

# NEW AREVA PRODUCING, PROCESSING AND MANAGING NUCLEAR MATERIALS



#### **NEW AREVA**

- 01 Profile
- 02 Our businesses, our mission, our strengths
- 04 Board of Directors of the AREVA group
- **Message from Philippe Varin,**Chairman of the Board of Directors of the AREVA group
- 06 Interview with Philippe Knoche, Chief Executive Officer of AREVA
- 09 New AREVA's Executive Committee
- 10 Key figures of New AREVA
- 12 New AREVA's international footprint

#### 14 OUR OPERATIONS

- 16 Mining
- 20 Interview with Éric Chassard, Director of Performance
- 22 Uranium Conversion and Enrichment
- 26 Interview with Guillaume Dureau, Senior Executive Vice President, Customers, Strategy, Innovation and R&D
- 28 Used fuel recycling
- 32 Interview with François Nogué,
  Senior Executive Vice President, Human Resources
  and Communications
- 34 Nuclear Logistics
- 38 Interview with Dominique Guilloteau, Senior Vice President, Safety, Health, Security and Environment
- 40 Dismantling and Services
- 44 Nuclear Engineering

New AREVA adds value to nuclear materials so that they can contribute to society's development, first and foremost in the field of energy.

The group offers high value-added products, technologies and services across the nuclear fuel cycle, from raw materials to waste treatment. Its operations encompass mining, uranium conversion and enrichment, used fuel recycling, nuclear logistics, dismantling and services, and engineering.

The group's 20,000 employees bring their expertise, their command of cutting-edge technologies, their continuous search for innovation and their uncompromising commitment to safety to customers in France and abroad.

1

#### **OUR OPERATIONS**



**MINING** 



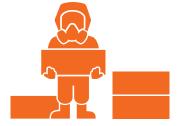
URANIUM CONVERSION AND ENRICHMENT



USED NUCLEAR FUEL RECYCLING



**NUCLEAR LOGISTICS** 



NUCLEAR SITE DISMANTLING



**ENGINEERING** 

#### **OUR MISSION**

To be the leading player in nuclear fuel cycle operations

To create value for our customers through innovative technologies and solutions

To do so while being profitable and competitive

To serve the French and international nuclear industries

#### **OUR STRENGTHS**

An uncompromising culture of safety

An unparalleled nuclear customer portfolio

Recognized industrial expertise and renovated facilities

Cutting-edge technologies and unique world-class expertise

Men and women recognized for their skills, their commitment and their ability to meet the challenges

#### **BOARD OF DIRECTORS OF THE AREVA GROUP**

as of March 31, 2017

Composed of 11 members serving 4-year terms of office, the Board of Directors sets the direction for the company's operations and ensures that they are followed. It may take up any matter concerning the proper functioning of the company. It performs such checks and verifications as it deems necessary. The Board has specific powers such as the approval of the financial statements and of the annual management report and the appointment of the Chairman and Chief Executive Officer.

DIRECTORS APPOINTED BY THE SHAREHOLDERS

DIRECTOR APPOINTED BY THE FRENCH STATE BY MINISTERIAL ORDER DIRECTORS REPRESENTING THE EMPLOYEES

Philippe Varin,

Chairman of the Board of Directors

Daniel Verwaerde,

Vice Chairman of the Board of Directors

Marie-Hélène Sartorius

Claude Imauven

Philippe Knoche

**Christian Masset** 

(on the proposal of the French State)

**Pascale Sourisse** 

Alexis Zajdenweber

Françoise Pieri Jean-Michel Lang Odile Matte

#### THE FOUR SPECIALIZED COMMITTEES OF THE AREVA GROUP'S BOARD OF DIRECTORS

To execute its missions, the Board of Directors is backed by four specialized committees which issue opinions and recommendations to the Board of Directors.

STRATEGY AND INVESTMENTS COMMITTEE

Chaired by **Philippe Varin** 

AUDIT AND ETHICS COMMITTEE

Chaired by

Marie-Hélène Sartorius

COMPENSATION AND NOMINATING COMMITTEE

Chaired by

Claude Imauven

END-OF-LIFE-CYCLE
OBLIGATIONS MONITORING
COMMITTEE

Chaired by Claude Imauven

#### **MESSAGE FROM PHILIPPE VARIN**

Chairman of the Board of Directors of the AREVA group



The AREVA group continues to implement its restructuring plan, which enters its final phase in 2017 with the redefinition of the French nuclear industry, to achieve an ultimate objective: to be an industry of excellence and the third largest industrial sector in France representing 220,000 jobs. Born of financial necessity and political will at the highest reaches of the French State, this restructuring translates into the forming of New AREVA, refocused on the fuel cycle, and the sale of AREVA NP, led by Bernard Fontana, to EDF, which owns the world's largest nuclear fleet. All of our teams are mobilized to make this transaction effective by the end of 2017. Strong and united, the French Nuclear Team is backed by long-term contracts which will contribute to the creation of value between the two groups. Let me also point out that this plan is accompanied by the sale of our operations in renewable energies, propulsion reactors and nuclear measurements to partners capable of supporting their future growth.

Our goal for New AREVA is a lofty one: to be the leader in nuclear materials production and recycling, in waste management and in dismantling within the next ten years. Our requirements for safety, security and product quality are uncompromising. The same is true for competitiveness, customer value, operational excellence and agility, so that we outshine our competitors and meet the expectations of civil society. These requirements are shared by AREVA NP and take on their full meaning in the large-scale audit we are conducting at the Creusot plant, with complete transparency, in order to draw lessons from the past and enable the restart of commercial production in the summer of 2017.

We are opening a new chapter in our group's story. Against a difficult backdrop, I wish to salute the tremendous mobilization of our teams under the leadership of Philippe Knoche, Chief Executive Officer of AREVA, and to say how proud I am to chair a group whose experience, know-how and technical expertise are recognized in every one of its businesses throughout the world. Our partnerships with the Japanese companies JNFL<sup>(1)</sup> and MHI<sup>(2)</sup>, each of which will become a 5% shareholder of New AREVA, and the signature of a new framework agreement for industrial and commercial cooperation with CNNC in China strengthen our longstanding ties in Asia.

