

THE ESSENTIALS, 2015

PROMISING INNOVATION

OVER 4,000 PEOPLE
COMMITTED TO YOUR FUTURE

*Since 1918, world leading
company for advanced batteries
designed for industry*



SAFT

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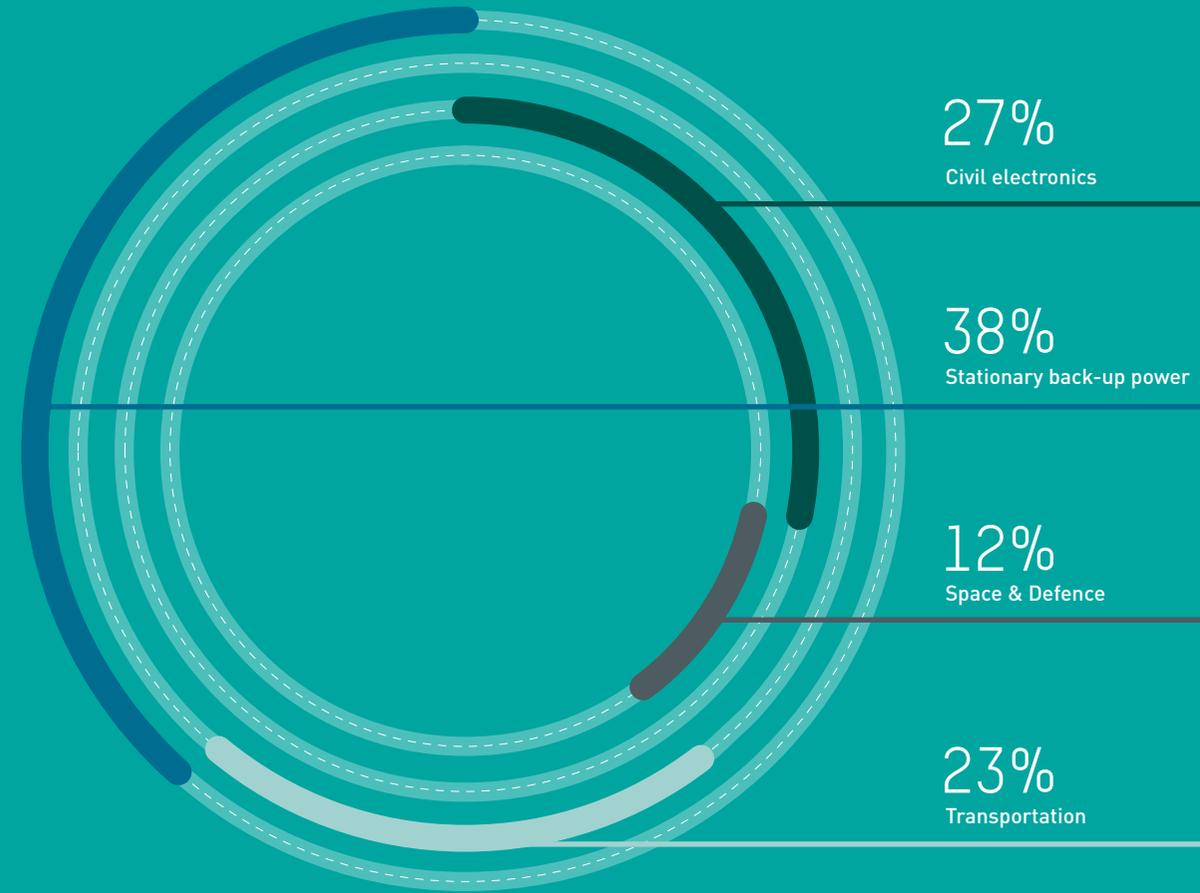
Saft. World leader in advanced battery systems

**Innovative battery systems for industry are Saft's business.
Customers are Saft's focus.**

Founded in 1918, Saft continues to be the leading designer, developer and manufacturer of advanced batteries. Designed to serve a whole range of needs, Saft battery systems use multiple cutting-edge nickel-based, primary lithium and lithium-ion technologies. Worldwide, Saft batteries power industrial infrastructure and transportation systems, smart cities and medical devices, renewable energy and telecom networks, industrial vehicles and defence systems, along with satellites and space applications.

End to end, Saft works closely with original equipment manufacturers, distributors and final end users to design new generations of batteries for new applications, offer enhanced integration, after-sales services and through-life support.

 2014 sales per market segment



FOCUSING ON YOU:

SAFT ADDS VALUE TO YOUR PRODUCTS

Saft brings its know-how in advanced battery technologies and applications to its customers, along with a full range of services, whatever market they are in, so their products will get added value from Saft's.

Technologies

Saft makes rechargeable and non-rechargeable batteries for a wide variety of uses and markets. Using nickel-based, primary lithium, lithium-ion, super-phosphate lithium-ion and silver-based technologies, Saft solutions range from traditional robust industrial batteries with high-end storage and performance to advanced systems that weigh less and perform better, even under extreme conditions.

Applications and markets

Saft batteries can be found:

- Supporting sustainable transportation with back-up power for rail, safety-critical aviation solutions, and innovative marine and industrial vehicles.
- Securing power supplies in extreme conditions in oil and gas installations, industrial facilities, and telecommunications networks.
- Fostering alternative energies by ensuring grid stability.
- Enhancing performance in space, in smart cities and medical devices, and in highly demanding defence systems.

Services

Saft accompanies its customers throughout the life of their products, offering full turnkey solutions and services that include configuration, installation, commissioning, operation, training, maintenance and spare parts supply. Saft ensures that their battery systems are robust, reliable and well-maintained for long-lasting optimisation so that customers get the most value from their investment over an extended period of time.

€678.4
million in sales (2014).

9.5%
of Group sales invested in R&D.

BEING NEAR YOU: SAFT IS EVERYWHERE YOU ARE

Present in both Europe and the United States, Saft continues to grow in Asia, South America and Russia, with strong local networks working closely with customers and providing a competitive advantage.



18 countries

4,078 people

14 production sites

30 sales offices



€65 M

invested in R&D in 2014.

147

patent families.

IMPROVING YOUR PERFORMANCE:

SAFT EXCELLENCE AND INNOVATION AT YOUR SERVICE

*Saft's customers' success is Saft's greatest success.
That is why Saft works closely with them, providing tailored,
integrated, responsible solutions and services, with a culture
of excellence and groundbreaking innovation.*

DEVELOPING NEW, COST-COMPETITIVE PRODUCTS

Saft has a truly worldwide footprint, which makes it possible to work closely with its customers, proactively identifying their needs and requirements, understanding their markets and how advanced battery technology can provide significant advantages and lower total cost of ownership. Saft has 475 engineers and technicians on the research and development team developing new materials, new chemistries and innovative processes tailored for each industry.

