2015

ACTIVITY REPORT

CNIM

The pioneer spirit

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Profile

For a hundred and sixty years, the men and women at CNIM have imagined and built the solutions that shape the contours of a cleaner, safer, more energy-efficient and environment-friendly world.

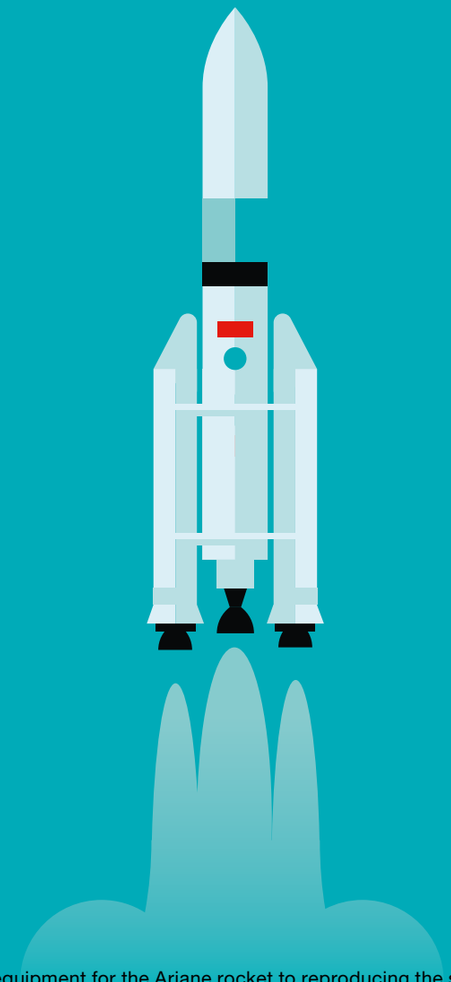
When they call upon the Group to design, build and operate their energy transition, defense or security infrastructure, our customers know that every member of our 3,000-strong team will strive relentlessly to push back the frontiers of technology and use their creativity to produce reliable, long-lasting solutions. CNIM serves major customers in both the public and private sectors, from France to the farthest corners of the globe.

On land, at sea and in space, the diversity of the Group's skills and expertise comes to the fore in activities that address the long-term issues facing today's world. This diversity is also the hallmark of a job-creating mid-size company whose family owners are deeply committed to development and whose growth is driven by an unrelenting capacity for innovation.

Over a hundred years old

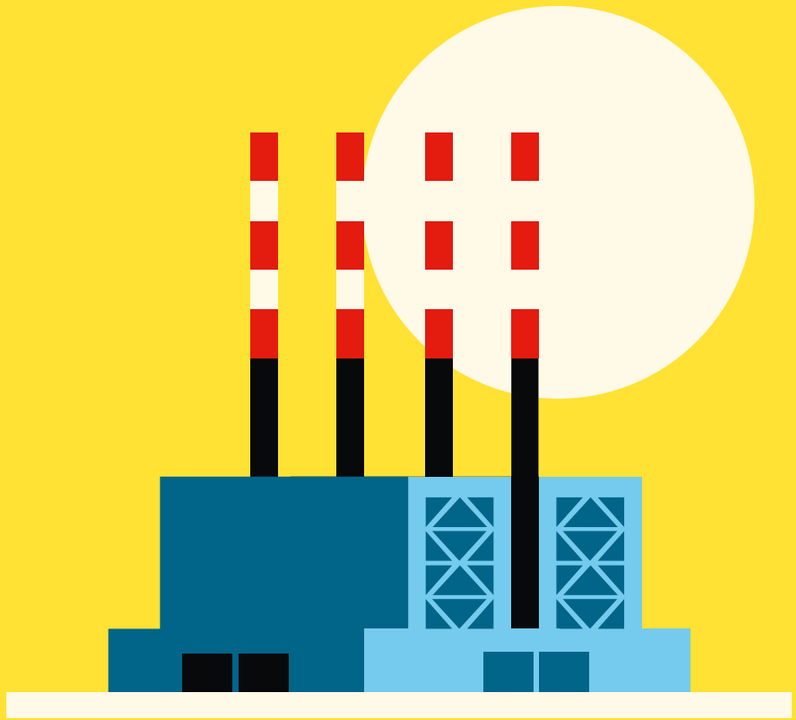
1856: with the industrial revolution of the French Second Empire in full swing, merchant vessels, armored frigates, torpedo boats and equipment for the Suez Canal leave the workshops at La Seyne-sur-Mer. Right from the outset, these were visionary men, driven by a shared passion for innovation. Today, in our workshops and offices and on site at our clients' premises, whether in France or in the farthest corners of the globe, CNIM's employees inject a constant wave of creative momentum into the company. A hundred and sixty years after its creation, the Group continues to explore new territory and break new technological ground with the same pioneer spirit.

yet still innovative



From building equipment for the Ariane rocket to reproducing the sun's energy on Earth as part of an international research project, from reinventing the concept of the landing craft (unchanged since 1945) to lighting up towns and cities, from heating homes with energy produced from waste or the sun's rays to remotely operating industrial boiler houses to reduce their thirst for energy –CNIM's staff express their creativity across many fields, on land, at sea and even in space, to respond to the major issues concerning energy transition, state security and today's industrial companies.

An industrial benchmark



With 100,000 boilers installed across every continent, 163 turnkey waste-to-energy plants delivered throughout the world (processing 70 million tonnes of waste every day), and 35,000 scientists using Precellys® (a laboratory instrument that can extract DNA molecules in just a few seconds), CNIM is proud to have forged long-term relationships of trust with major purchasers in both the public and private sectors, on both a national and international scale. The Group is renowned for the reliability, longevity and technological excellence of the solutions that it offers.

yet still flexible

Whether an item of military equipment making it possible to deploy 100 meters of bridge in just thirty minutes, a system for recovering energy for industrial applications or else a medicine that is easier to digest for patients, each of these innovations profits from a streamlined decision-making process and the close proximity of the design and manufacturing teams, which provides better feedback. CNIM has an innate ability to mobilize and let loose the creative dynamism needed for exploring new technological fields.

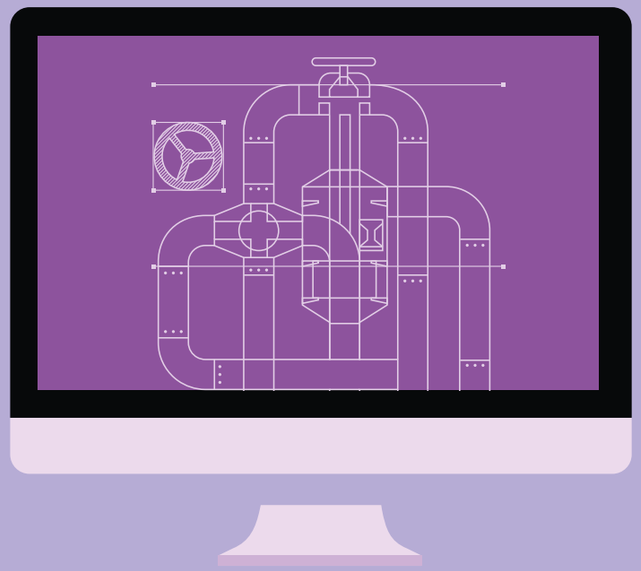
A French family business

As a company on a human scale, CNIM benefits from a stable family shareholder base which is fully committed to its development and has a strategic vision very much focused on the long term. Based from the very beginning in La Seyne-sur-Mer, the Group is currently the second largest private industrial employer in the French department of Var. Its 3,000 employees all have the same entrepreneurial spirit which has prevailed within the Group since it was founded in 1856, and which has been passed down from generation to generation at all levels of the company, like a connecting thread.

that operates worldwide

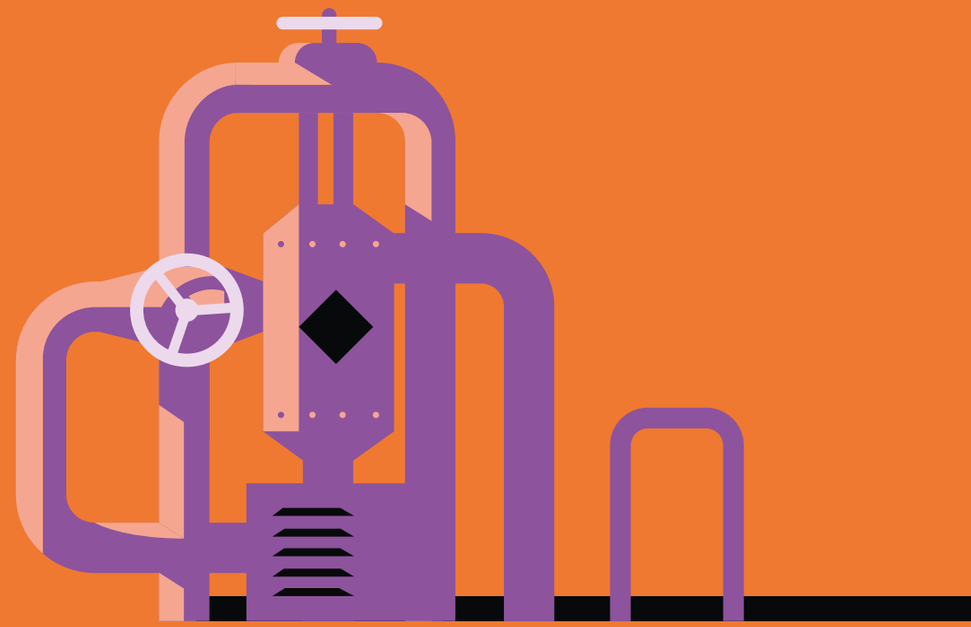
CNIM did not wait long before expanding its horizons beyond France, with the company starting its conquest of foreign markets in 1857. Its technological excellence was exported from La Seyne-sur-Mer as far as Japan, going via Italy, Turkey, Russia, Brazil and even Egypt. Today, its five industrial manufacturing sites allow it to serve its clients throughout the entire world. In 2015, the Group made 61.3% of its revenues from exports, and it makes no secret of its desire to move into new geographical regions.

Creativity



Creativity means knowing how to start from a blank sheet. It also means being able to draw on multiple strands of technological know-how, to achieve anything from building a waste-to-energy plant to designing cybersecurity software. Creativity means knowing how to handle concepts whilst perfectly mastering processes, as well as being bold enough to break the mold and come up with a range of solutions at the cutting edge of innovation. The Group's collective intelligence lies in its ability to add extra value to everything it makes, and to overcome the technological challenges posed by its clients.

with our feet on the ground



From heat pump systems that are perfectly adaptable to the technical constraints specific to each vessel, to mobile testing units that allow clients to verify, in real conditions, the performance levels of flue gas treatment systems –creativity and the quest for innovation are rewarded when they give rise to solutions which precisely meet the demands of the client, and even more so when they go beyond the targets initially set.