The world needs competitive, low-carbon energy. This deep conviction is equal to the immense challenge represented by the 70% growth in global demand for electricity by 2040 attributable to increased consumption, particularly in Asia, but also to new uses of electricity in developed countries. At the same time, to meet the objectives of COP21, it is imperative that greenhouse gas emissions be reduced 50% by 2050. Nuclear will therefore remain an essential energy in the global energy mix.

<sup>(1)</sup> Japan Nuclear Fuel Limited. (2) Mitsubishi Heavy Industries.

#### INTERVIEW WITH PHILIPPE KNOCHE

Chief Executive Officer of AREVA



"The success of New AREVA lies in bringing competitiveness, operational excellence and innovation to its customers."

#### How would you sum up 2016?

Philippe Knoche: Key milestones have been met with the creation of New AREVA, which combines the operations dedicated to the nuclear fuel cycle; the launch of a 3-billion-euro plan to sell assets, including the major sale of the AREVA NP reactor operations to EDF; and the setting of the terms for the capital increase of AREVA SA and New AREVA in the amount of 5 billion euros. These transactions will be carried out subject to the European Commission's green light for the purchase of AREVA NP and French nuclear safety authority's (ASN) favorable opinion on the Flamanville 3 reactor vessel tests. In the interval, the French State granted a shareholder advance of 3.3 billion euros to AREVA.

At the same time, we have carried out three fourths of our performance plan, which aims for 500 million euros in savings by the end of 2018 for New AREVA, and we have considerably simplified our organization. When AREVA NP is sold, the Japanese industrial groups JNFL<sup>(1)</sup> and MHI<sup>(2)</sup> will become shareholders in the total amount of 500 million euros. We have had close relations with these two partners for a long time; they believe in our future and can accelerate our penetration of those markets.

#### What is New AREVA's business plan?

**P.K.:** In a competitive energy market, we developed a business plan with a hundred of our managers based on three priorities. The first is to create value for our customers by offering them competitive products, technologies and services which meet their current and future needs. The second priority is to make operational excellence integral to our operations and to our management, both through simplification and by being highly disciplined. The third priority is to encourage innovation in every field, whether industrial, technological, commercial or organizational, both in our existing markets and in new markets.

Our goal for New AREVA is a lofty one: in the next ten years, we want to be the global leader in nuclear materials production and recycling, in waste treatment and in dismantling. We have the skills and the technologies to achieve that. In addition to safety, this objective relies above all on profitability. We must have positive cash flow starting in 2018 to fund our goals on our own: here, too, we want to set the standard.

#### Can you give us a short review of your results?

**P.K.:** 2016 was a year of transformation, of reorganization and of a change in management culture. It was also characterized by major commercial successes, particularly in conversion and enrichment, recycling and logistics, by a very large order intake, and by the trust our international customers have placed in us for all of our operations.

For the AREVA group, our financial results improved, although they remained negative with net cash flow from operations of -621 million euros, which is nonetheless at the higher end of the latest forecasts, thanks to the efforts of the company, our employees and our suppliers. For New AREVA, operating income rose sharply: it was up 540 million euros compared with 2015, i.e. more than 10% of revenue. This is due in particular to our performance plan, which is more than 70% complete.

As a result, we are able to confirm our profitability objectives for 2020, through growth in operating income, to more than 8% of revenue, despite difficult market conditions.

In short, it is the strength of our backlog combined with the focus on improving our cost, quality and schedule performance that are bringing up our operating margin.

#### How is New AREVA different from its competitors?

**P.K.:** New AREVA has real advantages in its favor. This starts with its market which is, for all its difficulties, still a growth market, since nuclear capacities will continue to rise 50% by 2040 and meanwhile fuel will have to be supplied to operating reactors and solutions will have to be provided for used fuel management and recycling, for radioactive waste and for dismantling. Two figures illustrate this: the used fuel inventory of light water reactors will climb 70% from 2013 to 2030, and more than 150 GW of nuclear capacity will be shut down by 2040.

New AREVA is in a very good position to meet these challenges because it is in the global Top 3 in mining, in conversion and enrichment, and in recycling. I would add that our worldwide expertise in the shipment of nuclear materials and waste gives us a unique advantage in logistics.

We have an unparalleled portfolio of nuclear customers and strong visibility anchored in a backlog of more than eight years of revenue equally divided among our major operations and among Europe, the Americas and Asia.

Our production plants have been completely renovated, with the Comurhex II and Georges Besse II plants recognized as being the most modern in the world for conversion and enrichment. In recycling, the technical complexity and industrial capacities of our La Hague and MELOX plants have set the global standard. This is also true of our uranium mines and mills.

We are also recognized for our technologies and our expertise. This is the case for mining methods, which are at the cutting edge of innovation, such as the in-situ recovery technology (ISR) and the jet boring system. The same goes for our know-how and engineering in MOX fuel fabrication, which we have

brought to the MFFF facility in the United States and the Rokkasho-Mura plant in Japan. In dismantling, we are working on two of the largest projects in the world: Marcoule and the UP2-400 plant at La Hague. It is because of all this technical expertise that we can offer our customers real solutions.

Internationally, where close to 60% of our revenue is earned, our historical presence in Asia puts us in an advantageous position to acquire market share, particularly in China, which will account for 50% of global nuclear growth by 2030.

Our group has the means to bounce back. But in a competitive world, with uranium and enrichment market prices sharply down, with technological and economic competition from Russian, Chinese and Japanese industries, not to mention the competition from renewable energies, we must be even more competitive, even more effective and even more customer-oriented to secure New AREVA's position as a world leader over the longer term.

#### What is your commercial outlook?

**P.K.:** We have a solid base of orders with EDF, in particular through the signature of long-term contracts in both the front end and the back end of the fuel cycle until the 2020-2030 period. Nor should we forget the contracts to build two EPR reactors at Hinkley Point in the United Kingdom, for which New AREVA will supply a share of the fuel.