INVESTING IN GROUNDBREAKING TECHNOLOGY

Building on the foundations of successful nickel-based products, Saft has brought about revolutionary changes with lithium-ion rechargeable technology that enables customers to deliver higher performing products. Saft continues to invest in innovation and knows that research and development are key to the future. In 2014, 9.5% of sales were re-injected into research and development designing new-generation batteries and technologies for new applications in multiple markets.

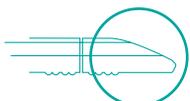
PRIORITISING SUSTAINABLY RESPONSIBLE PRODUCTS

Saft is committed to high standards of environmental stewardship and is fully aware of its responsibility to develop sustainably responsible products. Saft's actions range from eco-design, life-cycle assessments, using recycled raw materials and reducing its own emissions, to ensuring that its customers have access to recycling solutions and facilitating end-of-life collection.

DRIVEN BY OPERATIONAL EXCELLENCE

Saft supplies batteries for applications where there is no room for failure, particularly in the aviation, defence and space industries. Improving operational performance is the mindset embedded in Saft's culture. Since 1998, Saft World Class, an internal programme of quality improvement, has been raising performance so customers get better services and products. Saft ensures that everyone - from production to customer service, logistics and support - is ready to find the best solutions to today's and tomorrow's challenges.

SUPPORTING SUSTAINABLE TRANSPORTATION



Rail p.10



Aviation p.12



Marine p.14

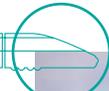


Vehicles p.15

Energy efficiency and weight reduction are key to new-generation aircraft such as the Airbus A350 XWB.

“Saft has been working in close cooperation with Airbus to develop optimal advanced on-board battery systems.”

Hervé Lefebvre, Saft's System Development Unit Manager



RAIL



60 years

experience of meeting the rail industry's evolving needs.

-50°C to +65°C

Temperature variations that Saft battery systems can withstand.

On the rail market, Saft has over 60 years of experience, the widest range of both nickel-based and lithium-ion products, the most comprehensive engineering support teams and the best international commercial network.

Your World

Railway and mass transit operators and train manufacturers need reliable products to provide back-up power for lighting, air-conditioning and on-board communications, as well as critical safety applications such as emergency braking and door opening systems. Batteries must be powerful and able to last 10 to 15 years under extreme weather conditions and subject to strong vibrations. Furthermore, where possible, they should be maintenance-free and compact.

Our Solutions

Saft supplies an extensive range of robust, predictable and reliable nickel-based battery systems to the rail sector, along with innovative lithium-ion solutions, such as on-board batteries that store kinetic braking energy for reuse. For both new-build and replacement projects, Saft's systems have optimised weight and volume, low maintenance and low life cycle costs. Add to that turnkey solutions, along with a worldwide sales and distribution network which works closely with our customers to provide the best services.



HIGH-ENERGY POWER BRAVING STOCKHOLM'S WINTERS

• Facing temperatures as low as -35°C, Stockholm's commuter trains need highly dependable solutions. Saft is providing fully integrated high-energy back-up on new trains serving the greater Stockholm area. Battery systems support additional electrical loads with ubiquitous Wi-Fi and passenger sockets, and Saft's slim, lightweight roof-mounted block offers a size and volume advantage.

VITAL BACK-UP POWER FOR SHANGHAI METRO

• On the world's longest metro in the China's most populous city, safety and reliability are essential. Saft's compact MSX systems now provide back-up power for vital emergency functions on 35 new six-car train sets for Shanghai Metro lines 3 and 4. Space and weight-saving are key for the Optonix traction systems designed specifically to reduce travel time and increase operation frequency of high-speed metro trains.

ON-BOARD BATTERIES IN BRAZIL

• With the World Cup and the Olympics boosting Brazil's need for upgraded transportation systems, Saft delivered on-board batteries for new suburban electric trains serving the city of Belo Horizonte, each carrying 1,300 passengers. Nickel-based battery systems ensure critical control and safety functions in the event of main power loss. Performance, reliability, low total cost of ownership, low maintenance, compact size and light weight are key design features.

AVIATION



Expert Opinion

“To discover the future of batteries, we create the conditions for innovation,

which include nurturing a close relationship with aircraft manufacturers based on a high level of trust. Today, batteries are becoming a more integral part of aircraft. Manufacturers are exploring the new roles and functions. How can energy storage do more than provide back-up power and start the engine? How can they truly enable more-electric aircraft? Lighter, more integrated solutions that reduce fuel consumption and lower operating costs are just the beginning. To find new applications, it is key to work with aircraft manufacturers earlier in the design process, thinking a turbine or a start sequence differently. Saft is also pushing Li-ion technology to greater levels of safety and performance, as well as innovating in control algorithms, software, thermal management, and mechanical integration. Saft brings to the table unrivalled experience in both aviation batteries and Li-ion technology along with strong relationships with customers whilst also working on new electrochemical couples and systems that tomorrow will enable the hybridisation of aircraft propulsion.”

Antoine Brenier,
Saft Sales and Marketing Director, Aviation

Saft is the leading supplier of battery systems for the aeronautics industry, serving aircraft manufacturers, distributors and airlines. Our batteries are aboard two-thirds of the world's fleet of passenger, freight and military aircraft.

Every **2** seconds a Saft battery takes off.

80 kilos is the weight saved with Li-ion systems on the long-range A350XWB.

Your World

Very high aircraft dispatch rates rely on auxiliary power units and engines to start unflinching. Passenger safety, even in case of total loss of electrical generation is even more crucial to airlines and aircraft operators. Both rely on batteries. Reliability in extreme conditions, low maintenance and low weight are needed, along with low cost of ownership and extended life. Customer support throughout the life of an aircraft can last up to 40 years. Batteries are the last link to safety, just as they are the technology enabling the innovative systems needed for more-electric aircraft.

Our Solutions

Saft's advanced nickel-based batteries boast an unrivalled track record for reliability. Used for back-up and emergency systems, engine and turbine starting and flight preparation, they have a low cost of ownership, reduced maintenance, and extended life. Saft also provides high-power lithium-ion solutions that are smart, light, and easy to maintain. These systems are the first to receive Design Assurance Level-A certification, and are produced industrially. Technical support teams, distribution and recycling, updates and training are available worldwide.

CUSTOM-ENGINEERED AIRBUS HELICOPTERS BATTERIES

• Saft ultra-low maintenance rechargeable nickel-based batteries now ride the new Airbus Helicopters H175, providing emergency back-up and starting power for the auxiliary power unit. Primarily designed for offshore, search and rescue, and VIP transport, this 16-passenger twin-turbine helicopter cruises at a speed of 140 kts. The harsh vibrations and extreme temperatures on helicopters place high demands on batteries, and deployment on life-saving missions can require the aircraft to fly in severe weather conditions. Saft worked in close cooperation with Airbus Helicopters' teams to custom engineer the battery system, coming up with an ideal combination of high performance, low weight and ultra-low maintenance that enables



significant reductions in total cost of ownership. This programme strengthened a long-standing partnership between Saft and Airbus Helicopters.

