PUSHING BACK
THE BOUNDARIES
OF TECHNOLOGY
In 2030, technologies without borders

In 2016, laying the groundwork for the future.

Since 1856, the solutions imagined and then developed by the men and women of CNIM have been paving the way for a world that is cleaner, uses less energy, takes better care of the environment, and is safer.

CNIM clients in the public and private sectors, from France and across the world, turn to the Group for the design, development and operation of infrastructure and equipment to be used for the energy transition, defense and security. They know that CNIM’s 2,500 employees will work together to push back the boundaries of technology and channel their creative energy to come up with reliable and sustainable solutions.

The wide range of skills and expertise of the Group’s workforce is fully expressed in business areas directly addressing the long-term challenges our world faces today. These skills and expertise also constitute the brand of a medium-sized enterprise with a family shareholder base that is fully committed to growing and to creating jobs – a Group with a limitless capacity for innovation.

The acceleration and convergence of technologies are creating major opportunities for us to better serve our clients. We know that now is the time to prepare for the future, and are already anticipating how our businesses will evolve.
The World Bank estimates that urban waste volumes could rise by 70% between now and 2025. Waste will also become more diverse and complex over this period. The harmful impacts of this increase for our environment and health are well-known. At the same time, the growing scarcity of available natural resources will force us to find alternative solutions, making urban waste a precious resource if it is processed and recycled extensively and intelligently. Energy from waste is now the second source of renewable energy in France, and many more initiatives are on the way in this field. In the UK, one large grocery chain is powering its delivery trucks with food waste that it turns into biofuel. Its trucks have a range of up to 500 miles, or 800 kilometers, and emit 70% less carbon dioxide.

To manage these new resources properly and fully tap their potential, we will have to look at them as a whole – from product design and manufacturing processes through to the collection of different types of waste and their final recycling, not to mention the identification and reuse of previously buried waste. We will need to rely on new optical and chemical sorting techniques that can separate fine particulates, and on new industries focused on processing and extracting value from categories of waste that have until now been recycled very little, if at all. Lastly, it will be necessary to seek out new end-markets for different types of waste, processed or not, either finding ways for them to be used for production in industry or marketed directly to end consumers. Experts in “rudology” will fully comprehend this new value chain. They will make sure that resources created from waste will be greater in number, more available, more accessible and of better quality.
Industrial firms are striving to adapt to a number of changes at the same time. Their clients want increasingly customized products, often produced in short runs. And societal demands are dictating where production sites are located and how they are operated.

The energy and environmental transition is under way. In an increasingly urbanized world, reducing greenhouse gas emissions and preventing major environmental and health risks will be every bit as important as using renewable energies. Beyond meeting regulatory requirements, firms will be maintaining their industrial performance and competitiveness through innovative energy storage, management and recovery solutions. Factories will be part of a connected world where pieces of equipment are constantly communicating at each level of the chain and can be remotely controlled. Sensors will be used in production, maintenance and safety to measure a variety of parameters and provide information that can be processed and acted upon very quickly.

Meanwhile, client demands will determine the responses provided, and the latter will have to be constantly adapted. Production units will change scale and atomize. Microproduction runs, started up on demand, will rely on 3D printing technology, paving the way for products that are increasingly diverse and customized. Factories will be reconfigured and incorporate new design and manufacturing techniques. They will be more flexible, capable of adapting to demand in real time.

New mobile, modular facilities will make it possible to stay in step with markets and change format as needed. As industrial process specialists, rescaling experts will advise clients on how to best adapt their systems or production equipment to new requirements and to changes in the urban and regulatory environment. It will be their job to help industry remain proactive and efficient.

In 2030, the industrial landscape will look very different. To comply with new environmental, economic and societal requirements, factories will be more energy efficient, cleaner, and more versatile. Production equipment and processes will be mostly digitized, and they will adjust to demand in real time. CNIM teams are already partnering with industrial firms to provide equipment and advice for complex turnkey solutions.
With 66% of the world’s population expected to be living in and around cities by 2050, the issue of quality of life in urban areas will become increasingly urgent going forward. People will produce more waste, and fewer natural resources will be available, forcing billions of urban dwellers to make sure they have enough energy, which will be a scarce and expensive resource, while also taking advantage of the overabundant waste produced.

Energy production and consumption will be coordinated everywhere in an effort to minimize energy use and maximize waste recovery. Industry will no longer let heat from facilities be released into the atmosphere. Thermally insulated buildings will be able to use the heat provided at no charge by the sun or household appliances or wastewater to keep hot water and heating needs in check. Heat released from corporate and government IT servers will be used directly for residential heating through next generation heaters. Rainwater will be used in lavatories. Organic waste will be transformed on-site into biogas or compost for use as fertilizer on urban farms. Biogas will be directly injected into natural gas networks or to generate electricity. In other words, every bit of waste and residual heat will be reused and returned to the grid – a grid designed and managed as a coherent, interconnected system in which resources are identified, analyzed and stored for use as needs arise.

Circular ecology specialists will be “conductors of the energy recovery orchestra”, monitoring all flows, from collection at source and reuse (recovery of materials and energy) up until reintegration into the virtuous circular economy loop. Their job will be to make urban development more sustainable.

In 2030, nearly two-thirds of the world’s population will live in and around cities. Waste and other residue of human activity will be turned into new resources in densely-populated areas. Energy from IT equipment will be recovered in the form of heat, and household waste will be recycled in different ways. With its complementary expertise in treating waste and improving energy efficiency, CNIM is already positioned to take on this challenge.

In 2030, the energy available for use will come from a variety of sources and geographic locations. The process of recovering and redistributing energy from different production sites will be refined and made more secure by using networks of wireless sensors and complex management solutions. With its expertise in renewable energies, smart energy management and cybersecurity, CNIM is already working on solutions to these challenges.

Biomass, hydropower, geothermal, wind, solar, marine and nuclear energy, fossil fuels: renewable or not, the energies available to us are evolving as quickly as the related technologies. Different types of energy can be complementary and used together in various combinations to meet the energy needs of communities. For instance, late in 2016, Denmark was able to source all of the electricity needed over an entire day from wind turbines(1).

The global energy generation market is no longer the preserve of major industrial groups that manage large power grids. Here and there, across the globe, smart grids are connecting a multitude of small renewable energy sources scattered across regions, including wind and tidal turbines, solar panels and heat pumps. At the same time, steady progress is being made in energy storage, notably via thermal solutions, reducing the gap between production and consumption. Digital technologies will be making these microgrids smarter and more efficient. They will manage the variability of some types of energy, such as wind and solar power, as well as differences in production densities between sources. To collect energy flows and redistribute them appropriately, ultra-precise wireless sensors will be used to measure electricity consumption and greenhouse gas emissions. Secure data gathered in real time will then be integrated and analyzed within advanced management systems capable of making choices that will make facilities more efficient.

Tasked with designing the smart grids of the future, micro-energy architects will know how to reconcile the fluctuating capacities of renewable energy sources with the needs of consumers who will also be producing energy. In other words, they will help make energy management more responsible.

