

# Le Minorange

BOUYGUES

BOUYGUES CONSTRUCTION

## CASABLANCA ON THE RISE

COLAS

NEW INROADS  
IN CANADA

BOUYGUES IMMOBILIER

CURRENT TRENDS  
AND INNOVATIONS

TF1

DIGITAL WITH A  
FEMININE TOUCH

BOUYGUES TELECOM

LOCAL ACCENTS  
IN MARKETING

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# “Very good sales results in all our businesses”

In 2018, the sales of all the Group’s businesses have been very good, and Bouygues Telecom has reported strong growth in its results.

The order book of our construction businesses for the first nine months of 2018, as announced in November, rose to a record level and offers excellent long-term prospects. At **Bouygues Construction**, nearly half the projects ordered as of September 30 are to be carried out in more than two years.

In France, Bouygues Construction has been awarded substantial contracts, including the Co’Met at Orléans, comprising a convention center, a sports facility, and an exhibition hall, and the renovation of the building at 17 boulevard Morland in Paris.

**Bouygues Immobilier** and **Colas** saw their order books grow by 1% and 3%, respectively. In particular, Colas won a large contract for metro line 15 Southeast in the Grand Paris program. It also moved into its new Paris headquarters, Prism’, a Bouygues Immobilier project with Bouygues Construction as the builder.

At the end of September 2018, international contracts accounted for 59% of Bouygues Construction and Colas’ order book, compared with 56% a year earlier. Bouygues Construction won several excellent contracts, including the construction of the physics laboratory at the University of Cambridge, in the UK, and the WestConnex tunnel at Sydney, Australia. Several acquisitions were made too. Last summer, Bouygues Construction and Colas finalized the buyout of the Swiss company Alpiq Engineering Services, a major player in energy, industrial services, and infrastructure in Europe. In Australia, Bouygues Construction strengthened its presence by completing the acquisition in July of A W Edwards, a company in the building construction sector.

On the other hand, the profitability of construction activities suffered from difficulties completing three energies and services projects in the United Kingdom and Ireland. This was also the case at Colas Rail in France owing to labor strikes at the French railway SNCF. This prompted us to issue a profit warning on October 18 in expectation of a slight decline in current operating profit and current operating margin in the construction businesses in 2018, compared with 2017, and contrary to the previous forecast of an improvement.

At **TF1**, audience ratings were up 0.4 points on each of the sales targets, thanks in particular to the World Cup of soccer and the autumn programming. TF1 also expanded in the digital realm with the

acquisition of two companies, aufeminin and Doctissimo.

At **Bouygues Telecom**, the strong upward trend in sales continued through the first nine months of the year, and the operator reported sustained growth in financial results. It now has 15.8 million mobile customers, a gain of 1.4 million. Another reason for great satisfaction: in the Arcep survey, Bouygues Telecom ranked number one in rural areas for its voice, text, and data services and number two on average in France as a whole thanks to the quality of its mobile network and its coverage. In the fixed-line market, a boost from FTTH helped lift the number of customers to 3.6 million at end-September, an increase of 162,000 customers.

Bouygues Telecom’s EBITDA margin rose 2.7 points to 29.4% in the first nine months of the year, and profitability returned to its level before the arrival of the fourth mobile phone operator.

Bouygues Telecom’s governance underwent a change at the beginning of November with the appointment of



Richard Viel as chief executive officer. This promotion is well-deserved recognition of his outstanding abilities and dedication to bringing about the operator's turnaround, of which he was one of the principal architects as deputy CEO, alongside Olivier Roussat. I have full confidence in Richard and wish him every success in his new position.

Last, **Alstom** and Siemens have begun the process of obtaining the approval of various international authorities for the merger of their rail transport businesses, thereby creating a major European player in the transport sector. It is hoped that the merger can be finalized within the first half of 2019.