MARINE



As demand grows for hybrid and all-electric marine craft and offshore vessels, Saft is working proactively with navies, shipyards and manufacturers to design integrated turnkey systems backed by extensive technical support.

40%

of offshore fleet will be replaced in the next 10 years.

1,000 V

- peak voltage of the Seanergy® range.

Your World

Today, marine vessels need to be environmentally-friendly, cost efficient and safe. Fuel savings, noise reduction, and reduced emissions are key concerns driving the growing demand for hybrid and all-electric marine craft. Meanwhile, offshore supply and drilling vessels require special high-power batteries, and all customers are facing tighter regulations and growing performance expectations. At the same time, fully reliable, efficient and safe batteries need to be economic and affordable.

Our Solutions

Saft's advanced compact, weight-saving lithium-ion technology is well suited for work boats, ferries, cruise liners, cargo vessels and offshore vessels. Whether to power electric-diesel hybrid ferries in Bordeaux, or fully battery-powered shuttles in Paris or Stockholm, we have specific solutions for each sector, including the high power, high voltage needed for offshore vessels. We focus on safety, cost savings, long life and a full range of services for new crafts and retrofitting, with end-to-end service.



RECOGNISED, SAFE, CLEAN PROPULSION • Designed for fully-electric and hybrid marine applications, Seanergy® modules received the highest quality assessment from Bureau Veritas, an independent reviewer. Saft understands how critical safety is in the demanding marine environment, and as an end-to-end manufacturer, Saft ensures total quality control. This certification demonstrates that design meets industry quality standards and the highest level of safety approval.

VEHICLES



Saft has been designing and delivering battery solutions for hybrid and electric vehicles for over 15 years, with advanced know-how in lithium-ion solutions that are key to sustainable transportation.

100%

electric bus fleets planned for cities such as London and Paris by 2025.

10-20%

by 2020 - the conversion rate from traditional lead acid to Li-ion batteries in the material handling market.

Your World

Global climate change and dwindling fossil fuel reserves combined with new legislation are driving the development of hybrid, plug-in hybrid and electric vehicles. Commercial vehicles (on-road) in busy cities for public and goods transportation, industrial vehicles (off-road) in material handling (warehouse, airport, seaport), construction, mining, and farming, are all looking for alternative lithium-ion battery solutions providing a better total cost of ownership while reducing CO₂ and noise emissions.

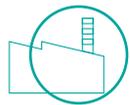
Our Solutions

Saft offers a broad spectrum of dedicated solutions for the vehicle markets where electric propulsion ensures efficient and reliable operation. Our customer-tailored fully integrated battery systems offer maximum flexibility and modularity, quality and safety. Lithium-ion technology offers good ergonomics, faster charging, longer life duration, scalable energy and power. Specific Li-ion solutions have also been developed for sport vehicles with unique performance in extreme conditions. Our product range includes nickel supercapacitors, which can lead to fuel savings during "no-idling" and 50% faster engine starting.

REDUCING AIRPORT EMISSIONS • The aircraft tractor specialist Kalmar Motor AB is equipping the world's first hybrid electric tractor for wide-bodied aircraft with a Saft Li-ion battery system combined with a diesel engine. The TBL 800 eSchlepper should enable airports to generate substantial saving in maintenance and fuel costs, and to reduce CO₂ emission by more than half.



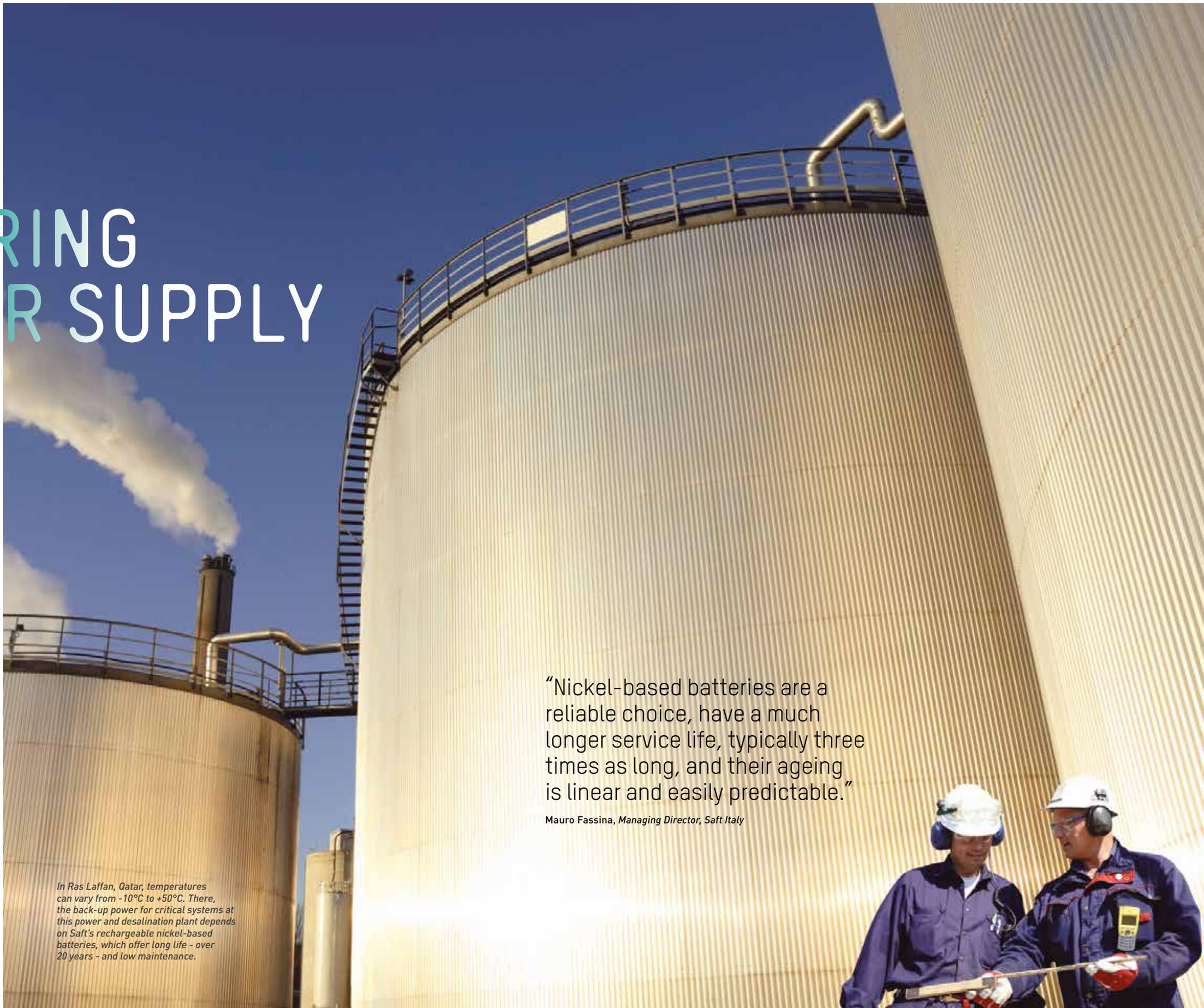
SECURING POWER SUPPLY



Industrial standby applications p.18



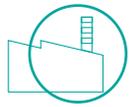
Telecom networks p.20



“Nickel-based batteries are a reliable choice, have a much longer service life, typically three times as long, and their ageing is linear and easily predictable.”

