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AREVA in Mongolia

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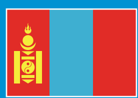
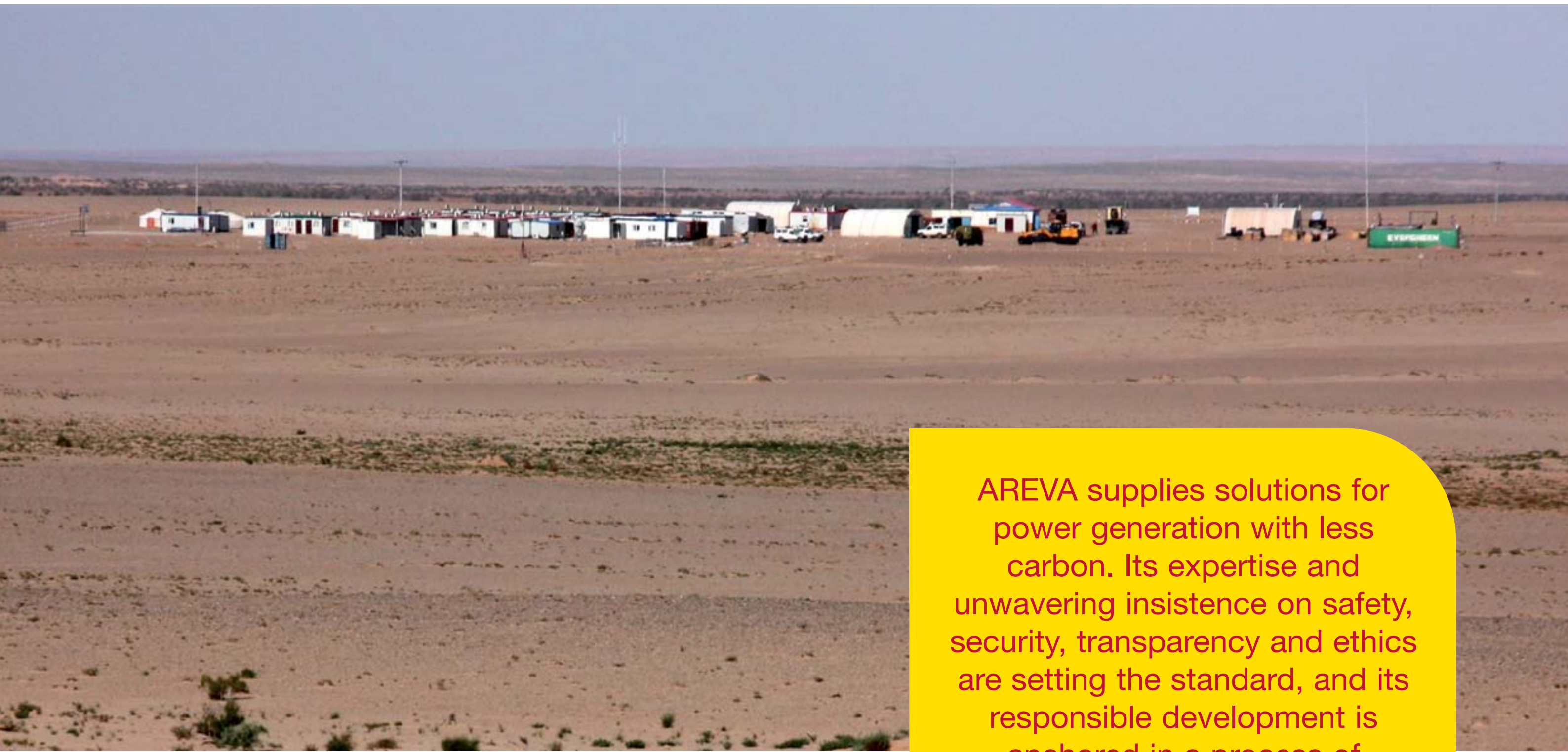
AREVA
forward-looking energy

AREVA has been present in Mongolia since 1997. The Group holds several exploration licences in the southeast of the country.