(1) https://lenergeek.com/2016/12/27/danemark-a-tourne-a-100-denergie-renouvelable-a-veille-de-noel/
Climate and geopolitical risks require new solutions that can be rolled out very quickly in emergency situations. Responding with maximum efficiency to hurricanes, sudden rises in water levels, famine and armed conflict will require logistics systems that are well-organized. Whether in a civilian or military setting, the challenges will be the same: intervention teams and specialized materials must be projected to disaster sites thousands of kilometers away in a timely manner. These forces will then need facilities to make them perfectly autonomous on-site. Provisions, emergency equipment and field hospitals will have to be sent by special vehicles that can be mission-ready within a few hours. Amphibious landing craft will facilitate the rapid unloading of technical and human resources. Ultra-resistant motorized floating bridges will make it possible for heavy vehicles to cross wet gaps to accelerate rescues in areas that can no longer be accessed through other means. Mobile base camps producing their own energy will be unloaded and installed at strategic locations. Wind turbines and solar thermal and photovoltaic panels will make them electricity-independent, while the regular treatment of wastewater and waste will power their heating circuits. Mobile incinerators, mounted on trailers, will be brought in to quickly remove excess waste and limit the risk of epidemic. When responding to civilian or military emergencies, emergency team projection specialists will plan missions to isolated locations to set up the necessary base camps and autonomous logistics systems. They will ensure that all resources deployed are optimally coordinated.

In 2030, we will be seeing more environmental and geostrategic emergencies, often arising without warning. States, as well as public and private institutions, will need to have comprehensive logistics resources ready for dispatch to disaster sites. Energy will be self-produced at base camps, and water will be treated at purification stations. With its bridging systems and amphibious crafts, CNIM is already delivering projection equipment and specific expertise in autonomous equipment.

GO WHERE THE URGENT NEEDS ARE

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Ready for new adventures in technology

Since 1856, the Group has been exploring new geographic and technological frontiers with the same pioneering spirit. This never-ending quest for innovation is what drives our growth and earns us the trust of our clients.
We’ve never been intimidated by major industrial challenges. DNA, the core areas around which it constantly reinvents itself. There’s also a fine tradition of audacity at CNIM, reflecting the fact that while our relatively small size forces us to be savvy and resourceful, we’re also capable of taking very big steps. In several of our businesses, we either partner with or compete head-on against very large corporations to win major contracts, notably outside France. In more than a century and a half, we’ve never been intimidated by major industrial challenges.

How do you explain the Group’s solidity over such a long period?

Nicolas Dmitrieff. Summing up CNIM is not an easy task, given that we’ve been around for 160 years. An outsider could see the Group as a conglomerate with different businesses that have no clear link between them. But the truth is that our business portfolio is extremely coherent. This becomes clear if we look back at the Group’s history. CNIM was founded as the result of a decree issued by Napoleon III, under the Second Empire, between the industrial revolutions. Its workshops in La Seyne-sur-Mer filled orders from the State to build first armored frigates, then submarines and tanks. These fundamental skills were mastered during the shipyard days: thermal engineering, mechanical engineering and industrial contracting. These three areas of expertise are still the Group’s core activities.

How do you explain the Group’s solidity over such a long period?

Nicolas Dmitrieff. CNIM is a family-owned firm with a history that spans several generations. It has a stable and committed shareholder base, which benefits both its employees and clients. We make decisions quickly; there is genuine proximity between management and employees.

From a legal standpoint, CNIM is a public limited liability company (société anonyme), but in reality we are anything but anonymous: the company is represented by a Chairman, a family, a Management Committee and every one of its employees. This representation guarantees solidarity, staying power and stability. We will never use a scorched earth policy – it would not be in our interest to do so. All of our efforts are geared to supporting, perpetuating and building the Group. And our teams have total confidence in us.

Let’s talk about the past year: How were the Group’s 2016 results?

Nicolas Dmitrieff. The results were in line with the business plan we’ve been sticking to for several years. We met our profitability targets. Stripping out Babcock Wanson, the subsidiary we recently sold, revenues decreased slightly, as anticipated: we are currently in the process of rebuilding our order book. It should also be noted that some very big orders were booked in 2016, totaling €810 million, well above the 2015 level. At the same time, we continued to expand our business portfolio and now have under development a number of new products and projects that will require further investments: operation of the Llo solar energy power plant (SUNCNIM, see p. 28), treatment of flue gas emissions from ships and bottom ash (LAB, see p. 32), instrumentation and cybersecurity (Bertin).

So, results were in line with your forecasts… What were the main highlights?

Nicolas Dmitrieff. There were several key highlights, at different levels. In terms of business, we landed two large contracts for turnkey waste-to-energy plants in the UK, in Kemsley, North Wales. In France, CNIM developed a third of the plants of this type between 1970 and 1990, and there are currently few opportunities to build new ones. However, plant renovation contracts, which the market has been
anticipating for some time, are starting to appear – this is a trend that will continue in the coming years. CNIM notably landed two new contracts in Thiverval-Grignon, in the Yvelines department, and in Saint-Saulve, in the Nord department. Another highlight of 2016 was the return to our historical headquarters after more than two and a half years of renovation work. Our Paris-based teams had been working at two separate sites but are now back in the same building. This beautiful site was originally a private mansion, and we redesigned it to create a friendly environment that represents the CNIM spirit to all those who enter the building, be they employees or clients. Since our 2,500 staff are spread out across numerous sites throughout France and abroad, we want to make this the Group’s flagship, a place where they want to come to see one another and work together. The last highlight of 2016 would mention the sale of our subsidiary Babcock Wanson, which makes industrial boilers.

On that subject, why did you sell a subsidiary that is expanding?

N.D.: That wasn’t always the case: in 2007, the company was in trouble. We were able to turn it around starting in 2010. By 2015, it was in a good shape, with a solid product-service strategy and a strong management team. It needed more funding to become the European leader in its market. It also had a unique position within the Group, offering relatively few synergies with our other businesses. I wanted it to have the resources it needed to continue to expand. We had to make trade-offs, choose our investments, select the businesses around which we wanted to continue to develop CNIM. Babcock Wanson was not a priority, but putting it on standby wasn’t an option either. I had seen the danger of this type of attitude firsthand: when I took over the reins at CNIM in 2009, our Transport Division was going through a rough patch since it lacked the resources it needed to grow. We had to sell it under difficult terms that did not guarantee its continuity. I learned many things from that experience, and did not want Babcock Wanson to go down that same path. We thus worked with its executives to select, among several suitors, the one that would be best for the company’s future growth. I would point out that we did not sell to the highest bidder, but rather to the one that had a bona fide plan for Babcock-Wanson.
In other words, the decision reflected your personal approach, not just financial factors?

N.D.: That’s exactly right. I make sure my decisions will not have any negative long-term consequences for the Group or its subsidiaries, and I am free to take them with the approval of the Supervisory Board. When I took over the helm at CNIM, I fought to regain control of the shareholder base. Today, it is majority-owned by our family. This gives us the freedom to make our own decisions. The industrial sector requires long-term investments that only produce their full effect after several years: one must know how to be patient. Many executives today find themselves in a tough situation because they focus on short-term thinking and immediate results. Being family-owned, CNIM can develop projects with staying power.

After selling that business in 2016, is the plan to grow through acquisitions, or purely organically in 2017?

N.D.: It will be a mix of both. We always look at acquisitions that could help us build our core businesses by adding new expertise or filling in or expanding our offering in technology or geographical terms. But CNIM is not after size or volumes at any cost. We want to see our revenues increase on the back of organic growth combined with synergies unleashed with new entities. In a word, CNIM’s aim is for enhanced solidity and credibility.

How do you plan to secure the Group’s growth going forward?