In China, of course, it's about the recycling plant construction project, for which technical discussions have now been completed. Added to that is a framework agreement for industrial and commercial cooperation on nuclear fuel cycle operations signed by CNNC and New AREVA in early 2017. This agreement paves the way to new industrial and commercial prospects between our two countries.

Japan is also a long-term partner. Our bonds are illustrated by all of our activities with Japanese customers and more specifically by our support for the restart of the Rokkasho-Mura treatment plant and the J-MOX plant. In South Korea, we are winning market share in mining, conversion and enrichment, a source of commercial pride for us.

"We have the skills and technologies to be the world leader in each of our businesses."

<sup>(1)</sup> Japan Nuclear Fuel Limited.

<sup>(2)</sup> Mitsubishi Heavy Industries.

The Asian outlook should not make us overlook the new markets we can capture in mature countries, such as Belgium and Spain for recycling, or Germany, the United Kingdom and the United States for dismantling.

#### Is your commitment to safety still the same?

**P.K.:** Safety has been integral to the group's culture for years: it is a constant obsession, and no compromise is acceptable. It is an imperative which we must obey, not only for our customers and stakeholders, but also for ourselves, at all of our industrial platforms. In 2016, more than 350 million euros of our capital spending went towards improving the safety of our facilities, and we are engaged in considerable efforts to improve our safety organization and our daily behaviors and attitudes.

In occupational safety, there is still room for improvement. While the AREVA group has a frequency rate of 1.8, which is lower than that of the mechanical and nuclear industries, there are strong disparities within the group and the rates are still higher than the best in the chemical industry in particular, which are less than 1. These results are an incentive to be even more vigilant and to be present in the field, close to employees.

#### What role does innovation play in these new dynamics?

**P.K.:** Our ability to innovate is and must remain our hallmark. This is true in mining, for example, with innovations enabling us to access profitable new or complex deposits. It is also true in transportation with new types of casks, in dismantling with the use or robots, and, through AREVA Med, in experiments with radioelements to find treatments to fight cancer. We received the "Industry of the Future Showcase" label in 2016.

There is huge potential for innovation in our industry by mining the skills that lie at the core of our businesses, but also by being connected with external partners, from large companies to startups, in a virtuous ecosystem. Innovation is rooted above all in being customer-oriented. We develop projects, products and services corresponding to their expectations.

## "Our mind-set is both combative and positive through teamwork and shared values."

#### How committed are the teams to New AREVA?

**P.K.:** We can be proud of the initial results we've achieved, thanks to the efforts of all employees. The company's recovery is the biggest reward for everyone. Our new social contract signed in early 2017 aims for equity among all of the group's employees, but also for sharing of the fruits of our transformation. This calls for the involvement of all managers, who must act as true leaders to create momentum, encourage change and mobilize the teams.

Our mind-set is both combative and positive through teamwork and shared values of customer satisfaction, continuous improvement, respect for and development of people, team spirit and cohesion, exemplarity, integrity and responsibility. These are not empty words that are spieled off, but truly the foundations of our identity. New AREVA is strong because of its men and women, who are recognized for their skills, their commitment and their ability to meet challenges.

#### **NEW AREVA'S EXECUTIVE COMMITTEE**

as of March 31, 2017



Philippe Knoche Chief Executive Officer



**Stéphane Lhopiteau**Chief Financial
and Legal Officer



François Nogué Senior Executive Vice President, Human Resources and Communications



**Guillaume Dureau**Senior Executive
Vice President, Customers, Strategy, Innovation and R&D



Éric Chassard Senior Executive Vice President, AREVA Projects Business Unit and Director of Performance



Jacques Peythieu Senior Executive Vice President, Mining Business Unit



Antoine Troesch
Senior Executive
Vice President, Chemistry
- Enrichment Business Unit



Pascal Aubret
Senior Executive
Vice President, Recycling
Business Unit



**Alain Vandercruyssen**Senior Executive
Vice President, Dismantling and Services Business Unit



Frédéric de Agostini Senior Executive Vice President, Logistics Business Unit



**Christian Barandas**Special Advisor to the Chief Executive Officer

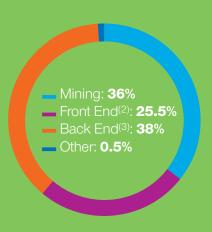
#### **KEY FIGURES OF NEW AREVA**

2016 Revenue €4 bn(1)

**Backlog** €31.8 bn

#### Revenue by business segment

20,000 employees worldwide



**Global Top 3 in** its businesses

<sup>(1)</sup> Contribution to revenue of the AREVA group.(2) Conversion and Enrichment.

<sup>(3)</sup> Recycling, Logistics, Dismantling and Services, Nuclear Engineering.

#### **KEY FIGURES OF NEW AREVA**

#### **Occupational Safety**

2.5

Accident frequency rate with lost time in 2016 (excluding commuting accidents).

0.07

Accident severity rate in 2016 (accidents reported during the year, excluding commuting accidents).

#### **Radiation protection**

0.83

Average employee dose from radiation exposure over 12 consecutive months<sup>(1)</sup> (mSv).

