

# THE FRENCH KNOW-HOW IN THE WORLD

in management and financing of public services and infrastructures



PROOF BY EXAMPLE





The french Institute of PPP (IGD) is very honored to participate in this third edition of Paris Infraweek, of which it has been a partner since the beginning.

This major event jointly organized by Paris Europlace and the Ministry of Economy and Finance is an opportunity to highlight the french know-how of operators and financials in the world.

Our country can be proud of having a dozen world leaders in infrastructures and a French presence on all continents.

At a time when most international organizations advocate for sustainable and quality infrastructure, French experience and talent in this subject are well established.

The 46 thematic projects presented in this document provide a non-exhaustive illustration of the French expertise and our international success.

Thus, the entire chain is represented, from financing to construction and operation, always in the respect of the public service, the responsibility of elected officials and the needs of users.

Founded in 1996 by the State, the french Institute of PPP keeps on promoting the quality and performance of public services.

I wish all the participants a good 2019 Infraweek event and already give you rendez-vous in 2020!

**Hubert du Mesnil**  
*President of IGD*



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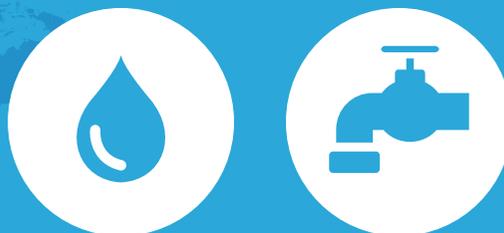


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## THE FRENCH KNOW-HOW IN THE WORLD

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## WATER AND SANITATION

Proof by example



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# MASA, MANAGING WATER FOR THE INDUSTRIAL CENTRES OF SAUDI ARABIA



Operation of water and sanitation services.



## OPERATING AND MAINTENANCE CONTRACT

The story of Saur in Saudi Arabia began in 2005 with the technical and financial audit of water supply and wastewater treatment services for the cities of Dammam (750,000 residents) and Al Khobar (360,000 residents), followed in 2006 by a quick wins consultancy assignment in Jeddah (3.5 million residents). In partnership with the Zamil Group, these initial experiences were followed by the management contract for the cities of Mecca and Taif, which includes the delivery of essential water supply and wastewater treatment services for the millions of pilgrims who flock to Mecca every year for the Hajj.

The resulting experience, combined with the confidence of the Saudi authorities in the abilities of the Group, encouraged Saur to form the Masa joint venture in conjunction with Marafiq, the country's leading private-sector water and electricity services provider. In 2011, the joint venture was awarded the contract to operate and maintain water supply, wastewater treatment and industrial cooling water services for the new city of Jubail in eastern Saudi Arabia. Masa provides the city with drinking water from a seawater desalination plant capable of producing 95,000 m<sup>3</sup> per day delivered by two main pumping stations, 29 secondary stations and an 885 km pipeline network. Wastewater treatment is provided by a plant with a daily processing capacity of 120,000 m<sup>3</sup>.

Saur has operational management responsibility for the joint venture, and its central missions are to introduce a new organisational structure, implement action plans for staff training and operational performance, and transfer expertise.

In 2014, Masa was contracted to operate and maintain the water supply and wastewater treatment facilities of the industrial city of Yanbu in the west of the country - the Kingdom's second-largest petrochemicals complex after Jubail Industrial City - followed, in 2016, by Ras Al-Khair industrial city to the north of Jubail.

The confidence of the Saudi authorities in this form of management is reflected in the fact that the country has effectively been divided into 6 regions, for which contracts will be awarded via a tendering process. "Each of these regions will generate annual revenue of between €100 million and €200 million from the provision of drinking water supply and wastewater collection and treatment services", explains Emmanuel Vivant, Executive Vice-President International of Saur, which hopes to triple revenue generation in Saudi Arabia between now and 2023 (Masa currently reports €120 million in annual revenue).

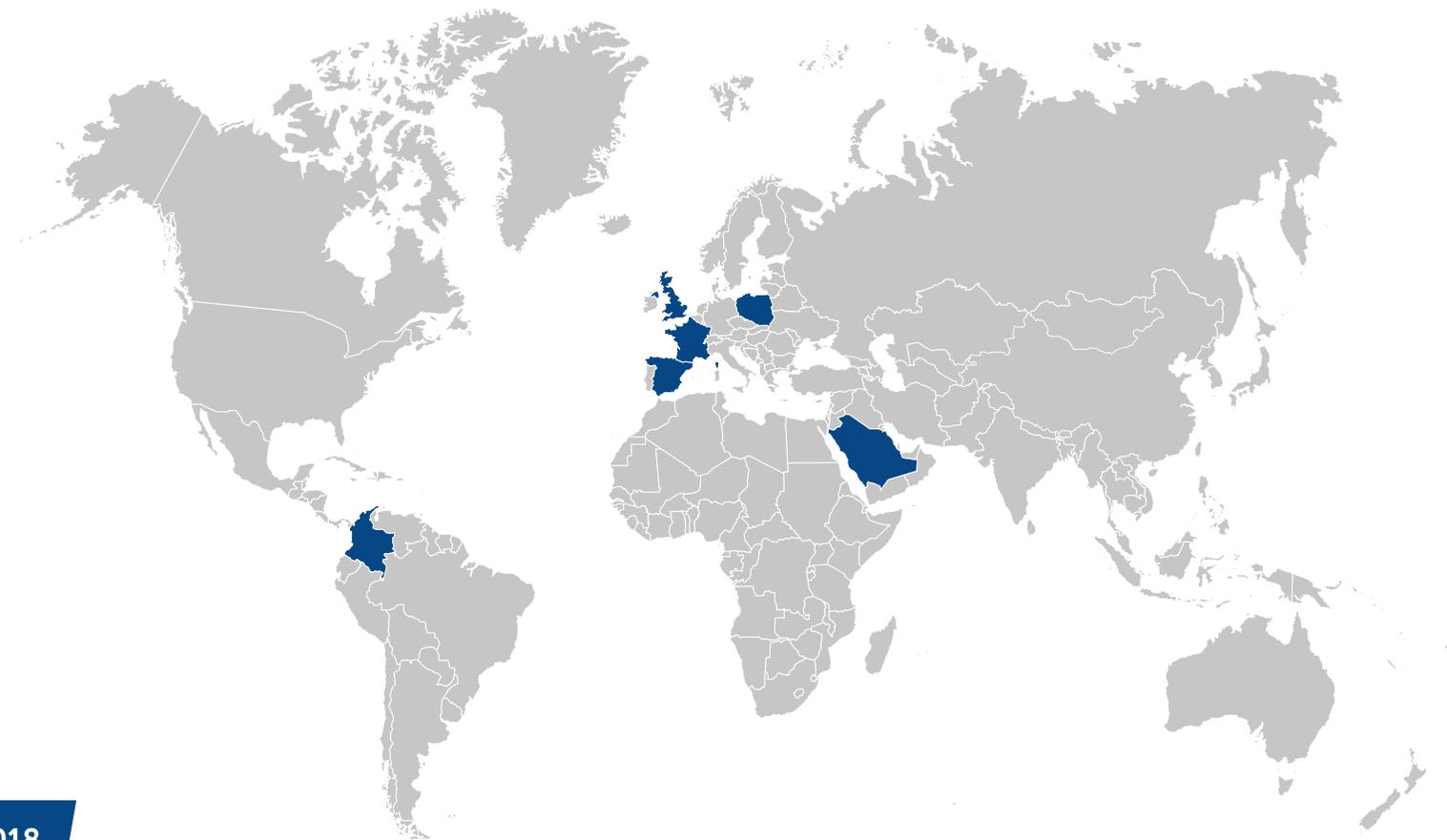
## TECHNICAL FEATURES

Secure water management for the largest industrial complex in the Middle East, which is subject to extreme climatic conditions and temperatures in excess of 50°C in the summer months.



# SAUR IN THE WORLD

**Group activities:** 100% water: full water cycle, for operation & maintenance and engineering & construction



## KEY FIGURES 2018

**12,000**  
employees worldwide

**3**  
continents

**6**  
countries

**€1.3**  
billion in 2018, including  
€1 billion generated in France

**12**  
million residents  
served

**3,000**  
treatment plants built



# EMI: WEB SOLUTION TO PRESERVE WATER RESOURCES AND WELLS IN GREATER NANTES



Algorithms to predict the evolution of water resources.



## OUTSOURCED PUBLIC SERVICE CONTRACT

ImaGeau joined the Saur Group as a startup in 2017. Its EMI (Environmental Monitoring Interface) solution is an online app that manages water resources and catchment areas within a given region. This solution makes it possible to act ahead of any risk of water shortage, optimise catchment area maintenance and facilitate decision-making on the basis of enhanced and centralised data.

At Basse-Goulaine in the Loire-Atlantique region of France, where Saur manages the drinking water production plant, all 10 boreholes are now fitted with pressure sensors and flow meters. Every day, the quantity module of the EMI Web app collects data - water level, flow rate, volume, pumping time, etc. - from sensors installed in the groundwater abstraction facilities. Simultaneously, EMI interrogates government servers and Open Data databases to source additional data on the water abstraction point (the alluvial deposits of the Armorican Loire). The data collected are verified and processed using hydrogeology algorithms to calculate indicators for drought vulnerability, abstraction efficiency and water quality. Against the backdrop of the ongoing Loire Valley drought crisis, and the fact that the local authority has access to an online mapping and graphic visualisation system, EMI provides a continual stream of updated information that enables the water authority to monitor the water level remaining above the pumps, the historic trend of the current level and the daily trend in the volume of water produced by each of the 10 boreholes. Continuous monitoring has allowed the local authority to take early action to refurbish and re-develop water supply facilities, beginning with the most urgent. As plant operator, Saur has the ability to adjust and spread abstraction between the 10 available abstraction points by continually monitoring instantaneous fluctuations in water levels above the pumps. The EMI application is now making an effective contribution to maintaining the production capacity of the aquifer at a time of historically significant crisis in water levels.

### TECHNICAL FEATURES

Securing operations within a geographical area subject to water stress.

### IMPLEMENTATION CONSTRAINTS

Drilling equipment, pressure sensors and flowmeters, accommodating climatic and man-made parameters within the operational area, and the reliability of cross-referenced private and public data.



Basse-Goulaine  
France



1 January 2019



ImaGeau 12;  
Saur Group 12,000



10 years



# WASTEWATER TREATMENT PLANT IN CHILI - BIOFACTORY



A concrete responses to the challenge of climate change.



In 2017, Aguas Andinas launched a multi-dimensional project to transform the wastewater treatment plants of Santiago de Chile into biofactories, together with SUEZ, its main shareholder.

The La Farfana wastewater treatment plant is one of SUEZ's concrete responses to the challenge of climate change. It is one of the five largest plants in the world, and helps to treat the wastewater of the 7 million inhabitants of Greater Santiago.

But La Farfana, the first biofactory in the world, has much higher ambitions. The plant aims to achieve **zero waste, zero environmental impact and zero consumption of fossil energy**. The plant reuses 100% of the wastewater, by transforming it into new resources, such as biogas to generate electricity and heat, or by transforming sludge into fertiliser for local farmers. 100% of the biogas produced from the treatment sludge is reused.

## TECHNICAL CHARACTERISTICS

The wastewater follows the traditional path of screening, then grit and grease removal, primary settling, biological treatment and clarification before finally being disinfected in chlorine prior to discharge.

The sludge benefits from a full treatment line: thickening that is gravity-based or uses flotation, digestion, dewatering, drying and discharge. The plant now produces 120 tonnes of dry solids per day.

The biofactory uses treatment processes that are as natural as possible. In this way, the consumption of reagents and energy is kept to a strict minimum. An energy-sober treatment of nitrogen, coupled with the transformation of carbon into biomethane and dry biosolids (ultra-dehydrated sludge), have enabled the plant to become energy-positive.





# WASTEWATER TREATMENT PLANT : A MAJOR ASSET FOR JORDAN



High quality treated water for agriculture and renewal energy solutions.

## BUILD, OPERATE, TRANSFERT (BOT)

Population growth, water scarcity and increases in energy cost are a challenge for Jordan. To face these constraints, local authorities knew they needed to produce reused high-quality treated water for irrigation with a crucial on optimizing energy consumption.

The As SAMra Waster Water Treatment Plant (WWTP) project meets these objectives ; it is a success story in terms of wasterwater treatment technologies, renewable energy, transfer of know-how, expertise, and above all, life improvement for the future generations in Jordan.

Awarded in 2003 through a competitive international tender and completed in 2008, the initial As Samra WWTP (Phase 1) was designed to treat the wasterwater of 2.3 million inhabitants of Amman and its surrounding areas.

To adress tje needs of an ever-increasaing population growth, the Government of Jordan decided in 2009 to expand the plant. The Ministry of Water and Irrigation awarded a new 25-year Build, Operate and Transfer (BOT) contract for the expansion of the As Samra WWTP. The contratc plant is expected to meet the wasterwater treatment needs of 3.5 million inhabitants of greater Amman and surrounding areas.

## A SOUND AND SUSTAINABLE PROJECT

- 70% of the wastewater treated in Jordan;
- 80% energy self sufficiency;
- 300,000 tons of CO<sub>2</sub> saved per year thanks to renewal energies;
- 10% of water consumption in agriculture come from the WWTP;
- 133 million m<sup>3</sup> per year of high-quality water produced;
- 230,000 kWh of green energy produced per day.



169 millions USD for phase 1/  
267 millions USD for Phase 2



2008 for the phase 1  
2012 for the phase 2



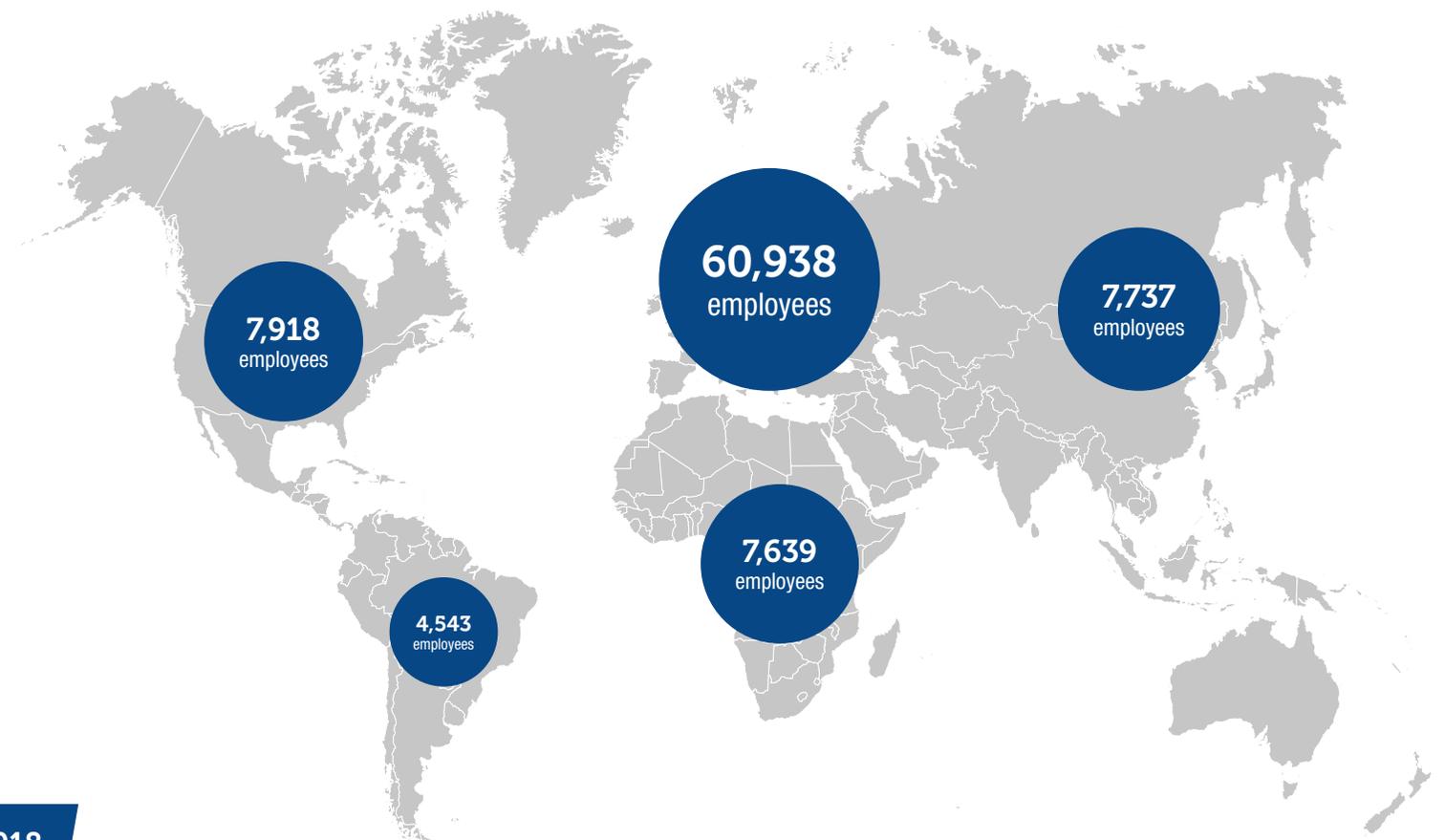
Until July  
2037



210 permanent local employees  
(up to 2,500 employees during  
construction phases)

# SUEZ IN THE WORLD

**Group activities:** drinking water production, wastewater treatment, desalination, sludge treatment



## KEY FIGURES 2018

**89,000**  
employees worldwide

**5**  
continents

**160**  
countries

**€17.3**  
billion revenue  
(4.210 million € in France)



# WASTEWATER TREATMENT PLANT IN HONG KONG



Veolia built a truly innovative complex, fully autonomous and self-sufficient in energy and water: T-Park.