A guardian of traditional skills

CNIM’s historical business lines of thermal and mechanical engineering require highly specialized skills, from designing and modeling the equipment right through to manufacturing it. In the Group’s workshops in France, China, Italy and Morocco, boilermakers and welders bring the blueprints drawn up in the design offices to life. Their dexterity and precision, their knowledge of metals and alloys, and also their mastery of complex production processes such as electron beam welding, form a unique heritage which is enriched with each new advance and passed down from generation to generation through mentoring, which has always gone hand in hand with the technological progress of mankind.

at the cutting edge of digital technology

The digitization of CNIM’s business lines serves ambitious objectives. By remotely operating boiler houses and power plants, the Group is seeking to ensure that equipment is available 24 hours a day, and also bring down the operational costs of that equipment. In recent years, new activities have enhanced the range of solutions on offer. Teams specializing in data processing and security are developing solutions for keeping information systems and critical infrastructure secure, and for analyzing open-source multimedia content in order to detect any possible risks or threats.

Second Sight®

This remote gas detection camera alerts users to a chemical threat during military operations, but can also be used to monitor major events or industrial sites. It is a testament to the ability of Bertin Technologies to develop civil applications from defense projects. This flexibility enabled Bertin Technologies to win a contract from Petrofac, a leading service provider to the oil and gas industry in early 2016, for the monitoring of the Saudi Aramco refinery in Jazan.

700

meters long by 400 meters wide: the size of an area covered by Second Sight®.

GROW yet stay flexible

In 2015, CNIM expanded its portfolio of products and services and extended the bounds of its operations, opening the way to opportunities for international growth. The acquisition of Saphymo, a leading French firm in detection and measurement systems for ionizing radiation, enabled Bertin Technologies to add to its range of systems and instruments for nuclear, defense and environmental uses, while cyberintelligence has been boosted by the acquisition of AMI Software, whose applications compile, manage and process text information from the Web. Meanwhile, the establishment (with the support of Bpifrance) of the new subsidiary SUNCNIM should accelerate the transformation of CNIM's concentrated solar power technology into an industrial product for the global market.

ENERGY

SUNCNIM, accelerating solar power

A concentrated solar plant, 100% recyclable, with eco-design and turnkey delivery. This is the innovative idea behind SUNCNIM, a subsidiary founded by CNIM in June 2015 in partnership with Bpifrance. SUNCNIM's pioneering development model enables the Group to hit the ground running in a market with considerable potential for growth.

IN CHOOSING THE FRESNEL SYSTEM, CNIM OPTED FOR THE SIMPLEST, MOST ROBUST AND MOST ECOLOGICALLY SOUND TECHNOLOGY.

CNIM is one of the pioneers of concentrated solar power. In the 1980s, the Group was involved in the construction of Thémis, the world's first solar tower, in the Eastern Pyrénées department. In 2010, it brought a demonstration solar power station into service at La Seyne-sur-Mer, based on a proprietary concept using Fresnel mirrors[1]. The maturity of the technology has now convinced the Bpifrance-managed[2] SPI (Sociétés de projets industriels) fund to invest in a joint venture which will develop this promising business. Forecasts by the IEA (International Energy Agency) suggest that solar power could generate 260 GW of electricity by 2030 and 1,000 GW by 2050, compared to just 5 GW of installed capacity in 2015.

ECOLOGICAL ENERGY STORAGE: A VITAL ASSET

CNIM's concentrated solar power plants have movable mirrors which concentrate the sun's rays onto a fixed receptor tube placed 10 meters above the ground. Water circulating in the tube is thus heated and transformed into steam.
The mirrors track the movement of the sun over the course of the day. The steam produced can either be employed directly in industrial processes or used to generate electricity, heat, fresh water or cold. It can also be stored in reservoirs for use at a later time–even at night. As Christophe Lehaut, SUNCNIM's Director of Engineering, points out, "This storage capability is a considerable asset when it comes to using a renewable but intermittent source of energy. With the Fresnel system, we have opted for a technology that is simpler, more robust and more flexible than the other alternatives. And because the heat transfer fluid is just water, it's also more ecologically sound." The creation of SUNCNIM will accelerate development of this solution, targeting parts of the world with high levels of direct sunlight such as the Middle East, Northern and Southern Africa, Latin America, Central Asia and Australia.

LEADING THE FIELD

"For CNIM, this development model is a first," says Christophe Lehaut. "As an investment partner, SPI gives us the financial leverage we need to mass-produce and sell our product." CNIM solar power stations are 100% recyclable. The majority of the equipment is built and assembled on site, promoting the creation of local jobs. Operation is largely automated, making the plants well suited to arid regions where maintenance needs to be kept to a minimum. As well as generating energy independently, the plants can also be coupled to existing fossil fuel facilities in order to reduce costs and cut fossil fuel use. These benefits give SUNCNIM a substantial lead in a market which still has relatively few suppliers. The scheduled commissioning in 2018 of a 9 MW solar power station at Llo in the Eastern Pyrénées will provide us with a industrial-scale showcase for this new solution. Other potential projects are currently being examined in Oman and Chile. This could lead to the creation of several hundred direct jobs in La Seyne-sur-Mer and the surrounding region in years to come.

(1) The Fresnel lens was invented in the 19th century by the French physicist Augustin Fresnel to increase the power of the light from lighthouses. It is still used in lighthouses today, as well as in automobile headlights and movie projectors.
(2) On behalf of the French government, as part of the Investments for the Future Program.

"SPI gives us the financial leverage to mass-produce and sell our product on an industrial scale while maintaining long-term mastery of the technology."

Christophe Lehaut,
Director of Engineering,
SUNCNIM

TESTIMONY

"Staking out territory in the sales market quickly"

SUNCNIM was the first investment made by the SPI fund, whose role is to help companies transform innovations into job-creating industrial businesses. When we chose CNIM as a partner, the decisive factors were the potential of their solar technology, their expertise and their ability to provide a complete design, build and maintain solution, as well as the Group's experience as an exporter.
The goal is for SUNCNIM to stake out territory in the sales market very quickly, so that it can become a leading player in a business that is central to energy transition.

MAGALI JOESSEL, SPI FUND DIRECTOR FOR BPIFRANCE

ASH TREATMENT

LAB on a quest for gray gold

A specialist in emissions treatment, CNIM's subsidiary LAB offers a comprehensive range of solutions for the extraction and recovery of metals from the by-products of combustion. It has perfected two specific procedures, RecuLAB™ NF and RecuLAB™ Au, technology which proved its worth in 2015 in factories in the US and Switzerland.

Waste is a source of energy, and its incineration is central to the circular economy. Combustion by-products come in different forms, such as residues from flue gas treatment, hazardous waste containing heavy metals or incinerator bottom ash, which is made up of predominantly inorganic clinkers and residues. Incinerating five tonnes of household waste produces around one tonne of bottom ash and 150 kg of flue gas treatment residue, so it is no surprise that recycling and reusing this waste is of major interest to LAB's customers.

Since acquiring the technology and assets of Geodur Recycling AG in April 2013, LAB has offered a whole range of solutions to stabilize and solidify flue gas treatment residues and recover the metals contained in incinerator bottom ash. Physicochemical treatment of flue gas treatment residues using the proprietary TraceLock™ chemical additive enables such residues to be reclassified from "hazardous waste" to "non-hazardous waste." Two specific processes are used to extract metals during the treatment of incinerator bottom ash: RecuLAB™ NF, a dry-type process for the extraction of ferrous and non-ferrous metals from coarse fractions and RecuLAB™ Au, a wet-type process that enables non-ferrous heavy metals and precious metals such as copper, zinc, silver and gold to be extracted from fine particle fractions.

BOTTOM ASH TREATMENT PROJECTS

In the United States, LAB has a BOO (Build, Own, Operate) contract for the treatment installation at Roosevelt, Washington State. Commissioned in March 2016, the installation is equipped with the RecuLAB™ NF process and can process up to 180,000 tonnes of fresh ash or discharge ash per year. The metals recovered are sold on the local market or exported to Europe.

In Switzerland, LAB has installed the RecuLAB™ Au process at an existing bottom ash treatment plant near Zurich. The system has been running since April 2016 and can treat 20 tonnes of fresh incinerator bottom ash per hour. The high-quality metal concentrate thus recovered is then sold through LAB's distribution channels in Europe and overseas. These first two contracts should soon be followed by further sales in the United States, Switzerland and other countries.

RECOVERY

The RecuLAB™ process allows substantial quantities of precious metals to be recovered from every 100,000 tonnes of bottom ash:

RECULAB™ Au

- 40 kg of gold,
- 650 kg of silver,
- 180 tonnes of copper,
- 200 tonnes of zinc.

RECULAB™ NF

- 8,000 tonnes of ferrous metal
- 2,500 tonnes of non-ferrous metal (copper, brass, aluminum, stainless steel).

WASTE-TO-ENERGY

An 18th plant in the UK

Since the 1990s, CNIM has forged solid relationships with the Clugston and Lagan construction groups to provide waste management companies and their local authority clients with a turnkey solution for the design and construction of waste-to-energy plants. Viridor, which runs 320 waste treatment sites in the UK, has contracted CNIM and Lagan to build its Beddington plant in Croydon, South London. This is the third time Viridor has put its faith in CNIM, following on from plants at Ardley in Oxfordshire (built with Clugston) and Trident Park in Wales (built with Lagan).

The Beddington plant is expected to process up to 302,000 tonnes of non-recyclable residual household waste and produce 26.1 MWe (megawatts of electricity) per hour. Part of this power (22.2 MWe) will be sold into the UK's National Grid and will supply around 30,000 homes.

CNIM is designing all of the plant's engineering. The combustion section will be built by its long-standing partner, Martin GmbH. Flue gases will be treated by a lime-based VapoLAB® dry-type system, covered by four patents and installed by CNIM's subsidiary LAB. Both energy-efficient and economical, VapoLAB® not only recovers energy, which will be reinjected into the flue gas treatment process, but also cuts operating costs by reducing reagent consumption by 25%.

The plant is being built next to a conservation area which is home to a significant population of wildlife. The build schedule has therefore been adjusted to avoid disturbing birds during the nesting period. Another unusual feature of the center is its architecture, which will take the form of a cube without the soaring curves of a typical facility. To fit this design, the flue gas treatment will be placed alongside the boilers instead of further down the line. Meanwhile, the air-cooled condensers will be situated above the machine hall within the main building, rather than on the outside as is usually the case.