True to its commitments, AREVA has made local integration a priority for its presence in Mongolia.



The AREVA Group



AREVA supplies solutions for power generation with less carbon. Its expertise and unwavering insistence on safety, security, transparency and ethics are setting the standard, and its responsible development is anchored in a process of continuous improvement.

Ranked first in the global nuclear power industry, AREVA's unique integrated offering to utilities covers every stage of the fuel cycle, nuclear reactor design and construction, and operating services. The group is also expanding in renewable energies – wind, bioenergy, solar, energy storage – to become a European leader in this sector.

NUCLEAR ENERGY

- **Mining,** exploration, project development, mining and site rehabilitation
- **Front End,** conversion and enrichment of uranium, design and production of nuclear fuel.
- **Reactors and Services,** design and construction of nuclear reactors, service activities at the installed bases.
- **Back End,** recycling of used nuclear fuel, transport, clean-up and disassembly services.

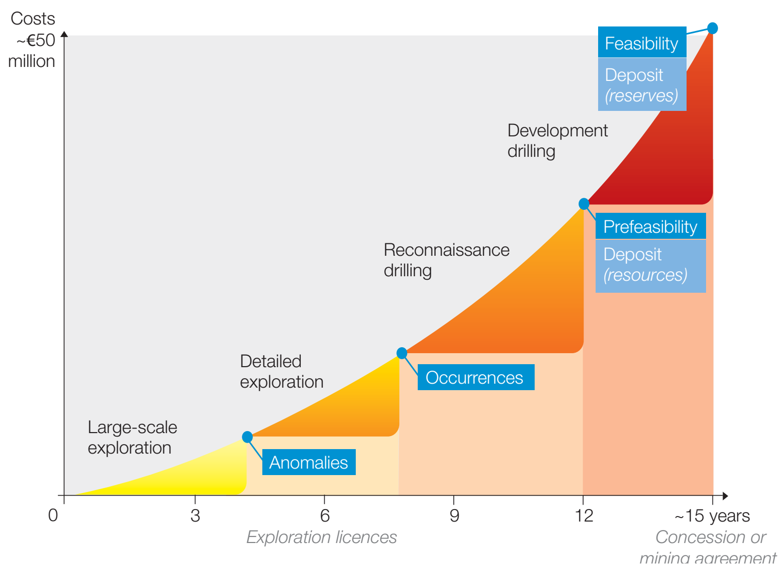
RENEWABLE ENERGIES

- **Offshore wind turbines:** provision of high-power M5000 turbines that convert the wind's motive power into electricity.
- **Turnkey biomass power plants** enabling the production of energy from organic residues of vegetable or animal origin.
- **Solar power plants** using thermodynamic concentration technology based on compact linear Fresnel reflector technology.
- Solutions for producing hydrogen through water electrolysis and for generating electricity through **fuel cells**.

AREVA's mining activities

Mining is the first link of the nuclear fuel cycle and of the AREVA Group's integrated model. With a workforce of over 6000 people on the five continents, it ensures long-term uranium supplies for nuclear power generation.

AREVA is engaged in a continuous improvement process to reduce the amount of CO_2 emitted by its mining activities through minimizing the footprint of these activities on Man and the Environment and contributing to regional development.



Each phase of AREVA's mining activity involves major challenges in terms of sustainable development which must be controlled during the long cycles of activity (up to 50 years for some operating sites) and after mine closure.

EXPLORATION

Natural uranium is a metal that does not occur in its native state. It contains two main isotopes: ^{238}U (non-fissile) making up 99% and ^{235}U (fissile) making up 0.7%.