## DESIGN, BUILD, AND OPERATE THE WORLD'S LARGEST WASTEWATER TREATMENT PLANT CALLED T-PARK

Hong Kong produces nearly three million cubic metres of effluent per day which is converted into 1 200 tonnes of sewage sludge. This volume will reach 2 000 tonnes per day in 2030. Until 2015, this sludge was either buried or released into the sea.

The customer's objectives are to provide a state-of-the-art, sustainable incineration technology solution to the massive and growing volume of sewage sludge and to raise public awareness on the environment.

T-Park is 100% energy independent with two 14 MW turbines that operate with steam produced during sludge incineration. When the plant is operating at full capacity, it produces nearly 2 MW of surplus electricity which is injected into the public grid.

T-Park is 100% self-sufficient in clean water - supplied by the on-site seawater desalination plant - and process water - rainwater collection and wastewater treatment to achieve 'zero liquid discharge'.

T-Park diverts 90% of Hong Kong sewage sludge from landfills. The plant operates with the thermal energy produced during sludge incineration, which is recovered and converted into electricity.

### TECHNICAL CHARACTERISTICS

- Incineration: sludge inflow, fluidised bed incineration, and steam boilers.
- Treatment of gas emissions: DeNox to control nitrogen oxide emissions, dry reactor to reduce acid gases, multi-cyclone filter and pocket filter.
- Water treatment: Multiflo™, reverse osmosis.
- Wastewater treatment: flocculation, MBBR.



Hong Kong  
China



Date of  
inauguration  
2015



Contract length  
15 years operations



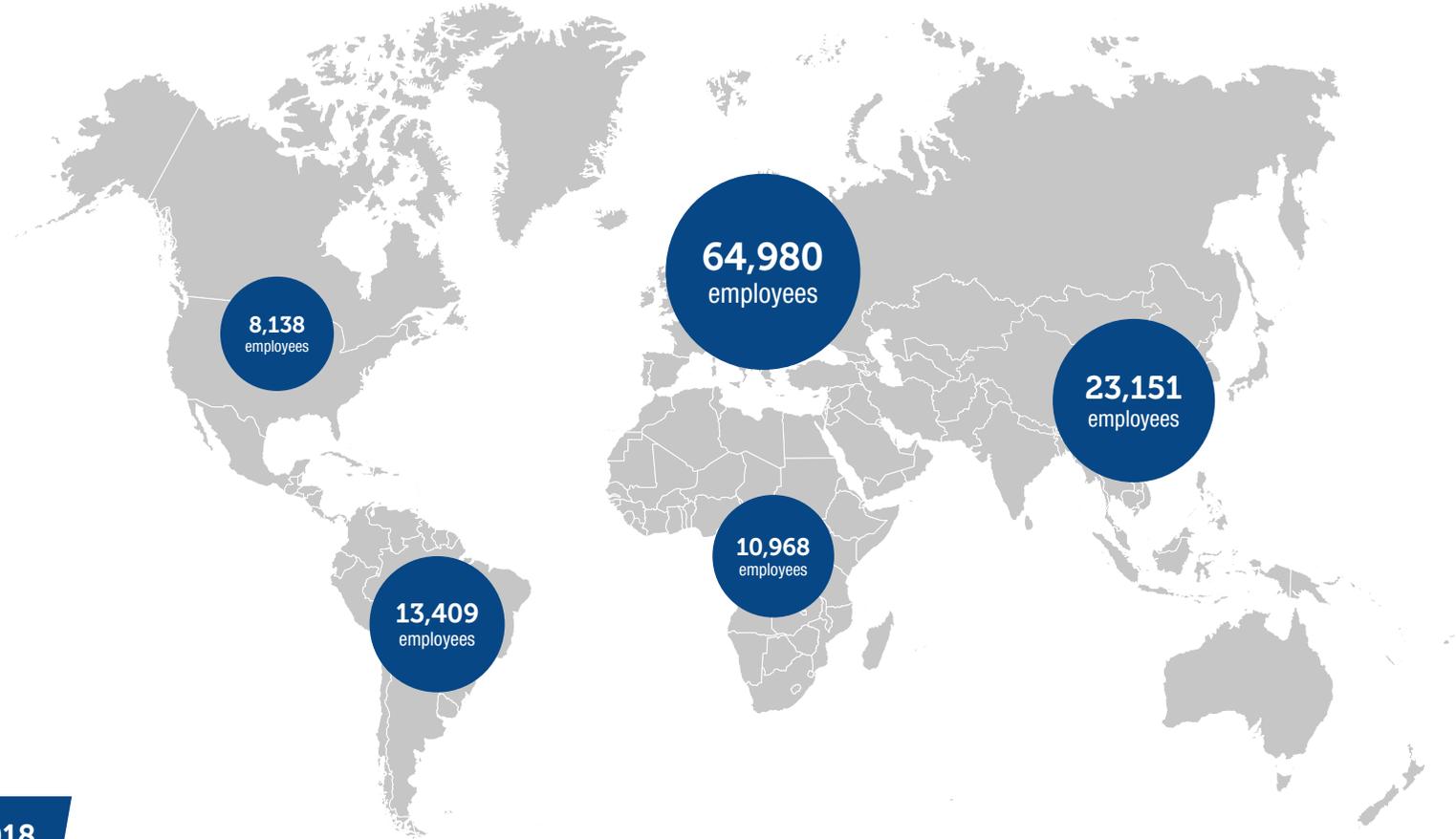
7.2 millions  
inhabitants



11 wastewater  
treatment plants

# VEOLIA IN THE WORLD

Group activities: water, sanitation, waste and energy



## KEY FIGURES 2018

**171,495**  
employees worldwide

**5**  
continents

**€25,911**  
million revenue worldwide  
(30% in France)



# ECOLOGICAL HEATING FOR THE WATER OF THE OLYMPIC BASIN



Adding value to wastewater: Cercle des Nageurs de Marseille (CNM).



The Cercle des Nageurs de Marseille wanted to make major energy savings in heating its prestigious 3 000 m<sup>3</sup> Olympic pool and pre-heating its domestic water, while favoring a 100% renewable energy supply.

Recover the calories in wastewater through the proprietary Energido® process. This process allows some of the wastewater from a wastewater collection system (collector) to be diverted to a heat exchanger installed outside this network.

By capturing unavoidable energy produced by urban facilities in the vicinity of the equipment (wastewater collection systems), fossil fuels can be replaced by renewable resources from a permanent (wastewater) rather than intermittent energy source (solar, wind, etc.).

**250 KW**

Installed power to increase and maintain water temperature

**27 °C**

Pool temperature maintained all year round

**35%**

Savings on the annual energy bill

## TECHNICAL CHARACTERISTICS

The infrastructure equipping the CNM generates 250 KW to heat the pool's water and maintain it at 27 °C all year round. Thanks to this heat input, the heat pump connected to the system has an average efficiency of 1 to 5, i.e. for an energy consumption of 1 kWh, 5 thermal kWh of energy are produced.

Ideal for heating swimming pool water, Energido® is reproducible for a variety of uses, including heating and cooling homes and offices. Other aquatic centres, such as Aquarena in Arras or Aqualac in Aix-les-Bains, have already adopted the solution for their heating needs.



Marseille  
France



September 2013



4 000 members including  
150 top-level athletes



# MANAGEMENT OF URBAN WATER SERVICES : 150 MUNICIPALITIES IN ILE-DE-FRANCE



Design of the ServO control centre and management of three drinking water production plants : Syndicat des Eaux d'Île-de-France (SEDIF).



At the time of the Greater Paris project and reflection on the pooling of resources and the streamlining of production tools, Syndicat des Eaux d'Île-de-France (SEDIF), the largest public utility in France, focuses on customer satisfaction and the sustainability of management combining transparency and performance for cost effectiveness.

Even though it is at its first Climate Water Energy Plan, SEDIF intends to reduce the energy consumption of its equipment and its greenhouse gas emissions and better preserve the resource.

At the heart of the system, ServO - a hypervision and remote control centre equipped with artificial intelligence - was developed by Veolia Eau Île-de-France, a Veolia subsidiary. Fully operational since 2016, ServO - also known as a piloting center, a virtual platform that allows multiple operating systems to work together at the same time - provides a 360° view of the network.

**762 000 m<sup>3</sup>**

Average volume of drinking water supplied every day

**10%**

Leak rate target for 2020 (against 12.5 in 2016)

**1.250 billion**

Volume of data processed in real time by ServO

## TECHNICAL CHARACTERISTICS

- The ServO piloting center receives all the technical data from SEDIF's three main plants located in Méry-sur-Oise, Choisy-le-Roi, and Neuilly-sur-Marne as well as secondary sites, such as reservoirs and water towers. Equipped with 1000 management rules, it recovers, calculates, and crosses nearly 1.250 billion bytes of real-time data, from the river up to customer homes. As it is connected to water production, transportation, storage, and supply locations, it can instantly detect dysfunctions. It can also detect deteriorations in water quality, altered by an unsuitable temperature or pressure or by the presence of chemicals. This is made possible by 200 sensors positioned in risk areas in the Oise, Seine, and Marne.
- ServO also uses 1 700 Res'Echo sensors to locate water leaks in the pipes which cannot be detected by a person.
- ServO mobilises a hundred people: field operators in charge of repairing water cuts, heads of equipment maintenance stations, and technicians in charge of the various PLCs. All of the data can be viewed by each operator on a computer, tablet, or smartphone. ServO also integrates volumes consumed, calculated from remote reading indexes, from the fixed network. It thus makes it possible to relate the Volumes put in Distribution with the Volumes consumed by sector. This allows a reinforced management of the network.



# SEAWATER DESALINATION IN KUWAIT



Two factories to contribute to new urban development.



**Fresh water produced by seawater desalination currently meets about 1% of global requirements (source: International Water Association). More than 90% of water demand is fulfilled by seawater in Kuwait.**

With one of the world's greatest water stress ratios with per capita water availability ratio of 5m<sup>3</sup> per year, Kuwait is exploiting the seawater desalination sector to meet consumption that is 34 times higher than its natural supplies. For the Az Zour North plant, delivered in 2016, Veolia chose thermal desalination, a process also known as multi-effect distillation (MED). The unit is capable of producing 486,500 m<sup>3</sup> of desalinated water per day.

For the Az Zour South plant, opened in 2015, Veolia opted for reverse osmosis membrane desalination. The unit has a capacity of 136,000 m<sup>3</sup> of water per day. The desalinated water comes from the cooling water in the adjacent power plant, creating a local circular economy loop.

The MED technology chosen for Az Zour North has to adapt to variations in water demand over time. It is also one of the most energy efficient and reliable desalination technologies on the market and therefore the most economically efficient.

- The Az Zour South plant has a special feature: seawater is preheated thanks to the waste energy from a nearby power plant, which saves a lot of electricity on the site.
- For 40 years all the electricity and water produced at the Az Zour North plant will be purchased by the Kuwaiti state.

Awarded to a Franco-Japanese-Kuwaiti consortium, including Veolia, the construction of the Az Zour North plant is the first public-private partnership for an independent water and power project (IWPP) in the country. This project is part of the long-term development plans for electric power and water production capacity in Kuwait.

## TECHNICAL CHARACTERISTICS

- **For the Az Zour North plant**, Veolia chose thermal desalination, or multi-effect distillation (MED). The salt is separated from the water by evaporation in a distillation system. This process reuses the energy produced by the condensation of the steam, reducing the energy consumption needed to heat the water. With a portfolio of more than 250 projects representing over 80% of the global market, Veolia is the undisputed leader in thermal desalination.
- **For the Az Zour South plant**, thanks to reverse osmosis desalination plants located on the Arabian Gulf coast in Kuwait, fresh water is produced from seawater previously used for cooling the neighbouring power station.



Kuwait  
Kuwait



2011 (Az Zour South) and  
2014 (Az Zour North)



4.5 millions  
inhabitants



2 factories

## THE FRENCH KNOW-HOW IN THE WORLD

in management and financing of public services and infrastructures



# WASTE

Proof by example



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# AN INNOVATIVE WASTE CONTRACT BASED ON PERFORMANCE



Optimization waste collection and treatment for 71 municipalities.

## PUBLIC SERVICE DELEGATION

**The contract's objective, which has begun in January 2019 for a duration of 10 years, is to reduce residual non-recyclable household waste by 40% and recover 100% of waste by the end of the contract.**

Veolia will optimize waste collection and treatment from the 21,000 households in a 700 km<sup>2</sup> perimeter. Covering 2 distinct local authority groupings, the contract makes it possible to pool collection resources.

An incentive fee based on the "polluter pays" principle, which is already in operation in part territory, will reward good sorters and those who make an effort to reduce their waste. This new approach to financing waste collection also allows users - citizens or industry - to control their bills.

Information campaigns are planned to reduce the production of non-recyclable waste. New collection resources will be gradually deployed alongside a series of local social and solidarity economy initiatives.

*"Our community wants to be exemplary in terms of sustainable development and waste policy. For us, the best lever for infusing this innovation is a long-term partnership, with a single delegate who can build a global and coherent solution: the answer that Veolia has given us. But to allow us to have the means of our ambitions, we needed a certain scale to reach a critical mass of about 50 000 inhabitants" explains Laurent de Gouvion Saint Cyr, President of the Community of Commons of the Territory of Luneville to Baccarat.*

*"This contract is both innovative and virtuous since reducing the quantity of waste will ultimately reduce collection and processing costs. It is no longer a question of being paid by volume but by performance. In these Lunéville territories we will co-build new models for relationships and for creating shared value" said Franck Pilard, Director of Local Authorities Services for Veolia in France..*



France



January 2019



21,000 households served



700 km<sup>2</sup>



# CLEANING SERVICES MANAGEMENT IN BUENOS AIRES



Collection of solid household waste and urban cleanliness of Zone 1 of the Argentine capital.



To meet the objectives of the «Zero Waste» law adopted in 2006, the city of Buenos Aires entrusts to Veolia the collection of solid household waste and the urban cleanliness of Zone 1 and its 6 key neighborhoods: Retiro, San Nicolás, Puerto Madero, San Telmo, Monserrat and Constitución.

A dense and complex urban area, with significant population and transport flows, which concentrates economic and tourist activities. With its large population and over 12,000 commercial and service buildings, Zone 1 is the most complex part of the city to operate.

Partner of the city since 1998, Veolia has been providing a complete public service of urban cleanliness since 2014 - garbage collection, manual cleaning and daily mechanics - in the heart of emblematic districts of the Argentine capital. In order to improve service performance and hygiene, Veolia deploys and implements total containerization of waste in the sector. For this contract, Veolia and the municipality created the AESA Buenos Aires entity.

## TECHNICAL CHARACTERISTICS

More and more integrated and connected urban waste collection and hygiene services:

- collection routes are optimized through sector programs, planning and GPS systems that support the fleet of vehicles in real time;
- employees have mobile devices to report incidents, fill sensors, equip containers...

**2,600 containers**  
installed

**6,000 tonnes**  
tonnes of waste generated  
every day in the city

**480 rotations**  
per night of compactor trucks that carry  
4,000 tonnes to 3 transfer stations



Buenos Aires  
Argentina



206,000 inhabitants + Daily floating  
population of 1.5 million people



10 years

## THE FRENCH KNOW-HOW IN THE WORLD

in management and financing of public services and infrastructures



# ENERGY

Proof by example



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# THE FRESH ISLAND, INNOVATIVE URBAN FURNITURE



A new concept of refreshment available to all.



**The fresh island is an innovative urban furniture connected to the cold network of the City of Paris. This temporary refreshment service protects people who live in city from the heat island phenomenon.**

The objectives of the contrat are to meet the challenge of the energy transition, to be a partner of the sustainable city of tomorrow and to innovate in cooling modes to adapt the territory to global warming.

## TECHNICAL CHARACTERISTICS

The fresh island is a device connected to the cooling network of the City of Paris. It provides a first feeling of freshness thanks to its roof providing shade, the base of the seat which houses a fresh air diffusion system guaranteed a second level of optimal cooling. A heat exchanger housed in the base and connected to the cold network allows, by the circulation of chilled water network, to cool the air in contact, before being blown through the perforations of the seats. The cool island is available in two versions: Oasis and Banquise. The two models stand out in particular by their design and their materials: wood and stone. They are both autonomous in energy. Temporary, reusable, and modular, the cool island is designed to fit easily into any space in the city. Deployed on 4 sites in Paris, the fresh island is a device that integrates with the fresh journey of the city of Paris.

## COMMISSIONING CONSTRAINTS

The commissioning of the fresh island requires a connection to the district cooling network.



Paris, on the forecourt of the Gare de Lyon,  
Rosa Parks, on the forecourt of the Palais de Tokyo  
and the Museum of Modern Art, and Beaugrenelle.



July 2018

**Group activities:** refrigeration energy production and distribution

Concessionaire of the City of Paris since 1991, CLIMESPACE has developed the urban cooling network to reach today more than 79 km and serve nearly 700 customers.

A subsidiary of the ENGIE group, CLIMESPACE is 78% owned by ENGIE Energie Services and 22% by CPCU.



CLIMESPACE integrates all the business related to the operation and development of the network: feasibility studies in partnership with private and public players, systems engineering, installation construction, network management and remote control, cold distribution, electricity purchase, maintenance, advice.