The Group is engaged in the implementation of Sapin II, the transparency and anti-corruption law passed two years ago by the French parliament. Its aim is to bring French law into line with the most rigorous European and international standards in the fight against corruption and influence peddling. I personally consider it extremely important that everyone embrace this law, whether he or she works in France or abroad. It is totally consistent with our notion of ethics and will help us to further enhance our image and reputation with our customers and stakeholders. That is why I have asked that training sessions be organized on this subject for as many people as possible in the Group. I know that I can count on everyone's involvement.

To conclude, I want to thank our employees for these results. I extend to them and to their families

and those close to them my warmest wishes for health, happiness, and success in the New Year. ■

A handwritten signature in black ink, appearing to read 'M. Bouygues' with a stylized flourish at the end.

Martin Bouygues  
December 12, 2018

FOLLOW MARTIN BOUYGUES ON  
THE SOCIAL NETWORKS



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# PANORAMA

## GOVERNANCE

### Two new appointments at Bouygues Telecom

On 9 November 2018, Richard Viel was appointed Chief Executive Officer of Bouygues Telecom. He joined Bouygues Telecom in 1998, first as Director of Customer Relations, then as Director of the Plan segment from 2000. In 2002, he became Vice-President, Consumer Marketing, before being appointed Senior Vice-President, Business Services, Wholesale and Development in 2003. Richard Viel had been Deputy Chief Executive Officer of Bouygues Telecom since 2007. Olivier Roussat, who retains his post as Deputy Chief Executive Officer of the Bouygues group, was appointed Chairman of the Board of Directors of Bouygues Telecom.



## SAFETY

### A virtual-reality safety-training module

Colas has joined forces with Immersive Factory, a French start-up specialising in the design of virtual-reality (VR) training programmes, to develop an innovative training module that immerses employees in a virtual job site where they have to respond to occupational hazards. This game-based approach is intended to raise employee awareness of the main risks pertaining to jobs in civil works, namely being run over by a truck or site plant.



## FRANCE

### Line B of Angers tram network

In June, three subsidiaries of Colas won two construction contracts for the second tram line in Angers and for associated street reconstruction work. The contracts are worth a total of €63 million. The 10.1 km of new line will connect the Belle-Beille neighbourhood in the west of the city to Monplaisir in the north-east, crossing the Maine river and passing through the central city area.