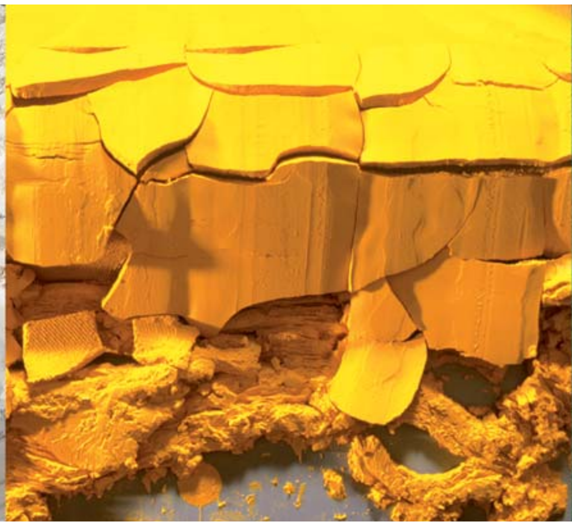
In nature, uranium is relatively widespread as an ore in the earth's crust (3 grams per tonne on average). Deposits currently being mined contain between 100 grams and 10 kg of uranium per tonne of ore extracted.

Exploration is carried out to locate deposits of uranium ore that are sufficiently high grade to be mined under sustainable economic, technical, environmental and societal conditions.

PROJECT DEVELOPMENT

Development is a key phase of the mining project. The work of the project teams involves several steps:

- Defining the mining and processing techniques,
- Assessing, with the stakeholders, the project's impact from every economic, societal and environmental aspect,
- In-depth environmental and societal impact studies at the proposed mine site,
- Constructing the industrial production facilities and installing the necessary infrastructures.



MINING

The world's second largest uranium producer in 2011 with a production of 8790 tonnes, AREVA has active mines in Canada, Niger and Kazakhstan. Three methods are used to extract the uranium ore:

- opencast mining (for shallow deposits less than 150 m deep),
- underground mining (for deeper deposits),
- in situ recovery or ISR (injection of an acid or alkaline solution directly into the deposit).

The last method is used for low-grade deposits located in aquifers*, as in Kazakhstan.

Once extracted, the ore is mechanically crushed and ground and then processed and purified with chemical solutions whose transport, storage and use are very strictly controlled to meet environmental norms. The ore is then washed, filtered and heated in kilns to obtain a solid concentrate assaying 75% uranium and known as "yellow cake". It is in this form that the uranium is shipped from the mines to the conversion plants to undergo further transformation, notably through enrichment, in the production of nuclear fuel.

REHABILITATION

The main objective of this stage is to ensure security and public safety of the mine sites once mining has ended and to limit the residual impact of past activities on the environment and the population.

One of the required rehabilitation steps for old mine sites is re-landscaping so as to preserve the local biodiversity and allow potential reuse depending on the level of constraints. The rehabilitation is anticipated as early as the exploration phase.

The Group ensures proactive environmental and radiological monitoring of closed mine sites with their stocks of tailings and waste rock**. More than 250 closed mine sites are currently being managed by AREVA, with more than 100 specialists in radiation protection, geology and the environment, and an investment of more than €4 million per year to monitor the rehabilitated sites. Nearly 10,000 analyses are performed each year. AREVA reports on and communicates the results of its environmental monitoring and radiological measurements to the supervisory authorities. The results are also presented regularly to representatives of the local population (local and regional authorities, the media, NGOs, etc.) at meetings of the Local Information and Monitoring Commission.

** Geological formation whose permeable rocks contain temporary or permanent mobilizable water and which is capable of being naturally or artificially recharged.*

*** Waste rock: earth, sand or rock containing no exploitable uranium ore, or containing no uranium at all, but which has to be extracted in order to reach the ore itself.*

Environmental responsibility

Water and energy are essential for mining activities whether for extracting and processing the ore or to support the workers and their families. AREVA's mining projects have given it experience of desert conditions. Be it in Kazakhstan, the Steppes, the Namibian desert, or the Sahara in Niger, AREVA makes every effort to minimize the impact of its activities on the environment and the population.