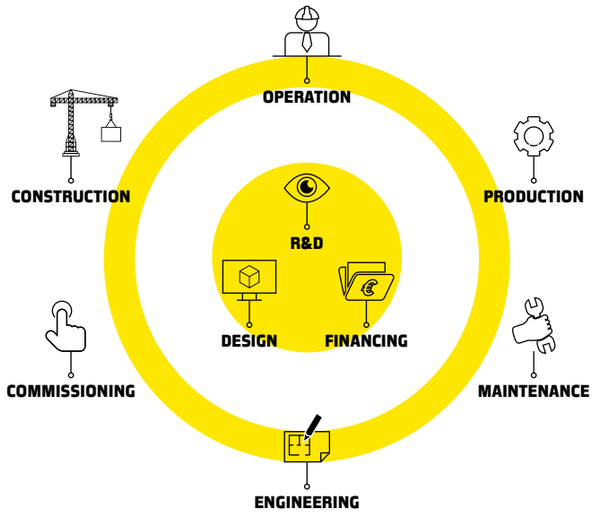
HISTORICAL CONNECTIONS

A few years ago, the UK embarked on a major waste treatment plant construction program. An increase in landfill taxes meant operators had both environmental and economic incentives to build facilities. Through the relationships of trust built up over thirty years with its UK clients and partners, CNIM has won contracts to construct London's Selchp waste processing plant as well as facilities in Chineham, Marchwood, Portsmouth, Sheffield, Jersey, Lincolnshire, Staffordshire, Oxfordshire, Suffolk, Cardiff, Shropshire, Ridham Dock, Leeds and Wilton. CNIM also operates centers at Dudley, Wolverhampton and Stoke-on-Trent.

END-TO-END KNOW-HOW

From the immense to the microscopic

As an international turnkey supplier and industrial equipment maker, CNIM has the state-of-the-art expertise, technology and production facilities needed to support customers through the entire life cycle of a project. CNIM responds to their innovation needs in energy transition, defense and security with an all-round palette of design, construction and associated services based on a portfolio of proprietary technologies.



CNIM and its subsidiaries can draw on multidisciplinary teams of specialists, development experts and project financing specialists as well as on substantial research and manufacturing resources.

CNIM is distinguished by its ability to build in-house or coordinate the manufacturing of equipment and systems designed in its own design offices. This sets it apart from its competitors and creates added value. Feedback from the production process helps lead to further advances at the design and dimensioning phases and vice versa. In the same way, the design & build teams for turnkey waste-to-energy plants draw on feedback from operating and maintenance staff on the ground to enhance their technical proposals to clients. CNIM is an expert in systems engineering and manufacturing processes, and has first-rate resources and testing capabilities. As such, it is involved at every stage of a project from defining clients' needs to verifying systems and equipment prior to commissioning.

CNIM manufactures at several industrial sites in France, Italy, Morocco and China. The Group makes large-scale, high-precision mechanical and thermal equipment in small and medium quantities for the defense, nuclear and energy industries.

The Group also works at the microscopic level, through a specialized life sciences subsidiary whose French-based research laboratories provide R&D services to the pharmaceutical and biotech industries. CNIM's palette of skills also extends to digital technology, where we offer cybersecurity software development and cyberintelligence as well as online services for combustion facilities.

NEWS IN BRIEF

SCIENTIFIC EQUIPMENT

THREE NEW ITER CONTRACTS

CNIM has been awarded three contracts to supply complex systems and on-site manufacturing services by Fusion For Energy (F4E) and the ITER Organization (IO).
These agreements form the latest milestone of a partnership that began in 2009, and reinforce the Group's status as a vital player in this high-profile international scientific alliance.
• The "Poloidal Field Coils Manufacturing" contract concerns key components for the ITER reactor core, in which the plasma will be confined by a system of superconducting magnets. The coils will create a "magnetic cage" to help maintain the shape and stability of the plasma.
• The "In Vessel Viewing System" contract, which has been awarded to the CNIM/Bertin Technologies consortium, covers the design, production and installation of six remote-controlled visual inspection and measurement systems capable of taking 3D pictures with a resolution of 1-3 millimeters. They will operate inside the ITER vacuum chamber, in which the fusion reactions will take place.
• Lastly, the "Mechanical Handling Equipment" (MHE) contract relates to the design and production of the equipment needed to assemble the internal components of the vacuum chamber.
These three contracts are just reward for the Group's expertise in the field of large scientific instruments and for the quality of its industrial facilities, which are designed to handle large-scale projects.

THE ITER PROJECT AIMS TO PROVE THE SCIENTIFIC AND TECHNICAL FEASIBILITY OF NUCLEAR FUSION AS A NEW SOURCE OF ENERGY.

ERGONOMICS

THE USER EXPERIENCE IS CENTRAL TO INNOVATION

At Bertin Ergonomics, technological innovation is no longer enough: the user experience now constitutes a key innovation goal. In early 2013, the department began work on its first advanced engineering contract with carmaker PSA. The aim of the contract is to incorporate the user experience into the design of next-generation multimodal (voice, touch, visual) interfaces for automobile cockpits. The carmaker has also charged Bertin Ergonomics with the creation and management of a fully dedicated platform for the ergonomics of human-machine interfaces. This will involve assessing the ergonomics of cockpits to be used in vehicles from 2020 onward.
It also covers R&D work on innovative onboard systems, specifically new driving habits for "connected" or "self-driving" vehicles. Through this work, the carmaker hopes to enhance the overall driver experience, improve safety and gain customer loyalty.

Find out more:
https://www.youtube.com/watch?v=VZf8MiB9fjQ

160 meters of bridge built across the Rhône

CNIM's motorized floating bridge (PFM) can be configured as either a bridge or a ferry to allow waterways to be crossed.
In 2015, the PFM was the focus of a French army training exercise in which a 160-meter bridge was built across the Rhône.
This provided proof in practice of the system's ability to carry vehicles of up to 80 tonnes.
The reliable PFM bridging system can be easily and rapidly deployed in a large number of situations and is in service with several armies around the world.
The PFM can also be used for civil purposes, for example in the event of natural disasters.

30
minutes is enough to build 100 meters of PFM.

BLAZE
new trails yet stay true to our roots

The Group is renowned for its mastery of cutting-edge technology, and innovation has always been the driving force of our growth.
Concepts emerge in our design offices which our production halls bring to life. Born out of long-standing capabilities in thermal and mechanical engineering, these new products and services also benefit from the input of newer fields of expertise such as life sciences and information technology.
Online services for the remote management of industrial boilers help cut their operating costs, while new markets are opened up for tried and tested equipment: innovative or mature, CNIM's products and services are the fruit of its technological conquests.

LAUNCH VEHICLES

Roxane, a project in orbit

Miniaturization is revolutionizing the commercial satellite and launch vehicle industry. The miniature launch vehicle project led by CNIM subsidiary Bertin Technologies in partnership with the CNES (Centre national d'études spatiales) from January 2014 to December 2015 confirmed the Group's ability to stake out a position in this market.

SINCE 2000, THE NUMBER OF SMALL SATELLITES HAS TRIPLED EVERY FIVE YEARS. THEY ARE CHIEFLY USED FOR COMMUNICATIONS AND OBSERVATION PURPOSES.

The microsatellite market emerged in the decade after 2000 and is now taking off. Thousands of devices with weights varying from a few kilos to a few hundred kilos –as opposed to several tonnes for traditional satellites– will be launched over the next ten years. They will have two main fields of use. One is communications, with the goal of providing genuine global Internet coverage (three billion people in the world today are still not online). The second is Earth observation, where the aim is to open up access to ultra high-resolution satellite imaging to new providers and to new uses such as the management of natural resources, transport management, urban planning and the monitoring of climate risks.

TEN YEARS OF COLLABORATION WITH THE CNES

"Rather than placing one or two large satellites far out in space, the strategy for start-ups in this market is to put 'constellations' of tens or hundreds of low-cost microsatellites in lower orbits. This requires specialized low-cost launch systems to be developed that will be more flexible and quicker to get moving than traditional heavy launchers," says Cédric Dupont, Head of Project Roxane at Bertin Technologies. Working under a two-year contract with the CNES, the CNIM subsidiary has sought to meet this need with the design for a micro-launcher that can carry a 250 kg payload to an altitude of 600 km. During this project, Bertin Technologies staff drew on lengthy R&D experience in the space sector, and in particular on the know-how built up over more than ten years of cooperation with the CNES.

TESTIMONY

"Achieving lift-off"

"The development model for micro-launchers differs from the essentially state-funded model used for traditional rockets. Here, the role of the CNES was essentially to create initial lift-off by ordering feasibility studies from industrial companies. In Bertin Technologies we found a perfect partner for Project Roxane who had genuine expertise in the field and was able to take a highly pragmatic approach."

JÉRÔME VILA, HEAD OF THE INNOVATION, OUTLOOK AND FUTURE PROJECTS DIVISION, CNES/LAUNCHER MANAGEMENT

"Roxane exploits innovative architecture and motor choices which cut the industrial development costs of the micro-launcher."

Cédric Dupont,
Head of Project Roxane,
Bertin Technologies

As well as participating in several launch vehicle projects, the company has been lead contractor since 2005 for the software platform for the preliminary design of HADES new generation space transport systems, making use of innovative multidisciplinary optimization techniques.

A TURNKEY LAUNCH SYSTEM

"This software platform enables us to model and simulate new launch systems and optimize them in both technological and economic terms," explains Dupont. "With Roxane, that has led to innovative architectural choices that will cut the industrial development costs of the micro-launcher." For example, to bring the final stage –the orbiter– to its operating altitude, a two-stage booster is used with identical motors in each stage. This robust motor design uses a "green" mixture of liquid methane and liquid oxygen. The combustion chamber is fed by electric pumps. Analysis of the market potential has led to the proposal of an end-to-end launch service that goes beyond the vehicle itself: Project Roxane thus also includes on-the-ground operations at the Kourou space center in French Guiana, preparation of the satellite and associated sales services. Starting in 2016, Bertin Technologies aims to carry out complementary design studies with a view to commencing sales in 2023-2025.

STRATEGIC MONITORING

Minerva watches out for Deutsche Telekom

In a highly competitive, constantly changing telecommunications market, Deutsche Telekom's strategic monitoring group receives large volumes of data every day that are crucial to the company's strategic management. AMI Software has supplied Deutsche Telekom with Minerva, a centralized content aggregation platform that staff can access from every corner of the globe. To learn more, read on.

A centralized data aggregation platform has manifold advantages: information is better organized, staff are freed from manual processing, giving them more time to spend on data analysis and communication with other departments, and information sharing becomes easier. With Minerva, the data that Deutsche Telekom's strategic monitoring team receives from free and paid sources is now collected in a single monitoring center. The center uses the company's own graphics codes for greater familiarity and is perfectly integrated into the IT systems.