## COLOMBIA

### Tallest cable-stayed bridge in South America

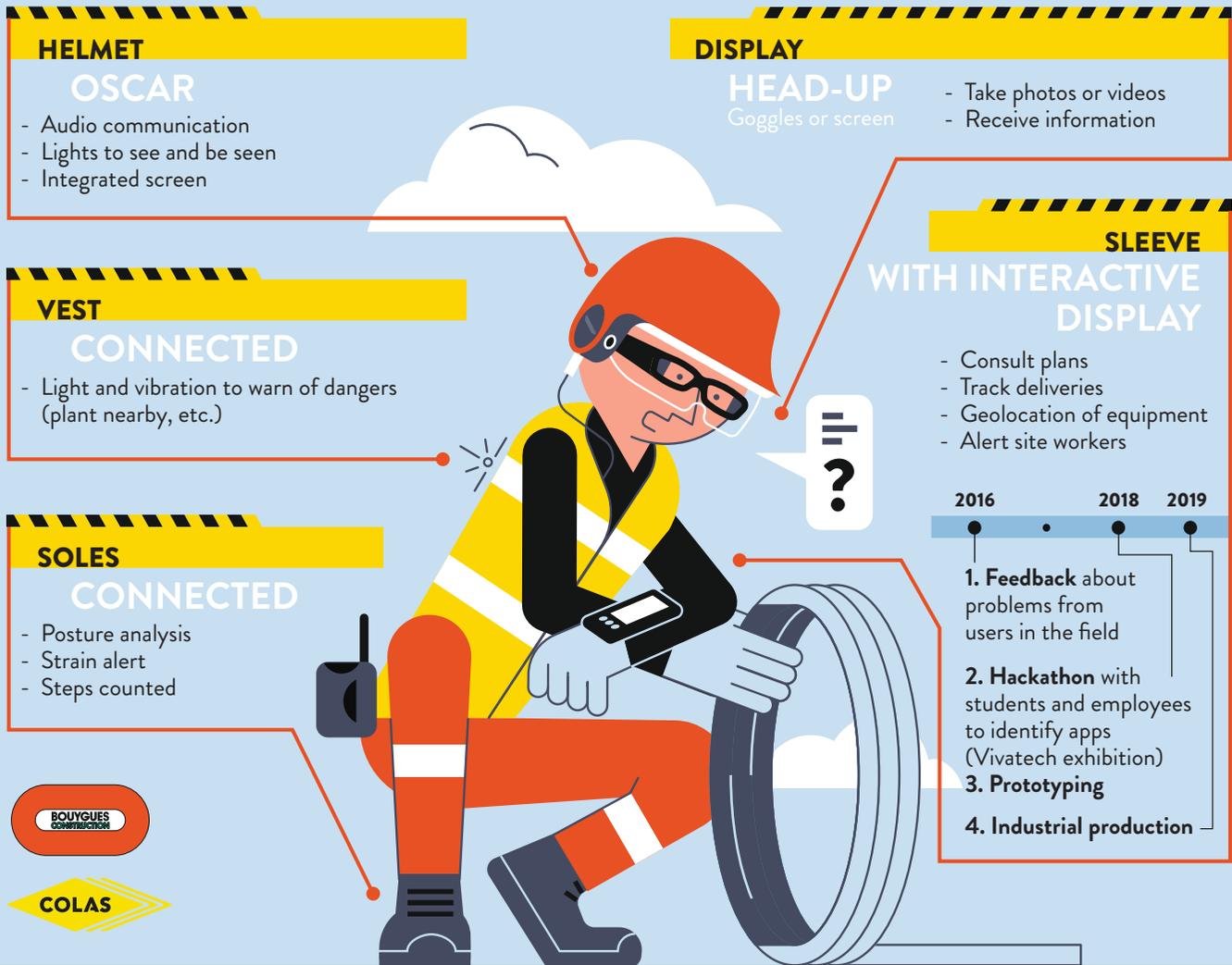
In June 2018, Bouygues Construction subsidiary VSL completed construction of a 580-m long cable-stayed bridge in Colombia. VSL worked on the stay cables and on prestressing, and supplied travelling formwork. Located in San Andrés, Colombia, the bridge is the tallest of its kind in South America. It is on the eastern side of the Andes, on a 147-km long road that crosses a major fault line responsible for many landslides in the region. Its construction therefore improves road safety.



THE DIGITAL TRANSITION ON WORKSITES

# Musts for the connected site worker

Through R&D investments, the Group's businesses are working on the design of new augmented tools in cooperation with the e-Lab, the Group's Innovation department. In the connected operator project, an environment 4.0 is being created to improve the safety, well-being, performance, collaboration, and productivity of site workers.



**Oscar** 2011 2015 2019

**The connected helmet created by Colas Rail**

R&D on a helmet for working at night capable of detecting alternating current at a distance

900 helmets deployed at Colas worksites:

- Communication on free frequencies and full-duplex\*
- Detection of alternating current
- Double lights

New version (concept and prototype): compatible with the activities of site workers in all the construction subsidiaries developed by the e-Lab



\*A communications channel on which both people can speak at the same time

## FRANCE

## Green Office Explore project

In September, the **Green Office Explore project** was presented to potential investors and local residents during an event. It comprises construction of a 35,000-m<sup>2</sup> positive-energy office building and a 29,000-m<sup>2</sup> data centre. Located just 20 and 25 minutes from Orly Airport and the La Défense business district respectively, the project is at the heart of the Meudon-Vélizy business cluster. The building has over-roofing consisting of 2,500 m<sup>2</sup> of photovoltaic panels and meets very high environmental quality standards.