#### KEY FIGURES 2018

**90.2**  
million euros turnover

**79**  
km of underground  
network

**10**  
production  
sites

**3**  
energy storage  
sites

**6**  
million m<sup>2</sup>  
air-conditioned



# THE ENERGY-EFFICIENT DISTRICT REFRIGERATION NETWORK OF THE CITY OF PARIS



CLIMESPACE, the european leader of District Cooling and cold distribution.



## CONCESSION OF PRODUCTION AND DISTRIBUTION OF COOLING ENERGY

To develop a high-efficiency urban cooling network for the City of Paris, to produce and distribute cooling energy.

A concession holder with the City of Paris since 1991, CLIMESPACE operates and develops the district cooling system of the City of Paris, the largest in Europe and the 11<sup>th</sup> in the world.

In 2018, 10 production sites and 3 storage sites provided 486 GWh/year of cold to nearly 700 buildings via 79 km of network.

With a turnover of 90.2 million euros and 149 employees, CLIMESPACE meets the refreshment needs of hotels, department stores, offices, corporate headquarters, republic buildings, restaurants, data centers, museums or theatres. CLIMESPACE is a subsidiary of the ENGIE Group, a global energy player, which supports the city in its energy transition.

## TECHNICAL CHARACTERISTICS

The urban refrigeration energy network consists of collective equipment for the production and distribution of chilled water. Its development is based on pooling the cooling needs of Parisian buildings. It is an essential tool of urban planning to serve communities involved in energy efficiency and the fight against climate change.





# CHARLEVILLE- MÉZIÈRES HEATING NETWORK



Heat recovery from PSA plants to fight against energy waste.



## PUBLIC SERVICE DELEGATION WITH THE CITY

**For the decarbonization of the territory, Dalkia values local resources by fetching energy where it is available. This is the case in Charleville-Mézières, in the Ardennes, where Dalkia and PSA Peugeot Citroen are committed to an exemplary project in the field of circular economy and the fight against energy waste.**

As part of a 25-year public service delegation, Dalkia has extended the La Citadelle heating network, while optimizing the existing heat production facilities. Among these means: the site of the first employer in the city, the foundry that makes the raw parts for the PSA Peugeot Citroen group's vehicles.

The 28,000 MWh thermal generated by the furnaces of the foundry feed more than 3,000 equivalent housing (against 930 previously) and the hospital center. The network, which operated 100% on gas, is now supplied with more than 50% renewable and recovery energy, which prevents the emission of 7,000 tonnes of CO<sub>2</sub> annually. Twenty jobs have been created.

This investment of 10 million euros carried by Dalkia, including four million from the «Heat Fund» of the Agency for the Environment and Energy Management (ADEME), is a win-win. On the one hand, heating users see their energy bills fall by around 15% (300,000 euros per year in savings for the hospital, for example); on the other hand, PSA sells Dalkia the so-called residual heat of its foundry kilns which, according to the director of the Ardennes site of PSA, "were only used to heat the birds".

### TECHNICAL CHARACTERISTICS

- Revaluation of 28 GWh/year on the city network;
- 50% renewable and recovery energy;
- 7,000 tons of CO<sub>2</sub> avoided per year;
- 15% reduction on the energy bill;
- 10-year renewable commitment;
- Increased competitiveness of the industrial site;
- 3000 equivalent-housing + 1 hospital;
- Tripling the length of the network to 8.9km.



Charleville-Mézières  
France



10 million euros



February 2019



25 years



# THALASSOTHERMY NETWORK IN LA SEYNE-SUR-MER



Un virtuous network powered by the calories of seawater.

## CONCESSION

The Toulon Provence Mediterranean Metropolis and the city of La Seyne-sur-Mer chose Dalkia for the development, management and operation for 20 years of the urban network of the commune of La Seyne-sur-Mer (south of Toulon) 75% powered by a renewable and local energy source: the Mediterranean.

This relatively small network (3.5 km at term) consists of a temperate water loop that connects a seawater collection station to heat pumps installed in the connected buildings. These heat pumps increase or decrease the temperature of the water loop, which is captured in the sea at a temperature between 12 and 25 degrees Celsius depending on the season, in order to produce heating, air conditioning and hot sanitary water. The heat resulting from the production of air conditioning is also recovered to feed the network in a logic of circular economy.

Supported by the South Region and ADEME as part of the Heat Fund, this innovative technology can supply 75% of the heating and cooling network with renewable and inexhaustible energy, thus avoiding the emission of 1,149 tonnes of CO<sub>2</sub> per year. Subscribers' energy bill is expected to fall by an average of 15%, thus combating energy insecurity in the territory.

All substations are connected to the Dalkia Energy Savings Center (Desc), a digital control center combining human, technological and artificial intelligence. A true thermal smart grid, the heating and cooling network of the municipality of La Seyne-sur-Mer is thus piloted in real time to meet subscribers. This modernization of the network, coupled with its expansion, allows Dalkia to commit to ensuring energy savings while ensuring the end-users' enduring well-being.

## TECHNICAL CHARACTERISTICS

- 75% renewable and recovery energy;
- 980 equivalent-housing;
- 15% reduction on the energy bill;
- 500m of network, with an estimated future extension of 3,000 m;
- 7 MW of hot and cold production capacity,
- 1,149 tonnes of CO<sub>2</sub> avoided per year.

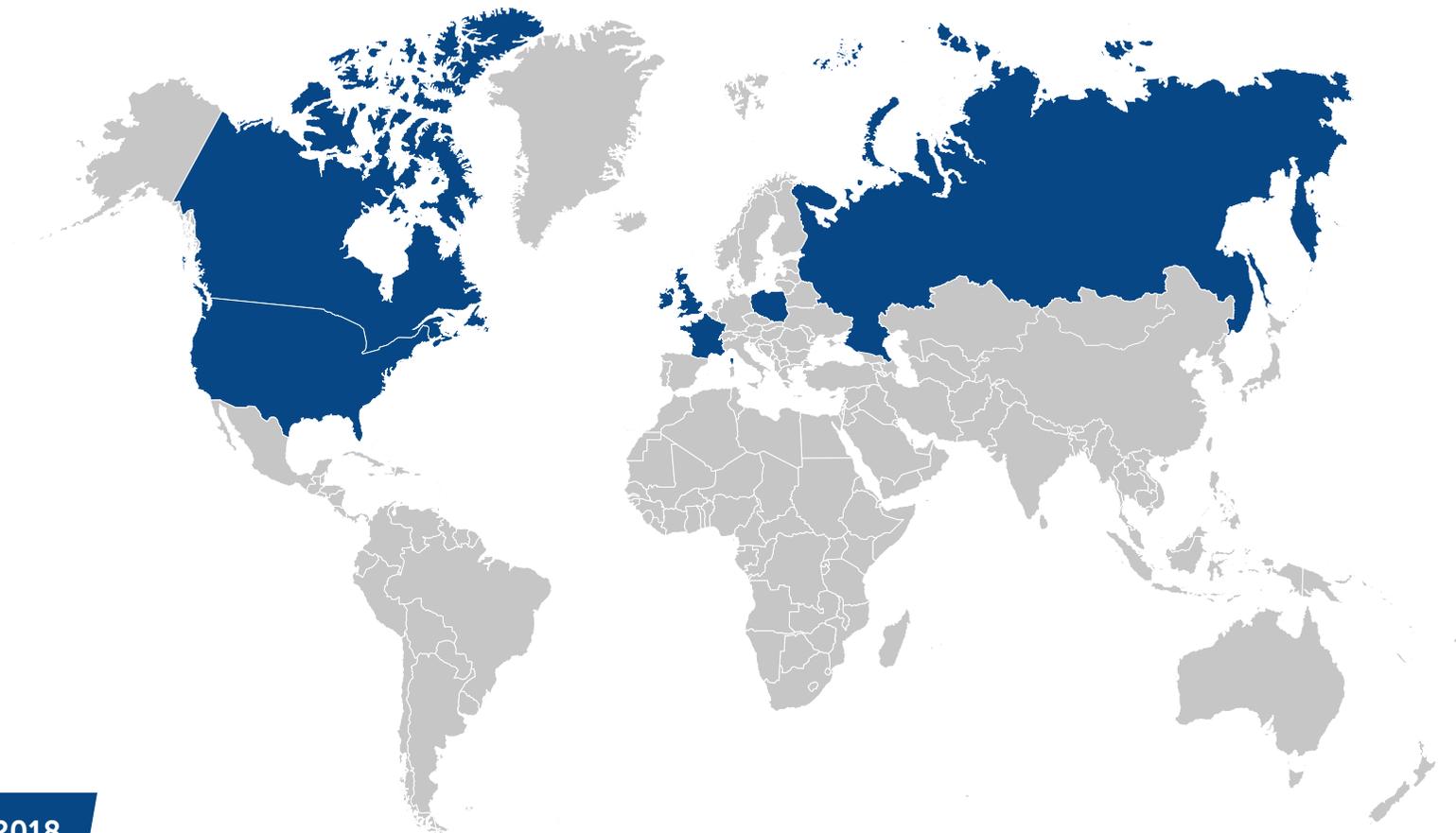


© Olivier Pastor TPM



# DALKIA IN THE WORLD

**Group activities:** heat and cold networks, energy services to industrialists, energy services to buildings



## KEY FIGURES 2018

**16,000**  
employees  
in the world

**7**  
countries

**€4.2**  
billion euros of  
turnover

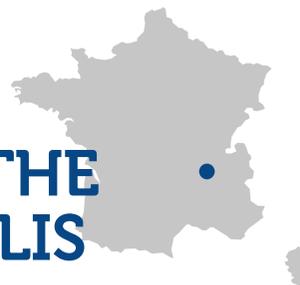
**330**  
heat and cold  
networks

**2 300**  
industrial sites

**more than 2**  
million heated dwellings



# BIOMASS HEATING AND COOLING NETWORK OF THE "GRAND LYON" METROPOLIS



The first green network in France.



© François Fèvre

## PUBLIC SERVICE DELEGATION

The Metropolis of "Grand Lyon" has chosen to entrust Dalkia with the heating and cooling network of the Centre Lyon sector for twenty-five years. The aim is to lower the prices of district heating and accelerate the energy transition. This involves the development of the network, while increasing the share of renewable energy, wood and recovery in its energy mix.

Dalkia is investing 285 million euros to double the heating and cooling network. Currently, about 70,000 households are connected to this district heating network which extends into six districts of Lyon, as well as in Vaulx-en-Velin (Carré de Soie), Vénissieux Nord and Bron. By 2030, the goal is to reach the equivalent of 220,000 dwellings. The cooling network only covers office buildings and some public facilities, such as the Part-Dieu shopping center, or the auditorium. For the user, the heating bill is about 15% lower than a conventional condensation collective gas heating. Valuing 85% of the energy from the energy recovery plant of household waste Gerland, reinforced in 2019 by the opening of the Surville biomass plant, this network will reach this year 65% of renewable energy. At term, Dalkia wants to reach 70%. Through this process, an average of 126,000 tonnes of CO<sub>2</sub> will be avoided per year, which corresponds to 50,000 vehicles that would not be driving each year.

## TECHNICAL CHARACTERISTICS

- 285 million euros of investment for the development of the network and the renovation of the facilities (470 substations, reconfiguration of the production plants) ;
- 15% savings on the energy bills ;
- High-performance and innovative technical choices: low-temperature network, connection of facilities to Dalkia's energy performance control centre (DESC, Dalkia Energy Savings Center), thermal storage, etc.
- A cold network sized to meet the development challenges of the Part-Dieu business district ;
- 932 GWh of heat delivered, which is 3 times more than with the current network and 91 GWh of cold delivered ;
- 85% of the energy of the Gerland household waste energy plant valued ;
- 2<sup>nd</sup> French urban heat network after that of La Défense, but 1<sup>st</sup> green network in France with a renewable energy rate of 65% in 2019.





# RENEWABLE ENERGY MINIGRID IN TANZANIA



A solar-powered mini-grid in deep rural territories.



## BUILD, OWN, OPERATE MINIGRIDS

Thanks to the PowerCorner project, which launched early in 2015, the Group now supplies electricity to Ketumbeine, a village that is home to 800 people. The installation of a mini-grid of solar panels, which will progressively be replicated throughout Africa, constitutes one of ENGIE's key objectives, which is to provide rural populations with access to environmentally-friendly energy.

This is an effective system which combines eco-friendly credentials with a novel business model. All 50 of the PowerCorner clients today pay their connection charge using a payment app (Mobile Money System). An operator working in the village is responsible for managing the PowerCorner site. The customer then consumes energy using pre-paid smart meters. Residents can also purchase electrical appliances under favorable credit conditions.

Following the clear success of this trial in the Arusha region, ENGIE now plans to develop mini-grid solutions elsewhere in Tanzania as well as in other parts of Africa. The initiative reflects one of the Group's strong commitments and meets Goal 7 of the United Nations Sustainable Development Goals: "Ensure access to affordable, reliable, sustainable and modern energy for all."

## TECHNICAL CHARACTERISTICS

12 minigrids with a total production capacity reaching 420 kW.

Consisting of photovoltaic panels with capacity of 16 kWp, a 45 KWh lithium-ion battery bank and a back-up genset, this mini-network serves to supply electricity to the village of Ketumbeine. 161 homes now enjoy clean energy without resorting to kerosene lamps, car batteries and power generators.



Kigoma area,  
Lindi, Mtwara,  
Tabora, Ruvua



3 million USD  
for 12 minigrids



March 2016



20 years



40 employees



# GREENING OF THE HEAT NETWORK OF THE CITY OF DAMMARIÉ-LES-LYS



## CONCESSION

Since 2018, the heat system in the city of Dammarie-les-Lys has been powered by geothermal, clean, renewable and local energy.

This project, fully enshrined in the city's environmental approach, heats the equivalent of 3,500 homes. Thanks to geothermal energy, this heat network is 86% powered by an ENR.

Concession related to operation and distribution of the geothermal heat network for the Abbaye districts and Plaine du Lys ( Geodalys, local subsidiary of Engie Networks).

## TECHNICAL CHARACTERISTICS

- Greening of the heat supply of the municipal network serving 3,500 equivalents-housing thanks to geothermal drilling at the dogger of 10 MW;
- Oil removal;
- Crossing the network at low pressure;
- Renovation of the boiler room / Setting up an 18 MW emergency point;
- Implementation of a 3 MW cogeneration engine.

## SERVICE UPDATE

Treatment of 24-hour drilling nuisances for 3 months near homes.



Dammarie-les-Lys (77)



20 million euros



March 24, 2018



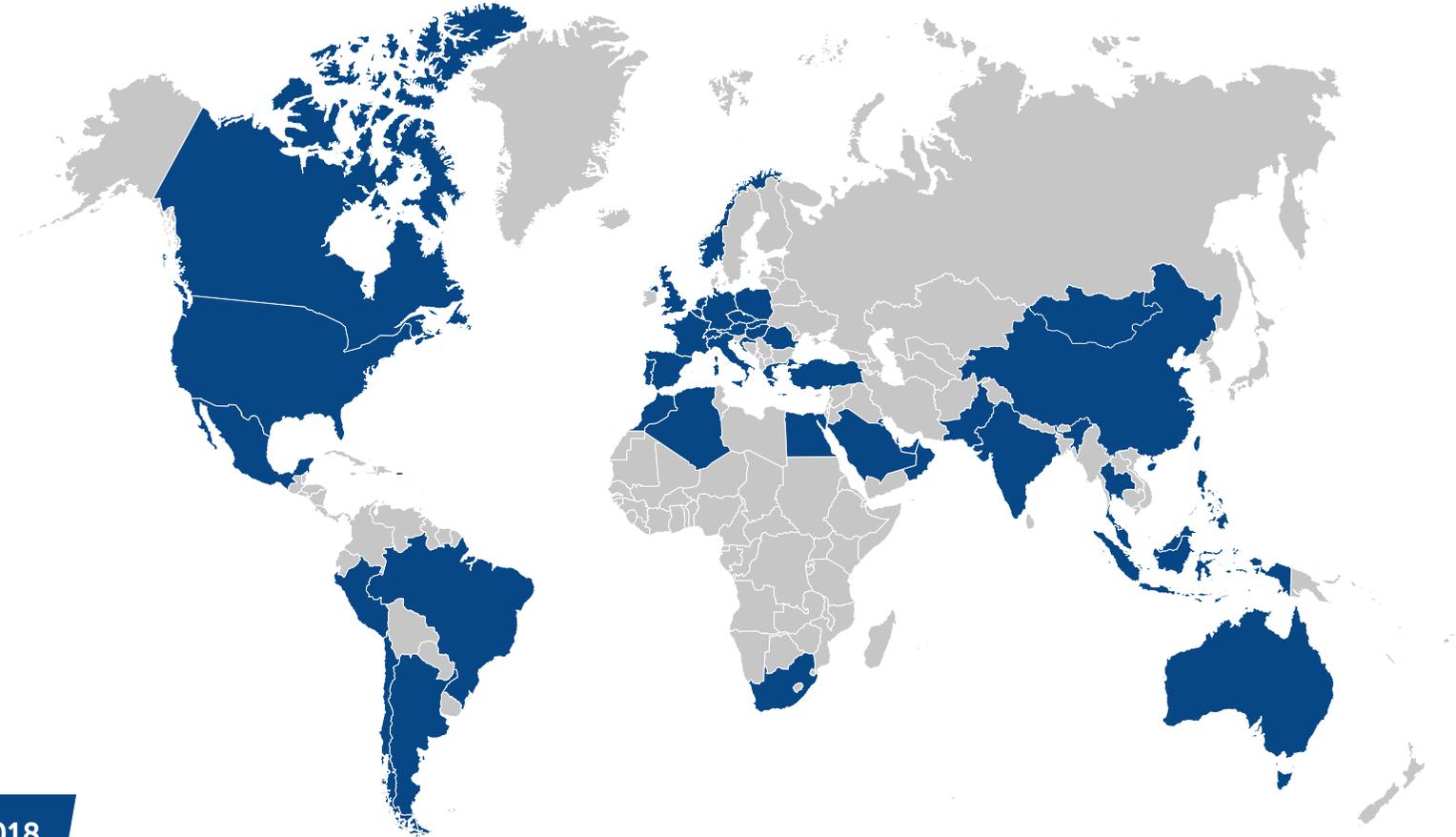
27 years



5 employees

# ENGIE IN THE WORLD

**Group activities:** engineering consultant in energy, water and infrastructure



### KEY FIGURES 2018

**160,000**  
collaborators  
in the world

**70**  
countries

**€66.2**  
billion business amount for the  
group (11.5 billion in France)



# ELECTRIFICATION OF CHITANDIKA THROUGH A SOLAR MINI-GRID SOLUTION



ENGIE inaugurates first mini-grid in Zambia and accelerates its electrification efforts in Africa.