STAFF TRAINING A KEY FACTOR IN MINERVA'S SUCCESS

Minerva, named after the Roman goddess of wisdom, was designed by AMI Software to be easy to use with user profiles adapted to fit each individual's needs. The presentation of Minerva to staff was one of the key factors in its success, as was the training given in the new processes and functions it will enable them to enjoy. To achieve this, AMI Software seconded consultants to the client to help people get to grips with the new system. The new system has received a thumbs-up from employees.

A SYSTEM THAT MATCHES DEUTSCHE TELEKOM'S AMBITIONS

Minerva has achieved its initial aim, namely to give Deutsche Telekom a monitoring system that matched the scale of its commercial goal of cementing its position as Europe's telecommunications leader. The telecoms operator is now determined to further extend the scope of the system. In collaboration with AMI Software's R&D department, Deutsche Telekom is currently exploring new methods to help it optimize expenditure and in particular to determine which commercial intelligence sources justify the investment made.

REMOTE MANAGEMENT

Intelligent & connected industrial boiler houses

At Babcock Wanson, R&D is guided by the desire to improve energy and environmental performance. Staff talk to each other about the development of new equipment, such as new-generation burners that reduce nitrogen oxide emissions, and about new digital services and solutions. Babcock Wanson's intelligent boiler houses are connected to a web-based service platform, providing industry with online assistance to control energy use.

BW e-Manage is one of a suite of digital tools forming part of a subscription service that enables firms in any location to remotely monitor boilers in real time 24 hours a day, anticipate problems and take pre-emptive action to keep equipment operational and running efficiently. Settings and energy consumption can be monitored from a PC, tablet or smartphone. Data on the operating status, temperature, output and fuel consumption of the equipment, along with the raw figures recorded from the sensors, is stored in the Cloud and permanently accessible. A warning system helps companies follow efficiency programs based on anticipation and responsiveness. Meanwhile, Babcock Wanson staff can supplement their on-site activities with remote work performed on the BW e-Manage platform. Seventy per cent of boiler breakdowns are due to poor water quality. The BW e-View monitoring application has therefore been supplemented with the BW e-Water app which allows water treatment to be monitored and managed in real time. The idea is simple: operators use a device of their choosing (a PC, tablet or smartphone) to track key water quality metrics such as pH, hardness and conductivity. If any of the metrics reaches a "critical" level preset by a Babcock Wanson specialist, the operator receives advice on what action to take and a warning is sent to Babcock Wanson. Once they receive this alert, Babcock Wanson's water treatment specialists can intervene proactively to bring water quality back to a satisfactory level. BW e-Water also offers other benefits such as automatic report generation and data archiving.

Launched in France at the end of 2015, the application is already a great success, enabling Babcock Wanson to offer a more distinctive and better-performing service.

ISSUES

Innovation as a driver of growth

CNIM employs a wealth of boldness and ingenuity to bring equipment and services to life that are often world firsts or, more simply, respond to the issues faced by its customers. The Group possesses a core of high-level skills in design, industrialization, production, maintenance and on-site services. Each of these competencies feeds in turn into the innovation cycle: new ideas and operating feedback are shared between all staff, whether they work on design, in production or on site at the customers' premises.

Mastering technology gives rise to innovative equipment and services. CNIM uses proprietary technologies developed in-house or through targeted acquisitions that bring in additional skills to complement the Group's portfolio.
Innovative development is fostered by an organizational structure that favors short decision chains and by the emphasis placed on taking the initiative. Behind every idea that evolves into an exceptional technological service stands an enthusiastic and highly competent workforce supported by state-of-the art research and production facilities. The Group's R&D activities comprise research carried out on behalf of customers (this forms a significant part of the R&D at Bertin Technologies and Bertin Pharma) as well as its own self-funded programs. CNIM has a dynamic intellectual property policy with a portfolio of 137 patent families.
The innovation at the core of the CNIM Group is founded on continuous improvement aimed at perfecting our existing equipment and developing new products and services. This includes the development of civilian applications that grow out of defense projects.
CNIM puts a particular emphasis on collaborative innovation, not only between the different units of the Group but also in terms of projects carried out in partnership with customers or with French and international research organizations. In France, the Group is fully committed to the development of competitiveness clusters.

FLUE GAS TREATMENT

CNIM's subsidiary LAB files an average of six to seven patents a year, more than two thirds of which are directly put to use in its flue gas treatment procedures, products or services. Working on site enables LAB to anticipate and analyze customers' needs and create customized products in response. Central to this approach are the LAB Test Center and its mobile analysis units, including DemoLAB®. DemoLAB® is used to validate newly developed procedures before they are rolled out for industrial use, but that is not its only use. It can also be installed on clients' premises alongside their existing flue gas treatment systems, enabling them to test out LAB's new procedures.

NEWS IN BRIEF

ENERGY INNOVATION

URABAILA®, CAPTURING THE RIVERS AND TIDES

Can you generate electricity from river currents and estuarial tides? You can now, thanks to the Urabaila® turbine. Bertin Technologies, the designer and project manager, developed this prototype in just two years in partnership with specialist companies and laboratories in the Aquitaine and PACA (Provence-Alpes-Côte d'Azur) regions. Urabaila® incorporates innovative technology into a robust design that allows currents to be exploited in both directions of flow. It is also simple to maintain and installable in locations with strong currents. Global market prospects are estimated to reach several tens of gigawatts within ten years.

AN EASY-TO-MAINTAIN TURBINE DESIGNED FOR USE IN STRONG CURRENTS.

The Urabaila® has been installed in the Adour estuary, where it was officially opened on November 4, 2015 by Alain Rousset, President of the Aquitaine Region.

WASTE SORTING

A NEW-GENERATION WASTE SORTING CENTER IN THE CITY OF PARIS

A CNIM-built waste sorting center is set to be completed in 2019 in the Clichy-Batignolles eco-district in Paris. Syctom, the city's household waste agency, selected a CNIM-led consortium to design and build the new facility and operate and maintain it until 2021. The center will process 45,000 tonnes of recyclable waste a year produced by a million residents of Paris and neighboring municipalities. This will be clean and dry waste from the yellow household recycling bins. Paris will thus be in a position to extend waste sorting to additional types of waste such as food trays, polystyrene and plastic film. The site will employ 80 staff, half of them under an employment integration program.

HEALTH

DUALTAB® SWEETENS THE PILL

Dualtab® is the brand name of a patented Bertin Pharma technology for tablets with a suckable layer on one side and an orodispersible layer on the other. The tablets combine active ingredients with excipients to mask the unpleasant taste of the medicine. Result: patients adhere more to their treatment. Dualtab® is aimed at various general ENT treatments for coughs, sore throats and other winter ailments.

CULTIVATE
our skills and our commitments

Leeds WTE plant: turnkey delivery imminent

In the UK, CNIM is set to deliver the Leeds waste-to-energy plant to Veolia in spring 2016. During the final months of construction, CNIM staff will also train Veolia staff in the operation of the facility. CNIM provides theoretical and hands-on training for every plant it builds. This is a key part of its policy of supplying turnkey equipment for public interest purposes that works 24 hours a day, 7 days a week. The Leeds WTE plant will treat 214,000 tonnes of household waste per year, generating 13.8 MW of electricity.

60%

of waste recycled: the target set by the county of Yorkshire, to which the Leeds WTE will contribute.

CNIM strives to forge long-lasting relationships of trust with its customers, who can count on high-quality, reliable solutions that reduce the environmental impact of their activities or monitor the safety of their industrial facilities. These customers include critical infrastructure providers and public service contractor for whom continuity of service is a must. The Group is also committed to its employees, and aims to always go the extra mile in terms of corporate, social and environmental responsibility (CSER). This is a long-term commitment.

ENERGY TRANSITION

District heating goes green

In the city of Paris, CNIM Babcock Services and LAB Service have refurbished the Bercy steam generation plant operated by the Compagnie Parisienne de Chauffage Urbain (CPCU). The assignment, one of the largest environmental upgrades to be carried out in France in recent years, involved converting boilers that supply the French capital's urban heating and hot water network to run on gas and biofuel. It illustrates how one of the Group's traditional fields of know-how contributes to the achievement of pollution reduction targets and to the transition to renewable energy.

CPCU PROVIDES
ONE THIRD OF
PARIS'S COMMUNAL HEATING.

"The four boilers at the Bercy district heating plant in the 12th *arrondissement* ran on heavy fuel oil," explains start-up technician Alain Aeby from CNIM Babcock Services. "Starting in July 2014, the project consisted of converting the facilities to use less polluting fuels, namely natural gas for two of the four boilers and biofuel (diester from French-grown rapeseed) for the others. The work was performed by CNIM Babcock Services as part of a consortium with Actemium, which took charge of the refurbishment of the electrical equipment, and fellow CNIM subsidiary LAB Service, which provided the nitrogen oxide treatment for the two biofuel units."

This was a major undertaking for CPCU. Co-owned by the City of Paris and the energy engineering firm Engie, the company operates the biggest district heating network in France in the midst of Greater Paris. Eight CPCU power plants and three Syctom-operated household waste-to-energy plants together supply 5,300 GWh of heat each year across a 480-km distribution grid, enough for almost 500,000 standard households within the conurbation. They also supply energy to a large number of businesses, stores and public buildings.

ENVIRONMENTAL COMMITMENTS

As part of its ongoing efforts to reduce its environment footprint, CPCU has embarked on an energy transformation program aimed at ending the use of fuel oil in its production facilities. Alain Aeby explains, "This refurbishment is a response to the changes in the atmospheric emissions regulations for large combustion facilities. All boiler houses must conform to the new European industrial emissions standards[1] by the end of 2015." Over and beyond the regulatory issue, abandoning fuel oil in favor of more environment-friendly combustible fuels reflects CPCU's commitment to energy transition and improving air quality in the Île-de-France. As from January 1, 2016, on completion of the two-year project, all of the Paris boiler houses will run on natural gas with the sole exception of Bercy, where CPCU has called upon CNIM to install an innovative energy mix. Two of the four units at this plant, which puts out 495 MWh of heat, have been converted to run on liquid biofuel with a view to increasing the proportion of CPCU's energy that comes from renewable sources.