## GOVERNANCE

## Appointments to the Board of directors

On 11 June, **Charlotte and William Bouygues** were appointed to the **Board of Directors** of the Bouygues group to represent the family-owned company SCDM, thus taking over from Edward and Cyril Bouygues, the respective sons of Martin and Olivier Bouygues. Charlotte Bouygues is currently a programming officer working for the TF1 TV channel. William Bouygues is in charge of Smart Office services at Bouygues Energies & Services, a subsidiary of Bouygues Construction.



## CHILE

## Extension of a metro line in Santiago

In July the joint venture **made up of Colas Rail (lead firm) and ETF**, was awarded the contract for construction and extension of Line 2 of the Santiago metro in Chile. The €36-million contract is for supply and installation of the rubber-tyred-metro track

and third rail in 5.5 km of tunnel and in the new depot. The consortium is in charge of maintenance of all the tracks of the Santiago metro network, i.e. 140 km of line, and in 2020 is to build the 4-km extension of the as-yet unfinished line 3b.

## ALSTOM

## The first hydrogen-powered trains

On 16 September, the **world's first hydrogen-powered train** rolled into the station of Bremervörde in Lower Saxony, Northern Germany. Built by Alstom in Salzgitter (located in Germany and the group's biggest plant), the Coradia iLint train is equipped with fuel cells that convert hydrogen and oxygen into electricity, thereby eliminating polluting emissions generated by traditional propulsion technology.

## FRANCE

## First 5G pilot site opens

In July, **Bouygues Telecom** opened **France's first 5G pilot site** operating under real conditions, in the city of Bordeaux. The trial will test new uses made possible by this latest-generation network. 5G will become a reality in France in 2020, by which point the network will have expanded to cope with the significant growth of French mobile traffic, which is doubling every year. It will also open up growth opportunities for businesses thanks to the emergence of completely new uses.



## UNITED KINGDOM

## NEW CARDIFF UNIVERSITY CAMPUS

Cardiff University, in Wales (UK), has awarded a contract worth £122.6 million (€134 million) to Bouygues UK, a subsidiary of Bouygues Construction, for the construction of its Innovation Campus. Amongst other facilities, it will incorporate the world's first social science research park and a Translational Research Facility (TRF). Work began in September 2018 with handover being scheduled for 2021.

## MEDIA

## IMPRESSIVE RATINGS FOR TV DRAMA

The launch of the US series *The Good Doctor* on 29 August attracted 6.59 million viewers to TF1, equivalent to 31.7% of the total audience. This was the strongest opening for a foreign series across the entire audience since *The Blacklist* in August 2014. TF1's new season will feature 15 new French drama series, financed by an investment of €150 million.

## DIGITAL MEDIA

## THE #SAFETY ACT APP

Developed by the Health and Safety Department of Bouygues Bâtiment International, it gives access to a wide range of information on safety and can also be used as a reminder on construction sites. It can be downloaded onto smartphones and tablets, and presents information in French, English and Spanish, even off-line.

CUSTOMER SATISFACTION

# Results surpassing objectives

Each quarter, a Customer Experience Survey measures the satisfaction of Bouygues Telecom’s customers. The survey conducted in September 2018<sup>1</sup> showed that it was the only operator to make gains in both the mobile and fixed<sup>2</sup> markets since March. Here are the key figures.



