclear development (in May, official estimates had placed the country’s 2020 goal at 70 GW.) Also, Russia and China agreed on two Russian reactors (with an output of 1,060 MW each) to be installed at the Tianwan NPP.

INDIA: Nuclear Power Corporation of India Ltd. (NPCIL) announced in November the start of the construction work on two 700 MWe indigenous pressurised heavy water reactors at the Kakrapar site (units 3 and 4), foreseen to begin commercial operation in June and December 2015 respectively. The country’s nuclear capacity could thus rise from the current 4,560 MW to 10,080 MW by end-2016. Furthermore, India signed two agreements with AREVA for the building of two EPR units at the Jaitapur site and the supply thereof with fuel for 25 years.

JAPAN: Under the terms of the memorandum of understanding (MoU) that Japan Atomic Power Company (Japco), Toshiba Corp. and a unit of Marubeni Corp. have recently signed with the National Nuclear Centre of Kazakhstan, the latter will be performing a feasibility study for the building of an advanced boiling water reactor (ABWR) with an approximate capacity of 1,000 MW.

RUSSIA: According to Rosatom’s first ever released Annual Report, its sales grew by 21% in 2009, while costs by only 18%. With 117 inter-governmental agreements concluded so far and subsidiaries active in diverse sectors, such as uranium mining, fuel production, NPP operation or nuclear waste reprocessing, Rosatom is also developing the fast neutron reactor technology. It holds alone more
than 40% of the uranium enrichment capacity worldwide (supplies of EUP to US market were worth ca US$ 4 billion in 2010) and is looking to expand its uranium mining capacities abroad.

SOUTH AFRICA: According to recent statements from energy industry officials, ca 50% of the country’s estimated energy needs, i.e. ca 20,000 MWe, could be covered by nuclear energy.

TURKEY: In October, details were made public concerning the agreement between Russia and Turkey to build the latter’s first nuclear power plant in Akkuyu. The envisaged operational lifetime of the plant is 60 years, with 4 units expected to be operational within 10 years.

USA: Fast reactors have the potential to fulfil demand for small reactors by offering designs with generating capacities from 25 to 311 MW. US vendors are developing concepts for reactors that can operate for even 100 years without shutting for refuelling.

VENEZUELA: On October 15, Venezuela signed an agreement with Russia for the construction of a ready-to-use nuclear power plant of a capacity of 2,400 MW. According to the US State Department, Venezuela’s nuclear project will be monitored for full compliance with international standards in the field.

Uranium production

In 2010, according to the latest forecasts by the industry, the global uranium production has increased by 5% as compared with the 2009 production level. The largest contribution to the increase continues to come from Kazakhstan and uranium producing countries in Africa; in turn the uranium production in Australia and Canada has contracted.

Kazakhstan has lowered its uranium production estimate to 17,800 tU (46.3 million pounds U3O8) for 2010, compared to an earlier estimate of 18,000 tU. Despite this, Kazakhstan remains the world’s leading natural uranium producer-country, and the latest estimates of uranium production indicate a 27% increase in 2010.

Energy Resources of Australia (ERA) has announced a decrease of 28% in uranium production to 3,793 tonnes U3O8 (8.4 million pounds U3O8) in 2010, as compared with 2009. The reason for this was lower than expected mined ore grade. In 2010 BHP’s Olympic Dam mine production declined by 21% to 2,768 tonnes U3O8 (6.1 million pounds U3O8), mainly due to the Clark shaft being inoperable in the first six month of 2010.

As regards Cameco, its annual uranium production amounted to 8,770 tU (22.8 million pounds U3O8), that is 10% more than uranium production in 2009, due to higher production at McArthur River/Key Lake and the continued ramp up of production at Inkai.

Paladin Energy announced that in 2010 the natural uranium production increased by 74% as compared with production in 2009 and amounted to 2,077 tU (5.4 million pounds U3O8). However, Paladin Energy has downgraded the estimated uranium production in 2011 to 2,423 tU (6.3 million pounds of U3O8) due to the situation of the Kayelekera uranium mine in Malawi.

ARMZ, the uranium-mining branch of Rosatom, has purchased a majority stake in Canada’s Uranium One. Uranium One and its major shareholder ARMZ expect to increase their importance in world’s uranium market as they expand their activities into more territories: Southern Africa and Kazakhstan.
Uranium prices

In the second part of 2010, the natural uranium UX U₃O₈ spot price indicator sharply reversed its decreasing trend that had started in mid-2007. The spot market changed from a buyers’ market to a sellers’ market. In 2010, the UX U₃O₈ spot price raised by 44.5% from US$ 42.50 per pound (end of December 2009) to US$ 62.50 per pound (end of December 2010). However, the spot price indicator did not gain momentum at the end of 2010, as it kept rising also in January 2011.