EMISSIONS CUT BY UP TO 90%

As Alain Aeby emphasizes, "CNIM Babcock Services drew on the best available techniques to renovate the mechanic and thermal parts of these boilers. Once the transformations were complete, a series of operational trials and adjustments enabled us to optimize their energy and environmental performance." Fitted with low-NOx gas burners, the two units that were switched to natural gas restarted on schedule in late 2015 in time to provide heating for the winter. The procedure for liquid biofuel was a little more complex: As Frank Tabaries, Director of LAB Service, explains, "The emissions targets are harder to achieve for facilities running on liquid combustible fuels. As well as low-NOx burners and flue gas recirculation systems, the two boilers had to be fitted with an additional TermiNOX® nitrogen oxide treatment system." This LAB-developed process uses urea solution as a reagent and combines an initial non-catalytic treatment phase in the combustion chamber with a final catalytic phase. LAB Service met the challenge of adapting this high-performance treatment method to the extreme temperatures in the combustion chamber.

Following a short, successful optimization phase, industrial use of the units is due to recommence at the start of June 2016. For the Bercy plant as a whole, this will ultimately mean emissions cuts of 91% for sulfur dioxide (SO_2), over 80% for nitrogen oxides (NOx), 85% for particulates and 50% for carbon monoxide (CO).

(1) The "IED Directive", i.e. Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010, transposed into French law by Ordinance no. 2012-7 of January 5, 2012 and the Ministerial Order of August 26, 2013.

TESTIMONY

"Responsiveness and professionalism"

The transformation project for the Bercy district heating plant held two key issues for CPCU. The first was absolute compliance with the operational timetable: the work had to be performed without endangering the supply of heating and hot water to our clients, who include quite a number of hospitals as well as other sensitive customers. The dedication and responsiveness of CNIM's staff enabled them to hit that target in spite of some technical difficulties. The other critical aspect was of course to meet the environmental performance targets. Here too, we appreciated the professionalism shown by the team, especially during the adjustment phase for the liquid biofuel boilers, which represent a major technological innovation.

CÉCILE TLILI, DEPUTY CHIEF EXECUTIVE FOR ENGINEERING AND DEVELOPMENT, CPCU

"LAB Service met the challenge of adapting this high-performance treatment method to the extreme temperatures in the combustion chamber."

Frank Tabaries
Director of LAB Service

WASTE-TO-ENERGY

From design to operation

For over half a century, CNIM's portfolio of services has included the operation of waste-to-energy centers for household waste and, more recently, other forms of energy generation such as biomass and renewable energy. With its reputation as a designer and builder behind it, CNIM can operate both its own turnkey plants and plants built by other suppliers, whether or not energy recovery equipment is installed. From Baku in Azerbaijan to Pluzunet in Brittany, CNIM's expertise knows no frontiers.

CNIM helps cut operating costs and enhance environmental performance at the sites it manages through the continuous improvement of processes and technologies. In its products and services, the Group strives to promote Best Available Techniques (BAT) as enshrined in the European Industrial Emissions Directive.

In France, CNIM has carried out major refurbishment work at the Saint-Pantaléon-de-Larche waste treatment plant in Corrèze, which it has operated since 2013, having previously improved the incineration and energy generating capacity at the Pluzunet plant (Côtes d'Armor department) beyond the regulatory requirements less than a year after winning the plant operation contract in 2007.

Work at Saint-Pantaléon, built in 1972 and with a capacity of 70,000 tonnes of waste per year, consisted of replacing the wet flue gas treatment system with a dry system, eliminating process water discharges, introducing an extra catalytic treatment phase to cut NOx emissions, repurposing the previous flue gas treatment equipment to deodorize the air in the unloading hall and improving energy recovery.

MAXIMIZING ENERGY YIELDS

More recently, CNIM has substantially improved the plant's energy yield by installing a turbine generator unit that produces electricity and allows positive use to be made of all of the steam generated by the facility, part of which is used to supply a local industrial firm and heat municipal greenhouses. CNIM is also currently performing work to improve the operation and energy yield at the Saint-Saulve plant (Nord department) and expects to receive the go-ahead for major work on energy recovery, improving flue gas treatment and general refurbishment at the Pluzunet plant.

SITES OPERATED

IN FRANCE

- **4 waste-to-energy plants:** Plouharnel (Morbihan), Pluzunet (Côtes-d'Armor), Saint-Pantaléon-de-Larche (Corrèze), Thiverval (Yvelines);
- **1 waste sorting center:** Thiverval, run in partnership with CNIM Insertion which aims to reintegrate people in situations of hardship into the world of work;
- **1 composting plant:** Lantic (Côtes-d'Armor);
- **2 biomass-to-energy plants:** Nesle and Estrées-Mons (Somme).

INTERNATIONAL

- **3 waste-to-energy plants in the UK:** Dudley, Stoke-on-Trent and Wolverhampton;
- **1 waste-to-energy plant in Azerbaijan:** Baku.

NEWS IN BRIEF

SAFETY

SAPHYMO EQUIPMENT MONITORS THE WORLD'S BIGGEST NUCLEAR FACILITY

Located on the shores of Lake Huron in Ontario, Bruce Power is one of Canada's biggest power generation facilities by output and the largest nuclear facility in the world. Saphymo has been selected to supply an emergency radiation monitoring system for this Canadian power plant, a contract secured only a few months after the acquisition of Saphymo by Bertin Technologies in early 2015. Learning the lessons of Fukushima, the system installed by Saphymo at Bruce Power can both measure the gamma radiation dose and remotely identify the composition of the nuclide. In the first phase, 49 fixed and 10 mobile stations fitted with SpectroTRACER probes were installed around the station to measure radioactivity in the air and on the ground. The system was then supplemented by eight spectroscopic systems to measure aerosols, iodine and noble gases in the air. Bertin Technologies and Saphymo are developing technological and commercial synergies in their product ranges in the nuclear and CBRN (chemical, biological, radiation and nuclear) risks fields. With a strong international presence, both CNIM Group units are involved in markets which have grown considerably in recent years, partly because of lessons learned from the Fukushima disaster and partly because of ongoing CBRN threats.

4,000 FULL-TIME STAFF WORK AT THE BRUCE POWER SITE

ENERGY EFFICIENCY

A 100% NATURAL GAS BOILER AT THE BERRE-L'ÉTANG PETROCHEMICALS CLUSTER

The Berre-l'Étang petrochemicals cluster in the Bouches-du-Rhône department, one of the largest petrochemical complexes in southern France, has hired CNIM Babcock Services to perform the revamp of one of its boilers. The contract related to the changeover from fuel oil to natural gas operation. The aim was not only to comply with future NOx-related environmental restrictions, but also to cut both energy bills and greenhouse gas emissions.

This aim was achieved: CO_2 emissions have been cut by 60 kt/year, the concentration of SOx and NOx emissions has been halved and particulates have been cut by 80%. The new boiler was officially brought into service on February 17, 2015 in the presence of the senator and mayor of Berre-l'Étang, an occasion at which the site owner, the world's third-largest independent petrochemicals company, expressed its satisfaction with CNIM Babcock Services' performance.

KNOW-HOW

Helping the Group to transform

A benchmark in its core businesses and renowned for its culture of technical innovation, CNIM is now accelerating its international expansion. New horizons are being tackled with a product and service offering specially designed to meet the requirements of prospective and existing customers in terms of contracting, performance, standards and competitiveness. To help the Group through its transformation, the Human Resources Department has launched programs aimed at staff in every career track from technical to sales and administration. Everyone has a role to play in shaping the new face of CNIM.

In line with the Group's development strategy, the Human Resources Department took the step in 2015 of implementing technical, skills-related and safety training courses as well as specific programs for managers, project leaders and sales staff. Much of CNIM's technical training is given by in-house experts whose competence in fields such as operational safety, nuclear power and production software enables them to help their colleagues improve their skills. Almost a hundred of these trainers have completed a special course on "Taking and leading an in-house training course." This enables them to wear their trainer's hat more comfortably by endowing them with teaching skills to complement their technical expertise.

TRAINING MODULE FOR MANAGERS

To respond successfully to the changes and strategic challenges facing the Group, CNIM's Human Resources Department has put in place a five-day development program targeted at all Group managers from newly promoted managers to team leaders, service heads and directors, which will run over a period of three years. The first 100 managers, drawn from all across the Group, followed the course in 2015, each taking four modules on the "CNIM Spirit" to update them on strategy as well as to foster dialog between managers from different business units and enable them to build up the internal contact networks that create synergies and potential joint sales developments. The modules focused on managerial and leadership skills, social law and financial matters.

FIRST HEALTH AND SAFETY AT WORK DAY

The Risk Prevention Cluster at the CNIM's La Seyne-sur-Mer site has held its first Health and Safety Day. The aim of the event was to raise awareness of risk prevention among both shop floor and office staff. The simple and effective interactive workshops enabled participants to get actively involved and enhanced their awareness of various types of risk such as road safety, health and general safety, in particular via demonstrations on using a defibrillator.

MENTORING, OR THE ART OF PASSING ON KNOWLEDGE

CNIM Babcock Services is convinced that the future can be planned for more effectively when knowledge and skills are passed on, and has introduced a mentoring scheme to this end. Six mentors were each assigned an assembly or welding technician as a protégé and given one year to tutor them. This initiative has demonstrated that one year spent in a working environment is equivalent to five years of traditional training.

NEWS IN BRIEF

TESTIMONY

Trusted by my managers

"I've always loved mechanical engineering, which is why I chose to take a vocational certificate as a machining technician, followed by a higher technical diploma in the industrial manufacturing of mechanical products. It's the hands-on aspect, the contact with the item and materials, which I like the most. I started at CNIM two years ago, initially as a work/study trainee and then on a permanent contract. I work on machining the ITER radial plates. This is a project that involves a lot of responsibility, and I think it's a mark of my superiors' confidence in me that I'm allowed to work on items like this even though I'm still young. They say that being a machinist is a man's job and that women don't easily fit in, but CNIM has been really welcoming and inclusive toward me. I benefit from the experience of my coworkers, who look at me as kind of a little sister!"

MANUELA, 24, MACHINIST AT CNIM

PARTNERSHIP

SEATECH STUDENTS IN A TENDERING ROLE-PLAY

CNIM is involved in the running of SeaTech, the Toulon and Var Institute of Engineering Science, and plays an active part in developing teaching at the institute, which specializes in marine science and technology. As part of this involvement, CNIM offered several groups of third-year students the chance to do something outside the normal run of academic learning, namely to conduct a role-playing exercise based on responding to a call for tenders in which the Group played the customer. The students had five months in which to submit a technical and financial tender, exhibit a 3D model and present their tender to a panel made up of four academic staff and six CNIM employees. The panel paid tribute to the creativity, methodology and team spirit showed by each of the groups. This cooperative exercise is being continued in 2015-16.