**Bouygues Telecom:  
No. 2 in customer  
satisfaction in the  
mobile market**

**85%**

are satisfied with the Sensation fixed-rate plan

**89%**

are satisfied with fixed-line services

**AMONG THE SATISFACTION CRITERIA:**

- ✓ The offer introduced in 2018 guaranteeing Internet access when changing operators or moving to a new home
- ✓ The choice of mobile phones offered
- ✓ The quality of the personal space on the Internet

**90%**

are satisfied with the B&YOU fixed-rate plans

**86%**

are satisfied with the reliability of Internet access with the Bbox 4K

**76%**

are satisfied with the phone network coverage

**16.2 / 20**

Overall satisfaction  
> Objective for 2018:  
16.1/20

**AN OBJECTIVE: ARIANE 2020**

Since mid-2017, the Ariane 2020 strategy has made customer experience a top priority and mobilized all of Bouygues Telecom’s businesses and departments in efforts to enhance it. Four key satisfaction criteria are emphasized: quality, immediacy, fluidity, and intuitiveness. These now underlie the actions taken regarding access to the fixed and mobile networks as well as the experience and services offered to customers. A further step in the implementation of this strategy is a project now under way to change Bouygues Telecom’s brand platform. A priority for 2019, this project will be based mainly on the components of customer experience.

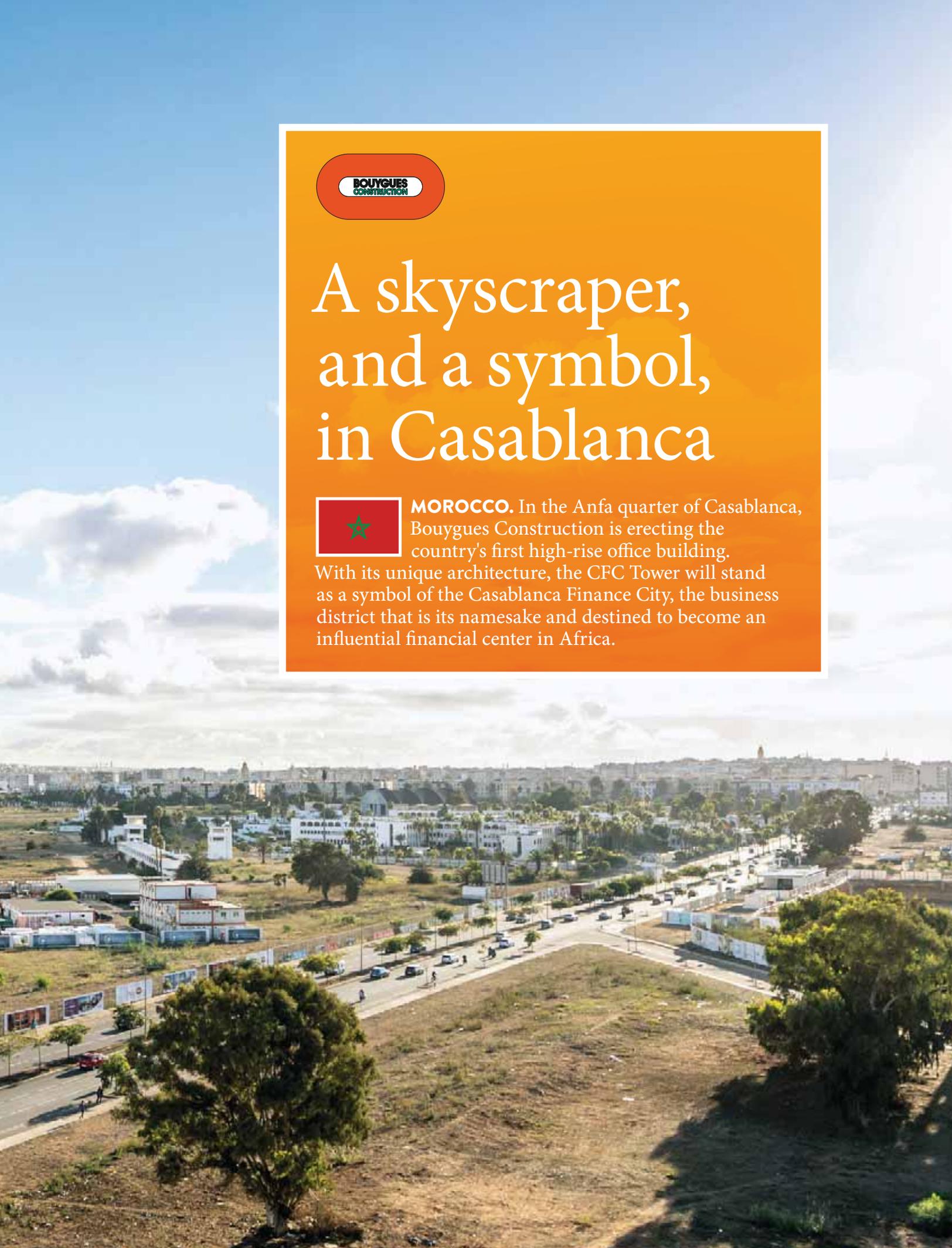
“These good results are the tangible sign of actions taken over several years and more recently in the Ariane 2020 strategy.”