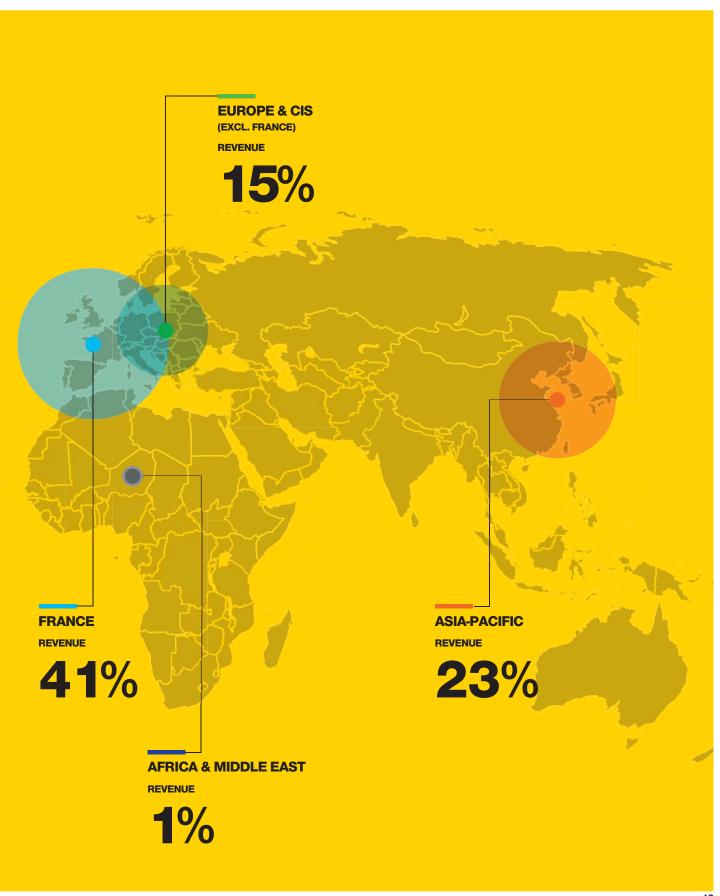
0.46

Average subcontractor dose from radiation exposure over 12 consecutive months<sup>(1)</sup> (mSv).

The average dose from radiation exposure of New AREVA employees is comparable to the regulatory limit for the public (1 mSv/year). No New AREVA employee has received an individual dose over 12 consecutive months greater than the limit in the French regulations (20 mSv).

#### **NEW AREVA'S INTERNATIONAL FOOTPRINT**







## **OPERATIONS**



Offering customers innovative solutions and technologies for nuclear materials processing



#### **Mining**

The first stage in the nuclear fuel cycle, New AREVA's mining operations encompass worldwide uranium exploration, production and marketing and mining site rehabilitation. With operating mines in Canada, Kazakhstan and Niger, the group is positioned among the world's leading uranium producers, with competitive production costs and mining techniques at the cutting edge of innovation and protective of the environment. With twenty years of diverse resources and reserves, customers are assured of sustainable access to uranium. To make this happen, New AREVA continues to invest in exploration for profitable deposits, in the development of mining projects, and in strategic partnerships.







"As a responsible, reliable mining company here for the long term, we make sure that the **economic, social and environmental impacts are controlled** throughout the project life cycle. Their acceptability is a decisive competitive advantage."

GILLES RÉCOCHÉ,

Director of Safety and Community Involvement, AREVA Mines





"Faced with low market prices, our competitiveness means **keeping mine production costs low.**Our investment in exploration is part of that strategy, particularly by targeting high-grade deposits or deposits that can be mined with in-situ recovery (ISR)."

GILBERT STEIN, Director of Geoscience





New AREVA has received operating permits to mine the Dulaan Uul and Zoovch Ovoo deposits in the Gobi Desert in Mongolia. These deposits are one of the biggest uranium discoveries of the past twenty years.

•00000

#### **Performance**



Our company has been in motion since early 2015, pursuing an ambitious cost savings plan. Mid-way through, we have reason to be proud: we have already achieved more than half of our savings objectives, giving us confidence in the future. Though we have been successful in meeting this first milestone, the road ahead is still long.

Today, performance takes the form of a cultural and managerial revolution serving the company's transformation. Operational excellence is part of New AREVA's DNA, and in pursuing it we have created momentum for a company focused on agility, added value and efficiency in which each person has a role to play in our transformation. We must constantly ask ourselves what can be done to improve our performance and create value for our customers.

We emphasize initiative and creativity, and we encourage change and new ideas. Managers play a vital role by supporting this cultural revolution with a very clear roadmap: being in the field, focusing on listening to and satisfying the customer, developing a problemsolving culture, rolling out and applying standards, supporting their teams while being responsible and exacting.

Our organization has been simplified considerably, meaning short decision-making channels for the six business units managed as profit centers and focused on business issues. With the digital transformation in full swing, it is contributing to agility and performance.

In this ecosystem of operational excellence, stakeholders such as customers or suppliers benefit from performance gains and are players in the construction of New AREVA.

While these changes are being made, we remain uncompromising on quality, occupational safety, nuclear safety, and compliance with standards and procedures. All this opens up new prospects for team spirit and cohesion at New AREVA.

With a simple, nimble organization, a customer orientation, a focus on innovation and above all on profitability, our company is destined to be a strategic player in the nuclear industry.

"A culture of operational excellence underpins the company's performance and transformation."

Éric Chassard

Director of Performance

Ahead of schedule on reduction of recurring costs of

€380 M at the end of 2016, compared with €350 M planned (objective: €500 M by 2018)

Including external spending cuts:

€157 M at the end of 2016, compared with €132 M planned (objective: €215 M by 2018)

Number of procedures and organizational documents

divided by 2

Ahead of schedule on the operational excellence training plan with more than

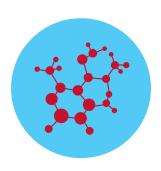
**1,500** people

trained in 2016, from entry level to the Executive Committee

#### **OPERATIONAL EXCELLENCE**

- the customer is the focus of our concern
- the company is oriented towards added value
  - employees play a role in transformation





## Uranium Conversion and Enrichment

Backed by an unrivalled, integrated industrial platform and the world's most modern facilities with the Comurhex II conversion plants and the Georges Besse II enrichment plant, New AREVA is recognized by the market as a whole for its technical skills and processes at the cutting edge of innovation. The group has solid industrial assets to provide high added-value services to customers with the best processes and practices in terms of safety, competitiveness and environmental footprint. This is borne out by the diversified, robust backlog representing close toten years of revenue.







"The Comurhex II Tricastin plant began startup testing on schedule for active commissioning, with half of industrial production capacity to be reached starting at the end of 2018. The goal is for the Tricastin platform to be **a global reference in conversion** with the highest standards of nuclear safety, occupational safety and environmental protection."