## ELECTRIFICATION OF CHITANDIKA, UTILITY SERVICES AND OPERATION AND MAINTENANCE OF THE MINI-GRID

**Chitandika is located in the Eastern Region of Zambia, close to the border with Malawi and Mozambique. With about 1500 inhabitants, the village is lying 20 km away from the national grid and could not hope for an electric connection for at least several years.**

The development of the mini-grid has so far allowed the connection of 130 households and businesses. Besides the basic domestic electrical needs, PowerCorner also allowed for the connection of the local school and health center. The primary school now has a working computer room. The clinic has new fridges for vaccines and is lit up all night long for any urgency. Businesswise, the cost of milling or oil producing fell down thanks to a switch from diesel generator to solar energy – and air pollution also drove down !

Current development in the village include expanding connections and implementing a clean cooking program with electrical cookers.

### TECHNICAL CHARACTERISTICS

28 kWp solar mini-grid, 105 solar panels, 2 3-phase invertors and 48 Lead Carbon batteries / 28kWp mini-reseau solaire, 105 panneaux solaires, 2 onduleurs tri-phase, 48 batteries Lead Carbon.



Chitandika  
Zombie



USD 300,000



3 April 2019



6 employees



# RENOVATION OF THE PUBLIC LIGHTING PARK IN MONTARGIS



Technology at the service of a connected and smart city.



## LEASING WITH OPTION TO PURCHASE

To offer a public service always more effective, economical and environmentally friendly, Montargis city chose ENGIE Ineo to renovate its public lighting.

To renovate public lighting for connected citizen: 2 priorities for Montargis.

Montargis wants to transform its public lighting for a public service responsive, effective and improving quality of life of its citizen. So Montargis decides to renovate its public lighting with new technologies that provide energy savings of 70%.

Thanks to its big proximity and its detailed knowledge of the challenges of the territory through its agency of Montargis, ENGIE Ineo teams support the city of Montargis for this renovation. All of the 2 657 lighting points of the city are replaced by LED. Maintenance will last 5 years.

To transform Montargis in a connected city, the 5 new WI-FI connexions are supported by public lighting infrastructure allocated in the city. These hot spots are embodied by a « high bar table », to put a smartphone or a computer. Thus, Montargis can offer to inhabitants or tourists places to meet.

Thanks to its new contract of leasing, Montargis can move towards a connected and smart city.

## TECHNICAL CHARACTERISTICS

Public lighting LED, remote control of public lighting for each point or for each street, wifi hotspot.

## CONSTRAINTS OF COMMISSIONING

Short timing since we renovated public lighting in 3 months.





# THE IDEX GROUP, MAJOR PLAYER IN THE ENERGY TRANSITION



Through its two businesses, the Idex Group is now a French player in the energy transition.

## ENERGETY EFFICIENCY SERVICES

### MANAGEMENT OF BUILDING THERMAL INSTALLATIONS

- Heat, ventilation, air conditioning;
- Driving, optimization, maintenance;
- Optimized supply of energy;
- Performance commitment in the long term. First French group certified ISO 50001 (energy management) throughout its entire scope.

### ENERGY AND ENVIRONMENTAL PERFORMANCE OF BUILDINGS

- Choice of energies (classics, heat pump, wood, solar thermal...);
- Optimization of energy production and distribution equipment;
- Building envelope performance;
- Regulation, facility management, smart buildings;
- Action on behaviors.

### MULTISERVICE, MULTITECHNICS AND FM

- Global contract management (customers and end-users);
- Multiservice: reception, security, green spaces, reprography, moving, cleanliness, safety, fire...
- Multitechnics: management of high current fluids, weak currents, networks, elevators...
- Global management of works in Facilities Management (multi-technical and multi-service).

### CLIMATE AND ELECTRICAL ENGINEERING INSTALLATION WORKS

- Advice and study expertise;
- Completion of the work of climatic installations (boilers rooms, distribution...);
- Realization of new work and renovation;
- Our know-how concerns: heating, ventilation - air treatment, plumbing, air conditioning, smoke extraction, fluid distribution, fluid production, strong current/ low current electricity, technical management building...

## ENERGETIC INFRASTRUCTURES

### INTELLIGENT HEATING AND COOLING NETWORKS

- 50 heating and cooling networks operated;
- From the small rural network ... to the network supplying the whole of La Défense with heat and cold;
- Idex valorizes the relevant local energies: geothermal, biomass, recovery of fatal heat, solar thermal...
- A solution that combines comfort, cost control and sustainable development.

### ENERGY RECOVERY OF WASTE

- 16 energy recovery plants managed;
- Design, construction, financing, operation of energy treatment and recovery facilities;
- Waste management and incineration, methanisation, composting and biomass valorization;
- Valorization of heat and electricity.

### BIOMASS

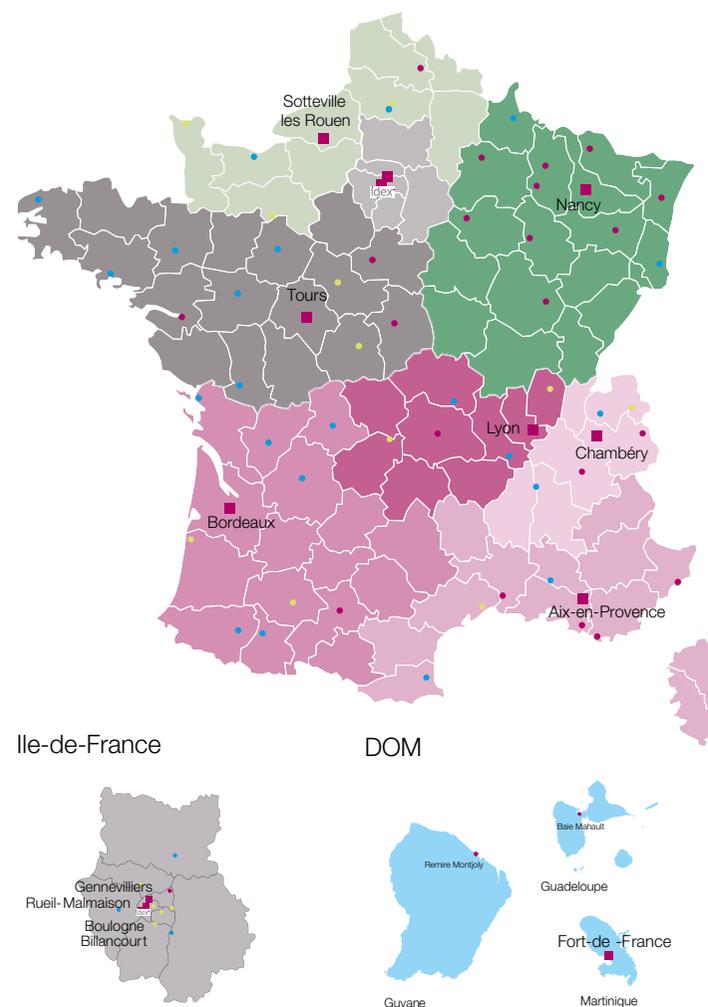
- 170 biomass boilers;
- A service specialising in the controlled supply of biomass for collective and industrial boilers;
- A guarantee of long-term operating performance;
- A mastery of boilers of less than 0.2 MW to more than 50 MW.

### GEOTHERMAL ENERGY

- Operating geothermal power plants since the 80's;
- Deep geothermal expertise and surface geothermal energy;
- Production of hot and cold.

The aim of the IDEX Group is **to reduce the territories' carbon footprint and optimize the energy bill of its customers** while ensuring their thermal comfort. The group supports the construction of the sustainable city, from the valuation and distribution of local renewable energies (geothermal, biomass) and/or recovery (waste recovery, data center, wastewater, cogeneration), energy performance and sustainable management of buildings (housing, tertiary, hospitals, industrial sites, etc.).

**France's leading independent energy services company, Idex**, which achieved a turnover of 929 million euros in 2018, is located throughout France with more than 100 branches and 4,000 employees, engineers and specialist technicians.



## KEY FIGURES 2018

**4 000**  
employees

**100**  
agencies

**929**  
million euros turnover

**19**  
business units



# REDEN SOLAR - AN INTEGRATED PHOTOVOLTAIC PLATFORM



French leader in solar energy with important international development objectives.



## POWER PURCHASE AGREEMENT (PPA)

Reden Solar is a leading utility-scale player in the PV market. Reden Solar has an installed capacity of more than 140MWp in France and 140MWp in selected international markets (equivalent to the annual electricity consumption of 80,000 households).

The projects in development represent a capacity in excess of 160MWp. Reden Solar is an integrated infrastructure platform throughout the entire PV supply chain from development to asset ownership.

InfraVia holds a 53% stake and continues to actively support the growth of the company.

## TECHNICAL CHARACTERISTICS

The role of renewable sources in the global power mix continues to increase. Solar power, which is increasingly competitive, is forecasted to become the world's largest source of electricity by 2050. In this context, Reden Solar's ambition is to develop 50 to 60 MWp of new capacity per year in France and other selected international markets.



France, Spain, Puerto Rico,  
Mexico and Chile



February 2017



92 employees

# INFRAVIA IN THE WORLD

**Group Activity:** an independent investment company specialised in the infrastructure sector



## KEY FIGURES 2018

**32**  
professionals

**11**  
countries

**30**  
investments

**€ 4.0 bn**  
of Assets Under Management  
across 4 infrastructure funds



# ERASME HOSPITAL BELGIUM



Healthcare facilities face crucial challenges.



**Continuity of healthcare, safety and management of health risks, availability of facilities and equipment, and economic and environmental efficiency.**

The unit in charge of the Université Libre de Bruxelles' energy policy must provide comfort to the patients and visitors of Erasmus Hospital, i.e. 130 000 m<sup>2</sup> including eight buildings dedicated to health care (over 1 000 beds), as well as research and teaching. Its goal is to improve energy efficiency and increase the share of renewable energy in the hospital's energy mix.

Veolia has fully renovated the heating plant by installing two CHP engines and converting the steam heating system into a hot water heating system. Implementation of an intelligent flow management and operating system to measure energy savings.

The Hubgrade platform is an energy performance management centre created by Veolia. The millions of bytes of data collected on the site are sent to analysts to build action plans. Operators implement these plans and intervene in real time when problems are detected. This threefold control of the process allows Veolia to contractually commit to the energy savings achieved.

#### TECHNOLOGIES

- Hubgrade platform to monitor the energy performance of equipment.
- 21.4 MWe CHP engines.

#### ENERGY EFFICIENCY

- Veolia commits to a percentage of savings by signing an Energy Performance Contract. If, at the end of the contract, this percentage is not achieved, Veolia reimburses the difference.
- Energy facility availability guaranteed for over fifteen years.
- Management, maintenance, and full guarantee of the two engines for fifteen years.

#### ENVIRONMENTAL PERFORMANCE

- Management and guarantee on the number of green certificates.

#### ECONOMIC PERFORMANCE

- Financing by a financial partner.
- 18 % savings on gas and electricity bills: a reduction of 6 000 MWh/year, equivalent to €300 000 in savings per year.



Brussels  
Belgium



Contract term 15 years,  
renewed in 2015



33 000 admissions/year,  
370 000 patients, and  
some 400 researchers

## THE FRENCH KNOW-HOW IN THE WORLD

in management and financing of public services and infrastructures



# PUBLIC TRANSPORT OF PASSENGERS

Proof by example



Institut de la  
**gestion déléguée**



# SOME OF KEOLIS NETWORKS IN THE UK



# KEOLIS

## 3 examples: train, metro & light rail



**Keolis has been present in the UK for over 20 years. Since 1996, Keolis has introduced more new trains than any other operator and has positively transformed mobility services on several key routes.**

Keolis operates some of the UK's busiest rail franchises as part of joint venture agreements. These include Southeastern and Govia Thameslink Railway (GTR). We are presently working in partnership with Network Rail and Siemens on the GTR franchise (a network that crosses London from north to south) to provide 50% more passenger capacity on trains. In total, we help to deliver 30% of heavy rail journeys in Britain.

Keolis is the leading provider of light rail in the UK, running Docklands Light Railway, Nottingham Express Transit and Manchester Metrolink. At present, we deliver one in every two light rail journeys in the UK.

In May 2018, KeolisAmey was awarded the Wales and Borders franchise to operate the Wales and Borders Rail Service and the South Wales Metro in partnership with Transport for Wales (TfW) and started the operations in October 2018.

### REGIONAL TRAIN NETWORKS : WALES & BORDERS

- Length of the contract : 15 years
- 1,623 km long network, with 247 stations
- 128 train units
- 32.3 million annual journey

### AUTOMATED METRO NETWORK – DOCKLANDS LIGHT RAILWAY (DLR) IN LONDON

- Length of the contract : 7 years (with possible extensions)
- 40 km long network, with 45 stations
- 50 metro trainsets (149 metro cars)
- 125 million passenger journeys per year

### TRAM NETWORKS – NOTTINGHAM TRAM

- Length of the contract : 23 years
- 32 km long network
- 51 trams stops
- 37 trams sets
- 18 million passengers per year



United Kingdom



4,500 employees excluding minority joint venture)



3 regional train networks  
2 tram networks  
1 automated metro network



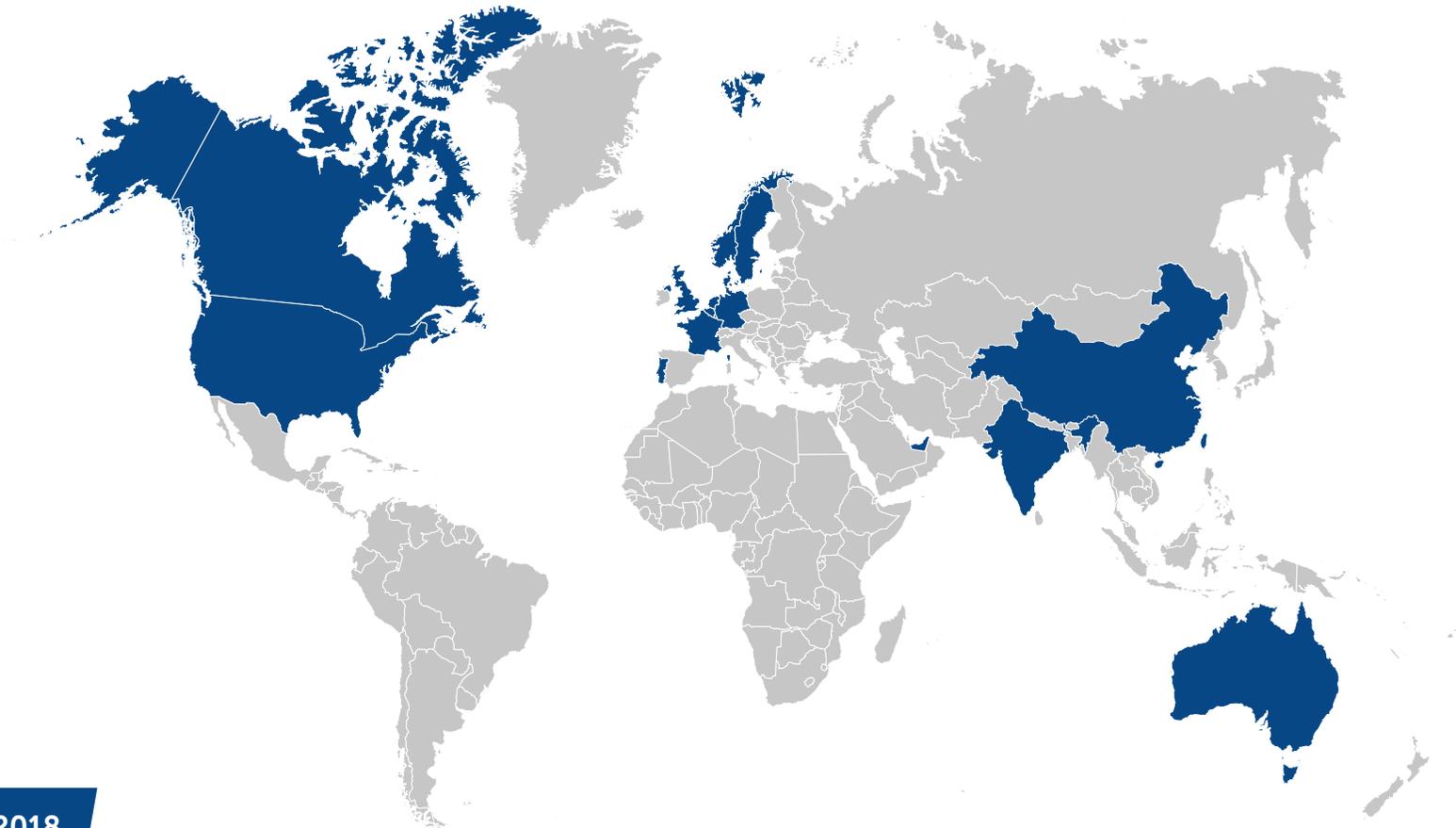
720 million passengers carried in 2018



4,743km of lines

# KEOLIS IN THE WORLD

Group activities: public transport



## KEY FIGURES 2018

**65,000**  
employees worldwide

**16**  
countries

**300**  
public transport authorities  
have placed their trust in Keolis

**5.93**  
billion turnover for the  
group (53% in France)

**3.3**  
billion passengers  
carried

**1<sup>st</sup>**  
global operator  
of Tram & Metro



# MOBILITY AS A SERVICE (MAAS)



# KEOLIS

## 3 examples: Dijon, Orléans and Rennes.

### 1. Plan your journey in real time

The combination of all public and private transport modes of the territory (train, metro, tram, bus, on-demand transport, carpooling, car sharing, taxi, self-service bike, walk, car, bike...) makes it possible to propose the most suitable itineraries for each situation. All information is presented to allow users to choose the most relevant options for their needs.