Aurélie Stock-Poeuf,  
director of Strategy at  
Bouygues Telecom

1. A satisfaction survey conducted with 5,000 interviews, including 1,500 customers of Bouygues Telecom.  
2. Subscriptions combining fixed-line, TV, and Internet services.



*The CFC Tower is being constructed in the Anfa district, a 350-hectare area in the heart of Casablanca that will eventually be filled with apartment buildings, commercial properties, and cultural, leisure, and health facilities.*



BOUYGUES  
CONSTRUCTION

# A skyscraper, and a symbol, in Casablanca



**MOROCCO.** In the Anfa quarter of Casablanca, Bouygues Construction is erecting the country's first high-rise office building.

With its unique architecture, the CFC Tower will stand as a symbol of the Casablanca Finance City, the business district that is its namesake and destined to become an influential financial center in Africa.



*The site workers who are members of the Atlas Guild are recognizable by their blue and orange work clothes.*



It's nine o'clock on a muggy morning and a dozen workers are installing the façade sections on the twenty-eighth and last floor of the CFC Tower. From here they have a sweeping view of the city of Casablanca and its sprawling suburbs. In the direction of the ocean stands the imposing Hassan II Mosque. Built in 1992 by Bouygues Construction, it boasts the highest minaret in the world. "Right now, it's the tallest building in Morocco," says Ahmed Bouqottaya, Quality-Safety-Environment manager at Bymaro, the Moroccan subsidiary of Bouygues Bâtiment International.

#### **HIGH-RISE OFFICE BUILDING**

With a height of 136 meters, the CFC Tower is the first skyscraper in Morocco. Since construction began in 2015, there have been as many as 400 workers on the job at peak periods. Slated for delivery in February 2019, the tower will have 23,000 m<sup>2</sup> of office space and a conference



### DID YOU KNOW?

Ten site workers belonging to the Atlas Guild are working on the CFC Tower project. A total of 49 employees of the Moroccan subsidiary are guild members. Like those in the Minorange Guild, they are chosen for their overall excellence and their skills, which they pass on to the next generations through training and a mentoring system. As guild members, they also receive special training and have annual performance reviews. They all get together once a year for a trip to a different region of Morocco.



*Installation of the last façade sections, which have blinds and a double layer of aluminum to protect against the heat and glare of the sun.*

room with a capacity of 100 people. With its asymmetrical structure and elongated diamond shape at its top, it illustrates the goal of making Casablanca “a modern city with bold architecture,” says Hicham Zegrari, general secretary of Casablanca Finance City, the future business district from which the tower takes its name. Since the last century,

Casablanca, the economic and cultural capital of Morocco, has been an Art Deco showcase. The architectural firm Morphosis<sup>1</sup> designed the building’s glass façades with a double layer of aluminum to protect the building against the heat and glare of the sun

1. The architectural firm Morphosis has won several international architectural awards, including the 2005 Pritzker Prize.

while preserving a splendid panoramic view for its occupants. “The 1,300 elements that cover the façade reduce energy consumption by up to 30% compared with standard buildings,” says Driss Kabbaj, Bymaro’s project manager for CFC. Another architectural particularity: Bymaro proposed building one more floor than initially planned ●●●



...

by using a post-tensioning system<sup>2</sup> supplied by VSL, another Bouygues Construction subsidiary. With this technique, it was possible to reduce the thickness of the concrete floors by about 10 to 20 centimeters. “This innovative proposal differentiated us from the other bidders on the contract,” notes Kabbaj.