#### JEAN-LUC VINCENT,

Director of the Comurhex II program

0 • 0 0 0 0



The Georges Besse II enrichment plant successfully reached its full production capacity of 7.5 million SWU (Separative Work Units) according to the initial schedule.

The plant uses a new enrichment process, centrifugation, offering the best guarantees in terms of competitiveness, energy savings, technical reliability and environmental impact reduction.

With the cleanup of the gaseous diffusion stages, New AREVA marks a major milestone in the dismantling of the Eurodif enrichment plant, which has been replaced by the new Georges Besse II industrial platform.







"The industrial plan and experienced, innovative approach used at Tricastin for the construction of the emergency management buildings is of interest to all nuclear operators. These buildings are capable of **withstanding extreme natural events** and comply with the requirements of the post-Fukushima Supplementary Safety Assessments."

#### CHRISTOPHE MÉI,

Head of the Tricastin Major Projects Department



## Customer added value



#### What are the challenges facing New AREVA?

In a competitive nuclear market with complex economic and political issues, we must find opportunities to meet customers' needs in order to write New AREVA's long-term future.

The first answer is strategic.
By refocusing on its core business, processing nuclear materials across the fuel chain, New AREVA stands out for its technology leadership in every business in the cycle.

The second answer concerns nuclear's share of the energy mix. By making access to competitive, long-term energy possible, nuclear power is integral to our planet's societal and environmental challenges. We cannot meet the greenhouse gas emissions

reduction commitment without nuclear. Nor can we meet rising global demand for electricity, whether in mature countries or in developing countries, without powerful, reliable electricity produced at low cost.

#### How can you sustain your development?

In the front end of the fuel cycle, we are in an industry of long lead-times in which the challenge is to optimize a portfolio of reserves to give our customers the assurance of twenty years of production visibility.

In mining, thanks to our knowledge of the full range of technologies, we are able to withstand the period of depressed prices by discovering and optimizing profitable deposits with low production costs and high uranium grades. In uranium conversion and enrichment, we have protected the future by investing in the renovation of our production resources with the Comurhex II and Georges Besse II plants, which are the most modern in the world and at the cutting edge for CO<sub>2</sub> emissions reduction.

In the back end, we also have the advantage of high-performance production capabilities in the treatment and recycling business with our La Hague and MELOX plants, which have set the standard worldwide. By making the customer the focus of our concern, we are instilling a high level of trust with EDF as well as with China and Japan, with which we are becoming a durable industrial partner. In dismantling, our ability to cover the entire value chain increases competitiveness and saves time. We are working on innovative offers for high added-value services, such as the design of dismantling scenarios, dismantling of the primary cooling system and management of radioactive waste packaging. This is what our customers expect, especially for the two major dismantling markets of Germany and the United States.

"Through customer orientation and customer value, a range of opportunities is opening up which will ensure New AREVA's long-term future."

#### Interview with Guillaume Dureau

Senior Executive Vice President, Customers, Strategy, Innovation and R&D

#### Can you give some examples of your customer orientation?

In China, the market has stabilized and restarted with the announced launch of eight to ten additional reactor units. For thirty years, we have been a solid partner of the Chinese nuclear industry, with which we have built strategic alliances and joint ventures. This is the case with CNNC(1), in charge of all fuel cycle operations in China, with which we have a balanced longterm cooperation. An example is the recent signature of a new industrial and commercial partnership agreement on nuclear fuel cycle operations. Another large-scale project, in the back end this time, is the construction of a treatment and recycling plant with an annual treatment capacity of 800 metric tons of used fuel.

Japan is slowly recovering from the Fukushima accident. Public acceptance for the restart of the reactors is a major challenge for which we can provide advice and experience. This ability to understand the customer's needs calls for empathy and is not just posturing. It lays the foundations of a long-term relationship which thrives because it is based on trust. One need look only at the equity interests in New AREVA acquired by JNFL<sup>(2)</sup>, whose shareholders comprise all of Japan's utilities, and MHI<sup>(3)</sup>, which has been allied with AREVA for ten years now.

This customer orientation has been demonstrated across all of the more or less mature markets. In Europe, I would mention the United Kingdom, with which France shares a common nuclear culture. That country is building new power plants but also has real management issues with the back end of the fuel cycle and dismantling, such as at the Sellafield site, the largest complex in the British nuclear industry.

We are advising them on the different critical stages of dismantling and phased mothballing by helping them to prioritize and to move forward efficiently. This work of understanding the issues and providing support is part of our business. An engineering report is not enough in the nuclear business.

#### Can you describe the cultural change underpinning your transformation?

To support the dynamics surrounding New AREVA, we have to develop a spirit of entrepreneurship, a questioning attitude which encourages critical thinking and new initiatives. First and foremost, we must do what we know how to do perfectly. This challenge calls for operational excellence, competitiveness, on-time delivery, continuous improvement... They are not enough, but they are a start. Secondly, we have to ask ourselves what more we can do. We must be able to offer our customers new, high added-value services, such as in the dismantling field, and create new drivers for growth. Lastly, taking a more forward-looking view, we must examine how to make full use of our potential, for example by improving a process or by turning a constraint or a question into an opportunity. AREVA Med is a good illustration of this: we were able to turn lead-212 into an opportunity, and today it is used in medical research to develop treatments to fight cancer.

#### How would you describe your approach to innovation?

Innovation is above all a culture based on a model of value creation. It involves developing an environment conducive to creativity, to the wise application of technologies, to taking risks as well, as long as we recognize quickly when we're headed down the wrong path and turn back. Because ultimately, if we know how to see differently, how to find the short-cut or the right solution that others haven't seen, the residual risk is minimal. There are no ridiculous ideas. Innovation is first and foremost a state of mind.

A backlog representing more than **8 years** of revenue

In the **Top 3** worldwide in mining, conversion and enrichment, and recycling

Close to **60%** of revenue from international customers



### **Nuclear** medicine

AREVA Med, New AREVA's medical subsidiary, develops new, highly pure lead-212 (212Pb) production processes. Lead-212 is used in a growing number of research projects on targeted alpha therapy, an innovative approach in oncology used to target cancer cells while limiting the impact on surrounding healthy cells.