N.D.: Our areas of focus are aligned with our clients’ key sovereignty issues, whether they relate to the energy transition, the security of States and individuals, or high technologies. All of our key product and service offerings tie in with these core themes. When it comes to the security of States and individuals, we will continue to focus on organic growth driven by our flagship products in the fields of land and maritime projection systems as well as detection and surveillance equipment. As for the energy transition, our aim is to continue to expand our offering and structure it in such a way as to considerably grow our revenues outside Europe over the coming years. This international expansion will create an even more solid springboard for our growth. The world is more complex than ever, and subject to cycles. Our diversified business mix has allowed us to withstand swings since our activities are countercyclical. Our job now is to achieve the same diversification in geographic terms, so that CNIM can continue to weather cyclical downturns. The Group is also working constantly to develop businesses that generate recurring revenues: operation, maintenance and services in energy industries and the sale of defense and security equipment produced in small and medium runs. Here again, the focus is on countercyclical businesses, since recurring revenue creates a balance and complements the large contracts we win.

Running a company requires making investment choices, notably in terms of technology. What choices are you making?

N.D.: Our thermal and mechanical technologies and expertise are proven. Our goal now is to find new applications for them in different areas in order to expand our offering and build on it in a more comprehensive, integrated way. This will allow us to extract more value from our existing expertise, whether in waste treatment, a field in which we are leaders, or in areas such as biomass, solar, flue gas treatment or emissions control. The energy market is evolving fast. Some...
“CNIM is deploying its hubs in four areas: the United States, the Middle East, Southeast Asia and China.”

trated primarily in the North American market. I would also mention our expertise in Energy Management Systems, through our subsidiary Bertin Technologies.

Can you explain the role of integrated business models (Build, Own, Operate) in the environmental and energy industries?

As Europe’s leading builder of turnkey waste-to-energy plants, CNIM has a deep understanding of the technologies underlying, the processes involved.

As a provider of turnkey facilities, the Group interacts with all stakeholders’ projects and guarantees the energy performances of its plants. The control it has over projects gives it the credibility to offer a range of tailored operations and refurbishment services.


cnimaes handicap

delteport cnim environment energy

Depending on the location and who we are dealing with, our partnerships can take on very different forms.

We have spoken a great deal about energy and the environment. How do you see your offering evolving in other businesses?

In defense and security, we are working on sensor-based detection and protection systems. CNIM offers a range of CBRN (1) risk detection and protection systems for military and civilian uses, as well as special craft with high-potential equipment for independent amphibious missions, including the L CAT® (see p. 37), a catamaran with a mobile platform. We are also very active in mechanics, working on such major research programs as ITER (see p. 34), the global research project aiming to develop a nuclear fusion reactor. The stakes are very high; ITER aims to make it possible to produce green nuclear energy for generations to come. We are currently building and assembling major components at the ITER site in Cadarache. CNIM is one of the key industrial players in this international program bringing together China, the European Union, India, Japan, Korea, Russia and the United States.

The CNIM Group is to continue to expand its presence across the entire value chain, from facility design through to operation. Because our expertise in construction and operation is complementary, we can meet all of our clients’ needs. We notably offer services relating to maintenance and the refurbishment of thermal power equipment, increasingly with a digital component, particularly for remote energy performance monitoring. In Europe, we continue to respond to requests for proposals in partnership with the major developers unless the end client specifies otherwise. But we have no reason to take this approach on international markets.

Fundamental trends are taking shape: decentralization - with the construction of smaller energy generation units – as well as decarbonization, reduced energy intensity, heat recovery, digitization of systems used, etc. The energy transition is creating a range of opportunities. For instance, CNIM is developing a new concept in maintenance vessels for offshore wind farms, WindKeeper®. We are working to design a vessel that is smaller and more efficient but able to withstand rough seas. We are also on the cutting edge of ash metal recovery plants, with progress in this area concern-
You spoke earlier about the need for geographic diversification. Do you have priorities when it comes to international expansion?

N. D.: Yes, our focus will be primarily on the Middle East, Asia and the United States. We already have strong positions in France and Europe. Our aim is to continue to support our businesses there while also developing value-added services in the environmental and energy sectors. Our Asian activities will be ramped up gradually, but things could take off quite quickly in the Middle East: five years from now, we could be generating a large share of our revenues there. This region is likely to become our second largest market soon.

What will you be doing to make this international expansion successful?

N. D.: CNIM wants to go from being an exporter to an international group by setting up hubs, under its own name, which will promote all of the Group’s products and services in each major geographic area. But CNIM is a French company, a European one. Our central design offices and key expertise will still be based in France. It is crucial for us to build and develop waste-to-energy facilities, we partner with local companies for everything that can be done on-site, thus preserving the existing ecosystem. The hubs CNIM is deploying outside the euro area are concentrated in four areas: the United States, the Middle East, Southeast Asia and China (Guangzhou). Our operations in the United States focus on fly ash treatment and defense-related instrumentation systems, nuclear and life sciences. Our Middle East hub set up an Abu Dhabi office in 2016. It is tasked with promoting our environmental, defense and security products and services (Bertin contract for gas detection systems, for instance) and energy transition offering (solar, thermal and petrochemical optimization). Our Southeast Asian activities are grouped together in Singapore to support our defense offering and the distribution of NRBC products for Bertin Technologies. We are also working on waste-to-energy and biomass facilities in the area.

These changes must require specific kinds of support for the Group’s human resources?

N. D.: Human resources are indeed a key issue for the Group, and we’ve been encouraging our employees’ growth for several years now. For sector-related and historical reasons, CNIM has traditionally had an engineering culture, and our most senior employees have a very strong sense of belonging. When the French shipbuilding sector was in deep trouble in the early 1980s, the State wanted to combine these activities within a single publicly-owned entity, NORMED (Charrière du Nord et de la Méditerranée). CNIM was almost merged into it, but my father, who was the main force behind the Group’s activities in this period, fought to keep it alive. Just 10% of CNIM staff at the time followed him down this entrepreneurial path. This was when CNIM acquired its true spirit, based on its pride in having reinvented itself. Those who were here at the time are naturally very committed and involved. But this spirit needs to be amplified and embodied by generations of engineers and technicians. We are working to help everyone understand these other aspects.

International expansion will make your working methods even less compartmentalized. Will this have an impact on digital security?

N. D.: This is a complex issue. The Group is expanding internationally, and exchanges between different continents need to be smooth. CNIM has been using shared databases and videoconferencing systems for a very long time, with a high level of security; working in different industries, including defense, we pay very close attention to IT security. But we have to find the right balance between extreme data security and ease of access for users. People could seek ways to go around a system if it’s too restrictive, essentially making it ineffective. This subject is more complex for our Group than others since our defense businesses require a high degree of confidentiality. For instance, access to some areas in our La Seyne-sur-Mer site is restricted. UEB keys are not allowed. So our policies must be adapted to the activities of our subsidiaries and the sensitivity of the data they handle. With our major projects for example, all trade information is exchanged with a high level of security to make sure it is protected.

How is CNIM preparing for the future?

N. D.: CNIM has a long industrial and technological history that is embedded in its corporate culture and embodied by generations of engineers and technicians. Long time horizons are important at CNIM, contrary to the short-term thinking many engage in today. When I took over the reins in 2009, with the backing of the Supervisory and Management Boards, I reorganized, streamlined and stabilized the Group. I worked to make our businesses easier to understand, to clarify their product and service offerings, and to rethink our strategy. International expansion will be our next big challenge. Our totally revamped websites takes impact on digital security?
New projects, new technologies, new skills… our experts are responding to the constantly evolving demands of our clients.
"The digital transformation is significantly changing the way users work. Success with digital services and applications requires a user-centric approach to technologies, one that makes it easier for people to accept new ways of working and also the development of new tasks that benefit their companies."