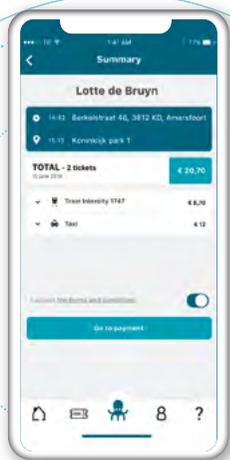
### 2. Book your trip & Pay

For all the stages of the journey, whatever the modes, only one payment is necessary. The payment methods offered are adapted to each territory (credit card, direct debit...)



### 3. M-ticket

The smartphone becomes the key to access all services, thanks to digital tickets: NFC, barcode, flashcode...



### 4. Single account

One account for all services, for the user and all the family.



### 5. Real time and customization

Personalized information in real time.



For aspiring smart cities, the successful implementation of MaaS is a key part of any future mobility strategy and demands a new way of working:

An integrated eco-system of actors and modes, combining private and public transport in a seamless experience. Neolis, Keolis's successful network planning methodology, integrates an already highly developed eco-system of new mobility startups into the mass transit network.

A consumer-led proposition that is attractive in price, packaging and product. Keoscopie, the observatory of mobility habits of Keolis, helps to understand the individual consumer's needs in each local area. Drawing on our marketing experience worldwide, Keolis allows city authorities to create quickly and effectively a winning MaaS product.

An agile, modular approach to technology, combining existing infrastructure with high functioning digital interfaces. Keolis, its digital factory Kisio Digital, and numerous technology partners propose tried and tested modular solutions that allow cities to deploy MaaS products at least cost.

As a pioneer of integrated multimodal networks and with a long history and culture of building successful partnerships, Keolis will continue to help public authorities bring vitality and dynamism to their region, developing tailored MaaS solutions.

### IN ORLEANS, PASSENGER TICKETS ARE STORED IN THEIR SMARTPHONE

A single app to prepare the journey, buy the ticket and validate it:

- Multimodal itinerary calculator integrating bus, tram, on-demand transport, bike and walking;
- Purchase of transport tickets or top-up subscriptions;
- Mobile Ticket in the form of a barcode;
- Real-time geo-localised information around me indicating up-coming arrivals and walking maps.

17 cities in France and Canada currently use the Plan-Book-Ticket solution developed by Kisio (the digital subsidiary of Keolis) for Orleans.

### IN DIJON, PASSENGERS USE THEIR CREDIT CARD AS A TICKET

Since March 2018, more than 74,000 passengers have used the Open payment system on the tram network (developed in partnership with Worldline).

Furthermore, mobility services extend even further than the city public transport network; the DiviaMobilité app integrates:

- Carpooling (DiviaPouce) plus on-street parking, car parks and also regional coaches;
- Predictive availability of bicycles.

### IN RENNES, THE KORRIGO PASS INTEGRATES MULTIPLE TRANSPORT MODES AND PUBLIC SERVICES

The Korrigo Pass hosts all types of transport tickets (city transport and all trains and buses) plus community services and facilities (swimming pool, library, car parks ...) across the region.

The Star app provides personalised connected services:

- Real-time information on traffic congestion and parking space availability, as well as about carpooling, cycling, P+R and traditional travel modes;
- Information on sites of interest;
- A completely personalised welcome screen.

300,000 Korrigo Passes currently used in Rennes Metropole  
650,000 across the Brittany region.



# THE NEW LINE 16 OF THE GRAND PARIS EXPRESS



A project management mission for the T1 section.

This section of the line 16 with a length of approximately 21 km will be made entirely in underground using the tunnel boring machine. It starts at the level of the connection facility of line 16 and 17 located in the town of La Courneuve before the station of the Grand Paris Express Bourget RER (included) and ends at the north of the front station of the Grand Paris Express Noisy-Champs (not included in this section).

This section includes seven stations, five of which are interconnected:

- Bourget RER station, interconnected with RER B and TLN;
- The Blanc-Mesnil and Aulnay-sous-Bois railway stations without interconnection;
- The Sevrans-Beaudottes and Sevrans-Livry stations interconnected to the RER B;
- Clichy Montfermeil station interconnected to Tram 4;
- Chelles station interconnected to RER E and Transilien P.

The Bourget and Clichy-Montfermeil stations are emblematic. The project also includes ancillary works (relief and ventilation wells) and installation works for connection to maintenance and storage sites.

## TECHNICAL FEATURES

The project management mission covers all the technical fields related to the design and construction of the civil engineering structures and installations necessary to the realization of the transport infrastructure. It is composed of the following elements:

- Basic Design (in two phases);
- Tender Design (in two phases);
- Assistance for the awarding of works contracts;
- Visa of Details Design;
- Direction of Works Execution;
- Assistance with receiving operations and the guarantee of perfect completion.

## CONSTRAINTS OF COMMISSIONING

There is a constraint on the planning of this project. The commissioning date this line should be before 2024. Moreover, this line is in interface with work in progress or to come, in particular the line 17 north, line 14 north and line 15 south and east.



© Architecte DUTHILLEUL



Ile-de-France  
France



2024



10 years  
2014-2024



15 employees



# SYDNEY LIGHT RAIL NETWORK



A future – proof transit system and a huge win for customers



## A LONG TERM PUBLIC-PRIVATE PARTNERSHIP

The NSW Long Term Transportation Master Plan is the NSW Government’s strategy to address Sydney’s transportation challenges due to of growth in population, mobility demand, employment and economy. In 2014, Transdev Sydney, as part of the ALTRAC consortium, alongside partners Alstom Transport Australia, Acciona Infrastructure Australia and Capella Capital, was entrusted with full management of the Central and South East Light Rail project: designing, building, financing, operating and maintaining the new light rail system for period of 15 years.

It is a four stage process to deliver new and improved light rail services in Sydney: Stage 1: Service integration & improvements; Stage 2: Modernize and extend the existing network; Stage 3: Deliver new services; Stage 4: Undertake longer term investigations.

Transdev Sydney has proudly operated Sydney light rail services since 1999. The new and significantly expanded light rail system, planned for 2019, will transform public transportation in Sydney: greater capability and reliability, less congestion and less pollution, better pedestrian safety... The new network will also improve intermodality with trains, buses and ferries. The strength of the proposal presented by Transdev and the ALTRAC consortium is that it addressed the strategic, organizational and technical concerns raised by the government.

## TECHNICAL CHARACTERISTICS

**System: Inner West Line: 12.8 km of track, 23 stops, 1 depot, 2 stabling areas.**

Central & South East Line: (estimated opening 2019) 11.8 km of track, 19 stops, 1 operation, 1 stabling area, 1 heavy maintenance area, 1.5 km wire free section.

A 24-hour Operational Control Center allows a real-time network monitoring through a continuous voice communications between drivers and the active duty controller, CCTV cameras at all stops and onboard all vehicles, and a live Rail Events Database recording all incidents and hazards for corrective action.



# TRANSDEV IN THE WORLD

Group activities: operator and global integrator of mobility

## NORTH AMERICA

United States of America  
Canada

## SOUTH AMERICA

Chile  
Colombia

## AFRICA

Morocco

## EUROPE

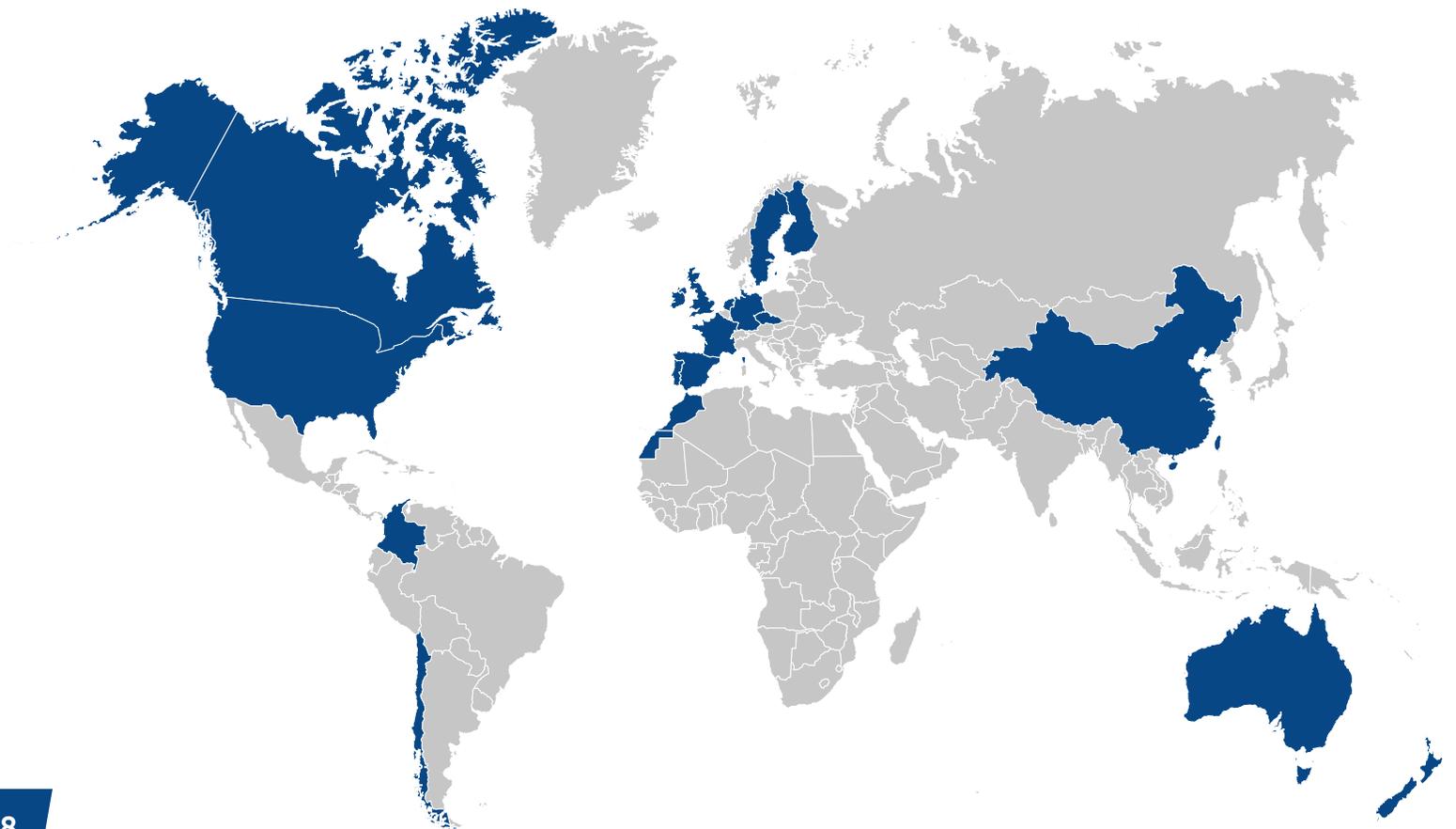
France  
Germany  
Czech republic  
Finland  
Ireland  
Spain  
United Kingdom  
Sweden  
Netherlands  
Portugal

## ASIA

China

## OCEANIA

Australia  
New Zealand



## KEY FIGURES 2018

**82,000**  
employees worldwide

**5**  
continents

**€6.9 bn**  
revenue from ordinary  
activities (ROA)

**11**  
million passengers  
trips every day

**3.5**  
million passengers travelled in Transdev  
autonomous vehicles since 2005

**1<sup>st</sup>**  
european operator of zero  
emission electric buses



# A "METRO STYLE" LIGHT RAIL SYSTEM



A pioneer in light rail construction and management



## FINANCING AND CONSTRUCTION OF THE LIGHT RAIL MANAGEMENT OF THE TCAR SYSTEM (LIGHT RAIL, BRT, BUS)

By the late 1980s, Rouen's transit system was saturated and the city needed to create a more efficient mode of transportation. In 1990, the Greater Rouen community launched a tender to build and finance a "metro style" light rail system and operate its integrated public transit network. The contract was awarded to the concession holder SOMETRAR, which outsourced the operation to TCAR, both fully owned by Transdev.

The objectives were to:

- Manage the light rail system in integration with other transit services such as BRT, buses, and paratransit services for customers with special needs;
- Provide a high performance transit network by optimizing connections, managing service disruptions and handling passenger information;
- Maintain the light rail system and its stations;
- Advise the Transit Authority about rolling stock replacement and major infrastructure maintenance;
- Manage the marketing operations and satisfaction policy.

### TECHNICAL CHARACTERISTICS

**System: 2 light rail lines (18.3 km) with 1 shared trunk line (3.2 km of which 1.7 km of tunnel) and 31 stations including 5 underground.**

Ongoing support for a fully integrated and complex system:

- A single control center manages three modes of transportation (light rail, BRT and buses), involving totally different technologies;
- Introduction of 5 BRT lines in September 2014 with high frequency (on average a bus every 8 minutes) on partly dedicated lanes;
- With more than two kilometers of underground routes, Transdev offers professionalism and a commitment to maintaining a high level of technical expertise.



Rouen  
France



1994



30 years



1,177 TCAR employees  
(including 706 drivers)



1.47 million km/year  
17.5 million passengers/year



# TWO INTEGRATED LIGHT RAIL LINES



A new pulse for the city



## INVESTMENT, CONSTRUCTION, OPERATION AND MAINTENANCE

In the historic city of Reims located in the famous Champagne region, the local community sought to achieve its mobility vision through a complete reinvention of the public transit system and the creation of two integrated light rail lines. A Public-Private Partnership was entrusted to develop the project, involving the local community and respecting the city's architectural and cultural heritage.

The objectives were to:

- Design, build and operate a brand new tramway in the city of Reims, integrated into the existing network and capable of satisfying current and future mobility needs;
- Propose attractive and innovative features from the outset in order to increase tramway use significantly.

Mobility and intermodality had been boosted :

- A completely reinvented network: routes and schedules optimize intermodality, with particular attention to connections with the regional and national rail network, with two high speed stations and four local train stations served.
- Centralized Operational Control Center (OCC): coordination of the entire transit system from a modern technical center.

## TECHNICAL CHARACTERISTICS

**System: 2 lines, 11.2 km of track, 23 stops (of which 1.9 km without catenary), 18 trains, 3 Park & Rides.**

Responsible for the project's investment, construction, operation and maintenance, this innovative urban Public-Private Partnership achieved:

- Speedy construction: new engineering techniques enabled installation of up to 300 m of track per day;
- Respect for the local urban landscape: next generation buried catenaries were used for the 1.9 km area around the Cathedral and other important architectural and historic sites;
- Transformation of the urban landscape: more than 100,000 m<sup>2</sup> of lawn and 2,500 trees were planted; building facades were renovated along 11 km of the tracks.



Reims  
France



April  
2011



30 years



570 Transdev Reims employees  
(including 421 drivers)



45,000 passengers/day  
3,300 km/day

**THE FRENCH KNOW-HOW IN THE WORLD**  
in management and financing of public services and infrastructures



**ROAD, RAILWAY, AIRPORT AND PORT  
INFRASTRUCTURES**



Institut de la  
**gestion déléguée**

Proof by example



# CONSTRUCTION AND EXTENSION OF THE ISTRIAN MOTORWAY



Construction of 145 km new toll road and extension of this road along 28 kilometers.

## FINANCING, DESIGN, CONSTRUCTION AND OPERATION CONTRACT

**Croatia signed in 1995 a contract with Bina-Istra for its first motorway under a concession.**

The project foresaw the financing, design, the construction and operation of a toll road network 145 km long – the Istrian Y Project, the backbone of Istria's road network, with Bouygues Travaux Publics as main shareholder of Bina Istra. Operation & maintenance with 260 employees is carried out by Bina Istra O&M, a subsidiary of Bina Istra. The project was implemented under several stages, with 3 successive financial closing.

Bina Istra signed in October 2018 an amendment to the Concession Agreement to allow for expansion works (Phase 2B1) encompassing the construction of a second carriageway and emergency lanes on a 28km stretch of the motorway.

The project will significantly enhance road safety by reducing congestion, connect Istria with the rest of Croatia, increase tourism in region, and it will also largely contribute to regional growth with the involvement of more than 90% of local contractors and labour working under the supervision and coordination of Bouygues Travaux Publics.

## TECHNICAL CHARACTERISTICS

Bina Istra was able to finance the new development stage by raising an additional financing with term loans amounting 240 M€, with 4 new lenders, while keeping in place the existing financing.