<sup>(1)</sup> China National Nuclear Corporation.

<sup>(2)</sup> Japan Nuclear Fuel Limited.

<sup>(3)</sup> Mitsubishi Heavy Industries.



## Used fuel recycling

Thanks to the performance of its large-scale La Hague and MELOX production plants, New AREVA is positioned as a leading international player in used fuel treatment and recycling. Its ability to recycle reusable materials and to produce safe and stable radioactive waste packages results in approximately 25% savings of natural uranium resources and divides final waste volumes by five and their toxicity by ten.





Placed 9 meters under water, the used fuel remains in the storage pool for three to five years to allow its radioactivity to decay. The demineralized water is continuously cooled and filtered inside the pool itself.

In November 2016, the La Hague site received the decree authorizing the extension of storage capacity for French vitrified waste.







"Operation of the **cold crucible** for vitrification is ramping up, with 154 canisters of glass produced in 2016."

#### BENJAMIN AUBERT,

Director of the Packaging Operations Unit at La Hague

000000





In 2016, the MELOX site produced 124 metric tons of MOX fuel for France, Japan and the Netherlands. The year saw the successful restart of fabrication for the Japanese customer Kansai EPCo. In addition, four Japanese specialists from Japan Nuclear Fuel Limited (JNFL) were trained for six months to prepare them for the operation of the MOX fabrication plant known as J-MOX, currently under construction at the Rokkasho-Mura site in northern Japan.



"Our technology assistance contracts together with the resumption of fabrication show that **the MOX road is indeed open** in Japan. 2017 will be a decisive year with JNFL and MHI acquiring a stake in the group and with the signature of several significant assistance contracts for the J-MOX project."

#### BERNARD COLLIN,

Project Manager, International Recycling

00000

## Social dynamics



#### What are the major thrusts of your business plan?

Our group is undergoing a major transformation which translates into organizational change, workforce adjustment, the upcoming sale of AREVA NP to EDF and the creation of New AREVA. We wanted to affirm our goals for New AREVA through a business plan which is meaningful and opens up new prospects for its employees. All of the managers were rallied around a common vision of shared values and exemplary behaviors such as customer orientation and customer satisfaction, problem solving, exemplarity, presence in the field and a spirit of initiative and creativity. The plan is based on the simplification of our organization into our six major businesses.

#### You are setting up a new social contract. Why?

As part of our plan for New AREVA, we have to modernize and adapt our social contract to market realities and global competition while sending a positive signal to the employees who are supporting the company's transformation and recovery. This means a system of profit sharing as well as visibility on the prospects for skills development and compensation. We must move forward by harmonizing employment status to reinforce equity among employees and encourage mobility within New AREVA, but also to meet industry standards for manager working hours and time savings accounts. This new contract aims to establish new social dynamics which contribute to the development of New AREVA and to its success.

#### Has social dialogue been constructive during this pivotal period?

Throughout 2016, we involved the employee representation bodies in each stage of the group's transformation. Through regular meetings, we constructed high-quality, ongoing dialogue anchored in the stability of the major company agreements. Following the agreement of October 2015 on manpower planning, we signed a majority agreement in the six companies involved in the voluntary departure plan (VDP). With some 4,500 departures recorded at the end of 2016, we are in line with our workforce reduction objective of 6,000 by the end of 2017.

Aware of the impact of these adjustments on the economies of the communities in which our sites are located, we signed an economic revitalization plan with the Ministry of Labor and the regions involved concerning several drivers conducive to the return to employment, business creation and the sustainability of the local economic fabric. We are totally committed to this.

"Our social dynamics are based on a balance between productivity gains and redistribution, between equity and competitiveness."

Interview with François Nogué

Senior Executive Vice President, Human Resources and Communications

#### What are the key measures of your wage policy?

While not overlooking the group's financial constraints, we would like our recovery and improved results to benefit all employees committed to the development of New AREVA. It's an overall balance. That means two new supplementary measures for incentive profit-sharing: group profit-sharing starting with the 2017 financial year, and a system for involving employees in New AREVA's recovery for 2017, 2018 and 2019 through a "claw-back" mechanism. This would seek to redistribute part of the net cash flow in excess of budgeted cash flow. These incentive profit-sharing measures tied to collective efforts contribute to team spirit and fairly reward the efforts made.

#### What are the goals for the group's skills initiative?

A skills initiative was launched in the second half of 2016 and will be the subject of consensus building with the labor partners in 2017. It is based on an in-depth review of skills requirements and available resources for each of our 15 reference disciplines. The goal is to have a pool of critical skills related to our technical expertise and to identify objectives for training, mobility and hiring. This initiative draws on a network of discipline advisors and on the involvement of our managers in the field. We want to promote career paths via our offering of training programs and discipline schools, which will drive manpower planning for the group.

#### How many employees are you going to hire?

For the consolidation scope of the six companies concerned by the voluntary departure plan, we have committed to replacing departures through attrition outside the VDP. The group may thus hire between 600 and 700 people in 2017 (including in Dismantling and Services), half of whom have engineering backgrounds. We must recapture our appeal as an employer in order to attract young talent and renew our age pyramid.

The group also wants to relaunch its policy in favor of work-study programs and the inclusion of young people in New AREVA by committing to hosting 5% work-study positions, with priority given to industrial and production jobs, and by hiring 20% to 25% under openended employment contracts from the population of work-study positions and fixed-term employment contracts.

#### What messages would you like to convey?

The success of our plan is conditioned on the commitment of all employees to the new dynamics of New AREVA. In fact, we are going to measure that support as part of an annual "barometer" survey.

By balancing performance and redistribution, equity and competitiveness, our social contract supports the cultural and managerial transformation that should make New AREVA a strategic component of the French nuclear industry, simple in its organization, nimble, innovative, customer-oriented and focused on operational excellence, and recognized for skills, technologies and industrial expertise which are unique in the world.