Preserving the saxaul in Kazakhstan and Mongolia

- The saxaul is an evergreen tree that requires a century to grow to a height of 4 metres. With its long roots, the tree plays a vital role in preventing dune erosion. Furthermore its wood is an essential source of heating in the country, and it is also used in construction. Its presence is also essential for the local wildlife. Although site activities require some saxaul to be removed, AREVA's policy is nevertheless to replant it on its Kazakh site. In Mongolia, AREVA made an agreement with local people of Ulaanbadrakh soum, Dornogobi province to develop with them a program for planting saxauls ; this work began 22 june 2013 and has been successfully going on.

Preserving the lichen *Teloschistes capensis* in Namibia

- This lichen, found only in Namibia and South Africa, grows in coastal environments specific to these regions and plays an important role in the ecosystem. To avoid constant traffic on and degradation of the lichen field, AREVA has built several miles of protection where vehicular traffic is banned. The species has been thus preserved and the lichen field is even expanding.

Imouraren project in Niger

- AREVA adopted an eco-design approach to find all rational means to save water. The technical solutions adopted as a result of this study have reduced water consumption by 40%.

Saxaul

Lichen Teloschistes capensis

Imouraren camp

Context and issues

ENERGY CONTEXT

In a context of rising energy demand, inevitable price increases and the fight against climate change, the development of virtually greenhouse-gas-free energy is a top priority.

AREVA is committed to meeting the energy challenges of the coming decades by producing energy with less CO_2.

By 2030, global energy demand will have increased by 50% over 2008. In addition to this, account must be taken of two unavoidable phenomena: climate change and the programmed exhaustion of fossil fuel resources. There is no one answer to these mixed issues. Nuclear power and renewable energies are complementary, guarantors of an economical and reliable energy mix.

URANIUM IN MONGOLIA

Mongolia is going through a crucial period in its history and setting up a strategic policy for uranium. The choices that are being made will affect the country and its future. Mongolia, since the mid-2000s, has benefited from significant mining development that has nourished the strong growth of the country. The giant Oyu Tolgoi (gold and copper) and Tavan Tolgoi (coal) deposits are the symbols of this mining potential.

Uranium in particular has a major strategic role. The exploration programmes have revealed the presence of exploitable resources. On 26 February 2013, the Professional Council of Mineral Resources with the Ministry of Mines officially classified the Zoovch Ovoo deposit's with more than 50 000 tons of uranium.

Following classification of the deposit of Dulaan Uul in 2011, the Zoovch Ovoo classification makes Mongolia officially one of the top 10 countries with the largest uranium resources.

MONGOLIA'S ENERGY POLICY

Mongolia has set about making the uranium industry a centrepiece of its strategy and its policy of independence. This new approach is founded in the Nuclear Energy Act adopted in the summer of 2009.

The Mongolian State wants to create a uranium industry that makes Mongolia a nuclear fuel supplier for the Asian market. The choice of partners with whom the country associates to mine the uranium deposits is therefore important.

Agreements have notably entered into with France, through AREVA which is a public company, as well as with Russia, China, Japan and India.

Societal responsibility and stakeholder dialogue

True to its groupwide commitments (AREVA Mines is a member of the ICMM*) as regards to societal responsibility, AREVA intends to define sustainable ways to manage its socio-economic impact by sharing mining benefits with local communities. That approach includes:

- Maximizing its positive local economic footprint: recruiting and training local employees for its mining operations and purchasing locally produced goods and services as much as reasonably achievable.
- Contributing to a sustainable local development through the support to the development of infrastructures benefiting local people. Since 2006, more than one billion MNT were devoted to sustainable development projects in the areas of health, education and access to water. A particular focus is put on herders' livelihoods with projects such as the drilling of nomadic water wells and cattle reconstitution.
- Ensuring a permanent dialogue with local stakeholders, with a particular focus on local communities through its dedicated field staff, grievance mechanism and regular dialogue venues with local people. The objective is to ensure that stakeholders are actively informed and consulted during the entire project lifespan.