Sandrine Coletti
User Experience Manager, Bertin Ergonomie

"CNIM’s expertise in the construction of turnkey plants lies in its technological mastery of processes and its ability to manage, within deadlines and from both a technical and a contractual standpoint, the thousands of interactions required with project stakeholders. The proof is that the 15 plants completed over the past five years deliver excellent performances on a daily basis."

Claude Boutin
Director, CNIM EPC Contracts BU

"Aside from all the regulations that are forcing industry to tackle the energy and environmental challenges we face today, going forward, industrial performance will also be driven by a hybrid approach to energy, products and processes."

Pascale Compain
Sales engineer, Innovative Processes, Bertin Technologies

"We’re always ready to capitalize on the fourth dimension by using time as a driver for finding future solutions. Sometimes we’re able to formulate technical responses by anticipating how they will come to fruition."

Éric Huet
Head of Engineering, Big Science, CNIM Industrial Systems

"LAB uses a proven mix of technology and process to recover and recycle high quantities of non-ferrous metals from landfilled fresh incinerator bottom ash. We create value for our partners and clients by driving a financially profitable and environmentally green program to extract value from an otherwise lost source."

Brent Dubois
President & CEO of LAB USA

"In the face of ever more widespread and sophisticated attacks, cybersecurity requires having several lines of defense. When it cannot prevent a threat from materializing, it has to be able to isolate and then neutralize the threat."

David Boucher
VP Product Security Solutions, Bertin IT

"Our R&D quickly materializes into reliable, high-performance products, and two-thirds of the patents we file every year are used right away. Our experimentation methods allow us to test solutions directly at client sites."

Frank Tabaries
Director of LAB Service

"LAB uses a proven mix of technology and process to recover and recycle high quantities of non-ferrous metals from landfilled fresh incinerator bottom ash. We create value for our partners and clients by driving a financially profitable and environmentally green program to extract value from an otherwise lost source."

Brent Dubois
President & CEO of LAB USA
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In partnership with the Grenoble Chamber of Commerce and Industry, Schneider Electric is undertaking a “Future Investment Project” dedicated to the theme of the “Smart Grid Campus”. This project aims to produce an energy microgrid at the level of the Institut des métiers et des techniques (IMT) de Grenoble integrating renewable energies and energy savings, with the dual aim of local energy consumption of self-produced electricity and renewable energy generation. The renewable energy sources considered are solar photovoltaic, installed on different buildings on the campus, and cogeneration plant (power and heat). A battery storage system will be used to save excess energy produced for use when demand peaks or renewable energy output is low. Bertin Technologies conducted a parametric study using its EMS (Energy Management System) software tool to assess the impact of photovoltaic power and battery capacity on self-consumption and self-production rates on the microgrid. It then carried out a preliminary study to define the different energy systems integrated: surface area and location of photovoltaic collectors, definition of cogeneration and connections to energy networks.

Micro-energy

Two studies to optimize energy microgrids

The thermal power plant powering the heating network of Clichy-la-Garenne (Hauts-de-Seine, France) operates at full capacity when heating needs are highest in winter. With a distribution network 20 km long (12.5 miles), it supplies more than 20,000 homes. Operated by CEVE (Clichy Énergie Verte, Idex-Coriance partnership), it is powered by two natural gas boilers that produce 52 metric tons of superheated steam an hour, and has a fairly recent biomass boiler producing 8 metric tons an hour. Late in 2016, CNIM Babcock Services intervened quickly when the operator detected a leak in the tubes of one of the gas boilers, requiring the full replacement of the superheater. It then used an endoscope to examine the lower water collectors after clogs were identified in the superheater. A tube inspection plan was also created for the other gas boiler to prevent potential losses of thickness. This more comprehensive plan for monitoring the condition of the generators and making them more reliable will continue in 2017, with a project involving the installation of a steam distribution manifold to better regulate the power delivered to the grid. This partnership with CEVE is a testament to CNIM Babcock Services’ ability to intervene in district heating networks and offer diagnostic services on the basis of which its teams make recommendations that allow clients to better anticipate work that needs to be performed.
 Searching for the ultimate thermal cycle

After steadily improving its technologies, CNIM, a pioneer in energy efficiency, is able to guarantee highly advanced thermal cycles (steam pressure and temperature) that make facilities much more efficient. However, there is a steam temperature and pressure threshold beyond which corrosion phenomena intensify at the heat transfer surface of the boiler. CNIM was the first company in Europe to introduce protections against corrosion using chrome- and nickel-based alloys. The Group is forging ahead with research in this area, in close cooperation with the suppliers of these materials. This quest to optimize energy efficiency is a driver of innovation for CNIM. One example comes from its subsidiary LAB, a flue-gas cleaning system uses steam soot of the boiler. The most common boiler clearing system uses steam root blowers. During clearing, steam is not available for use by the turbine to generate electricity. CNIM is working on a dry system that uses less energy and does not interfere with the energy production cycle. Lastly, SNCR Dolox, a patented CNIM process for reducing nitrogen oxides (NOx), involves injecting urea in a solid form into the combustion chamber during combustion. This innovation boosts the facility’s performance and brings emissions down well below regulatory limits. CNIM is working to develop this solution further. It will be implemented in the near future, with controls that incorporate operational data to optimize reagent consumption while reducing primary NOx production.

NO ENERGY EFFICIENCY WITHOUT ENVIRONMENTAL PERFORMANCE

Improving energy efficiency and plant availability also requires optimal systems for cleaning the heat transfer surfaces of the boiler. The most common boiler clearing system uses steam root blowers. During clearing, steam is not available for use by the turbine to generate electricity. CNIM is working on a dry system that uses less energy and does not interfere with the energy consumption process.

Two turnkey waste-to-energy construction contracts for Wheelabrator in the UK

In 2016, CNIM secured two energy-from-waste facility construction contracts in rapid succession partnering with Wheelabrator Technologies bringing the CNIM Group’s United Kingdom portfolio total up to 25 facilities. The two new facilities are located at Kemsley in Kent and the Desside Industrial Park in Flintshire (North Wales). The Wheelabrator Kemsley Generating Station is a combined heat and power facility which will generate sustainable electricity to power UK homes and businesses. Wheelabrator Kemsley will also provide 160 GWh of valuable steam heat to the adjacent Kemsley Paper Mill, owned and operated by DS Smith. The facility will be capable of processing 550,000 tonnes per annum of municipal solid waste with a generating capacity up to 49.9 MW gross of low carbon electricity. It is the largest recent undertaking of CNIM in the United Kingdom in terms of processing capacity. With the capability to process 200,000 tonnes per annum of municipal solid waste, the Wheelabrator Parc Adfer facility located in Flintshire will have the generating capacity of around 19 MW gross of sustainable electricity to meet the needs of over 30,000 UK homes and businesses. The facility will also be capable of providing valuable steam or heat to local industry and housing. The Wheelabrator Parc Adfer energy recovery facility will be built on a former steelworks site at the Desside Industrial Park. It has been named Parc Adfer to reflect how it will help North Wales recover energy from its non-recyclable waste (Adfer meaning to “recover” or “restore” in Welsh).