### A NEW FINANCIAL HUB

In 2010, at the request of King Mohammed VI, the Moroccan government initiated a 350-hectare urban development program in the district of Anfa (meaning *hill* in Berber), where Casablanca’s airport was formerly located, with the idea of creating from scratch a cosmopolitan and agreeable urban center. The 50-hectare Casablanca Finance City district, which is part of this program, is destined to become one of Africa’s major economic hubs. Bymaro is constructing the first tower there. Among its future occupants is CFC, an institution made up of financial entities such as the Casablanca stock exchange, the Caisse des Dépôts, and the state-run bank. This bank certifies the eligibility of companies for a package of incentives designed to persuade them to locate in this new business district. “Our objective is to attract major multinationals – holding companies, regional headquarters, financial and

2. Post-tensioning consists of compressing concrete using a system of steel cables anchored at each end to prevent cracking and increase the life span of structures.



### THE HIGHEST ECOLOGICAL STANDARDS

The goal is to obtain LEED certification for the CFC Tower, and one factor in its favor is the thermal inertial system, which accumulates heat or cold in the floors and then releases it as needed. Actions have also been taken during the construction such as rainwater recovery, recycling of worksite waste, and use of renewable energies. For example, rubble has been used to build roads. Altogether, 65% of the waste has been short-cycled. “As a result of all these measures, the Gold certification level has been achieved,” says Ahmed Bouqottaya, QSE manager at Bymaro.

service companies – that are looking to manage and oversee their activities on the continent,” says Zegrany. “We offer them tax and financial transaction incentives as well as assistance in getting set up here – things like obtaining visas and residence permits quickly or sorting out administrative formalities.” Another plus: Casablanca is strategically located between Europe and Africa, with an international airport that offers flights

to more than 120 destinations all over the world.

### A GREENER CITY

Anfa is no longer a vast wasteland. Eco-neighborhoods with planted terraces and flower-lined walks are springing up. Among them is the Faubourg d’Anfa, one of the first apartment complexes developed here by Bouygues Immobilier and built Bymaro. This program includes





*Zaïme Daoudi, an Atlas Guild worker.  
Above: QSE manager Ahmed Bouqottaya goes over the safety rules at the start of the day.*



*The Faubourgs d'Anfa, a Bouygues Immobilier property development consisting of 390 apartments plus commercial spaces, all built by Bymaro.*

390 apartments (350 of which have already been sold), with stores on the ground floor. This development has qualified for HQE<sup>3</sup> certification, thanks in particular to its renewable energy production capacity. Going up next to it is BO52, another HQE-certified eco-neighborhood, with 150 apartments. Linkcity Maroc, the

3. HQE Excellent for the first two portions of the project and HQE Exceptionnel for the third.

property development subsidiary of Bouygues Construction, is carrying out this project. Comments Charaf Soussi, director of operations at Bymaro: "Here the group is bringing into play its diverse capabilities in sustainable construction, which we're seeing much more here, and making them a trademark."