The 15
reference disciplines of
New AREVA were the subject
of in-depth review to identify
key skills and related
requirements

More than 200 training modules designed for skills transfer, mobility and professional development

900

managers met in October 2016 for the convention launching New AREVA



#### 2017 objectives

600 to 700 hires

5% work-study positions

20% to 25%

hires under open-ended employment contracts from among work-study position and fixed-term employment contracts



#### **Nuclear Logistics**

New AREVA has offered customers integrated nuclear logistics solutions for more than fifty years. Across the fuel cycle, New AREVA offers unique expertise in the design, licensing and manufacturing of casks and in shipping operations, whether by road, by rail or by sea, together with the highest level of risk management. The group is also a world leader in used fuel management and offers dry storage solutions and services suited to each market.





"New AREVA is the only nuclear company to offer **worldwide transportation**, from the uranium mine to the recycling plant. Our experience of more than fifty years combined with the services we offer, such as real-time tracking, emergency management and global acceptance, make the difference to our customers."

ÉRIC DELAUNAY,

Director, Transportation Business Operations





00000



The NUHOMS® horizontal dry storage system for used fuel is the market leader in the United States.

An integrated organization manages transportation-related risks.

Teams receive regular training in emergency management, as is the case here in the emergency management center of Saint-Quentin-en-Yvelines.





"With more than 1,200 dry storage casks loaded throughout the world, with technologies and services tailored specifically to our markets, New AREVA gives nuclear utilities **a sustainable solution** for their used fuel management. By continually innovating, we are positioned as a leader in growth markets in the United States, in Europe and in Asia."

#### GREG VESEY,

Director, Dry Storage Business Line



## **Safety**



# What are the major outlines of the group's health, safety and environment policy?

Our goals for health, safety and environment are based on three pillars.

The first is cultural. In its dozens of years of operating some of the most complex facilities processing the most sensitive materials, HSE<sup>(1)</sup> culture has always been part of the group's DNA. We are continuously building that culture, in particular through the Safety Excellence program, which brings together everyone involved in operational management in our plants. Acquiring HSE culture is a must before any job assignment: it is part of professional training and of our skills maintenance policy.

The second pillar is strict adherence to prevention standards and defined operating procedures, which together contribute to operational excellence. A key management initiative in 2016 was to make HSE management improvement a core component of operational excellence.

"The Managers in the Field initiative was a key program in 2016 and integrates operational excellence in HSE<sup>(1)</sup> management."

Interview with **Dominique Guilloteau** 

Senior Vice President, Safety, Health, Security and Environment

This commitment translated into the Managers in the Field program, which reinforces managers' operational involvement in the field to ensure that safety standards are applicable and are applied, and to correct them as quickly as possible if they are not.

The third pillar is operating experience, which lays a deep foundation for our HSE culture. This was illustrated in 2016 through the activities of a wide network to share best practices from every field. During the second WANO<sup>(2)</sup> peer review of our La Hague plant, areas for improvement were formulated by experts based on observation of best practices. They will be deployed across all of our industrial platforms.

### What has been accomplished in the area of nuclear safety?

There can be no compromising on nuclear safety in our facilities. Our performance in 2016 was in line with this imperative, as it was in previous years. Our objective is to have zero INES level 2 events in our facilities. To achieve this, we continue to roll up weak signals from the field through an incident prevention rate for INES 0 and 1 events.

We continue to conduct post-Fukushima Supplementary Safety Assessments (SSA), and we are completing the installation of "hardened core" equipment at all of our sites. The most notable initiative is the creation of emergency management centers to cope with extreme events for their full duration. Work is being completed according to schedule. In addition, we created the AREVA national response force (FINA, Force d'intervention nationale AREVA), which channels back-up to a site in difficulty from the group's other platforms. It assembles a community of volunteer responders and will be operational at the end of 2017. A total of more than 200 million euros have been invested to carry out the SSAs.

We organize emergency drills throughout the year in which all of our operations are involved. Large-scale drills involving government agencies are also regularly conducted at national level. We successfully demonstrated our ability to manage complex situations during the last "SECNUC" simulation at La Hague in 2016.

#### What are your health, safety and radiation protection priorities?

Our health, safety and radiation protection policy seeks to continuously improve occupational health and safety and to strengthen prevention programs. Our objective is to bring the lost-time injury rate to less than 1 by 2020. Having a presence in the field is part of this, as reflected in the Managers in the Field plan, which was designed to develop the technical and managerial skills of the management staff and to beef up line managers' presence in the plants. Safety is everybody's business. It calls for disciplined behaviors and heightened vigilance every day, along with sharing best practices.

In radiation protection, our average radiation exposures are below the regulatory limits. Our culture of prevention combined with initiatives such as the ALARA(3) initiative require that we ask the right questions and that we never let down our guard.

The physical health and morale of our employees are both priorities for which we continuously seek to improve prevention and to innovate, for example through systematic analysis of occupational stress factors in all of our entities. Screening for addictions and adopting of methods for reducing hard working conditions are two areas we focus on. As part of the voluntary departure plan, our program was specifically strengthened to prevent occupational stress: health workers and a selection of human performance tools have been mobilized at the sites to support organizational change.

#### How are you organized to implement this initiative?

Our HSE initiative is part of the group's overall policy. It is based on inspections and on continuous improvement through three bodies: the General Inspectorate, which provides independent control; the Occupational Health Service, which spearheads a network of doctors and nurses across our platforms; and the Expertise Cluster, which draws on a hundred experts to monitor new industrial and occupational safety regulations, support standards implementation at our facilities, and provide answers when difficulties are encountered. The Cluster thus acts as a hotline and has received a satisfaction rating of more than 92% at our sites.

#### How do you measure the effectiveness of your environmental protection policy?

Since 2004, AREVA has reported auditable environmental management performance indicators. We continue to provide non-financial reporting, with consolidated key performance indicators (KPI) validated by our auditors. Our ISO 14001 certification underpins our environmental protection initiatives at our different sites. In waste recycling, a new era has begun in the circular economy for major nuclear industry operators to better recover certain resources produced by dismantling, such as steel.