- The first challenge was to obtain the required waiver from the pool of 18 existing lenders and to structure intercreditor and security arrangements balancing interests from new and existing lenders.
- The second challenge was to obtain the approval by the European Commission of the new modified Concession agreement reflecting market practice and EU requirements, and the concession period extension for 6.5 years.

*\*The project was implemented under several stages, with 3 successive financial closing, representing a global investment of cca [800] M€, and a new stage representing cca 170 M€ of new capex.*



Croatia



A global investment  
of cca 970 M€\*



First delivery  
in 1999



4 contracts  
since 1995



# THE NÎMES-MONTPELLIER RAIL BYPASS



The first mixed line, passengers and freight, at national level.



## FINANCING CONTRACT, DESIGN, CONSTRUCTION AND MAINTENANCE AS PART OF A PUBLIC-PRIVATE PARTNERSHIP

The project, carried out under a 25-year partnership contract, includes financing, design, construction and maintenance of 80 kilometers of new line, including 60 kilometers of high-speed line between Manduel and Lattes in the extension of the LGV Midi-Mediterranean between Avignon and Nîmes.

This mixed-traffic rail bypass (high-speed trains and freight trains) aims to improve:

- The quality of service for passengers, with a development of regional trains on the classic line and increased accessibility of regional metropolises thanks to the high-speed offer.
- Performance for freight transport between Spain, France and Italy.

### TECHNICAL CHARACTERISTICS

The construction by Bouygues Public Works of the Nîmes and Montpellier railway bypass (CNM) creates the first mixed line, passengers and freight, at the national level, with one of the largest countervailing operations in Europe :

- Hydraulic transparency, noise protection, protection of biodiversity native plants and fauna, involvement of SMEs and craftsmen.
- In connection with RFF, several ecological corridors, located on the route of the line, have been the subject of special attention in order to be protected.
- 126 protected species identified and 1,800 ha of compensatory measures put in place.

In total, 128 registered protected species benefited from compensation measures on 1800 hectares.

### RELATED CONSTRAINTS IN THE FINANCE

The implementation of its financing, in the first half of 2012, in the midst of the public debt crisis in Europe, the downgrading of France's rating and a presidential election, also constituted a very complex challenge. Indeed, the CNM project benefits from a subsidy rate much lower than previous railways and this has led to having to raise for CNM a private financing equivalent to that of BPL (Brittany Pays de Loire).



France



Project montant  
\$1.8 billion



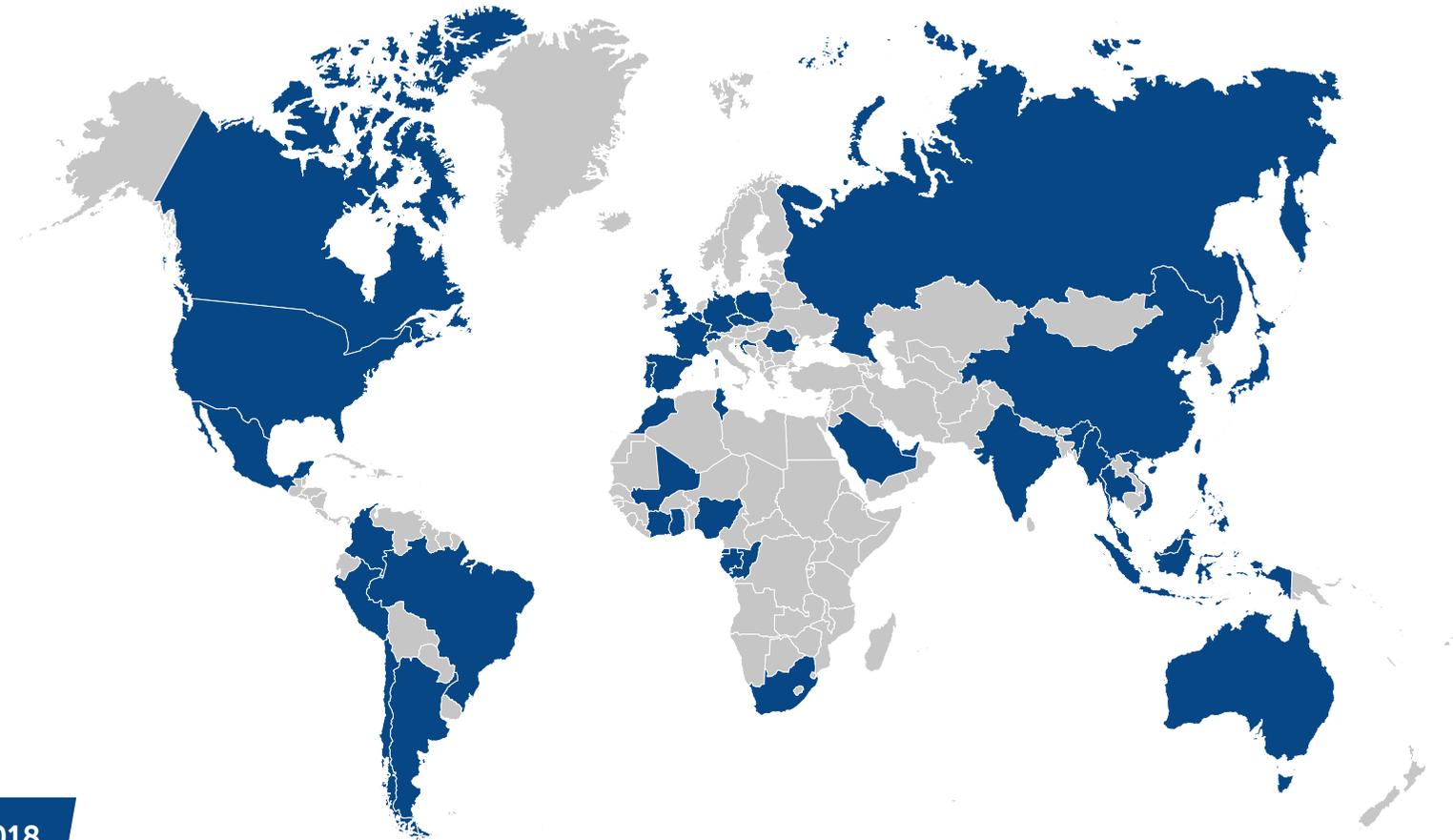
December  
2017



25 years

# BOUYGUES IN THE WORLD

**Group activities:** building, civil works, energies and services, concessions



## KEY FIGURES 2018

**56,980**  
collaborators  
in the world

**60**  
countries

**€12.4**  
billion of turnover  
(61% of international turnover)



# THE FIRST HIGH-SPEED TRAIN LINE IN AFRICA



Design-build of a 185-km section between Tangier and Kenitra, Morocco



© Jean-Michel Ruiz - Maroc Images

## DESIGN-BUILD CONTRACT

In 2013, Colas (Colas Rail and Colas Rail Morocco) won a contract with Egis Rail to design and build the Tangier-Kenitra high-speed railway line. This new service has been given the name "Al Boraq", in reference to the winged horse in islamic poetry.

The construction involved the track (studies and work on 185 kilometers of double track), catenaries and two engineering structures (studies, supply and works) located at Kenitra and Tine Sidi El Yamami.

GTR, a Moroccan road subsidiary of Colas for 90 years, also took part in the project by performing the earthworks, some 5 million m³ of cut and 2.5 million m³ of fill.

Out of the 1,000 Colas employees involved in this project, 95% were hired locally. A training center entirely dedicated to the project was opened to train new employees in railway safety rules. The organization made it possible to ensure a high level of safety on the construction site in line with Colas values and to start with an operational record: 3,564 meters of track laid in one day by the teams!

The railway and catenary lines were fully integrated and industrialized. Optimized interface management resulted in an average pace of 1,000 m per day.

Inaugurated by His Royal Highness the King of Morocco Mohammed VI, in the presence of French President Emmanuel Macron in the fall of 2018, the rail link between Tangier and Casablanca is the first high-speed rail line in Morocco and Africa. Trains travel at 320 km/h.

*"This project provides new structure for Morocco. It stems from a partnership between rail specialists who have been able to benefit from their local integration and pool know-how, engineering and technical expertise in the service of a major infrastructure project, unprecedented on the African continent,"* explains a senior official of the Moroccan railway authorities.

## TECHNICAL ISSUES

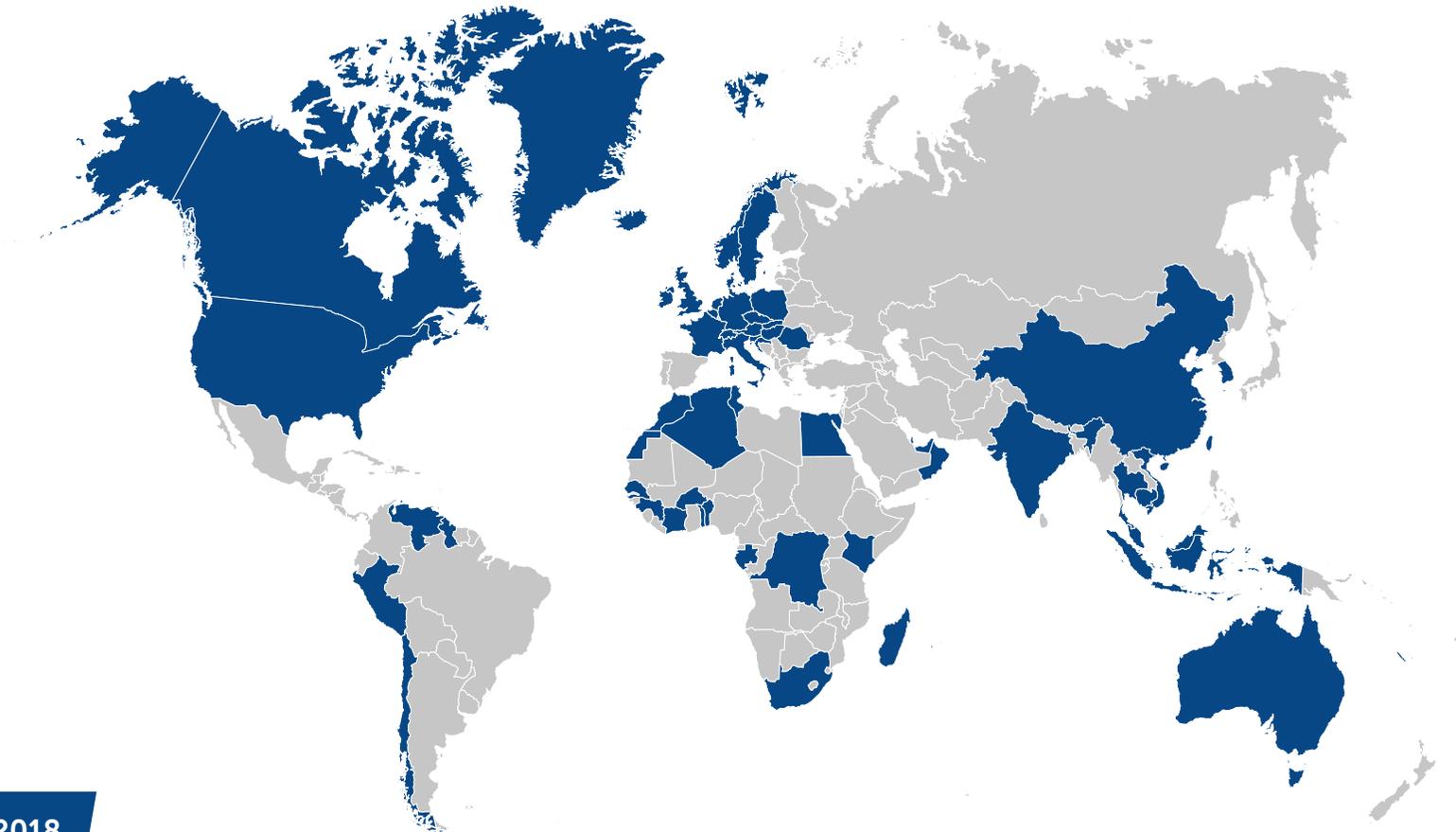
To ensure the stability of the viaduct located south of Tangier in a swampy area, piles were drilled 70 meters deep. There is not only a seismic fault, but also frequent, violent winds in the area, which meant that shock absorbers had to be added to the pillars of the viaduct along with continuous surveillance of the sensors.

Colas Rail was in charge of managing the interface and the use of the railways for all participants, as well as rail safety during the acceleration tests. The system allowed the safe completion of all railway work as well as peak speeds of up to 354 km per hour.



# COLAS AROUND THE WORLD

**Activity:** public works - **Main business segments:** roads, building materials and railways



## KEY FIGURES 2018

**58,000**  
employees worldwide

**+50**  
countries

**5**  
continents

**13.2**  
billion euros in revenue for the  
Group (51% outside of France)

**85,000**  
projects per year

**World leader**  
in the construction and maintenance  
of transport infrastructure



# ON THE RUNWAYS OF IVATO AND NOSY BE IN MADAGASCAR



## Upgrading at Antananarivo (Ivato) and Nosy Be (Fascène) airports



© Photothèque Colas

### CONCESSION CONTRACT

**Colas is a partner of the Ravinala Airports\* concession company as part of a concession on Ivato (Antananarivo) and Fascène (Nosy Be) airports in Madagascar.**

The concession granted by the Government of the Republic of Madagascar involves the upgrading and construction of infrastructure (terminal, runways, water treatment plants, networks, etc.) and the operation of these two airports, to accommodate growing air traffic and to make for a better passenger experience.

These two airports recorded passenger traffic of 845,000 and 147,000 people, respectively, in 2016, and are expected to experience annual average growth of more than 5% over the next few years.

Colas successfully completed this major project as part of a consortium with Bouygues Bâtiment International, and benefited from the longstanding expertise of its subsidiaries Colas Madagascar and Colas Projects.

The work at Ivato Airport included the construction of more than 250,000 m<sup>2</sup> of runways and a new 17,500-m<sup>2</sup> international terminal. The construction lasted 24 months and was completed on June 17, 2019, some 8 months ahead of schedule.

The teams in Madagascar also recorded excellent safety and environment performance. Indeed, this project was the first in the world to obtain the EDGE label, in partnership with IFC (a subsidiary of the World Bank's financial institution), focused on energy savings in airport buildings.

"The new international airports of Ivato and Fascene are among the largest and most modern infrastructure in the country, and will significantly improve the connection with Madagascar," boasted a senior political official of the country.

\*The concessionary company Ravinala Airports comprises Meridiam (45%), the ADP group (35%), the Bouygues group (20%) through Bouygues Bâtiment International and Colas Madagascar, a subsidiary of Colas, at parity.

### TECHNICAL CONSTRAINTS

In Madagascar, the issues involved in securing the supply of raw materials and specific equipment require excellent planning upstream from the project. For the construction work on the Fascène airport runway, located on the island of Nosy Be, a dedicated quarry was opened and the equipment and raw materials were delivered by barge. Air traffic remained open during the construction phase, which was an additional challenge, requiring a great amount of work to be done at night (more than 4,500 airplanes landed and took off from Ivato airport during the works).



Madagascar



140 million euros



December 23, 2016



28 years



500 to 1,200 employees depending on the period



# P3 FOR THE TROISSEREUX BYPASS



Finance, design, build, operation and maintenance of the Troissereux Bypass

## PUBLIC-PRIVATE PARTNERSHIP (P3)

On January 13, 2014, the Troissereux bypass company D3, comprised of Colas Nord-Est, Bouygues TP Régions France (subsidiaries of Bouygues Construction), and LIRI (an indirect wholly-owned subsidiary of HICL Infrastructure Company Limited, an investment company listed on the London Stock Exchange), signed with the Oise Departmental Council a 25-year public-private partnership (P3) contract covering the finance, design, construction, operation and maintenance of the Troissereux Bypass.

Colas Nord-Est (a subsidiary of Colas) built a 7.2-km four-lane roadway which has enabled users on Route D 901 to reach Beauvais safely and more quickly since the end of 2016.

The project also included the construction of 4 engineering structures as well as a 275-meter covered trench. The work lasted 35 months for an initial investment of 62 million euros. A total of 100,000 tonnes of asphalt mix was applied on the Troissereux Bypass.

The operation, maintenance and renewal were entrusted to Aximum, a subsidiary of the Colas Group, starting from the commissioning and for a period of 22 years.

## TECHNICAL ISSUES

One of the most complex issues on this project involved the actual land required to build it, as the route crosses through farm land. Good knowledge of the local network was an excellent asset.

Another complex environmental issue involved the construction of the covered trench. The structure crosses through a forest, and was designed to conserve the ecological corridor of a protected species of bat at the location.



© Yves Soulaillie



Troissereux  
France



62 million  
euros



January  
13, 2014



25 years



# THE THIRD LARGEST AIRPORT SYSTEM OF ITALY



SAVE Group - Airport system including the Venice and Treviso airports.



## CONCESSIONS

**SAVE manages the Venice airport system in North Eastern Italy.**

The company owns 100% of Venice Marco Polo airport, 80% of Treviso Antonio Canova airport, 41% of the Verona Valerio Catullo and Brescia Gabriele d'Annunzio airports as well as 18% of the Brussels Charleroi airport. Venice Marco Polo and Treviso Antonio Canova airports constitute the third largest Italian airport with a combined traffic in excess of 14.5 million passengers in 2018. The system serves the Veneto region, the 3rd richest Italian region and is the gateway for tourists visiting the area.

InfraVia holds a 44% stake and actively supports the growth of the group.

Venice and Treviso airports benefit from airport concession agreements expiring in respectively 2041 and 2053.