SKILLS

A PASSPORT TO SUCCESS

Since 2015, staff at CNIM Babcock Services have benefited from a new skills assessment and enhancement tool called the Passepro. Staff now take this small booklet with them on site. Drawn up jointly by the employee and his/her managers, it lists the employee's current skills and key development areas. This benefits everyone. For staff members, it is tangible proof that their skills are recognized and formal validation of their key development areas, which enhance the worker's employability. For the site manager, it is a way to improve the assignment of jobs and assure an even higher quality of service.

Vsevolod Dmitrieff, Chairman of the CNIM Supervisory Board, passed away in Paris on March 19, 2016 at the age of 93. An engineer by training and an entrepreneur in his soul, Vsevolod Dmitrieff described himself as “an industrialist deeply attached to his family, his business and his adopted country.”
Born in St. Petersburg in 1922, he arrived in France in 1924. After a degree at the École des Mines, he began his career at the French Overseas Territories Mining Bureau before joining CNIM in 1966. He expanded the Group around the world, always putting the emphasis on innovation. He was responsible for leading the acquisition of Alstom’s waste treatment business, which gave CNIM global scale in this strategic business.
His son Nicolas Dmitrieff was appointed Chairman of the Management Board in 2009. As head of the Supervisory Board, Vsevolod Dmitrieff continued to play a major role in defining CNIM’s strategy. The Management Board and all of the Group’s employees will continue his work while remaining faithful to the values he upheld.

The pioneer spirit

In facts and figures

MESSAGE FROM THE CHAIRMAN

Constant and continuing innovation

Two words seem to me especially apt to sum up the last few months: affirmation and acceleration.
Affirmation of the Group's vocation, which is to respond with technical and industrial innovation to the key issues of energy transition and the security of nations, societies and populations. As proof, I would like to point to the foundation of our SUNCNIM subsidiary with a partner of real substance, the SPI (Sociétés de projets industriels) fund operated by Bpifrance. SUNCNIM will develop the construction of turn-key concentrated solar power plants for export markets. Our technology is extremely well suited to desert regions. The acquisition of the Internet monitoring specialist AMI Software has enhanced the cyberintelligence portfolio at Bertin Technologies. It follows on from the integration of the staff of Saphymo, which we purchased in 2014.
Bertin Technologies is currently the only French industrial company to offer a complete range of detection instruments for chemical, biological, radiation and nuclear (CBRN) risks to the defense and security industries and ionizing radiation monitoring equipment for the nuclear industry.

The year 2015 also saw an acceleration of our ambitions, not only in our traditional markets in France and Europe, but also in more distant markets in which we have hitherto only been present as exporters. The Group is set to establish a more durable presence in these markets, where we are planning to open subsidiaries, sign joint venture and partnership agreements and recruit local staff.

In financial terms, CNIM has again demonstrated its sound health: our operating profit is rising thanks to good profitability in the Environment and Innovation & Systems divisions. Performance at our subsidiary Babcock Wanson is also good. This allows us to look ahead calmly to 2016, a symbolic year for the Group since our origins date back to the foundation a hundred and sixty years ago of the Forges et Chantiers de la Méditerranée, which served even then to supply France with large-scale defense equipment.

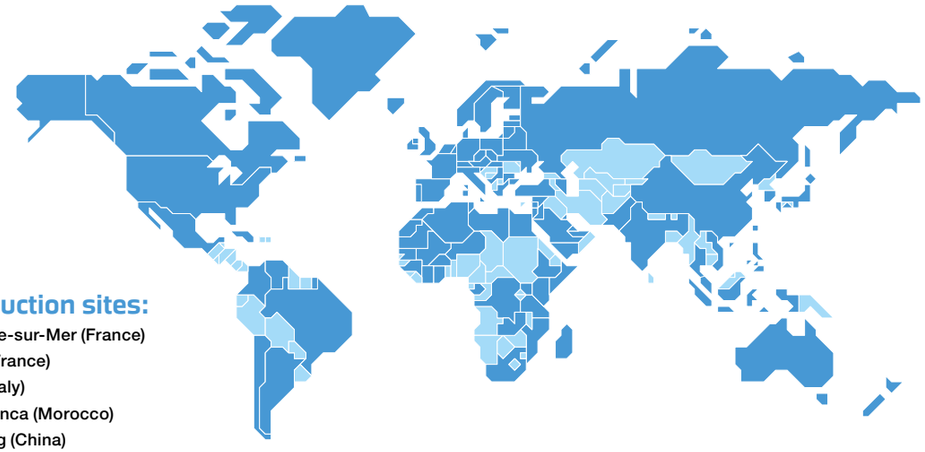
For a hundred and sixty years, CNIM has sought to demonstrate its ability to reinvent itself, push back the frontiers of technology and imagine industrial solutions to serve the world of tomorrow.

Nicolas Dmitrieff,
Chairman of the Management Board

In 2016, CNIM will also celebrate the 60th anniversary of Bertin Technologies.
The trust placed in us by our customers –in some cases for several decades– is the fruit of our commitment to join them in tackling the most exciting technological challenges. We also owe this trust to our ability to give them day-to-day support, not least through our range of services and plant operation contracts. Some of them have agreed to talk about their experiences in this publication, along with our staff, and I thank them warmly for doing so.

SITES

Sites and projects around the world



5 production sites:
- La Seyne-sur-Mer (France)
- Nérac (France)
- Milan (Italy)
- Casablanca (Morocco)
- Gaoming (China)

THE PEOPLE OF CNIM

3,000
employees in 2015

7%
gap in average pay between men and women in the CNIM Group, half the average in France (15.2%) as a whole (Source: Eurostat).

56
disabled employees, representing 2.2% of the workforce. Seven disabled persons were recruited in 2015.

94%
of the Group's staff are employed on permanent contracts.

€1.76 million
invested in health and safety in 2015, i.e. over €700 per employee. This amount, which is over 20% higher than in 2014, reflects the significance that CNIM attaches to employee health and safety.

45,000
hours of training provided, an average of 18 hours per employee.

Environment

CNIM offers a full spectrum of products and services for the development, turnkey construction, operation and maintenance of waste-to-energy plants for household and industrial waste, biomass-to-energy, flue gas and ash treatment and concentrated solar power. This offering is underpinned on proprietary technologies and solutions as well as by a range of services with regard to energy efficiency, operating cost optimization and reducing the environmental impact of industrial facilities.

CNIM is one of the largest European specialists in household waste-to-energy and biomass-to-energy. CNIM can also treat hospital waste, water treatment plant sludge or green algae. Its products and services also cover waste sorting and recycling and the production of compost. CNIM's turnkey installations comply with the strictest performance and environmental impact standards.

CNIM provides plant operation, assistance, refurbishment and environmental compliance services with a view to optimizing equipment performance, improving operational availability and reducing operating costs. Plant operation generates indispensable staff feedback that helps improve the technologies and procedures employed by the Group at the design and construction stages.

CNIM's subsidiary LAB designs, installs, commissions, maintains and refurbishes systems for treating flue gases from waste-to-energy and biomass-to-energy plants, power plants and industrial boiler houses. This work is also relevant to ships, an area that has seen substantial change in its regulatory environment. LAB treats the fly ash and bottom ash produced by waste incineration, enabling the extraction of ferrous metals, non-magnetic light metals (e.g. aluminum and copper) and precious metals and facilitating disposal.

Our subsidiary SUNCNIM has developed a design for a solar-powered steam boiler. The design includes Fresnel mirror technology to capture the sun's rays, along with all the auxiliary processes needed to guarantee the smooth operation of a solar power station. As well as producing electricity, this technology can also be used to provide process steam for industrial use. SUNCNIM is positioning itself as an all-round turnkey supplier of concentrated solar power plants.

163
CNIM-built waste-to-energy plants around the world

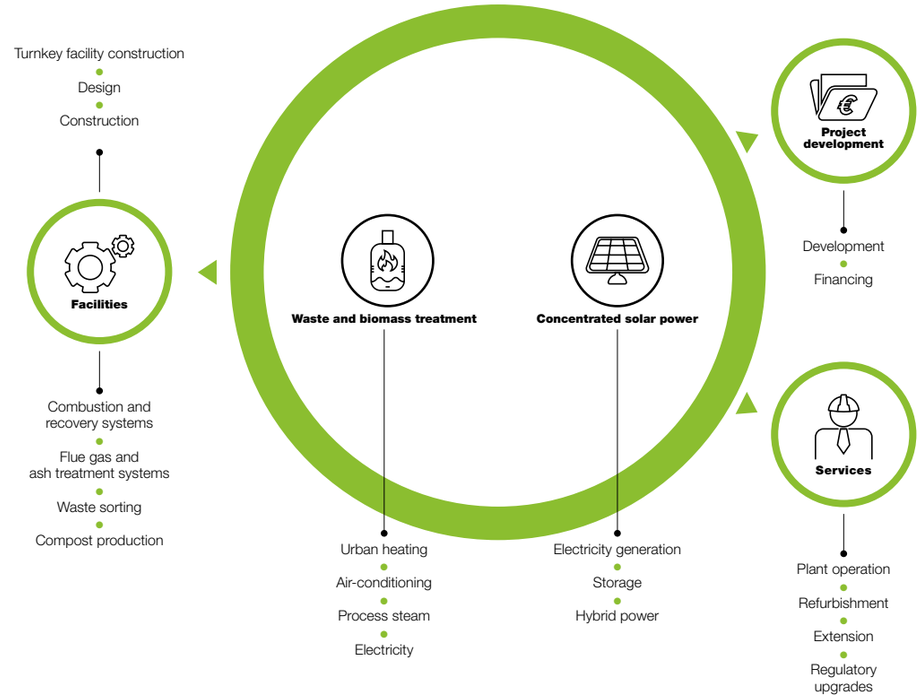
93
million people whose waste is processed by CNIM

CUSTOMERS

LOCAL AUTHORITIES, PLANT OPERATORS, PUBLIC SERVICE CONTRACTORS, PRIVATE INVESTORS AND PUBLIC AND PRIVATE SERVICE BUSINESSES.

ENVIRONMENT SECTOR

Producing energy from waste
Cutting emissions of pollutants
Generating renewable energy (biomass and solar)



WASTE-TO-ENERGY CENTERS IN THE UK

NEW ORDER

The Beddington WTE plant in South London is to be built for Viridor by CNIM and Lagan Construction Group.
It will comprise two 17.6 t/h units with an annual capacity of 275,000 tonnes, and will produce 26.1 MWe. The facility will include a VapoLAB® flue gas treatment system supplied by LAB.

DELIVERED IN 2015

Built for MVV Umwelt, the Ridham Dock combined heat and power plant in Kent uses contaminated biomass as a fuel. The plant was built in partnership with the Clugston civil engineering group and is fitted with one unit generating 25.5 MWe. Its design also enables steam to potentially be provided to a nearby industrial company. The facility includes a VapoLAB® flue gas treatment system supplied by LAB.