Mauro Fassina, *Managing Director, Saft Italy*

In Ras Laffan, Qatar, temperatures can vary from -10°C to +50°C. There, the back-up power for critical systems at this power and desalination plant depends on Saft's rechargeable nickel-based batteries, which offer long life - over 20 years - and low maintenance.



INDUSTRIAL STANDBY APPLICATIONS

With a large choice of technologies and cell configurations, as well as a complete range of low-, medium- and high-rate characteristics, Saft has a stationary battery offer for all types of industrial applications.

20 years

- stationary battery lifespan in challenging conditions.

8,000

cycles at 15% depth of discharge in temperatures from **-50°C** to **+70°C** - Sunica.plus



Your World

Refineries, power plants, onshore or offshore oil and gas providers, substations, airports and building infrastructures are just some of the locations that require reliable batteries systems that work when you need them to work, even under extreme operating conditions in the hottest and coldest climates. Long life span, high performance, and little or no maintenance are key requirements for back-up power, starting power and cycling applications. This is the peace of mind customers are looking for.

Our Solutions

Saft has traditional expertise and leadership in nickel-based technology for durable batteries with long life, and our advanced lithium-ion solutions offer high specific energy and high power where smaller, lighter, and more versatile batteries are needed. Saft's stationary battery experts are ready to solve the individual challenges of our customers worldwide. Not only do we provide the battery solution for each specific need, we also offer end-to-end service, comprehensive after-sales installation support, and training.

MAINTENANCE-FREE POWER SUPPLIES ACROSS CHINA

• For uninterruptible power supply installations that support critical control and safety systems across China, the country's largest producer of offshore crude oil and gas, CNOOC, chose Saft batteries. Saft's new-generation Uptimax maintenance-free design is optimised for stationary power back-up applications in the oil and gas industries, providing outstanding performance and reliability, at reduced total cost of ownership, even when operating in ambient temperatures of +40° or more.



ABSOLUTE RELIABILITY FOR REMOTE INSTALLATIONS IN QATAR

• Kentz, a global engineering solution provider, chose Saft's Sunica, plus for critical systems serving Qatar Petroleum's Dukhan oilfield. Some 40,000 nickel-based batteries will be deployed at around 775 wells across the oilfield, where they will provide energy storage and back-up power for well head industrial control systems and corrosion protection systems to ensure total continuity of operation.

COST SAVINGS FOR UTILITIES IN THE UNITED STATES

• Saft lithium-ion systems provide critical back-up for process controls to Crim Sales & Engineering for major utilities. Our intelligent Intensium® Flex Li-ion technology allows operating and alarm parameters to be continuously monitored, with increased efficiency, minimal preventive maintenance, and lower operating costs, which could ultimately bring cost savings to end-users.



TELECOM NETWORKS

Saft offers the innovation needed for today's telecom applications with high-performing battery solutions for every part of the telecommunications value chain, anywhere in the world.

Evolution (Li-ion):

172 Wh/l

volumic energy density and **130** Wh/kg weight energy density; **2x** more compact and **4x** lighter than conventional telecom batteries.

Tel.X (Nickel-based):

95 Wh/l

volumic energy density and weight that is **30%** lighter than a conventional battery.

Your World

With growing use of cloud computing and data streaming, effective, high-performance reliable back-up power is essential for the telecommunications industry to respond to increasing service demands. Remote locations and extreme conditions add difficulty and cost to maintenance. When network stability is low, good cycling capabilities and good chargeability are key. When network stability is high, equipment needs solutions with float charging capability and a long service life. Multiple solutions are needed.

Our Solutions

Saft's long service life and low- or no-maintenance battery solutions respond to our customers' needs wherever they may be: wireless or wireline installations, indoor or outdoor, on-grid or standalone, long or short back-up time. Saft has a large range of advanced, specialised batteries that are operational in very hot or cold climates, urban settings or remote hard-to-access locations, with both long-life rechargeable nickel-based batteries and Li-ion solutions that withstand tough environmental conditions and weak electricity grids.



Promising innovation: POWER FOR DATA CENTRES

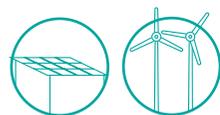
Data exchanges, particularly in mobile internet, are expected to increase by at least 66% come 2017. This means more new data for centres are being deployed - an estimated 60% more by 2020, in fact, representing a 155% increase in electricity consumption dedicated to data. For the telecom industry, increasing energy efficiency is key, while also increasing the number of servers, which means less room for all the rest, including batteries. Such a trend will generate interest in new generation batteries for backup. These batteries need very high power (up to 1.6 MW and more for the large UPS used in data centres) for short periods of time, long life, and a small footprint. Saft has a new Li-ion range of solutions especially designed to provide very high power for a short period of time. This Intensium® Flex battery range has a modular approach enabling the battery system to be configured to deliver hundreds of kW in a single unit. They last 2.5 times longer, are 80% smaller in size, and weigh 90% less than conventional batteries.



KEEPING WIRELESS NETWORKS RELIABLE •

In the event of electrical utility shortages, Saft's Tel.X and Evolution batteries make it possible to carry voice, video and data, and are used in systems that offer increased bandwidth for mobile telephone customers. The solution includes high-energy performance with a long-life cycle in a modular, maintenance-free design that eliminates the need for cooling and ensures optimal cost efficiency. In addition to conventional telecom sites, Saft's solutions are also deployed in airports, rail stations, shopping centres and sport stadiums.

FOSTERING ALTERNATIVE ENERGIES



Energy storage systems p.24

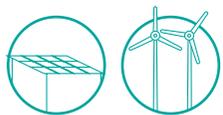


saft
Intensium
Max
Li-ion

“There is an expanding renewables market relying on Li-ion energy storage within island nations, and Saft enables trusted storage solutions.”

Blake Frye, Vice President of Sales, Energy Storage, Saft North America

The Island of Kauai, in Hawaii, has a growing percentage of hydropower, photovoltaic, biofuel and biomass. Saft's Li-ion Battery Energy Storage System (BESS) provides grid stability and mitigates issues caused by intermittent fluctuations that can occur with renewable power sources.