Italy and Belgium



August 2017



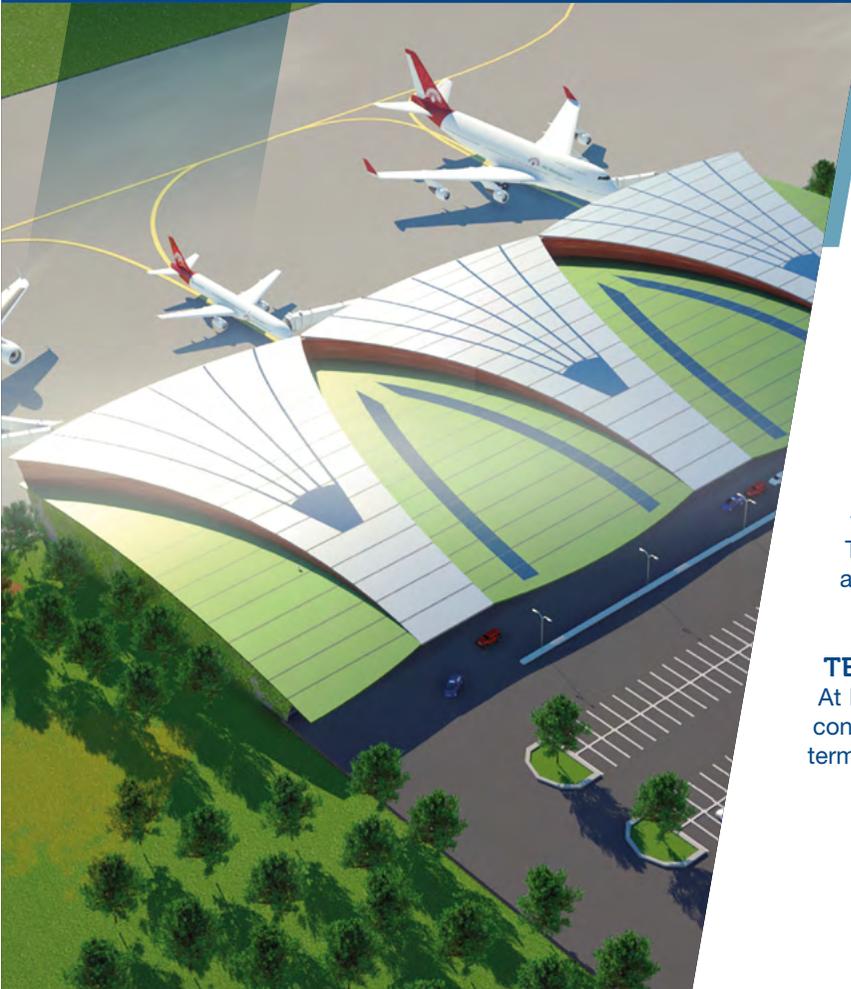
1 204 employees



# INTERNATIONAL AIRPORTS OF ANTANANARIVO (IVATO) AND NOSY BÉ



Ravinala Airports, concessionary company - Development and upgrading of the international airports.



## CONCESSION CONTRACT SIGNED IN JULY 2015

**Two major airports in Madagascar are being upgraded and operated by a consortium of French companies, as part of a unique public-private partnership project that promises to generate a single substantial economic growth in the country.**

The Conceding is the State of Madagascar, represented by various ministries.

The project is led by Ravinala Airports, a company formed by a consortium including Meridiam Infrastructure Africa (45% shareholder) Paris Management Airports (35%), Bouygues Building International (10%) and Colas Madagascar (10%).

The project includes the extension of Ivato International Airport, just north of the Malagasy capital, Antananarivo, and the improvement of Fascene airport to the popular tourist destination on the island of Nosy Bé, off the northwest coast of Madagascar.

Under the 28-year concession agreement, Ravinala Airports is responsible for the design, construction and financing of the modernization, as well as the operation and maintenance of both airports.

The majority of Ravinala's revenues come from an aeronautical development fee (RDIA) paid by the airlines using the airports. No subsidy from the public authority through a concession. An annual fee is paid by the contracting partner.

## TECHNICAL CHARACTERISTICS

At Ivato Airport, an additional international terminal (18,000m<sup>2</sup>) with a capacity of 1.5 million passengers per year is under construction. Existing facilities are being renovated and the airport runway has been redone. Similarly, in Fascene, the airport terminal and runway have been redesigned and modernized.



\*130 million euros in the form of commercial loans from financial institutions, 57 million from shareholders' equity and 32 million euros from income during construction).



# EXTENSION OF THE PORT OF CALAIS



The design, financing and construction of the « Calais 2015 » extension.



## CONCESSION

The Calais (FR) – Dover (UK) route is the shortest link between continental Europe and the UK. The traffic is shared between the Channel Tunnel (50%), the port of Dunkerque (10%) and the port of Calais (40%).

The traffic growth over the last 30 years and the forecast for the next 30 years, the experienced congestion and the evolution of the size of the ferries called for a capacity improvement in the port of Calais.

In 2012, the Nord Pas de Calais region, the statutory authority of the port of Calais, launched a call for tenders for the new concession of the ports of Calais and Boulogne-sur-Mer. The concession includes the extension works of Calais (Port of Calais 2015). CCI Côte d'Opale, as well as Meridiam and CDC Infra, as investment partners, have obtained the concession.

The revenues of the port mainly come from the fees paid by shipping companies depending on : The size of the ship, the volume of the freight and number of trucks, the number of passengers and cars / coaches. Freight is the main driver of the revenues. Tariffs are set in accordance with the Ports Code and tariff increase must be agreed with the Région.

## TECHNICAL CHARACTERISTICS

Current operation of the port experiences congestion periods. The scope of the extension of the port of Calais concerns:

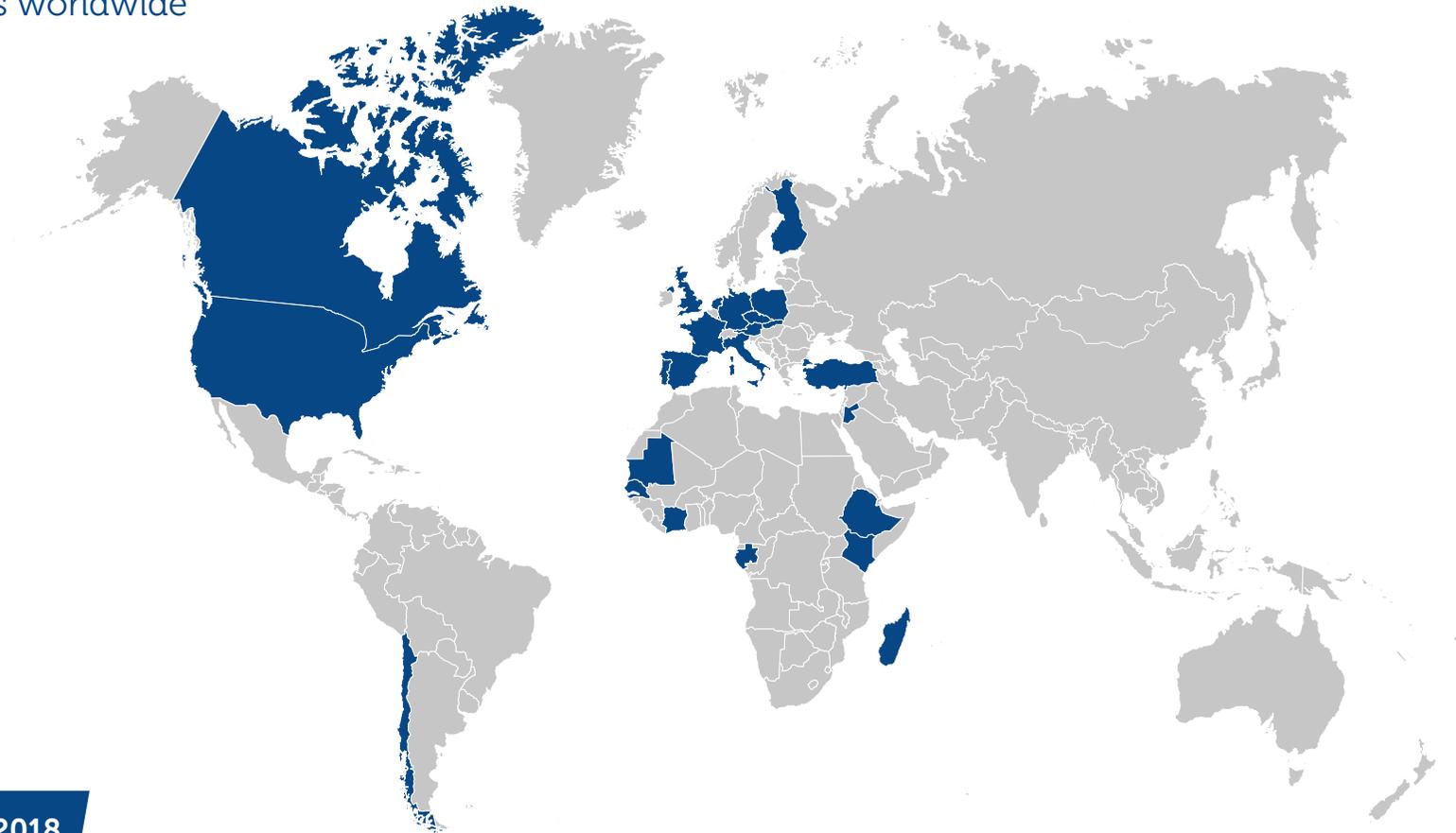
- New 3km sea wall, giving access to a new basin of 90 ha;
- 3 new ferry berths (230-240m size) + 1 new RORO berth;
- 70 ha of new park and storage areas;
- New multi-modal terminal (Rail – Road – Sea access);

Should the traffic further increase in the long term, the configuration of the new infrastructure will allow the construction of additional berths.



# MERIDIAM IN THE WORLD

**Group activities:** developer, investor and asset manager: a leader in positive social and environmental impact investments worldwide



## KEY FIGURES 2018

**250**  
employees

**23**  
countries

**3**  
sectors: mobility, energy transition  
and Environment, Social

**€7 bn**  
of assets under  
management



# ABIDJAN INTERNATIONAL AIRPORT TAXIWAY



spie batignolles

Overall renovation and development project at Felix-Houphouët-Boigny International Airport in Abidjan.

## WORKS CONTRACT

**Consortium: Spie batignolles Côte d'Ivoire (consortium leader), Spie batignolles Mallet (technical pilot), Franzetti Côte d'Ivoire, Inéo Energy & Systems.**

Extension of the airport's southern parking area, expansion of the taxilane, creation of a taxiway parallel to the main runway between the runway and the tarmac, installation of lighting and renovation of lighting. The creation of a taxiway (traffic lane) aims to optimize and develop traffic at Abidjan airport, both on departure and arrival. This route is intended to be used by aircraft.

It concerns several parking extensions works and the creation of new lanes. The contract led by the group includes 3 lots, Earthwork – Civil engineering, Beacons and Lighting. Work on lot 1 began in July 2017, after 4 months of preparation.

## TECHNICAL CHARACTERISTICS

The works began with earthworks, civil engineering of the beacons and sanitation before starting the construction of the pavement and then the installation of the beacons and lighting equipment.

## CONSTRAINTS

Abidjan airport remained operational during the various phases of the works.



Abidjan  
Côte d'Ivoire



€26.6M



December 2018



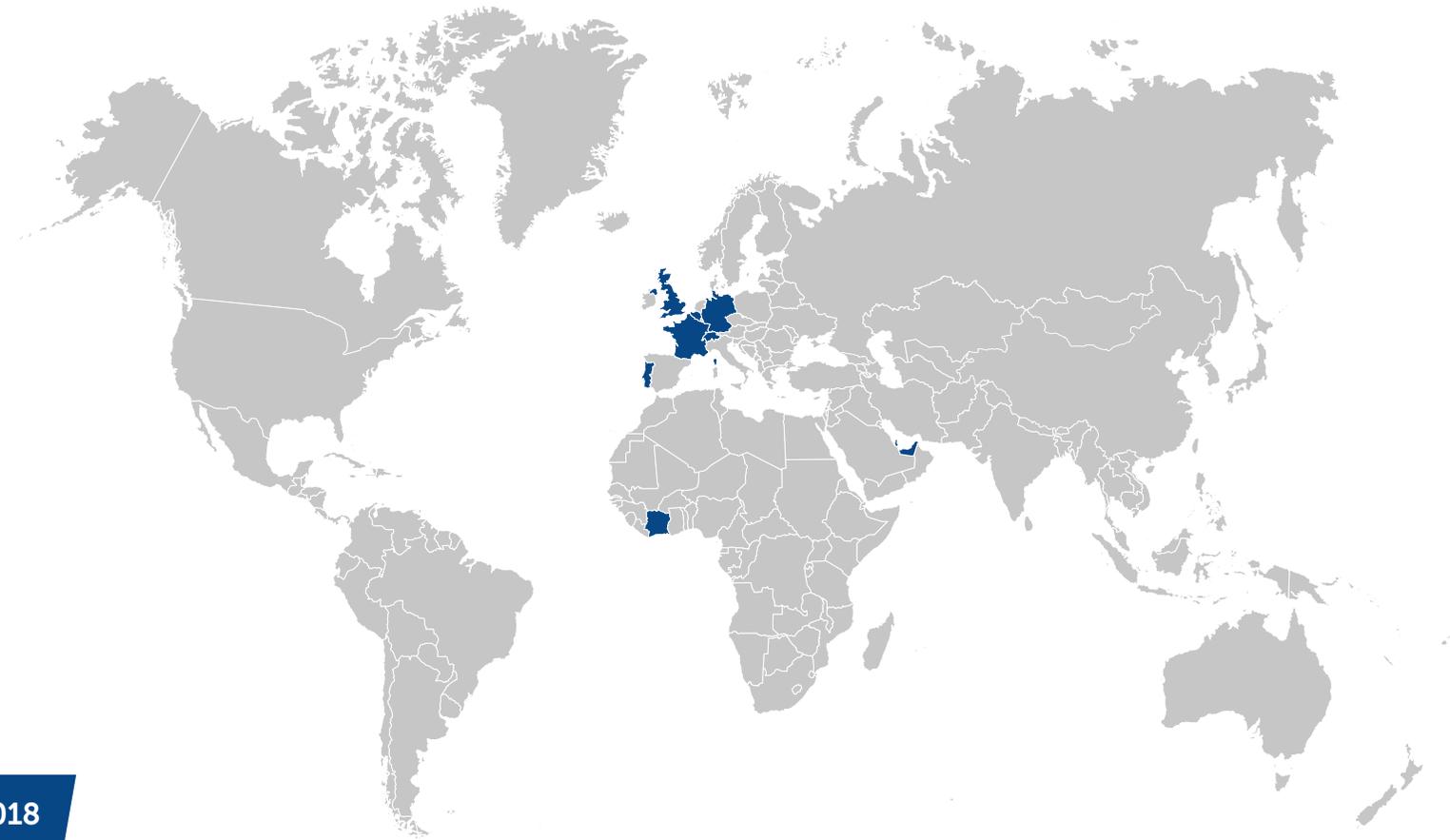
16 months



120 to 250  
employees

# SPIE BATIGNOLLES IN THE WORLD

**Group activities:** 6 areas of expertise - Construction, Energy, civil engineering, commercial real estate, public works, concession - divided into 3 areas: projects, major projects and local activities



## KEY FIGURES 2018

**174**  
employees worldwide

**8**  
countries

**2**  
continents

**€2**  
billion in turnover  
(including 97% in France)

**€50**  
million for export (with a target of €250 million  
in export turnover in the medium term)



# A63 MOTORWAY CONCESSION IN THE LANDES



spie batignolles

Concession over 105 km between Salles (Gironde) and Saint-Geours-de-Maremne (Landes).



## PUBLIC PRIVATE PARTNERSHIP

Concession of the A63 motorway by taking over the existing 2x2-lane road, bringing it up to geometric and environmental standards, widening it to 2x3 lanes, operating, maintaining and financing it.

**Concession. Group of companies (GIE): Spie batignolles Valérien, NGE, Colas.**

The consortium consisted of two financial investors, a motorway operator and three manufacturers. Spie batignolles Valérien, the earthworks subsidiary of the Spie batignolles Group, managed the technical offer. As an investor, Spie batignolles' teams played a very active role in the legal and financial construction of the offer, as well as in its contractual formulation.

## TECHNICAL CHARACTERISTICS

Technically, the project is characterized as a road widening project: no or few engineering structures, "surface" earthworks and creation of ponds, pavement, all with very unusual operating constraints due to the volume of traffic.

## CONSTRAINTS AND MAIN ISSUES

A major environmental challenge by bringing the existing road up to standard, particularly with regards to noise protection and water treatment and protection.

A road safety and traffic flow challenge by upgrading to 2x3 lanes and resuming certain geometric points of a particularly busy motorway with an average of 30,000 veh/day, with summer peaks of 80,000 veh/day and heavy truck traffic. The latter represent one third of the vehicles using this road.

A particular challenge related to the operation of the motorway, on the one hand by resuming the operation of the national road within three months of signing the contract, by integrating the civil servants of the State into the new private operating company, and on the other hand by carrying out all the widening works under traffic.

A financial structuring challenge (€1.1 billion) due to the payment to the State of an entry fee of €400 million almost equivalent to the amount of the works.



Les Landes  
France



€500M excluding VAT for works  
€1.1 billion in financing



December 2013



40 years



600 employees



# DEVELOPMENT OF THE NORTHWEST ROCADE OF TARBES



spie batignolles

Bypass of Tarbes in response to a challenge of spatial planning and the fight against nuisances.