The Thiverval-Grignon waste-to-energy plant gets a makeover

Sidompe, the joint syndicate for household waste disposal and energy production, processes the waste produced by residents of 116 towns and villages spread across eight communities in Western Paris, representing more than 460,000 people. In 2016, CNIM won Sidompe’s call for tenders for the design, production, operation, maintenance and energy optimization of the waste-to-energy plant in Thiverval-Grignon (in the Yvelines). Sidompe thus reaffirmed its trust in CNIM, which has been running the plant since 2008. Aimed at improving energy efficiency and fuel gas treatment, the work involves replacing the first two units with a new unit, modernizing line 3, replacing the turbo generator, and upgrading the existing flue gas treatment system with the patented VapoLAB™ processes using quicklime and SNOR/TermInOx™ developed by CNIM subsidiary LAB. In addition, switching from wet to dry flue gas treatment will eliminate stack plumes. From this standpoint, one important part of the project is to optimize the architecture of the existing facility, part of which was built in 1974, and to create an educational tour circuit for the general public.

CNIM will be working in a cramped space in full operation, and against tight deadlines because the turbo alternator needs to be operational before a certain date to comply with the new electricity supply contract. Once the work is complete, the plant will be able to produce 17 MW in all. It will supply electricity to 15,000 households (compared with 8,000 currently) and be operated by CNIM for ten years.
processes for the largest biomass plant in Europe

LAB, a CNIM Group subsidiary, offers solutions allowing its clients to boost the energy efficiency of their plants while reducing their environmental footprint. In 2016, LAB made further inroads into Northern Europe by winning a new contract for the design, engineering, supply, construction and commissioning of flue gas treatment and flue gas condensation plants for Hofor’s Energiproduktion BIO4 facility in Denmark, the largest biomass plant in Europe equipped with a LAB flue gas treatment system. BIO4 is being developed as part of the conversion of the Amagerverket combined heat and power plant in Copenhagen. It will replace a coal-fired line of the plant with a new one with capacity for 1.2 million metric tons of woodchips a year and to produce 415 MW of district heat and 150 MW of electricity. Designed for a nominal flow of 825,000 Nm3/h, the flue gas treatment and flue gas condensation plants incorporate the following LAB processes:

• SecoLAB™ dry flue gas treatment with recirculation;
• a direct to district heating condensation unit combined with humidification of combustion air. It will be the largest flue gas condensing plant in Europe;
• efficient condensate water treatment for boiler feed water production. LAB will begin work on this plant in September 2017, and it is scheduled to be commissioned in 2019. This new facility will give LAB another reference in Denmark, particularly in the Copenhagen area. The company already has a waste recovery center in Amager Bakke, where two lines equipped with LAB flue gas treatment systems are being commissioned. It is located less than 150 meters from the Hofor CHP plant.

In Roosevelt, in the state of Washington, CNIM subsidiary LAB runs, under a BDO (Build-Own-Operate) contract, a facility that extracts and recovers the metals present in flue gas cleaning residues. The plant has been in service since March 2016 and can treat up to 160,000 metric tons of bottom ash a year. A cementation of the circular economy, waste incineration is a source of energy, but it also generates residues, and recycling them is a top priority for operators. As a waste treatment specialist, LAB offers a comprehensive range of solutions for stabilizing and solidifying the residues resulting from combustion gas treatment and for recovering the metals present in incinerator bottom ash. To treat bottom ash at the Roosevelt facility, LAB uses its patented RecuLAB™ NF process, the leading recycling process for recovering ferrous and non-ferrous metals. It involves dry-heating the bottom ash once it has matured, in contrast to the RecuLAB™ AU process, which involves recycling wet bottom ash to extract precious metals from it. The contract was signed in April 2015. One year later, LAB brought the plant into service and will operate it for ten years. Metals extracted are sold on the local market or exported to Europe. It has been forecast that 4,250 metric tons of ferrous metals will be recovered every year, along with 4,650 metric tons of non-ferrous metals, with discharge volumes being reduced by 6%. The system has already contributed to the production of 15 km of recycled asphalt.

Delivery of 150th booster casing for Ariane

Late in 2016, CNIM received an order for the very first nozzles casings for the boosters of the Ariane 6. A continuation of the work the Group did for Ariane 5 and Vega, this contract is proof of the client’s satisfaction with the quality of the products CNIM has delivered. Indeed, CNIM has been making the lateral booster nozzle structures for the Ariane 5 launcher since 2004. The 150th booster casing was produced by its workshops in December 2016. CNIM is also continuing to work alongside Airbus Safran Launchers to qualify an innovative technology that can reduce production cycles and costs for these high value-added parts.

Helping La Poste transform its offering

Bertin Ergonomie has been selected by La Poste to join “Visier Innovation”, a pool of preferred partners chosen to work on innovative projects. Within this framework, Bertin Ergonomie is assisting La Poste in the digital conversion of its services and the diversification of its offering. Bertin’s ergonomists provided a number of services in 2016:

• assisting La Poste in implementing a solution allowing retailers to boost their sales and gain a foothold in online retailing;
• formalizing an interface and style guide for local services offered by La Poste through its mail distribution services;
• designing and assessing a parcel-tracking site for businesses.

This approach, focused on ergonomics and uses, incorporates as much client experience data as possible, notably relating to buy-in to the services offered among targeted users.

More accurate weather and climate forecasting

Having won an initial contract from Airbus Defence and Space late in 2015 relating to the study and production of a fiber optic system, Bertin Technologies was awarded a new contract in 2016 for the study and production of a laser diode system for weather and climate forecasting. Both systems will be mounted on a satellite in the IASI-NG (Infrared Atmospheric Sounding Interferometer– New Generation) atmospheric sounding system that Airbus Defence and Space will supply to Centre national d’études spatial (CNES) as part of Metop-ISO, the European program for forecasting the weather and monitoring the climate between 2020 and the mid-2040s. In addition to acquiring temperature and humidity data, the IASI-NG measures more than 25 other atmospheric components with a high degree of accuracy and provides the ultra-detailed data that are necessary for weather forecasting and monitoring pollution and the climate.

ON-BOARD SYSTEMS

helping la poste transform its offering

on-board systems

more accurate weather and climate forecasting

delivery of 150th booster casing for Ariane

recovery of metals

lab is extracting value from bottom ash in Roosevelt

biomass

image 293x288 to 653x532

image 827x541 to 1192x818

image 26x587 to 26x174

image 165473x19767

image 26x289 to 26x400
The nuclear industry of the future

The experimental Jules Horowitz Reactor (JHR) is a nuclear research reactor being built at the Atomic Energy Commission (Commissariat à l’énergie atomique – CEA) site in Cadarache. Research will primarily focus on applications for nuclear power plants and nuclear medicine. As the owner, operator and contracting authority, the CEA has built up an international consortium including EDF, Areva TA, the European Commission and research organizations in the Czech Republic, Spain, Finland, India, Israel, Sweden and England. Late in 2014, Areva TA awarded CNIM a contract to manufacture large components for the cell block forming the core of the JHR. This manufacturing contract will call on CNIM’s skills and expertise in the fields of electron beam welding and machining of large-scale components, as well as its high-precision capabilities. In 2015, machining work on the component designs and the initial aluminum and stainless steel welding were carried out at La Seyne-sur-Mer. Manufacturing continued in 2016, conforming to the quality standards for this type of equipment. The JHR will be made available to the nuclear energy industry, safety authorities and researchers. The studies conducted will be vital to the safety and competitiveness of plants. The reactor will also produce radioisotopes for nuclear medicine, meeting 25% of the European Union’s annual needs on average.

NUCLEAR FUSION

Replicating the energy of the sun here on earth with ITER

Through its participation in the ITER project since 2005, CNIM has been fulfilling its mission of supporting the energy transition. The contracts it has won in recent months are further confirmation of the Group’s strategic decision to position itself as a long-term supplier for this program.