#### Industrial site safety(1)

safetv inspections

entities inspected

recommendations made

#### INES events reported<sup>(2)</sup>

Level 0

Level 1

Level 2

#### 2017 objectives

- Ratio of INES 1 to INES 0 events: less than 0.1
- No INES 2 event

#### **INES** scale (International Nuclear Event Scale)



(1) 2016 figures.(2) Events occurring in the group's nuclear entities or during the shipment of radioactive materials

<sup>(1)</sup> HSE - Health, Safety and Environment.

<sup>(2)</sup> World Association of Nuclear Operators.

<sup>(3)</sup> As Low As Reasonably Achievable.



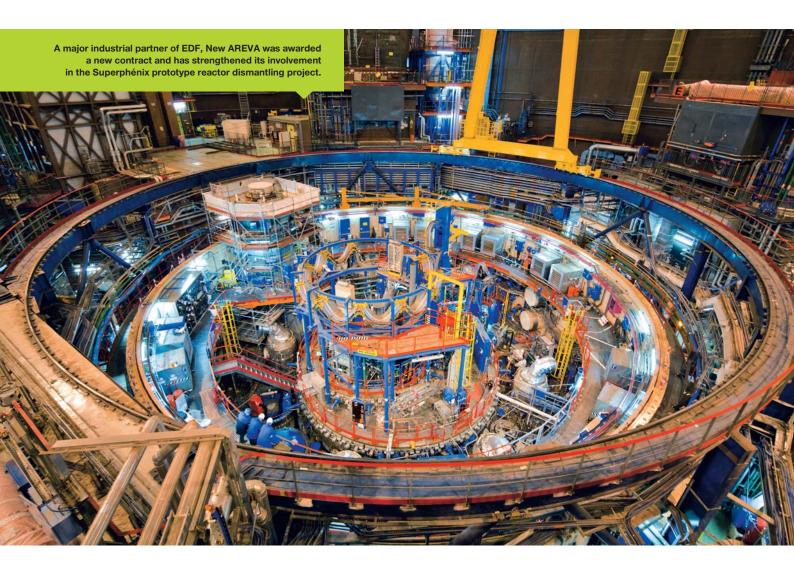
# **Dismantling**and Services

As a nuclear operator, New AREVA has world-class know-how in every phase of the equipment and nuclear facility life cycle. Fifty years of experience have made it a leading supplier of support services for nuclear site operations – site logistics, specialized maintenance and radiological safety – as well as for radioactive waste management and the dismantling of equipment and facilities at the end of their life cycle.



A major dismantling project involving the ATPu and LPC nuclear facilities at Cadarache was completed in 2016. This is the first time that a MOX fuel fabrication plant has been dismantled. The project mobilized up to 300 people for the deconstruction of 462 gloveboxes, more than 30 tanks and 4 kilometers of piping.







"Our offering of diversified, interconnected services is based on the **operating experience** of our teams and the operation of our own facilities. This unique know-how is brought to our customers at the CEA, EDF and Andra, and to our internal operations."

STÉPHANIE LAURIER, Marketing and Sales Director

000000





"For complex projects, innovation is both a source of technical solutions and a vehicle for competitiveness in our operations."

**BENJAMIN CHAGNEAU,** R&D Engineer





## **Nuclear Engineering**

As a recognized expert in nuclear fuel cycle engineering, New AREVA works for external customers as well as for its own facilities. Its services range from operational support engineering to full Engineering, Procurement, Construction and Management (EPCM).

Its engineering teams are present across all of the group's operations. New AREVA is also aiming to develop non-fuel cycle nuclear engineering operations and non-nuclear applications.









"Our simplified organization allows us to **be more nimble** in targeting our customers' specific needs. Our engineering stands out because of our teams' expertise and our methods."

**LISE WATTEZ,**Manager of the Tricastin Projects Group

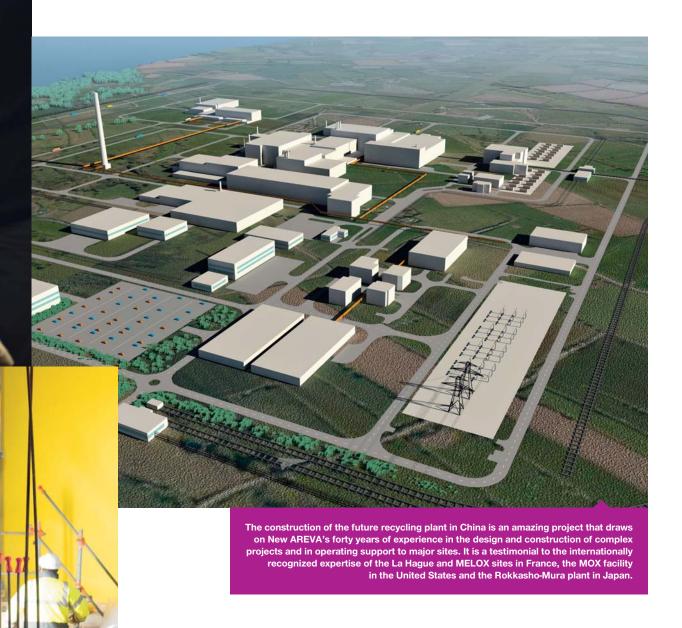
00000



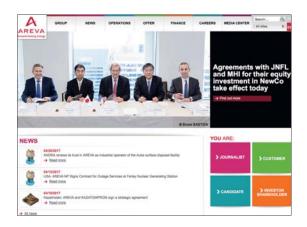


"Our goal is to develop internationally, in particular in the United Kingdom and China, and to become the **leading partner** of Asian customers for their investments in the nuclear fuel cycle, in dismantling and in responsible waste management."

FABRICE PEREIRA-MENDES,
Project Manager, China Proposals Business Operations



# Follow the group's latest news on www.areva.com



Find all the AREVA group's financial, share and social and environmental responsibility information for 2016 in the 2016 Reference Document, available at www.areva.com



Let's talk more about it, join us on