ENERGY STORAGE SYSTEMS

In today's new energy environment with grids integrating renewable energy sources, storage is vital in electrical networks. Saft has a range of battery solutions that provide the performance, reliability, and life required.

5_{kW} to 10_{MW}

- storage solutions for every step of the value chain.

135_{Wh/l}

- Li-ion high energy density.



Award-Winning: INNOVATION IN MOBILITY

Creating stable and dynamic electricity grids today requires thinking in new ways. Imagine a project that uses a hybrid energy storage system to capture, store and reuse regenerative energy created by the braking of thousands of trains stopping daily. The Energy Optimization Project does just that in the Philadelphia area, and it won the Energy Storage North America Innovation Award. The award was for Saft's work on behalf of the Southeastern Pennsylvania Transportation Authority (SEPTA), in partnership with ABB, Viridity Energy and Maxwell Technologies. For this innovative hybrid system design, Saft optimised its battery system in terms of regulation, achieving higher revenue and longer operating life. "This project showcased the vital role battery energy storage plays in advancing power grids and enabling next-generation technology within new and emerging applications", said SEPTA Chief Engineer Andrew Gillespie.

Your World

With an increasing demand for renewable energy sources, solar and wind generation are taking on greater roles in the global energy mix. Their inherently variable nature brings additional challenges to already stressed power grids. What is more, some of these renewable energy system installations are in remote locations and are subjected to harsh temperatures and punishing humidity. To ride through peaks and troughs, grid stability is a must for any electricity system, in which supply and demand need to be balanced at any time with ever increasing levels of flexibility and energy efficiency.

Our Solutions

Saft's range of battery systems delivers reliable and efficient energy storage in both off-grid and on-grid schemes, from the point of production through transmission and distribution to consumption. Our Ni-Cd, Ni-MH and Li-ion technologies deliver high performance and long service life with little or no maintenance even in extreme conditions. Storage solutions for every step in the value chain enable easier integration of small and large renewable generation plants, deliver primary reserve power to support frequency regulation at transmission level, provide stress relief for loaded distribution grids, and allow for new options for local energy management, all while maximising return on investment.

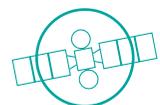
SYSTEM STABILITY IN BOLIVIA • Saft megawatt-scale lithium-ion energy storage systems will support the world's largest solar PV-diesel hybrid power plant in South America, improving access to electrical power in a remote area and helping to save 20 million litres of diesel fuel a year. Effective energy storage will play a critical role, ensuring system stability and smoothing out variations.

OPTIMISING RENEWABLE RESOURCES ON A REMOTE ISLAND • In Japan, the Intensium® Max 20M Li-ion Energy Storage System is set to be at the heart of a project that integrates variable renewable energies - diesel, solar and wind - into the grid on the remote Niiijima Island. The project investigates the use of energy storage systems to enable large amounts of renewable energy based power to be integrated into diesel powered grids.

ENHANCING PERFORMANCE

“Long-life, cost-efficient durable energy sources are critical to powering today’s interconnected world, which requires the right mix of technologies at the right price.”