The Shrewsbury WTE plant in Shropshire was built for Veolia Environmental Services
in partnership with the Clugston civil engineering group. It has one unit with a capacity of 12 t/h, treating 100,000 tonnes of household waste per year and generating 8 MWe. The facility includes a VapoLAB® flue gas treatment system supplied by LAB.

Built for Viridor, the Trident Park WTE plant in Cardiff is the first of its kind in Wales. Built in partnership with Lagan Construction Group, it is fitted with two 23 t/h units which can process up to 350,000 tonnes of waste per annum and generates 34 MWe. The facility includes a VapoLAB® flue gas treatment system supplied by LAB.

Innovation & Systems

CNIM creates equipment and systems with high technological content for customers in defense and security, energy, industry and the life sciences, operating across the entire life cycle from R&D to the manufacturing, supply and maintenance of products in small and medium production runs. This is the business of CNIM's Industrial Systems Division and the Bertin subsidiaries, whose expertise and technologies form a vital part of the Group's energy and defense portfolio.

The Industrial Systems Division designs and supplies equipment for use in nuclear deterrence (missile launch tube systems for French nuclear submarines), the projection of force on land and at sea, nuclear power and general industry. Its bridging systems (Motorized Floating Bridges and Modular Assault Bridges) and high-speed landing catamarans can also be used to provide logistical support to local populations in disaster areas. In the nuclear industry, CNIM is active throughout the cycle, from fuel enrichment and nuclear power generation right through to dismantling and waste processing. CNIM is also a leading participant in construction programs for nuclear research reactors such as the ITER or Jules Horowitz reactors. CNIM's production facilities in France, Morocco and China manufacture high-value-added industrial products for the energy and space industries, as well as performing contract manufacturing.

Bertin Technologies and its subsidiaries operate in four major fields of activity.

Consultancy and engineering: Technological management consultancy, multiphysical modeling expertise, process engineering, risk management, complex systems ergonomics, human factor engineering.

Systems and instrumentation: Bespoke technological systems and developments for use in defense, nuclear power, space, large scientific equipment, hospital waste treatment and the environment; measuring instruments and systems (ionizing radiation detection and measuring equipment, biological and chemical hazard detection, optronic detection and surveillance, laboratory equipment).

Information technology: Software, business solutions and services for big data processing (cybersecurity, cyberintelligence, speech processing, strategic intelligence).

Pharma and biotech: Products and contract research for pharmaceutical R&D (dosage and biological reagent kits, translational research, preclinical and clinical trials, analysis of drug candidates, bioanalysis, biosecurity).

55

years of serving
French deterrence

35,000

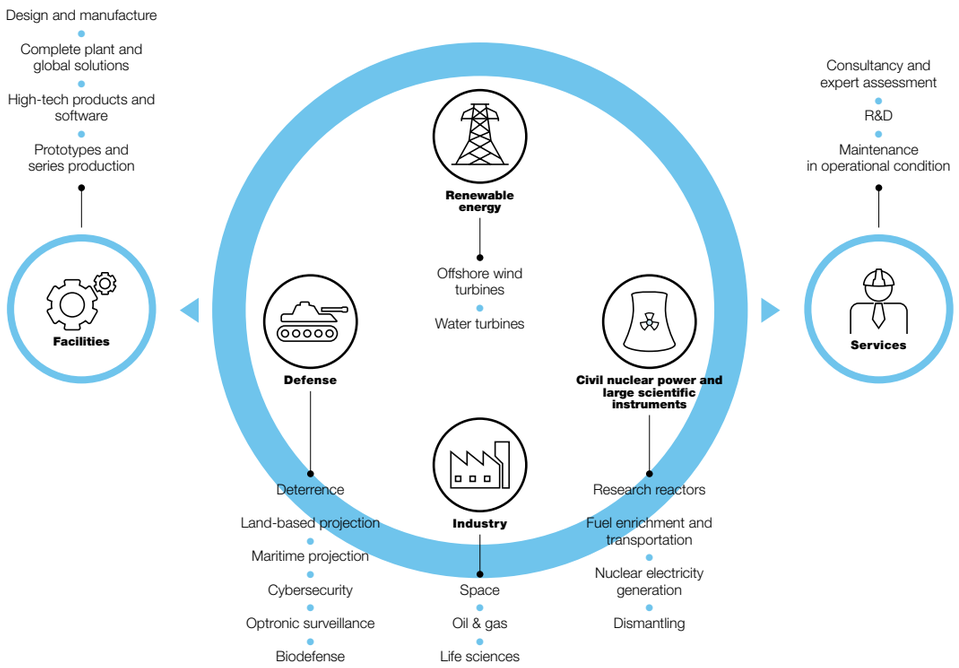
users of Precellys®,
Bertin's homogenizer
for biological samples

CUSTOMERS

MAJOR FRENCH AND INTERNATIONAL CUSTOMERS IN THE DEFENSE AND SECURITY, MARITIME, SPACE, NUCLEAR, ENVIRONMENTAL AND LIFE SCIENCES INDUSTRIES.

INNOVATION & SYSTEMS SECTOR

A multidisciplinary approach to industrial innovation



MAJOR CONTRACTS IN 2015

In December 2015, the French General Directorate for Armament (DGA) awarded CNIM a contract for the refurbishment of the French Army's motorized floating bridges.

Manufacturing of the radial plates for the ITER reactor continued at CNIM's facilities in La Seyne-sur-Mer. CNIM and Bertin Technologies have also obtained new contracts to provide research, manufacturing and key component validation for the ITER project.

On behalf of Saudi Aramco, petrochemical engineering group Petrofac has chosen Bertin Technologies to supply and install a Second Sight® remote gas detection system at the Jazan site in Saudi Arabia.

Secure handling systems for EPRs
CNIM's Chinese subsidiary CTE delivered a spent fuel transfer trolley to its customer CNPEC for use at the Taishan nuclear power plant. Constructed, assembled and tested in China, the complete system includes the trolley and components inserted into concrete interfaced with the spent fuel storage pool. This represents a major evolution of the system designed and produced by CNIM for 1300 MW and 1400 MW nuclear power plants in the 1980s. The system's largest component is a trolley that weighs 55 tonnes and is 8 meters high and 5 meters wide.

Understanding DNA repair by controlling the dosage of the enzymes responsible
In collaboration with LXRepair, a new company spun off from the French Atomic and Alternative Energy Commission, Bertin Pharma has designed a DNA repair assay kit aimed at pharmaceutical and cosmetics companies, which will be sold worldwide through its distributor network. The kit will enable the mechanisms underlying the formation of certain cancers to be better understood. It will also play a role in the development of new neurological, genotoxic (cancer) and anti-ageing treatments.

Energy

CNIM provides industry with an extensive range of equipment, systems, expertise and services to ensure rational energy management. The Group's work assures the optimization, functioning and continuity of operation for thermal energy facilities, forming part of an overall drive towards energy efficiency and reducing the environmental impact of industrial activities.

CNIM Babcock Services is the largest refurbisher of thermal power equipment in France. This CNIM division works on all types and makes of boilers, whatever their fuel type. Its network of branches across France allows it to respond very quickly and ensure a tightly controlled deployment of human resources and equipment. Through its centralized organizational structure, it operates both in France and internationally. Since 2012, CNIM Babcock Services has been active in the maintenance of nuclear facilities: already CEFRI-certified, it has also been granted UTO certification by EDF, which is essential for working in nuclear power plants.

Babcock Wanson, a leading player in the international arena, stands out through its highly technically advanced products and services for industrial boiler houses. From industrial boilers and burners, control and regulation systems, flue gas and VOC incinerators and water treatment right through to maintenance, refurbishment, rental, operational assistance and training services, Babcock Wanson helps customers maximize their energy production with products of proven quality and top-notch services.

100,000
industrial boilers installed worldwide

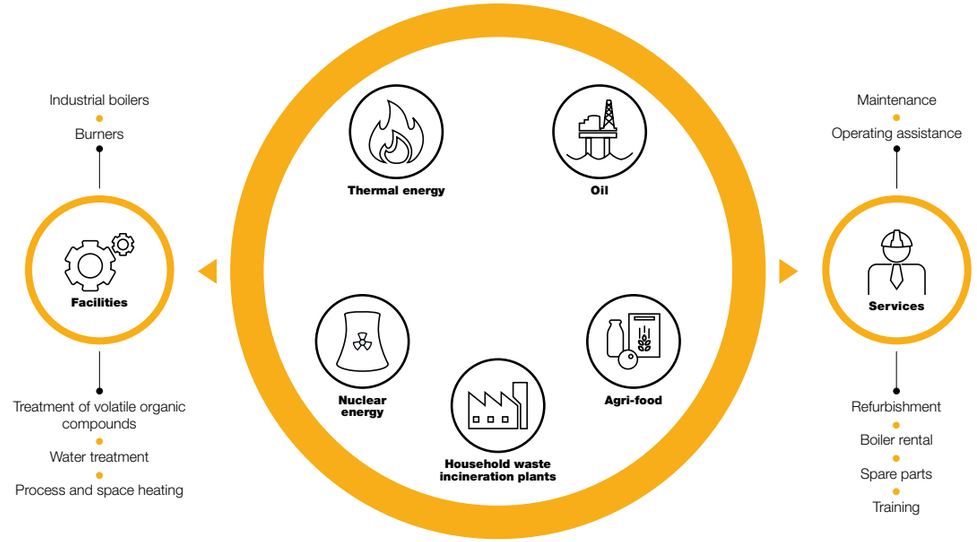
5,000
maintenance **contracts**

CUSTOMERS

POWER COMPANIES, AGRI-FOOD, CHEMICALS, PETROCHEMICALS, PAPER MANUFACTURING, PHARMACEUTICALS.

ENERGY SECTOR

Energy efficiency and optimization solutions



MAJOR PROJECTS IN 2015

In the nuclear industry, CNIM Babcock Services carried out assembly work at the Megajoule Laser site. In close collaboration with Saphymo, acquired by the Group in 2014, CNIM Babcock Services worked to very tight deadlines on modifying the installation of the radiation portal monitors at the pedestrian entrances to a French nuclear power station. At another French nuclear facility, CNIM Babcock Services performed welding work in a controlled zone on the iodine trap.

In the Caribbean, CNIM Babcock Services assisted a national power company with the refurbishment and maintenance of its main thermal power plant. The services provided comprised technical audits to ascertain the condition of the equipment, a recommended action plan and the supply of essential spare parts for the unit's operation.

Babcock Wanson performed work in the fire tube boiler and burner field, including assignments for Poland's leading dairy producer and a Spanish distillery, where the aim was to produce steam for use in the distillation process for aromas and medicinal plants.