A few landmark projects

- Equipment of the Dornogobi Aimag hospital of a laparoscopy column, ophthalmology equipment and training of local doctors with the NGO Action Mongolie
- Drilling of seven water wells for herders of Zuunbayan Bag and Ulaanbadrakh Soum
- Donation of an ambulance to Ulaanbadrakh Soum Hospital
- Renovation of Zuunbayan's schoolyard
- Donation of computers for Erdenetsagaan Soum Citizen development center

** The International Council on Mining and Metals (ICMM) was formed in October 2001 to comply with the mission set forth in the Global Mining Initiative. The Global Mining Initiative (GMI) was developed by the world's leading mining and metals companies to develop their industry's role in the transition to sustainable development and to ensure its long term contribution.*

COGEGOBI's environmental policy

COGEGOBI carries out environmental protection and remediation work in accordance with international, Mongolian and AREVA Group norms and standards.

- An environmental protection programme is carried out for each exploration licence. These programmes show in detail the work that has already been done, the work in hand and the work to be done in the future. The programmes are reviewed and approved by the Mongolian State, which is also responsible for their coordination and management in partnership with COGEGOBI.
- COGEGOBI uses the internal "STAR Indicator" control system. It is a programme that makes it possible to monitor and improve corporate performance.
- The mining activities generate waste in the form of very weak radioactive slurry which is stored in a facility dedicated for the purpose. The drilling mud storage facility was built according to the directives of the International Atomic Energy Agency in Mongolia and is regularly controlled.
- The COGEGOBI environment service works in close collaboration with local authorities and relevant state institutions.

AREVA's activities in Mongolia

At present, AREVA's activities are mainly in the Dornogobi and Sukhbaatar provinces (southeastern Mongolia). After the success of the test of uranium extraction made on the Dulaan uul site, the Group's objective with ist partners is now to study the economical faisability of a mining project and test new exploration targets at Dariganga.

AREVA is today represented in Mongolia by AREVA Mongol, its 100% subsidiary. AREVA Mongol carries out its exploration activities through Cogegobi and will manage its mining licences through AREVA Mines LLC.

In December 2009, AREVA signed an agreement with Mitsubishi Corporation for Mitsubishi's financial participation in the development of uranium exploration in Mongolia with the option of acquiring a 34% interest in AREVA Mongol.

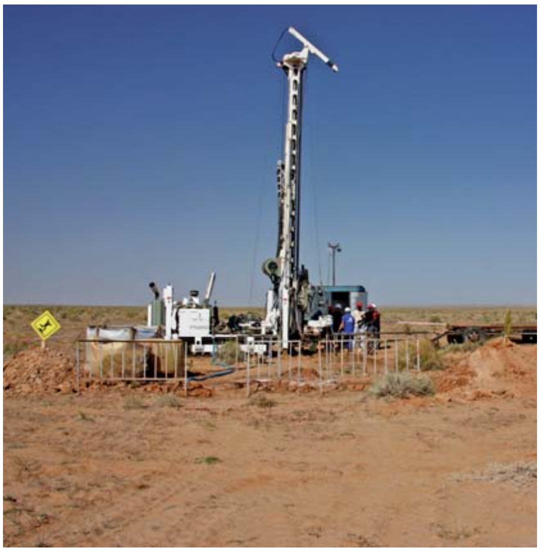
In November 2011, Mitsubishi exercised its option to acquire capital in AREVA Mongol as a financial partner in the project. Mitsubishi's entry was validated by the government. All future project functions and the mining will be grouped within AREVA Mines LLC.

It is within this structure that MON-ATOM, a public company under the supervision of the State Property Committee, will acquire an interest in accordance with Mongolia's Nuclear Energy Law. The shareholder agreement between AREVA Mongol and MON-ATOM has been signed in October 2013.

KEY NUMBERS

180 employees,
90% of which are Mongolian

25 exploration licences
distributed as follows:
11 licences in the Sainshand basin covering 3 096 km^2, and
14 licences in the Dariganga basin covering 6 028 km^2.