Wayne Pitt, Saft’s Business Development Manager for the Specialty Battery Group



Space p.28



Smart cities p.30



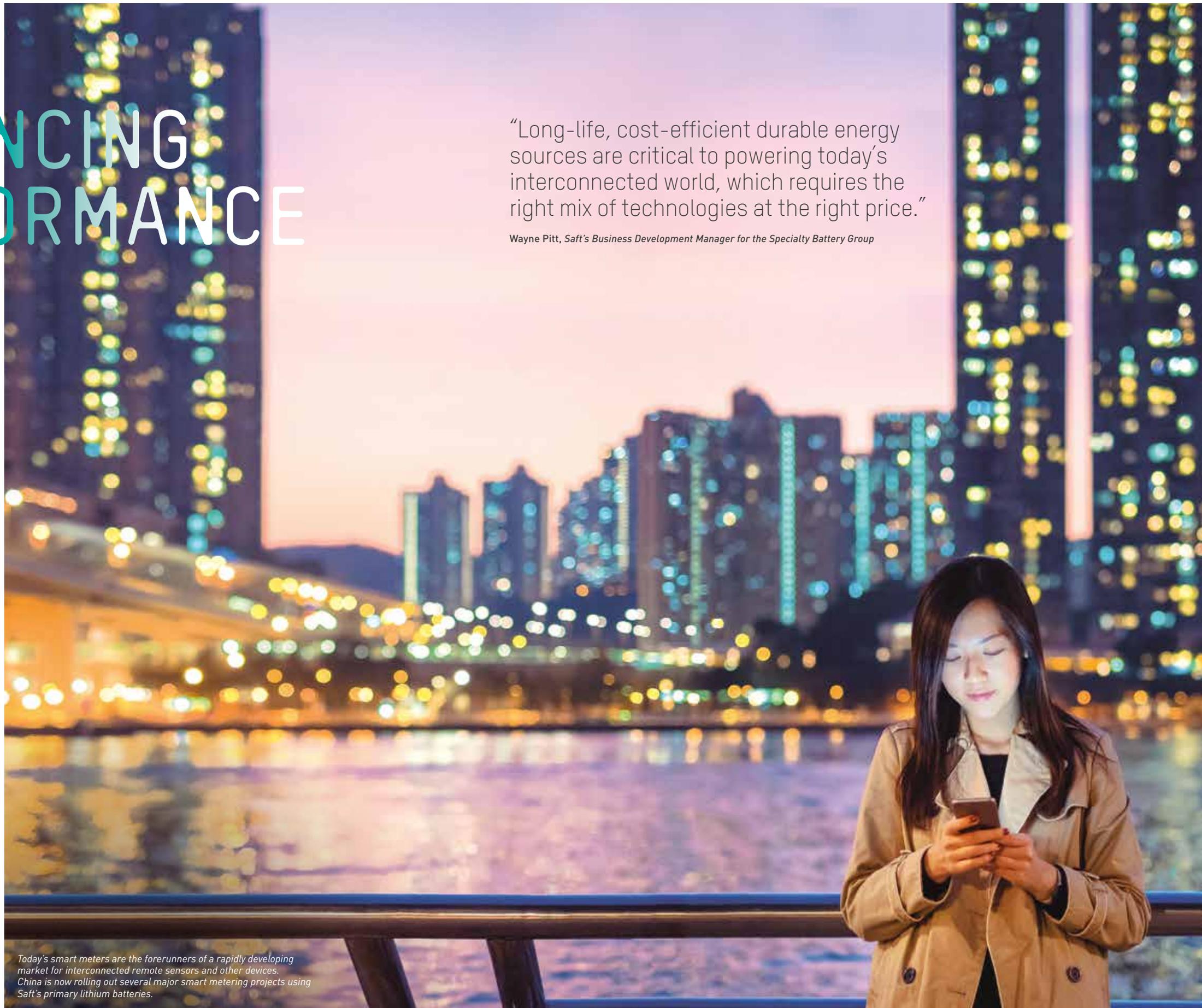
Oil & Gas p.31



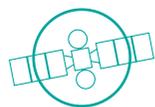
Medical p.32



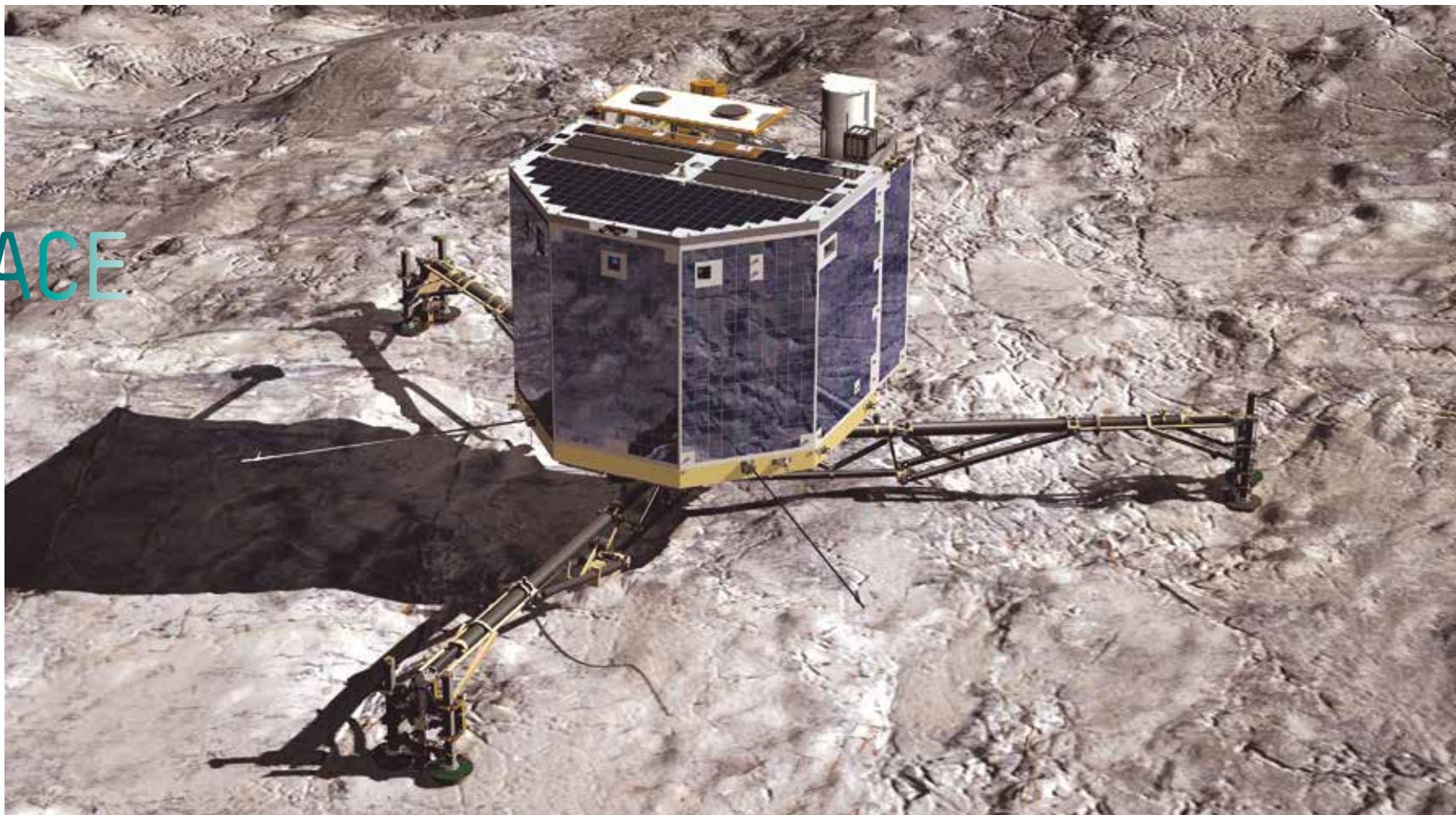
Defence p.33



Today’s smart meters are the forerunners of a rapidly developing market for interconnected remote sensors and other devices. China is now rolling out several major smart metering projects using Saft’s primary lithium batteries.



SPACE



With 50 years of experience in space, Saft pioneered lithium-ion in the sector and is the world's leading company for the design, development and manufacturing of batteries that meet such extremely demanding requirements.

+11 years

- on-board operation of first telecommunication satellite ever launched with Li-ion technology.

65 hours

battery-powered operation of Philae lander.

Your World

Space means long missions, vibrations, shocks, radiation, a vacuum and extreme temperatures (-160°C to +200°C). Highly reliable, maintenance-free, lightweight, high-energy density batteries are needed to free up payload for revenue-earning equipment. Today, the use of more fuel-efficient, longer-range plasma over chemical propulsion increases time-to-orbit, impacting battery life demands. And new low earth orbit satellite constellations require less expensive, quicker production at a whole new scale, revolutionising the industry on the same time that space debris mitigation is becoming tougher.

Our Solutions

Saft is the only manufacturer that masters the electrochemistry, the space cell through the full battery assembly and proposes a complete range of space-qualified battery technologies. Our cells meet the most rigorous quality, testing and documentation standards, powering telecommunication and global positioning satellites, and supporting specific applications in observation and defence satellites. In addition to custom designing today's solutions, we are using our heritage of 50 years in space and 20 years with Li-ion for satellites to develop the next generation of higher specific energy products.

Expert Opinion

“The battery on board the Philae Lander survived shocks, vibrations and a decade-long flight

to deliver more than 65 hours of power for the first sequence of scientific tests at a temperature far lower than foreseen. The success of the Rosetta mission is testament to Saft's 50 years of experience in batteries for space. There is cause to celebrate the achievement of the mission-critical primary lithium battery, which alone powered the Lander's systems for its descent to the comet nucleus and its first sequence of scientific tests, taking and analysing samples and sending back to Earth vast amounts of data and photographs. That battery was designed in 2004, and since then, primary lithium systems have developed higher specific energy and higher power whereas the energy density of rechargeable Li-ion batteries has grown from 130 Wh/kg to 180 Wh/kg and more. We are now working on the next generation of both primary and rechargeable lithium battery systems. The challenge is increasing the specific energy to reduce the weight further. We're also working on technical solutions to reduce the costs.”