• ITER awarded CNIM a contract for Mechanical Handling Equipment (MHE) for In-Vessel Assembly. This involves studying, producing and approving the resources that will be used during the ITER project for the assembly of the reactor’s internal components.

• Fusion for Energy (F4E) selected the CNIM-Bertin partnership to supply the In-Vessel Viewing System (IVVS), a remotely operated metrology and visual inspection system that can operate in the vacuum chamber of the reactor between two plasmas.

• F4E selected CNIM to make the poloidal field coils that will help maintain the shape and stability of the plasma by creating a sort of “magnetic cage”.

• CNIM will make the port plug structures, extremely heavy structures that will house the control instruments for the ITER machine.

• The purpose-built tools contract is for the design, supply and on-site installation of equipment for the assembly of the ITER tokamak.

• Lastly, CNIM secured a contract for the design and supply of three giant pre-compression rings (PCR) to support the toroidal coils around the vacuum chamber, the purpose of which is to absorb the phenomenal mechanical stress placed on the coils.

NUCLEAR SAFETY

CHERNOBYL: a polyurethane membrane to make the new arch leak-tight

Exceptional size, significant expansion capability, ability to withstand wind speeds of up to 300 km/h, an innovative system to block the spread of any tear caused by extreme conditions… these are the characteristics of the membrane used to guarantee the leak-tightness of the new arch protecting Reactor 4 at Chernobyl, which was damaged in 1986. Novarka, the consortium formed by VINCI Construction Grands Projets and Bouygues Travaux Publics tasked with building the new safe confinement, asked CNIM to design and produce a membrane 1.5 meter wide and 2 km long to protect the atmosphere from any new release of radioactivity.

The first order of business was to subject the different materials to a battery of tests – distortion, elongation, tear resistance – and to adjust the design to meet all requirements. After completing the qualification tests, CNIM moved on to the technical challenge of mass production, setting up an entirely automated workshop at its La Seyne-sur-Mer facility. The Group only had a few weeks to produce the 2,000 meters of membrane meeting the quality standards of the project in terms of thickness, quality of material, surface appearance, etc. CNIM’s ability to deliver was a further demonstration of the expertise of its teams and the excellence of its industrial facilities, which can accommodate large-scale projects. Novarka confirmed its confidence in CNIM by entrusting it to provide a safe handling system and maintenance carriage for the main deck of the arch, which will be used for the future dismantlement of the reactor.

2,000 meters of membrane produced in just a few weeks.
OPTRONICS

When darkness becomes an ally for armed forces

Bertin Technologies is a key provider of optronic surveillance systems to public and private clients. Its instrument portfolio combines the use of high-tech sensors with image processing modules. This expertise has allowed it to develop innovative surveillance and identification devices for use by day or night. In 2016, Bertin Technologies launched FusionSight®, a handheld monocular producing low-light digital and thermal images that can be used separately or fused. Particularly suited to the needs of infantry commanders and special forces, this reliable, lightweight equipment is effective in the field during operations, when facing hidden or camouflaged enemies. With an ergonomic design that meets users’ needs, FusionSight® can record images and stream them “live” to a remote screen.

AlphaGUARD, an all-terrain portable laboratory for measuring radon gas

Bertin Technologies, a CNIM subsidiary, has launched a new version of AlphaGUARD, its device for measuring radon gas, developed using the expertise of staff from Saphymo, integrated in 2016. This handheld device, the benchmark for many international scientists and experts, was redesigned to make instantaneous or continuous measurements of radon gas activity, identified as the second leading cause of lung cancer after smoking. Above and beyond use in labs and on industrial sites, AlphaGUARD is increasingly used for activities that serve the general interest, for instance the prevention of radon risk in homes. Radon detection and measurement modes and analytics functionalities. Its wide range of accessories is used for radon mitigation in buildings, industrial stack monitoring, uranium and rare earth mining, waterworks, seismic surveillance, radioactive waste management, etc.

The new AlphaGUARD features batter ergonomic, high responsiveness, and embedded digital display and additional measurement modes and analytics functionalities. Its wide range of accessories is used for radon mitigation in buildings, industrial stack monitoring, uranium and rare earth mining, waterworks, seismic surveillance, radioactive waste management, etc.

A solution for managing chatting on vessels

Protecting sensitive information systems and critical infrastructure has become a major challenge for organizations. As a cybersecurity expert, Bertin IT offers solutions ranging from the prevention of cyberthreats to the deep defense of the information systems of operators of vital importance. In 2016, Bertin IT unveiled a software solution that makes it possible to exchange information with different levels of confidentiality from a single workstation through instant messaging. This alternative to the physical separation of networks – which requires one workstation per data class – improves operational efficiency while reducing the number of computer workstations at navy buildings. The solution is based on the EAL 5+-certified and France Cybersecurity-labelled hypervisor.

A more autonomous L-CAT®

During the 2016 Euronaval exhibit, the annual world meeting for the naval technologies of the future, CNIM unveiled the new version of its L-CAT® Landing Catamaran. Following the L-CAT® ship-to-shore version, the new model is 100% shore-to-shore. It addresses the needs of Navies that want greater intervention and landing capacities over long distances without using the ship-to-shore model. The L-CAT® shore-to-shore has its own means of communication, detection and self-defense, which increases its operational autonomy. Gauging the need for amphibious operations, the L-CAT® shore-to-shore is perfectly suited to current maritime security needs, as well as to civil assistance missions, natural disasters, humanitarian aid, and the evacuation of populations or citizens in disaster-stricken areas. It has a cargo capacity of 100 metric tons, compared with 80 for the L-CAT® ship-to-shore operated from a projection and command ship (BPC). Hydrodynamic optimizations have made it possible to improve its behavior at sea when it is forced to ride waves, accelerate or maneuver. As a result, it can travel 800 nautical miles up to sea state 5. Its fuel consumption is optimized, and the switch to a single propulsion line per hull significantly reduces operating and maintenance costs.

During the 2016 Euronaval exhibit, the annual world meeting for the naval technologies of the future, CNIM unveiled the new version of its L-CAT® Landing Catamaran. Following the L-CAT® ship-to-shore version, the new model is 100% shore-to-shore. It addresses the needs of Navies that want greater intervention and landing capacities over long distances without using the ship-to-shore model. The L-CAT® shore-to-shore has its own means of communication, detection and self-defense, which increases its operational autonomy. Gauging the need for amphibious operations, the L-CAT® shore-to-shore is perfectly suited to current maritime security needs, as well as to civil assistance missions, natural disasters, humanitarian aid, and the evacuation of populations or citizens in disaster-stricken areas. It has a cargo capacity of 100 metric tons, compared with 80 for the L-CAT® ship-to-shore operated from a projection and command ship (BPC). Hydrodynamic optimizations have made it possible to improve its behavior at sea when it is forced to ride waves, accelerate or maneuver. As a result, it can travel 800 nautical miles up to sea state 5. Its fuel consumption is optimized, and the switch to a single propulsion line per hull significantly reduces operating and maintenance costs.
Gaïa-Index ranking illustrates the rapid advances in CNIM’s CSR performance

For the second year in a row, CNIM ranked among the top 70 companies monitored by Gaïa-Index, the EthFinance subsidiary that analyzes and scores the CSR performance of European SMEs and mid-sized companies. The Gaïa-Index gave CNIM a score of 86/100 for its CSR policy in 2016. For CNIM, this score is a testament to the commitment of our management and staff to the sustainable development of the Group’s activities. More than 500 small- and mid-cap companies were assessed by Gaïa-Index during the year. The data collected is used to score the transparency and performance level of the companies. The top 70 make up the Gaïa-Index.