## PARTNERSHIP CONTRACT

The consortium has provided all the necessary financing for the work and the department pays a rent to remunerate the consortium as soon as it is put into service and this for 20 years.

This project responds to a challenge of land use planning and pollution control by completing the Tarbes bypass in its north-western part, thus eliminating many heavy goods vehicle crossings in the city center. A technical challenge by the construction of hoppers perpendicular to the flow of the groundwater. An economic challenge in a context of declining revenues for all the departments.

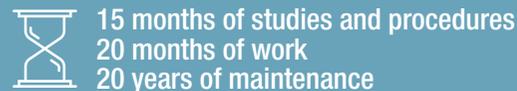
The contract covered the financing, design, construction and maintenance of the western ring road of Tarbes, consisting of a 1.7 km section to be doubled and a new 4.7 km section. The project includes 7 engineering structures, including the Echez crossing viaduct.

The project is characterized by the presence of specific structures (hoppers, lifting pumps, hydraulic structures, railway structures), by the operating constraints imposed by the level of traffic and winter service, and by the integration of existing sections to be renovated.

Spie batignolles Malet, a subsidiary of the Spie batignolles Group, was the representative of a consortium composed of the Caisse des Dépôts et Consignation and two other manufacturers, which designed the project and finalized the partnership contract.

## TECHNICAL CHARACTERISTICS

Triple point construction: 2 roads, mixed with railways.





# HIGH SPEED LINE: SOUTH EUROPE ATLANTIC (LGV SEA)



Monitory mission of conformity of the LGV to the technical and environmental requirements of the contract.

## CONCESSION CONTRACT

This project is implemented based on the concession contract between SNCF Réseau (formerly, Réseau Ferré de France) and LISEA, in charge of the design, construction, operation and maintenance of the project for 50 years.

It is to construct the 302 km South Europe-Atlantic high-speed railway line (HSL) between Saint Avertin in the south-east of Tours and Ambarès-et-Lagrave in the north of Bordeaux, with about 40 km of connection to the existing railway network, especially to serve Châtelleraut, Poitiers, La Rochelle and Angoulême.

With the investment capital of 7.8 billion euros, in 2017, this HSL can connect Bordeaux to Paris, taking two hours and five minutes to travel between the two locations

## TECHNICAL CHARACTERISTICS

The mission is carried out by a technical team temporarily established, to cover all the technical aspects (civil engineering + railway equipment) and environmental aspects of the project.

TRACTEBEL France is in charge of the followings of the mission:

- Management;
- Structures;
- Geotechnical engineering/ large earthworks;
- Roadway;
- Evaluation of the quality management system established by construction designers.

## CONSTRAINTS OF COMMISSIONING

The project was commissioned in its entirety at one time, and at the same time as the new high speed line Le Mans - Rennes (LGV BPL).



France



7.8 billion  
euros



July 2, 2017



7 years



15 employees



# IMPROVE THE USER EXPERIENCE AND SIMPLIFY ROAD MOBILITY IN DUBLIN



All-inclusive freeflow transactions solutions on Dublin ring road (M50).

## MANAGEMENT CONTRACT

**VINCI Highways, a subsidiary of VINCI Concessions, together with its partner, Abtran, the largest Irish-owned business process management provider, manages freeflow transactions services and customer relations on the Dublin ring road on behalf of its client, Transport Infrastructure Ireland.**

VINCI Highways delivers a complete service covering all technology, systems and operations to support transactions, payment collection and transmission to the state agency. Its mission includes installing and operating a new gantry crane with sensors to detect incoming vehicles, cameras and beacons for reading plates and tags. It also covers the design, implementation and management of a new back-office platform with data processing and information management capabilities to facilitate transactions.

VINCI Highways will also manage a global communications platform to develop the number of e-subscribers and promote new Mobility-as-a-Service schemes, increasing customers' convenience while meeting the urban challenges of fast-growing Irish capital.

With an average of 145.000 vehicles each day, Dublin ring road is the most heavily trafficked corridor of Ireland's national roads network.



Dublin  
Republic of Ireland



373 M€



April 16<sup>th</sup> 2019



11 years



# LYON-SAINT EXUPÉRY AIRPORT



Voted best European airport 2019 in the category 10-25 million passengers by ACI (Airport Council International).



## CONCESSION CONTRACT UNTIL 2047

The consortium made up of VINCI Airports, Crédit Agricole Assurances and the Caisse des Dépôts group acquired 60% of the shares of Aéroports de Lyon in 2016 under a concession agreement valid until 2047 for the airports of Lyon-Saint Exupéry, the second French regional airport, and Lyon Bron.

Three years after this privatization, the Lyon-Saint Exupéry airport has experienced an acceleration of its development allowing the territory to be better connected to the rest of the world. Significant investments have been made to increase the capacity and improve the operational efficiency of the airlines, but also to open new lines.

These initiatives have increased traffic by 27% since 2016, the platform having reached the milestone of 11 million passengers in 2018. In 3 years, 52 new routes were opened.

In terms of the environment, Lyon-Saint Exupéry is carbon-neutral. It has been accredited ACI 3+ by ACI (Airport Council International), which means that the airport not only reduces its carbon emissions, but also all his ecosystem in this process. VINCI Airports places innovation at the service of the continuous improvement of this quality of service and focuses on detecting and testing the necessary technologies. Lyon-Saint Exupéry airport is the first airport in the world to deploy a system of valet robots. This innovation brings a saving of time and comfort to the travelers while allowing the parking of 50% more vehicles in the carpark.

One of VINCI Airports' innovation hubs alongside London Gatwick and Lisbon airports, Lyon-Saint Exupéry is fully in line with VINCI Airports' quality of service policy, which aims to continuously improve the passenger experience at the 46 airports in its worldwide network.

## TECHNICAL CHARACTERISTICS

- Built-up areas (T1 - T2) : 177,000 m<sup>2</sup>;
- Freight terminal: 25,000 m<sup>2</sup>;
- CargoPort: 150 hectares;
- 2 existing tracks: track A (4,000 meters) and track B (2,670 meters);
- 2 planned tracks (APPM 1999) tracks C and D: 3,200 meters each.



Concession of 40 years (2007-2047) - purchase in 2016 of the share held by the State (60%) by the consortium composed of VINCI Airports - Crédit Agricole Assurances - Caisse des Dépôts Group





# HIGH SPEED LINE SOUTH EUROPE ATLANTIC



A new breath the South-West region.



## CONCESSION CONTRACT

South Europe-Atlantic high speed line, operated via a concession scheme by VINCI Concessions through its subsidiaries Lisea and Mesea, was commissioned in July 2017 after 5 years of work. It puts Bordeaux just two hours from Paris.

The line welcomed more than 20 million passengers in 2018 and, in 2019, Paris-Bordeaux became the busiest rail line in France after Paris-Lyon. A flow that feeds tourism and more broadly the local economy. The completion of these 302 km of new lines (and 38km of connections) is one of the largest infrastructure projects in Europe. Exceeding the requirements of the concession contract, the delivery of this structuring project took place one month in advance.

Since the start-up, the MESEA teams, in charge of track maintenance, are involved 24 hours a day to ensure the safety of traffic on the LGV. They meet particularly high safety and reliability requirements.

## TECHNICAL CHARACTERISTICS

- 302 km of new lines equipped with the ERTMS system;
- 38 km of connections;
- 500 works of art.

## CONSTRAINTS OF COMMISSIONING

223 protected species, 14 Natura 2000 areas and 3700 hectares of environmental compensatory measures, make LGV one of the largest environmental projects in Europe.



France



7.7 billion euros  
including 6.3 billion  
of investments



July 2, 2017



50 years



226 employees



# FRANCE – THE LONGVILLERS MULTIMODAL PARK



VINCI Autoroutes, partnering with territories to serve everyday life mobility.



In Ile-de-France, close to Paris, the A10 motorway is a key asset in the strategies of mobility carried out by both the State and local authorities. Thanks to this motorway, express bus lines can connect within 30 minutes the commuters from this area to central Paris via the RER B & C lines. Along the A10 is the Longvilliers Multimodal Park that offers the commuters free parking space to continue their journey to Paris with public transportation.

The Longvilliers Multimodal Park is currently being expanded. These works, amounting to € 6 million, are financed by VINCI Autoroutes as part of "Le Plan de relance autoroutier", signed with the French government in 2015.

These works consist in redesigning completely the current site to create a transportation hub offering a rich portfolio of services to encourage the commuters living in this area to change their way of commuting.

Transforming the current park into a true multimodal hub, that is accessible to all, will allow more people to benefit for free from this parking space and use the express bus lines running on the A10 to reach the RER B and C lines. The developments include the construction of 8 platforms serving 5 bus lines, as well as bicycle facilities and specific parking places dedicated to carpooling as well as disable people. The building welcoming commuters will offer many services as defined in consultation with both the current users and the local authorities.

According to a survey conducted in March 2019, 54% of the current users are saving 30 minutes on their daily commute. Two thirds of them estimate that they save between 500 and 3,000 € a year compared to using their personal vehicle.

This hub also promotes carpooling by easing relations between drivers and passengers. Indeed, according to a survey conducted by Ipsos on behalf of VINCI Autoroutes entitled "Les Français et les fractures de la mobilité dans les territoires", 38% of the respondents say they carpool but only 15% of them do it on a regular basis. The Longvilliers Multimodal Park will be a natural environment to encourage this new way of commuting.



Longvilliers  
France



6 million euros



Summer 2020

**THE FRENCH KNOW-HOW IN THE WORLD**  
in management and financing of public services and infrastructures



## COLLECTIVE CATERING



Institut de la  
**gestion déléguée**

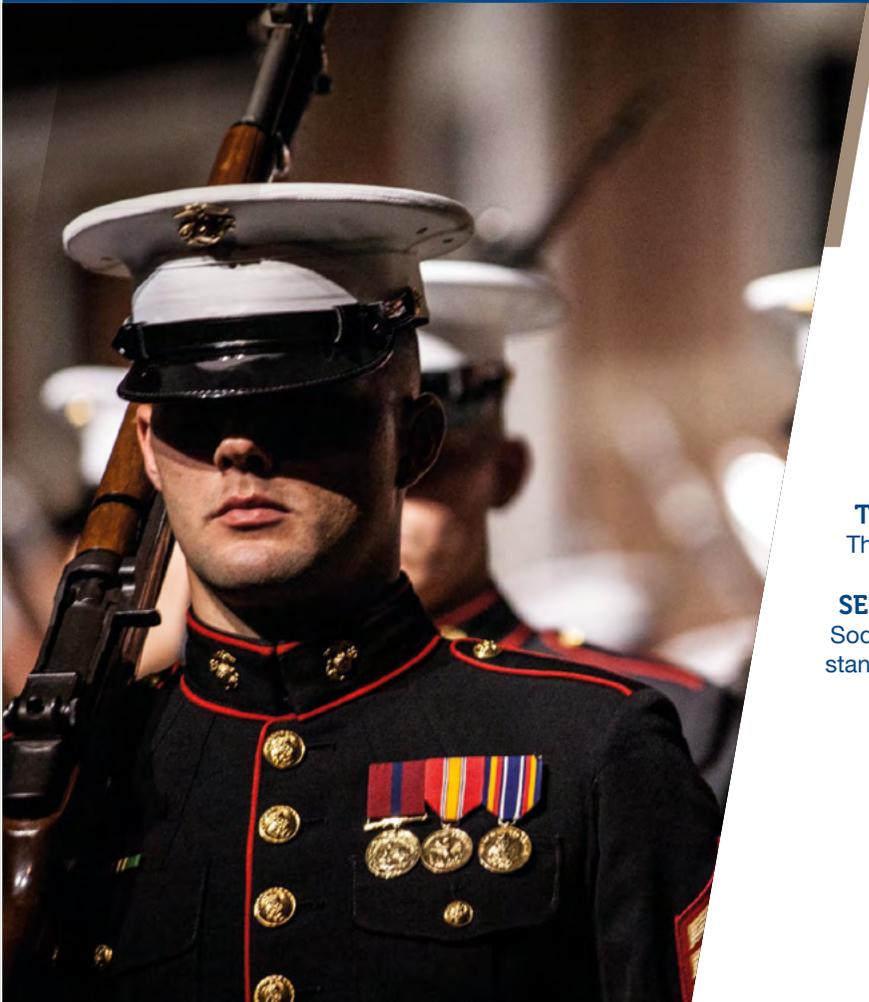
Proof by example



# CATERING OF US MARINE BASES



## United States Marine Corps Regional Garrison III (USMC).



**Sodexo, world leader in Quality of Life services and the nation's largest federal foodservice contractor, has provided services to USMC since October 2002.**

The company has fueled Marines for success on the battlefield through a multifaceted service approach focused on the overall quality of life of Marines, their families and USMC communities.

Sodexo's overall goal is to ensure USMC readiness by focusing on the six key dimensions contributing to quality of life: Health & Well- Being; Social Interaction; Ease & Efficiency; Physical Environment; Recognition; and Personal Growth.

### THE PURPOSE OF THE CONTRACT

- Food services;
- Kitchen equipment repair
- Maintenance services.

### TECHNICAL CHARACTERISTICS

Through RGIII, Sodexo will serve 29 million meals annually.

### SERVICE CONSTRAINTS

Sodexo uses more and more digital technology for food control processes to ensure outstanding quality and food safety standards.



United States of America



September 30, 2018



1 year contract - 7 additional one-year options.  
A partnership since 2002



2,800 employees



# CATERING AND CLEANING OF SECONDARY SCHOOLS IN A FRENCH COUNTY



114 secondary schools.



The Yvelines Council and Sodexo have teamed up to create C'Midy, a single mission public-private partnership, whose mission is to manage the food and cleaning services of its 114 secondary schools, since January 2019.

C'Midy aims to improve the quality of life of Yveline's pupils. This pioneering approach brings together a public shareholder - the county contributing 35% - and a private shareholder, Sodexo 65%.

Its objectives are to :

- Serve healthy and tasty meals to all the schoolchildren in ever cleaner and better-maintained schools;
- Make life easier for families with innovative services;
- Make catering and cleaning a lever for integration by continuing to recruit beneficiaries of the minimum social income;
- Contribute to economic, social and environmental development of the territory by including in particular local suppliers.

## TECHNICAL CHARACTERISTICS

- 48.000 meals served daily, 75 % of pupils are day pupils - 6 million meals per year;
- 600.000 square metres to be maintained;
- Nearly 100.000 hours of training during the term of the contract.

## SERVICE CONSTRAINTS

- Harmonize the quality of meals within the 114 secondary schools;
- Focus on traditional cuisine made with fresh local and organic products;
- Ensure the re-enrollment of 48.000 pupils within two months.



Department of Yvelines  
France



October 23, 2018



7 years



1,200 employees



**THE FRENCH KNOW-HOW IN THE WORLD**  
in management and financing of public services and infrastructures



## CIRCULAR ECONOMY



Institut de la  
**gestion déléguée**

Proof by example



# A CIRCULAR ECONOMY MODEL



3 samples in Europe.

## CITY OF ROSTOCK GERMANY

Ambitious German packaging recovery regulations came into force on 1<sup>st</sup> January 2019, and the European Union has legislation to ban the most common single-use plastic products by 2021.

### THE CUSTOMER'S OBJECTIVES

Renew resources in a circular economy model to reduce the country's dependence on raw materials and thus meet the objectives set by the new national regulations which increases the rate of recycled plastics from 36 % to 63 % by 2022.

### VEOLIA'S SOLUTION

Give new life to old plastic bottles using a PET (PolyEthylene Terephthalate) plastic recycling process that allows these recycled bottles to be used in the production of new food-grade bottles.

**1 billion**

recycled bottles per year

**31 000 tonnes**

oil saved per year

**113 000 tonnes**

CO<sub>2</sub> equivalent avoided per year

## CITY OF PÉCS HUNGARY

Accompany Hungary in its goal to achieve 14.65% renewable energy mix by 2020 in compliance with the European directive.

### THE CUSTOMER'S OBJECTIVES

Use local and renewable energy resources to make the country's fifth largest city (population of 170 000) truly energy independent.  
Create a many non-relocatable jobs.

### VEOLIA'S SOLUTION

Convert a major heat and electricity production plant that was initially gas-fired to cogeneration and transform it into the largest European fully biomass-fired (straw and wood) heating network.

**€80 m**

invested to switch year from gas to straw

**+31 000 homes**

and 450 public buildings heated

**400 000 tonnes**

CO<sub>2</sub> emissions avoided every

## CITY OF BRAUNSCHWEIG GERMANY

Help Germany achieve its renewable energy and climate change objectives.

### THE CUSTOMER'S OBJECTIVES

Support Braunschweig's Gliesmarode district in its transition to green electricity and heating.

### VEOLIA'S SOLUTION

Install a district heating network that runs on renewable energy. Launched by BS Energy, a Veolia Germany subsidiary, the Hungerkamp plant replaces 34 coal and oil-fired burners with a cogeneration plant, a wood-fired boiler and a natural gas-fired boiler, as well as two heat storage units.

**15 600 MWh/year**

Heating provided to approximately 1 000 Gliesmarode district homes - 60 % Share of heating from biogas produced from organic waste. The rest is broken down into 38 % wood and 2 % natural gas.

**8 000 tonnes**

of CO<sub>2</sub> emissions avoided every year.

## SPECIAL THANKS

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**The French Institute for Public Private Partnership (IGD)** is a foundation of companies with a mission of general interest that, **for more than 20 years**, brings together all stakeholders in the management of public services.

The State, associations of local authorities, public companies, private companies, consumer associations and representatives of trade unions work within it **to improve the quality and performance of public services**, particularly when those services are delegated.