Céline Morthe Céneç,
Satellite Power System Engineer DCT/TV/EL - CNES

HISTORIC COMET TOUCHDOWN POWERED BY SAFT •

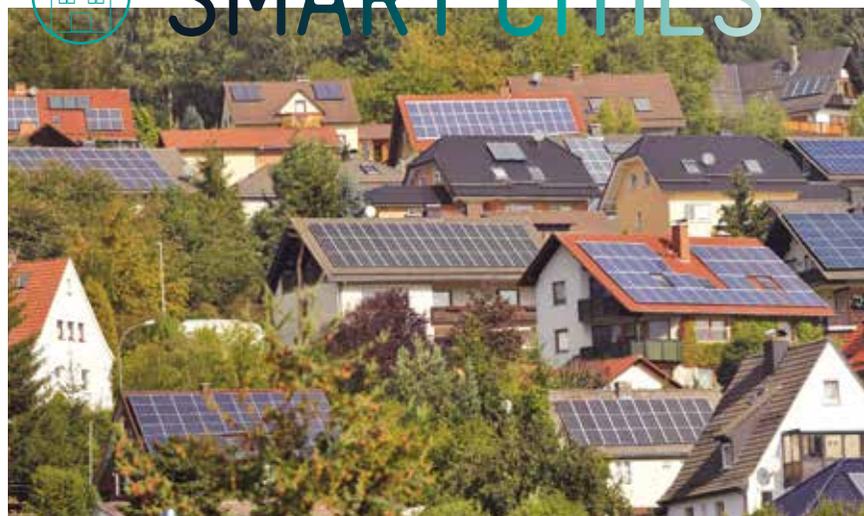
The Rosetta Mission: After a 10-year journey covering more than 40 times Earth's distance to the Sun, a Saft LSH20 battery enabled the Philae Lander to wake up from its 31 months of deep space hibernation, descend to the comet, carry out experiments and communicate results and information back to Earth.

LI-ION FOR THIRD-GENERATION WEATHER

SATELLITES • OHB System, a leading independent space firm, has specified Saft's VES Li-ion battery systems to provide on-board power for the new third-generation Meteosat MTG weather satellite programme that will improve the accuracy of Europe's weather forecasting, with benefits to agriculture, air travel and rescue services and deeper understanding of global weather patterns.



SMART CITIES



45%

our worldwide market share in metering.

20

 years

typical battery operating life without maintenance or replacement.

In a world full of meters and sensors, where objects are smart, Saft has a solid history of providing power and a wide range of fit-and-forget energy solutions for new sensing devices, along with proven success in applications.

Your World

Connected devices - smart meters, wireless sensors, data concentrators - need reliable batteries that are long-lasting in tough outdoor conditions. Similarly, robust, flexible, dependable batteries, capable of facing uncontrolled environmental conditions, are needed for the myriad wireless sensors being integrated into the world around us. Reporting on strain, vibration, shock, temperature, humidity, flow, current or voltage depends on sensors and their energy source, making the right battery a key choice.

Our Solutions

With a 20+ year no-maintenance lifespan, Saft's industrial batteries perform in extreme temperatures, combining high energy density, low self-discharge rates, and high voltage readings, ideal for metering and wireless sensor networks. A tested, trusted partner for over 35 years to leading meter providers, Saft also works with companies leading the "Internet of Things" revolution. Saft has ready-to-use battery systems and cost-competitive solutions for both mature and emerging economies.

Expert Opinion

"Imagine a storage tank sending an alert when it needs a refill, household appliances switching on when energy prices are at their lowest, and bridges monitoring their own structural health. Is this the future? Or is it now? The 'Internet of Things' and 'smart cities' are both developing fast, as we move quickly towards intelligent decision-making with new methods of measurement, control, quality, and cost reduction. This revolution needs the right mix of cost and technologies - including a long-life, cost-efficient durable energy source. Batteries will play an important role in system reliability. They will need to be dependable and last 10 years or more, with efficient operating costs, allowing no interruptions to services. Today's smart metering applications are just the forerunners."

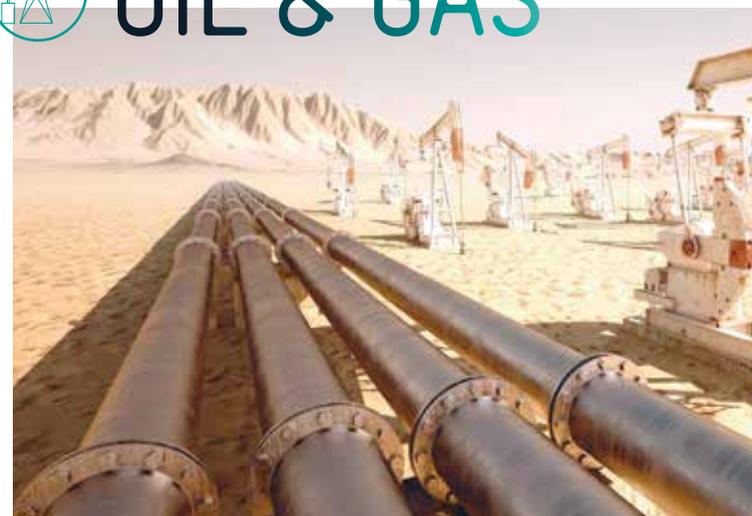
Wayne Pitt, Saft's Business Development Manager for the Specialty Battery Group

MAJOR BREAKTHROUGHS POWERING ELECTRICITY METERS IN EMERGING ECONOMIES

• Saft is supplying five million Eternacell ER 14250 cells to China, India and Taiwan to provide back-up power for electricity meters. The Eternacell design is the perfect choice for the specific needs of emerging economies, thanks to competitive pricing allied to an emphasis on long life and reliable field performance.



OIL & GAS



-60°C to +150°C

for primary lithium, -50°C to +130°C for Li-ion - Saft's technologies can handle extreme temperatures.

350m

below sea level - the depth at which Saft's Li-ion is proven for subsea applications.

Saft powers all types of oil and gas applications, from exploration of new sites to distribution pipelines and every step in between, all around the world.

Your World

Demands for energy are rising, pushing oil and gas companies to operate in increasingly remote and difficult-to-access locations, often in much harsher environmental conditions than before. These sites depend on batteries to power instruments, equipment and systems that make tasks possible, whether they are downhole, subsea, offshore or onshore. Reliability, energy and power density and safety are critical in this sector.

Our Solutions

Saft's batteries offer minimal or no maintenance and long life under harsh conditions, in extreme temperatures, and for sustained periods of operation, safely in potentially flammable environments. Be it primary lithium for high power and capacity, safe and proven lithium-ion, or durable long-lasting nickel-based, all our batteries are designed and manufactured to the highest standards for applications from the deepest subsea oil and gas developments to the largest and most complex offshore and onshore infrastructures, powering sensors, monitoring, communications and more.