According to market analysts, the main reasons behind natural uranium price strengthening accompanied by renewed interest in uranium market, were the current and anticipated natural uranium demand coming from China, as well as positive signs of nuclear market recovery from the 2008 global financial crisis. It is expected that the natural uranium spot market will continue to attract financial investors into the market also in the future periods.

Conversion

In October and December 2010, the conversion price indices offered by the Ux Consulting Company continued to be unstable, except for the Spot EU conversion price index. The increased levels of the conversion prices in the second half of 2010 could signal a necessity for new conversion capacities to be developed. During 2010, no large new developments or upgrades of conversion facilities were started.
Enrichment

The construction of new uranium centrifuge enrichment plants continued through September-December. The US Nuclear Regulatory Commission (NRC) has issued its final safety evaluation report for the Eagle Rock centrifuge enrichment plant of AREVA. The report stated that there would not be an undue safety or health risk to the public or the employees. The plant has an installed capacity of 3.0 million SWU per year and is planned to be operational in 2014, with the possibility of extending it if market conditions require.

Furthermore, French Industry and Energy Minister Eric Besson has announced that the AREVA Eurodif gaseous diffusion plant (GDP) in southern France is not to be closed at the end of 2010 as planned, but will remain operational through 2012. The production capacity of the Eurodif plant is 10 million SWU per year, however it runs optimally at about 8.0-8.5 million SWU per year.

In parallel, AREVA has inaugurated the Georges Besse II facility which is based on centrifuge enrichment technology and will have a production capacity of 7.5 million SWU by its initial start up, foreseen in 2011. Depending on market conditions this capacity could be increased later to 11 million SWU. The Georges Besse II facility has two units - a South Unit where final testing has been already carried out and a North Unit, where the start up is foreseen in 2011.

Argentina is looking forward to restarting its Pilcaniyeu gaseous diffusion enrichment plant in 2011, which is considered as the first step towards its nuclear program. As Argentina is planning to increase the number of its nuclear plants, the enriched uranium would be used for commercial use.

Fuel fabrication

AREVA and Kazatomprom established a fuel fabrication joint venture which is owned 51% by Kazatomprom and 49% by AREVA. The design capacity could be of up to 400 MtU per year. AREVA would
contribute with the fuel manufacturing technology, and Kazatomprom would supply fuel pellets for the assemblies.

Russian vendor TVEL signed a deal with Chinese Jiangsu Nuclear Power Corporation and China Nuclear Energy Industry Corporation that foresees the supply of fabricated fuel and also envisages the sale of nuclear fuel production technology to China.

Westinghouse Electric Co. has produced the first fuel assemblies for its AP1000 reactors at the company’s Columbia Fuel Fabrication Facility in South Carolina.

**Concluded natural uranium contracts in the EU**

During the fourth quarter of 2010, ESA processed 75 transactions, including contracts, amendments and notifications on the front-end activities. Between October and December, the European utilities concluded three new spot natural uranium supply contracts (including purchases, sales and loans) and no long term contract.

In 2010, ESA processed 312 transactions, including contracts, amendments and notifications on the front-end activities. According to preliminary results, there were 18 new spot natural uranium supply contracts (including purchases, sales and loans) and only one new multiannual natural uranium contract concluded by the EU utilities.

**List of common abbreviations:**

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ESA</td>
<td>Euratom Supply Agency</td>
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<tr>
<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<tr>
<td>(US) DoE</td>
<td>United States Department of Energy</td>
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<tr>
<td>(US) EIA</td>
<td>United States Energy Information Administration</td>
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<td>USEC</td>
<td>United States Enrichment Corporation</td>
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<tr>
<td>WNA</td>
<td>World Nuclear Association</td>
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<tr>
<td>PWR</td>
<td>Pressurized Water Reactor</td>
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<tr>
<td>SWU</td>
<td>Separative work unit</td>
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<tr>
<td>tU</td>
<td>tonne U (= 1 000 kg uranium)</td>
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<tr>
<td>toe</td>
<td>tonne of oil equivalent (= 11.63 MWh)</td>
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