EXPLORATION IS A LONG STORY

The COGEGOBI exploration company was founded in 1997, and an exploration programme was rapidly put together the following year to identify areas that could contain significant concentrations of uranium. In 2000, exploration was concentrated on the sandy Sainshand Formation, and in 2002 mineralization was confirmed at the Dulaan Uul site. Following this discovery, exploration was intensified over the next three years.

Several targets were identified between 2006 and 2010 and exploration was once again intensified with a larger annual budget and an ambitious drilling programme.

In 2009, the exploration entered a new phase with the discovery of promising mineralization in the Zoovch Ovoo area (still in the Sainshand Formation), 30 km from Dulaan Uul.

Zoovch Ovoo has the distinction of being larger and thicker than the Dulaan Uul deposit. The area is now covered by an exploration licence until 2015. Nowadays, the totality of the discovered ore bodies has been classified by the mongolian State.

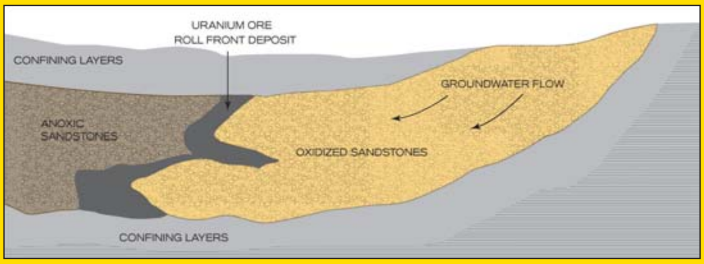
Next step: AREVA will set up a technological test to test and optimize the uranium recovery parameters. These parameters will be studied prior to putting together the future mining project with the Mongolian State and the partners. This will take the Zoovch Ovoo and Dulaan Uul deposits to the mining phase.

WHAT IS A "ROLL-FRONT"?

Roll-front type uranium deposits form naturally in Mongolia and Kazakhstan from the movement of phreatic groundwater circulating through permeable sandy or conglomeratic formations.

The uranium present in the aquifer precipitates at the interface between oxidizing and reducing environments, forming a specific crescent-shaped body known as a "roll-front".

The roll front migrates with geological time to create an accumulation that can extend for hundreds of metres.



Roll-Front

After nine years of exploration, a mining licence was requested for the Dulaan Uul site.

The mining project: a partnership between France, Mongolia and Japan

AREVA holds several exploration licences in Mongolia covering over 9,000 km^2 in the provinces of Dornogobi and Sukbaatar, where COGEGOBI is conducting its drilling programmes.

This first phase has led to the first project-development steps (hydrogeological tests, certification of the resources, in situ recovery tests, etc.) in the Dulaan Uul area ("Hot Mountain" in Mongolian) in a vast sedimentary basin of the Gobi desert.

KEY DATES

- **May 2006:** MoU signed with the Ministry of Industry and Trade ensuring technical assistance for the exploration and production of uranium.
- **October 2009:** MoU signed with the Nuclear Energy Agency of Mongolia for cooperation in the nuclear energy sector.
- **December 2009:** Cooperation agreement signed with Mitsubishi Corp, destined to become a partner in the Mongolian project.
- **December 2010:** AREVA launches its first in situ recovery (ISR) test on the Dulaan Uul licence area.
- **June 2011:** The ISR test is a success.
- **August 2011:** The Professional Council of Mineral Resources with the Ministry of Mines officially classified the Dulann Uul deposit's.
- **February 2013:** The Professional Council of Mineral Resources with the Ministry of Mines officially classified the Zoovch Ovoo deposit's.
- **October 2013:** The mongol government validates the entrance of Mitsubishi Corporation into the capital of AREVA Mongol LLC.
- **October 2013:** Signing of shareholder agreement between AREVA Mongol and MON-ATOM.