In Italy, one of Europe's leading bitumen producers placed the order for its 15th boiler.

For a leading global oil & gas company, Babcock Wanson performed a custom repair and revamp of a boiler situated on an oil platform off the coast of Pointe Noire in the Republic of Congo.

OUR COMMITMENTS

Acting for the long term

At CNIM, corporate and social responsibility matters are the object of a continuous improvement process. CNIM strives to maintain sustainable relationships with all its stakeholders, whether that means reducing the environmental impact of our activities, ensuring that our staff have suitable surroundings in which to do their work or getting involved in society at large, especially in the academic and economic fields.

MORE ENTITIES INCLUDED IN CSER REPORTING EVERY YEAR

In 2015, the scope of the Group's CSER reporting was extended to include Babcock Wanson's production facility in Morocco and the waste-to-energy plant at Baku, Azerbaijan. CSER reporting now includes data from all of our waste treatment sites. Companies included in the CSER report now represent more than 88% of the Group's consolidated revenues and cover 84% of its headcount over 39 sites.

EMPLOYEE HEALTH AND SAFETY IS FUNDAMENTAL AT CNIM

Any industrial activity can have an impact on the health and safety of employees. The Group therefore takes action to reduce the risks inherent in its activities. In 2015, this resulted in an increase in certifications, notably under MASE and OHSAS 18001. On site, construction of the Trident Park waste-to-energy in the UK saw only one accident take place during 1,600,000 site hours worked by 600 employees, an exemplary rate for a site of this size. Risk prevention is a cornerstone of the Group's business culture. At La Seyne-sur-Mer, cooperation between factory floor technicians, the Risk Prevention cluster and the training department helps to drive down the risk of workplace accidents, a prime example being the composites and polyurethane workshop which has recorded just one accident in the last 800 days.

A PREVENTIVE APPROACH TO THE ENVIRONMENTAL IMPACT OF THE GROUP'S ACTIVITIES

Bertin Technologies' management system received QSE (Quality, Safety and Environment) certification in 2015. The company has had an ongoing quality program since 1999, obtaining threefold certification under ISO 9001 (Quality), OHSAS 18001 (Safety) and ISO 14001 (Environment) for its sites at Montigny, Aix-en-Provence and Tarnos.
In 2015, nine Group companies were certified under ISO 14001; a total of 17 sites thus make environmental issues an integral part of their management systems. A thousand employees thus receive regular training and familiarization under environmental risk anticipation and management programs.

REDUCING THE ENVIRONMENTAL IMPACT OF BUSINESS TRAVEL

Implemented in 2015, the new travel policy encourages everyone to take an ecologically responsible attitude to business travel and ask pertinent questions such as: Is my journey absolutely necessary? Shouldn't I consider a videoconference instead? What if I car-share with my colleagues?, and so on. To promote compliance by staff, we created a boastful and petulant character, Mr. Oops, to serve as the embodiment of what not to do, whose humorous misadventures were published on the Intranet.

CNIM: A COMPANY THAT CONTRIBUTES TO CIVIL SOCIETY

CNIM actively contributes to the work of business associations and environmental organizations and helps promote their activities. In 2015, the Group took part in the "Factories and People" initiative run by METI, the French mid-sized businesses association, which aimed to highlight industrial excellence in France. At the European level, the Group is working in line with the key pillars of the Horizon 2020 program for industrial leadership and social challenges.

GOVERNANCE

Supervisory Board, Management Board and Senior Management (as at May 24, 2016)

MANAGEMENT BOARD

Nicolas DMITRIEFF
Chairman

Stanislas ANCEL

Philippe DEMIGNÉ

Christophe FAVRELLE

EXECUTIVE COMMITTEE

Nicolas DMITRIEFF

Stanislas ANCEL

Philippe DEMIGNÉ

Christophe FAVRELLE

Éric CHADENIER

François DARPAS

ADVISORS TO THE CHAIRMAN

Mohamed Ayachi AJROUDI

Stefano COSTA

SUPERVISORY BOARD

Christiane DMITRIEFF
Chairman

François CANELLAS
Deputy Chairman

Sophie DMITRIEFF

Lucile DMITRIEFF

FREL,
represented by **Agnès HERLICQ**

André HERLICQ

Stéphane HERLICQ

Johannes MARTIN

MARTIN GmbH,
represented by **Ludwig VON MUTIUS**

Sigrid DUHAMEL

Louis-Roch BURGARD

Alain SONNETTE
Employee shareholders' representative

François HERLICQ
Honorary member

Éric CHADENIER
Secretary

AUDIT COMMITTEE

François CANELLAS
Chairman

Christiane DMITRIEFF

Sophie DMITRIEFF

Lucile DMITRIEFF

FREL,
represented by **Agnès HERLICQ**

Sigrid DUHAMEL

Louis-Roch BURGARD

STRATEGIC COMMITTEE

Louis-Roch BURGARD
Chairman

Christiane DMITRIEFF

Sophie DMITRIEFF

Lucile DMITRIEFF

Sigrid DUHAMEL

François CANELLAS

André HERLICQ

Stéphane HERLICQ

Group Functional Departments

Group Finance Department

Christophe FAVRELLE
Director

Legal, Group Purchasing and Corporate Social Responsibility (CSR)

Éric CHADENIER
Director

Human Resources, Information Systems and Communications

François DARPAS
Director

Departments by major product and service lines

ENVIRONMENT SECTOR

Chief Executive
Stanislas ANCEL

Deputy Chief Executive
Klaus ZINK

Assistant Chief Executives
Claude BOUTIN
Thomas FEILENREITER
Didier FONTAINE
Roger PUJOL

Business Units

• CNIM Waste and Energy Management Solutions (CNIM WEMS)

Thomas FEILENREITER
Director

Didier FONTAINE
Deputy Director

• CNIM EPC Contracts

Claude BOUTIN
Director

• SUNCNIM

Roger PUJOL
Chairman

• LAB

Thomas FEILENREITER
Director

INNOVATION & SYSTEMS SECTOR

Chief Executive
Philippe DEMIGNÉ

• INDUSTRIAL SYSTEMS DIVISION (CNIM Industrial Systems and non-French subsidiaries)

Philippe LAZARE
CEO and Site Manager,
La Seyne-sur-Mer

CNIM Industrial Systems

Defense, Space and Maritime
Matthias BAYART, Director

Nuclear, Thermal Power and Large Scientific Instruments
Ludovic VANDENDRIESCHE, Director

Engineering
Philippe LAZARE, Director

Non-French production and subsidiaries
Daniel ROSSI, Director

CTE (China)

Daniel MANSO
Chief Executive

Babcock Wanson Morocco

Daniel ROSSI
Chief Executive

• BERTIN SUBSIDIARIES

Bertin Technologies
Philippe DEMIGNÉ
Chairman

Bertin Pharma
Xavier MORGE
Chief Executive

Bertin Corp.
Bruno VALLAYER
Chief Executive

Saphymo
Bruno VALLAYER
Chief Executive

Vecsys
Béatrice BACCONNET
Chief Executive

Bertin IT
Béatrice BACCONNET
Chief Executive

AMI Software
Béatrice BACCONNET
Chief Executive

ENERGY SECTOR

Chief Executive
Nicolas DMITRIEFF

CNIM Babcock Services division

Hubert DUMAS
Director

Babcock Wanson Holding

Cyril FOURNIER-MONTGIEUX
Chairman

Babcock Wanson France

Cyril FOURNIER-MONTGIEUX
Chief Executive

Babcock Wanson Italiana

Furio SABBATINI
Chief Executive

Babcock Wanson UK Ltd

Chris HORSLEY
Chief Executive

Babcock Wanson España

Jon GOITISOLO
Chief Executive

Babcock Wanson Caldeiras Lda.

Paulo LOBO
Chief Executive

CNIM Babcock Central Europe

Artur SZNURA
Director

Main locations in France

La Seyne-sur-Mer
Waste-to-energy plants; complex mechanical systems and equipment for defense, nuclear power, research and industry; biomass boilers; concentrated solar power plants.
Zone portuaire de Brégaillon – CS 60208
83507 La Seyne-sur-Mer Cedex
Tel.: +33 (0)4 94 10 30 00
Fax: +33 (0)4 94 10 31 00

Saint-Aubin
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25, route de l'Orme
Parc des Algorithmes, Bât. Esope
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CNIM Babcock Services
La Plaine Saint-Denis
Refurbishment and after-sales service for thermal power equipment and waste-to-energy plants; boiler house installation
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93210 La Plaine Saint-Denis
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Fax: +33 (0)1 43 52 04 03
babcock@cnim.com

Northern Cluster
Paris/Île de France: Villepinte (93)
Central/western France: Saint-Herblain (44)
Eastern France: Ilzach (68)
Northern France: Wattrelos (59)

Southern Cluster
Rhône-Alps region: Chassieu (69)
South-east France: Gardanne (13)
South-west France: Le Barp (33)

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Nuclear (upstream and downstream)
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Fax: +33 (0)4 94 11 15 91
vincent.gautier@cnim.com

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LYON
Flue gas treatment systems
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Fax: +33 (0)4 26 23 37 70
lab@lab.fr

SUNCNIM
Development and turnkey construction of concentrated solar power plants and solar stream generators
Zone portuaire de Brégaillon – CS 60208
83507 La Seyne-sur-Mer Cedex
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Fax: +33 (0)1 46 86 14 16
commercial@babcock-wanson.fr

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Fax: +33 (0)2 32 82 43 34

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GERMANY
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BAHRAIN
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www.lab-usa.us

UNITED KINGDOM
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Hanford Waste Services Ltd
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Waste-to-energy plant operation
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INNOVATION & SYSTEMS SECTOR

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CHINA
CTE
Complex mechanical systems and equipment for defense, nuclear power, research and industry
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Laboratory equipment and bioreagents, NRBC threat detection solutions
155 Gibbs Street, No. 533
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Tel.: +1 301 339 81 03
info@bertin-corp.com

ITALY
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Systems and instrumentation for the nuclear industry
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MOROCCO
AMI Software
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Babcock Wanson Maroc
Industrial boilers, air treatment, overhaul of thermal power equipment, water treatment, associated services
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Km 12400 - 28 632 – Aïn-Harrouda
Mohammedia
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ENERGY SECTOR

SPAIN
Babcock Wanson España
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48950 Erandio (Bizkaia)
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UNITED STATES
Babcock Wanson USA LLC
Incineration of gas effluents and odors
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ITALY
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Industrial boilers, air and water treatment, associated services
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POLAND
Babcock Wanson Polska Sp. z.o.o.
Industrial boilers, air and water treatment, associated services
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Constructions Industrielles de la Méditerranée

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a Management Board and a Supervisory Board
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