Promoting the development of skills

It is a point of honor for the CNIM Group to develop its own training modules with assistance from its employees, while also supporting them in terms of teaching methods. Trainers are employees who master a skill and/or have specific expertise, and who volunteer to share these with their colleagues. The use of experts from within the Group to teach modules on operational safety, nuclear power or production software helps build the skills of the workforce. Nearly 100 in-house trainers have completed the course on “Taking and leading in-house training courses”. The course allows them to wear a trainer’s hat more comfortably, particularly in terms of teaching skills and the oversight of interns. In 2016, 16% of the CNIM SA training plan was delivered via in-house training. The Group has over 160 in-house trainers working to develop new modules for specialist technical and cross-functional training.

Stepping up the fight against autoimmune and inflammatory diseases

Bertin Pharma is enabling the development of a repositioned drug (1) derived from biotechnologies by using Interleukin 2 to combat autoimmune and inflammatory diseases such as juvenile diabetes and lupus. From taking charge of the formulation through to analysis, the manufacture of clinical batches and ending up with stable pilot batches, Bertin Pharma has, on behalf of the French biotech company Itox Pharma, drawn on a broad range of human and technical skills. This cooperation arrangement, which began in 2013, has allowed Itox Pharma to forge ahead with the development of one of its flagship drugs.

A 0.088 accident rate in the UK

Over the past five years, CNIM has completed a number of projects in the UK (three waste-to-energy facilities for Veolia, two for Suez, one for FCC, two for Viridor and one for MVV Energie). During this time, the Group developed a health and safety culture, establishing a very robust management system in strict compliance with established procedures and regulations. Implementation of these measures at each site is overseen by a dedicated safety team, which ensures that all adhere to the measures and comply with the company’s safety rules. To further strengthen its health and safety culture, CNIM SA regularly organizes on-site internal or external audits, and is taking all the necessary steps to earn OHSAS 18001 certification in 2017. In compliance with UK regulation CDM (Construction, Design and Management), CNIM also set up a dedicated, independent team allowing it to act as Principal Design as defined in this regulation. Statistics prove that the system CNIM set up in the UK works: over the course of 10 million hours worked, CNIM’s RIDDOR (1) accident rate was 0.088, well below the UK average of 0.4.

(1) Repositioning involves finding a new therapeutic indication for a drug already on the market approved for a specific type of treatment. Advantages include shorter development lead times, reduced development costs, and higher success rates.
RESULTS & OUTLOOK

CONSOLIDATED REVENUES

€539.9 million

OF WHICH:

54.6% from exports

38.58% Innovation & Systems

61.42% Environment & Energy

The Innovation & Systems sector includes the following activities: nuclear and big science, defense, security and digital intelligence, consultancy and innovative engineering services, infrastructures, solutions for life sciences.

The Environment & Energy sector includes the following activities: waste treatment and recovery, renewable energy, emissions control, energy efficiency.

BREACKDOWN OF 2016 GROUP REVENUES BY SECTOR

NET INCOME ATTRIBUTABLE TO OWNERS OF THE PARENT COMPANY

€22.2 million

€49.7 million

RECURRING OPERATING INCOME

2014 2015 2016

274.2 574.7 605.8

ORDER BACKLOG

2014 2015 2016

2054 2048 2094

ORDER INTAKE

1504 655.6 839.7

2014 2015 2016

1472 274.2 574.7

THREE PRODUCTION SITES

La Seyne-sur-Mer (France)
Casablanca (Morocco)
Gaoming (China)

GEOGRAPHIC FOOTPRINT & PERFORMANCES

2,515 employees

69% of the water consumed by the Group is recycled water.

594,077 MWh of electricity were generated at sites operated by the CNIM Group, along with 321,368 MWh of heat.

87% of employees are satisfied based on the internal satisfaction survey conducted in 2016.

€1.7 million was invested in security in 2016.

(1) Data restated following the sale of Babcock Wanson.
ENVIRONMENT & ENERGY

The main issues facing CNIM’s clients are resource optimization, the energy transition and reducing the environmental impact of human activities. CNIM helps them address these challenges by proposing a range of innovative, tailored solutions dedicated to waste treatment, emissions control, renewable energy and the energy efficiency of industrial facilities – all with a focus on maximizing sustainability and security.

As an international specialist in the treatment and energy recovery of waste, CNIM provides services to local authorities, public service contractors and waste treatment operators. It teams design, build and operate turnkey plants for the treatment of biomass, household waste, and non-hazardous commercial and industrial waste. CNIM also treats infectious medical waste, sludge from water treatment plants, green algae. As a developer, CNIM works with its clients at every stage of their projects, whether they are seeking recommendations about the type of facility best suited to their needs or about a particular type of equipment. Services include the definition of their legal, fiscal and technological needs, the search for financial and technical partners, environmental impact assessments, construction-permit applications, coordination with public authorities, civil society, etc. When operating waste recovery and biomass facilities built by the company or other providers, CNIM leverages a variety of technologies to cut operating costs. It can work with any type of energy recovery or flue gas treatment system. This business has been expanded to other areas, including waste sorting and recycling, organic resource recovery and renewable energies.

Waste of 100 million people recycled by CNIM.

As a developer, CNIM Babcock Services, a subsidiary created in 2015 in partnership with Bpifrance, designs, builds and operates turnkey solar power plants that produce thermal energy and electricity with storage capacity. Thermal energy is produced with a technology developed by CNIM that uses Fresnel mirrors to generate steam at a more competitive price than fossil fuels in many sunny countries, steam that can be used directly in industrial processes such as enhanced oil recovery (EOR). For power generation, SUNCNIM designs and builds photovoltaic plants with battery storage, making it easier to integrate this intermittent energy source into the grid. SUNCNIM’s offering is based on the Energy Management System (EMS) developed by subsidiary Bertin Technologies, the provision of performance guarantees in line with the project’s financing requirements, and the experience acquired in building turnkey energy generation facilities. CNIM offers energy generators and consumers innovative energy storage, management and recovery solutions to optimize their performances and keep them competitive: high-capacity absorption chillers and integrated energy recovery systems with heat pumps, as well as optimization software supplied by Bertin Technologies.

CNIM also offers a wide range of services for the optimization, maintenance, refurbishment and standards compliance of waste-to-energy plants along with profitability and environmental performance guarantees. Its LAB subsidiary has a range of patented processes and flue gas cleaning services for emissions from waste-to-energy facilities, thermal power plants, industry and ships. LAB is also involved in the recovery of precious metals from waste incineration bottom ash. Its solutions are designed to preserve air quality and reduce final waste volumes.

CNIM Babcock Services is France’s largest company active in the modernization and standards compliance of thermal power equipment. It supports industrial companies around the world for all types of boilers, regardless of the fuel used. Its expertise covers the entire sector – from design through to manufacturing, preventive and corrective maintenance, refurbishment, fuel switching, consulting, energy and environmental optimization, spare parts and turnkey boiler houses.