ISR (IN SITU RECOVERY) MINES

In Kazakhstan, the ISR method has been used by AREVA to extract uranium since 2004. The principle of ISR is the injection of a leaching solution into the deposit through wells. The solution dissolves the uranium as it passes through the deposit and is pumped back up to the surface. The uranium-pregnant solution is then transported by pipeline to the plant where the uranium is extracted and fixed on ion exchange resins.

ISR technology is today favoured for extracting uranium from low-grade deposits. It generates very little surface disturbance (no excavation, no dust, no mine tailings), and the operating costs are low.

The geological data enabling a technical and economic feasibility of the mining project are being collected by AREVA with respect for the environment and in partnership with the Mongolian authorities.

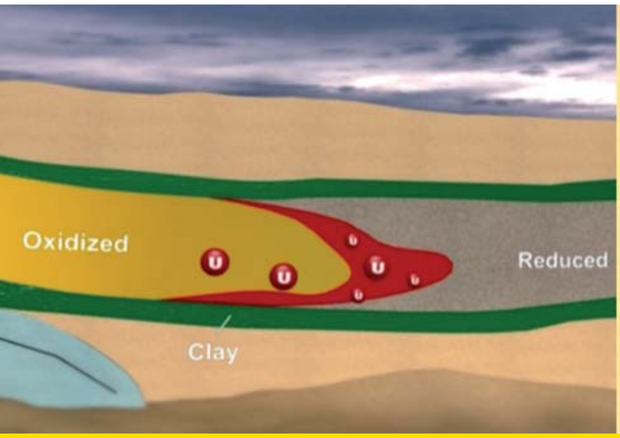
Site rehabilitation is systematically studied and planned for any mining project. This activity requires specific technical and human resources in many areas of expertise. The aim of the rehabilitation at the end of the mining operations is to restore the site as close as possible to its original state in the logic of sustainable development that is so dear to AREVA.

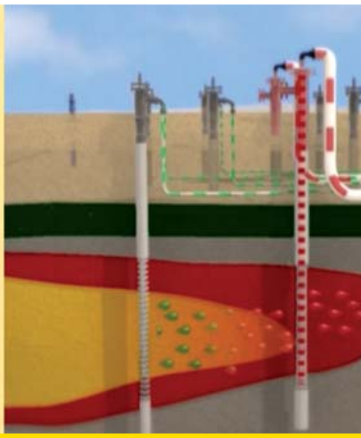
THE DULAAN UUL ISR TEST

The test was designed to optimize the production of a future industrial pilot. The choice of ISR technology was determined by the very nature of the uranium deposit. It is a method that, when the geological conditions are suitable, is used for low grade deposits.

On 1 December 2010, with the approval of the NEA (Nuclear Energy Agency of Mongolia) and the Ministry of Environment, COGEGOBI launched its first ISR (in situ recovery) test at the Umnut site in the Dulaan Uul area. The low grade, the shallow depth, and the nature of the host rock are all elements conducive to use of the ISR method. The event marked the transition from exploration phase to project development phase, a major milestone in the mining project.

The test, completed in June 2011, demonstrated the technical feasibility of in situ recovery for the Dulaan Uul deposit. Based on these results, AREVA is working with its partners on an evaluation of the mining project.





Roll-front type deposit

Hexagonal leaching cell

Uranium extraction process

THE SUCCESS OF THE ISR TEST FROM 3 ASPECTS

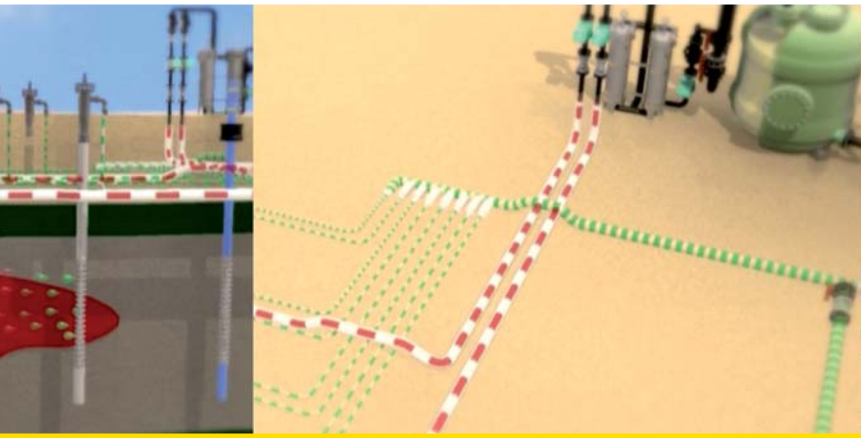
COGEGOBI submits the results of the environmental tests to the Mongolian State agencies. Similarly, the environmental impact study conducted after the test are also sent to them.