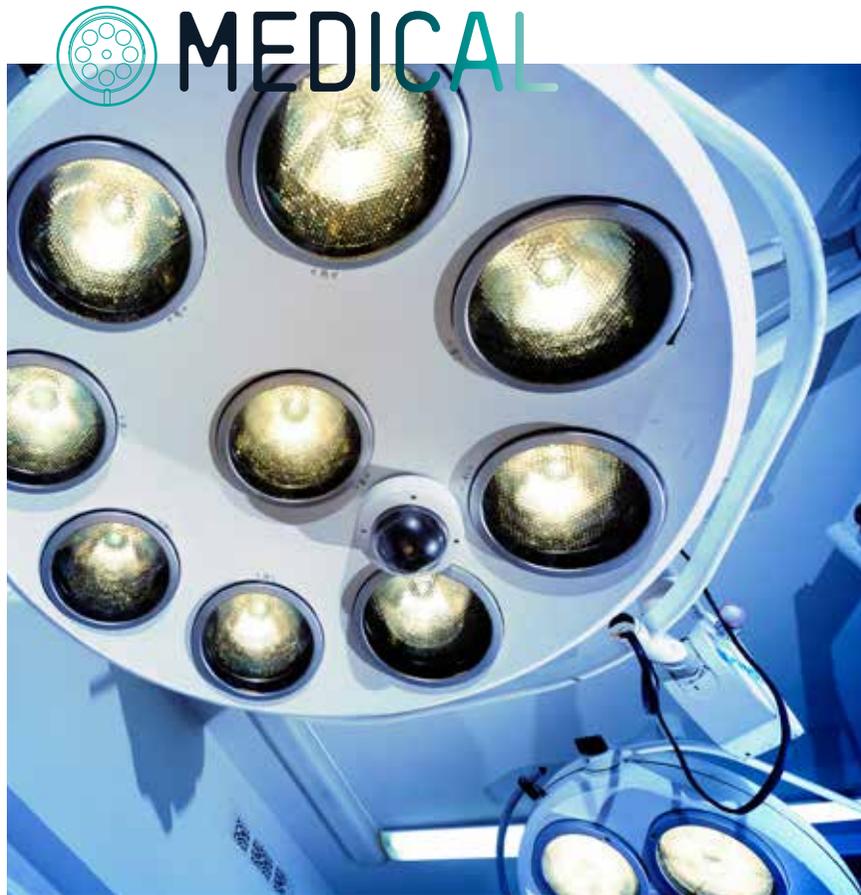
Expert Opinion

"We are committed to pushing present technological limits further to overcome the current challenges of the Oil & Gas industry. Beyond the advanced lithium technologies that Saft recently introduced, the research team is focused on breakthrough innovative solutions and is investigating next-generation cathode active materials, novel innovative electrolytes and separators and new high-temperature anode materials that will further broaden the operating temperatures for primary or rechargeable technologies."

Patrick Bernard, Saft Research Group Manager

SEISMIC SURVEYS AROUND THE WORLD

• Saft lithium-ion batteries are being used in oil and gas fields around the world by leading companies to power sophisticated equipment that determines the precise location of oil and gas deposits. New breakthrough MP Integration xtd Li-ion cells combine compact size, the widest operating temperatures available in Li-ion and exceptional life, making them perfect for the specific needs of seismic prospecting equipment.



MEDICAL

For over 30 years, Saft has designed and manufactured a wide range of specialised battery solutions that provide critical power for medical applications, offering reliability and performance where it is most needed.

3

primary lithium, 4 Li-ion chemistries to serve the medical market.

>10 years

without battery maintenance or replacement.

Your World

Tough standards of reliability, durability and safety apply for medical devices. Doctors, nurses, and rescue to squad technicians should not need to worry whether critical medical equipment will start up and run properly. Whether it is for emergency and critical equipment, patient care, patient monitoring, patient diagnosis, or patient mobility, battery-operated critical equipment for medical applications needs to be safe, cost effective and extremely reliable with a long shelf life - lives depend on them.

Our Solutions

With Saft battery systems, portable equipment, mobile workstations, patient-worn devices, respirators, ventilators, defibrillators and other medical devices perform reliably and operate autonomously, even in the most demanding environmental and usage conditions. Our customised battery solutions, complete with electronics and monitoring, are highly specialised. Whether primary lithium or rechargeable lithium, our batteries for the medical sector are safe, cost effective and extremely durable.

SEEING AGAIN • Smart retina implants with a Saft-powered energy source are bringing partial sight back to some visually impaired patients. With Pixium Vision, a pair of glasses analyses movements, a computer decodes information and an implanted chip stimulates the optic nerve. This revolutionary system is in preclinical testing.

MONITORING EACH HEARTBEAT • Lifestar is a small, lightweight sensor with electrodes worn on a patient's chest that transmits each heartbeat wirelessly to a phone monitor, and doctors are notified in case of irregularity. This critical health device cannot leave batteries to chance, and uses Saft's LS 14500, which has a wide operating temperature range, low self-discharge rate, and is easily integrated into compact systems.



DEFENCE

14x

Xcelion 6T™ life compared to lead-acid batteries.

12 years

storage life/zero maintenance - AgO-Al solution for heavyweight torpedoes.

With worldwide capability, rapid response, multiple ranges and reliable performance, Saft is uniquely capable of providing complete integrated systems to power today's sophisticated battlefield equipment and military applications.

Your World

When time and urgency are critical, lightweight, compact batteries need to deliver exceptional reliability and performance, be it for infantry communications, base camps and weapon systems, torpedoes, aircraft, or hybrid armoured vehicles. Portable military applications such as radios and night vision goggles have size and weight restrictions, while torpedoes and missiles need robust, long shelf life, high-energy power sources. Defence applications require solutions that do not compromise a soldier's manoeuvrability and safety.

Our Solutions

Saft's lithium solutions for a large set of applications have been field-proven as the best value in terms of long cycle life, cost savings, weight, size, efficiency and reliability. Saft also has silver-based customised batteries, which are reliable under extreme conditions. Saft coordinates power storage, electrical systems and charging in autonomous units with easy operation. Working with equipment manufacturers, Saft has expertise in advancing precisely designed, cutting-edge technological solutions as part of customers' strategic product development.

LITHIUM POWERS UP TACTICAL VEHICLES • Li-ion technology use is growing in high-power military vehicle applications. Thales Australia ordered Li-ion battery systems for 1,300 Hawkei military tactical vehicles, a next-generation of protected mobility for defence forces challenged by Improvised Explosive Devices, mines or small arms ambushes.

TWO TIMES MORE POWER AT HALF THE WEIGHT AND VOLUME • Saft's Xcelion 6T™ Li-ion battery is a drop-in replacement for lead-acid batteries in military vehicles and is now industrialised to reduce the cost and produce an off-the-shelf product. The battery reduces vehicle weight and total cost of ownership, while offering great power density and energy efficiency.



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