SUNCNIM, a subsidiary created in 2015 in partnership with Bpifrance, designs, builds and operates turnkey solar power plants that produce thermal energy and electricity with storage capacity. Thermal energy is produced with a technology developed by CNIM that uses Fresnel mirrors to generate steam at a more competitive price than fossil fuels in many sunny countries, steam that can be used directly in industrial processes such as enhanced oil recovery (EOR). For power generation, SUNCNIM designs and builds photovoltaic plants with battery storage, making it easier to integrate this intermittent energy source into the grid. SUNCNIM’s offering is based on the Energy Management System (EMS) developed by subsidiary Bertin Technologies, the provision of performance guarantees in line with the project’s financing requirements, and the experience acquired in building turnkey energy generation facilities. CNIM offers energy generators and consumers innovative energy storage, management and recovery solutions to optimize their performances and keep them competitive: high-capacity absorption chillers and integrated energy recovery systems with heat pumps, as well as optimization software supplied by Bertin Technologies.

CNIM Babcock Services and LAB Services refurbished the steam generation plant in Blanzy (Fron, France) operated by CPCU, the largest environmental upgrades in France in recent years. This involved converting the boilers that supply heat to the Parisian district heating and hot water networks to run on gas and liquid biofuel.

KEY EVENTS OF 2016

In 2016, the construction business completed projects in Lezelle and Wilton, the UK as well as the biomass facility at Steeve-Mesnil in France. CNIM booked new orders for turnkey energy recovery facilities for Wheelabrator in Harrold and Paris, London in the UK, in France. Sundyne selected CNIM’s bid late in 2016 for the design, construction, operation, maintenance and energy optimization of the waste-to-energy plant in Therais (Gironde, France).

Also in 2016, SUNCNIM finalized the financing of the joint venture company, SUNCNIM-EOR, that was set up to build and operate the concentrated solar power plant with EOR in Spain (Catalunya)
INNOVATION & SYSTEMS

CNIM’s products cover the entire lifecycle of high value-added equipment and systems (design, production, installation, commissioning and maintenance) in the fields of defense, nuclear power and general industry. The Innovation & Systems sector includes the Industrial Systems Division of CNIM and the Bertin subsidiaries, the skills and resources of which are used synergistically.

As a partner to the major defense and security organizations since it was founded in 1856, CNIM contributes to the protection of nations and individuals. The Group offers efficient, lasting solutions in the areas of nuclear deterrence, land and maritime armed force projection and security. To protect forces, corporations and citizens, Bertin offers a full range of optical surveillance and detection solutions and CBRN risk detection[1]. Its Bertin IT subsidiary, specializing in information technologies, provides software that can neutralize USB threats, secure information system interconnections and protect sensitive data within multi-domain workstations. Bertin IT also has expertise in advanced data analysis, with multi-source and multi-format (text, image, audio) analysis solutions for use in cybersecurity and cyberintelligence.

CNIM is a major player in the nuclear industry. It develops and produces equipment and systems for nuclear facilities, covering the entire fuel lifecycle. Its expertise in large scientific instruments, acquired on major projects such as the Megajoule laser program and ITER reactor, allows it to meet the most demanding specifications for the design, production, installation and maintenance of complex instrumentation and mechanical systems.

In so doing, it leverages its exceptional capacity for innovation and multidisciplinary engineering skills, as well as its flexible industrial facilities that are competitive and of the highest quality.

Bertin also offers technology consulting and research services for many sectors: energy, environment, defense, aeronautics, space, healthcare, life sciences, etc.

[1] CBRN: chemical, biological, radiological and nuclear

56 years of serving France’s Strategic Ocean Force.

KEY EVENTS OF 2016

CNIM delivered two L-CAT® amphibious vessels to the Egyptian Navy. Navana, the joint venture formed by VINCI and Bouygues that is building the Chernobyl arch, entrusted to CNIM several contracts that are currently in progress:
- waterproof membrane between the arch and the sarcophagus;
- a garage transfer system mounted on the main bridge of the arch;
- a maintenance trolley on the main bridge of the arch.

The contract to manufacture radial plates for the ITER reactor is proceeding apace. CNIM also landed new contracts for various parts of the ITER reactor in 2016.

Bertin’s Systems and Instrumentation Business Unit brought three new pieces of equipment to the market in 2016:
- FusionSight®, a portable monocular particularly suited to the needs of infantry commanders and special forces;
- AlphaGUARD, a new-generation radon gas measurement solution;
- InCellis, a new digital microscope designed to generate high-quality images and to facilitate cell observation.

OUR CLIENTS

MAJOR FRENCH AND INTERNATIONAL DEFENSE AND SECURITY FIRMS AND THE MARITIME, SPACE, ENERGY, ENVIRONMENT AND LIFE SCIENCES INDUSTRIES
GOVERNANCE
Supervisory Board, Management Board and Management Committee

MANAGEMENT BOARD
Nicolas DMITRIEFF
Chairman
Stanislas ANCEL
Philippe DEMIGNÉ
Christophe FAURELLE

ADVISORS TO THE CHAIRMAN
Mohamed Ayeah ALJADUOD
Chairman of CNIM Saudi and CNIM Middle East
Stéphane COSTA

MANAGEMENT COMMITTEE
Nicolas DMITRIEFF
Stanislas ANCEL
Philippe DEMIGNÉ
Christophe FAURELLE
Eric CHADENIER
François DARPAIS

SUPERVISORY BOARD
Christiane DMITRIEFF
Chairman
Françoise CAMELLAS
Deputy Chairman
Sophie DMITRIEFF
Member
Lucile DMITRIEFF
Member
Société FREL
represented by Agnès HERLICQ
Sandrine DUMAIS
Member
Louise-ROC BURGARD
Member

AUDIT COMMITTEE
Françoise CAMELLAS
Chairman
Christiane DMITRIEFF
Member
Sophie DMITRIEFF
Member
Lucile DMITRIEFF
Member
Société FREL
represented by Agnès HERLICQ
Sigrid DUHAMEL
Member
Louise-ROC BURGARD
Member

STRATEGIC COMMITTEE
Louise-ROC BURGARD
Chairman
Société FREL
represented by Agnès HERLICQ
Société DUMAIS
represented by Stéphane MARTIN
Sandrine DUMAIS
Independent Member
Louise-ROC BURGARD
Independent Member

Group Functional Departments
Chief Financial Officer
Christophe FAURELLE

Group General Counsel, Corporate Purchasing & CSR
Eric CHADENIER

Human Resources, Information Systems and Communications
Director François DARPAIS

DEPARTMENTS BY MAJOR PRODUCT AND SERVICE LINES

ENVIRONMENT & ENERGY
Chief Executive
Stanislas ANCEL
Deputy Chief Executive
Ralph Grafeiter ZINK
Assistant Chief Executives
Claude BOUTIN
Thomas FEILNER Reiter
Dider FONTAINE

DIVISIONS
CNIM Waste and Energy Management Solutions (CNIM WEMS)
Thomas FEILNER Reiter
Director

SUNCNIM
Stanislas ANCEL
Chairman
Sylvain LEGRAND
Chief Executive

LAB
Thomas FEILNER Reiter
Chairman of the Board of Directors
Denis BAUER
Chief Executive

CNIM Balosco Services
Hubert DUMAIS
Director

INNOVATION & SYSTEMS
Chief Executive
Philippe DEMIGNÉ

DIVISIONS
CNIM Industrial Systems Business Unit
Defence, Space and Maritimes
Matthias BAYARD, Director

CNIM Industrial Systems Business Unit
Nuclear and Big Science
Ludovic VANDENBRECHEN, Director

CNIM Industrial Systems Business Unit
Industrial Manufacturing Business Line
Daniel ROSSI, Director

BERTIN DIVISION
Bertin Technologies
Philippe DEMIGNÉ, Chairman
Consulting and Engineering Business Unit
Energy and Environment
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