1 URANIUM EXTRACTION

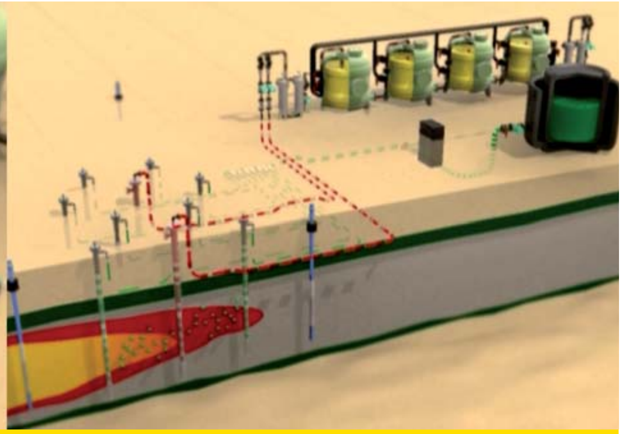
To perform the test, COGEGOBI built a "well field" which, in this case, consisted of two cells. Each cell was hexagonal with an injection well at each vertex and a producing well in the centre. The tested mineralization was 10 metres thick and the producing wells were located in the heart of the mineralization.

To make up the leaching solution, groundwater is pumped and stored in reservoirs to which sulphuric acid is added. The obtained solution is then injected into the orebody via the injection wells located at the hexagon vertices. The solution permeates the mineralized sand through the well's perforated casing.

The uranium in the orebody is thus gradually dissolved by the solution, which becomes saturated with uranium. This pregnant solution flows to the central production well where it is pumped to the surface and routed to the plant where the uranium is extracted. At the end of the process the uranium is fixed on ion exchange resins.



Solution distribution circuit



Installations of the in situ recovery test

2 EFFLUENT RECYCLING

Once the uranium has been extracted from the solutions, these are forwarded to the acid plant.

Sulphuric acid is added to strengthen the solution which is then reinjected down the wells and into the orebody.

Although the entire leaching process take place in a closed circuit, small amounts of waste water from the laboratory sorption unit and the acid unit are drained to a storage pool. This pool is regularly controlled and the waste water is treated after the test.

3 CONTROL AND MONITORING

The test parameters are monitored and regularly controlled automatically by computer, which carries out hydraulic and chemical analyses. The uranium, iron, acid concentration, pH, salinity and other elements are analysed daily on site in a laboratory installed to supervise the leaching process. More than 400 analyses are performed weekly.

The main hydraulic parameters to be controlled are pressure and flow. The balance between the injection and production solutions is automatically adjusted according to the instructions of the operator. It is primordial to respect the balance between the injected and recovered solution flows to ensure environmental preservation.

The leaching process takes place in the aquifer, which is why several control wells are installed above, below, around and within the cells to measure the aquifer's hydrodynamics and quality. A systematic groundwater sampling programme is carried out during and after the test to determine the impact of the process on the environment and especially on groundwater quality.

Where radiation protection measures are concerned, all employees wear dosimeters to measure their exposure to gamma rays. Similarly, air, dust and work areas are measured and analysed daily.

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With these two major offers, AREVA's 46,000 employees are helping to supply ever safer, cleaner and more economical energy to the greatest number of people.

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Energy is our future, don't waste it!