All the projects in the Anfa district must comply with the latest environmental standards demanded by the

customer. After hosting the COP 22<sup>4</sup> in Marrakech, Morocco is launching a major energy transition plan, with €10 billion to be invested in the construction of solar farms. "Africa will be hard hit by climate change," predicts Zegrari. "Morocco is supporting green financing and has set a goal of producing 30% of its energy with green technologies by 2030." With its recognized expertise in managing complex projects and its knowledge of the entire value chain, the Group has many capabilities to assist Morocco in this rapidly developing area. ■

— Isabelle Godar

4. The 22nd Conference of the Parties. This event attended by all the heads of state is held each year to discuss issues related to global warming and to enact measures to combat it.



# Local market outreach

**STRATEGY.** After sharply accelerating the rollout of its fixed and mobile networks, Bouygues Telecom launched a locally targeted sales strategy in 2017. The goal? To increase its market shares in both the fiber and 4G mobile segments in areas where it has a very limited presence.

La  
Main  
avec

#ilove  
FIBRE





la fibre  
maintenant chez vous  
Bouygues Telecom



*The Bouygues Telecom team presents the fiber offers in Lorient.*



*To win new customers in the fiber market, Bouygues Telecom is counting on a strong local presence, like here in Brittany.*



**M**idday, a few steps from Place Aristide Briand in the center of Lorient, a town of 58,000 in Brittany. A team from Bouygues Telecom is finishing up the installation of large blue and white blocks emblazoned with #ILOVEFIBRE that will be impossible for passers-by to miss. This is part of the fiber marketing campaign that also includes checking eligibility, conducting a contest on social media, and generally engaging with the public. “The fiber business must be promoted locally. Here our

aim is to introduce ourselves to future customers,” explains Régis Van Brussel, business development director at Bouygues Telecom. The operator is doing this with a new strategy of marketing and communications specifically adapted to areas where it has little or no presence.

#### MARKETING FACTORY

The local teams are also preparing actions with a focus on personalization. “We are adapting all our marketing tools specifically for the areas that we are targeting,” says regional manager Marion Legrand. “For example, we

have put bread bags with the town’s name on them in the local bakeries.” In the Lanester store, a few kilometers from Lorient, digital display screens show a map of the Morbihan department indicating the coverage rates of the Bouygues Telecom network. A “marketing factory” is making this agile approach possible. Van Brussel explains: “We have worked with the Network teams at headquarters to coordinate and automate the local actions in order to be as effective as possible commercially when an area gets coverage. Each week, 50,000 more households become eligible,



Digital display screens and bread bags... in Brittany, Bouygues Telecom is using innovative, personalized methods to advertise at local merchants.

and through our actions we're able to reach 50% of them within a very short time." That is a key objective for Bouygues Telecom in this new fiber market. "In the fixed segment, we are the number four operator. Fiber is helping to increase our market shares," points out Legrand. In front of the #ILOVEFIBRE installation, Laurence and Florence are checking whether their homes are eligible or not. "I've wanted to have fiber service for a long time, and as soon as I'm eligible, I'll sign up," says Laurence. "It's the most practical and the least expensive," adds Florence.

### CHANGING PERCEPTIONS

More than 1,000 kilometers from there, in Corsica, the Club Bouygues Telecom in Ajaccio is opening its doors. Located on the main shopping street in the imperial city, it is the pride of its co-manager Frédéric Mossé. "After opening the Club in Bastia in 2017, we arrived here in the spring of 2018. Bouygues Telecom had been absent from Corsica since 2013." The Crozon project<sup>1</sup> finds a perfect symbol in the "Beautiful

1. The pooling of Bouygues Telecom and SFR's 4G networks in medium-density areas will be completed by mid-2019. ...



**"Getting known locally also means being present physically"**



**Richard Viel**

CEO of Bouygues Telecom

### What is Bouygues Telecom's local marketing strategy?

In 2014, we decided to expand our network to cover all of France. To grow our market share, we have adopted a structured approach that enables us to be present on the ground, locally.

### What does this approach involve?

Getting known locally requires being present physically. That's why in 2018 we opened several Clubs Bouygues Telecom. Then we set up a "marketing factory." This is a process at the headquarters level to coordinate all local activities.

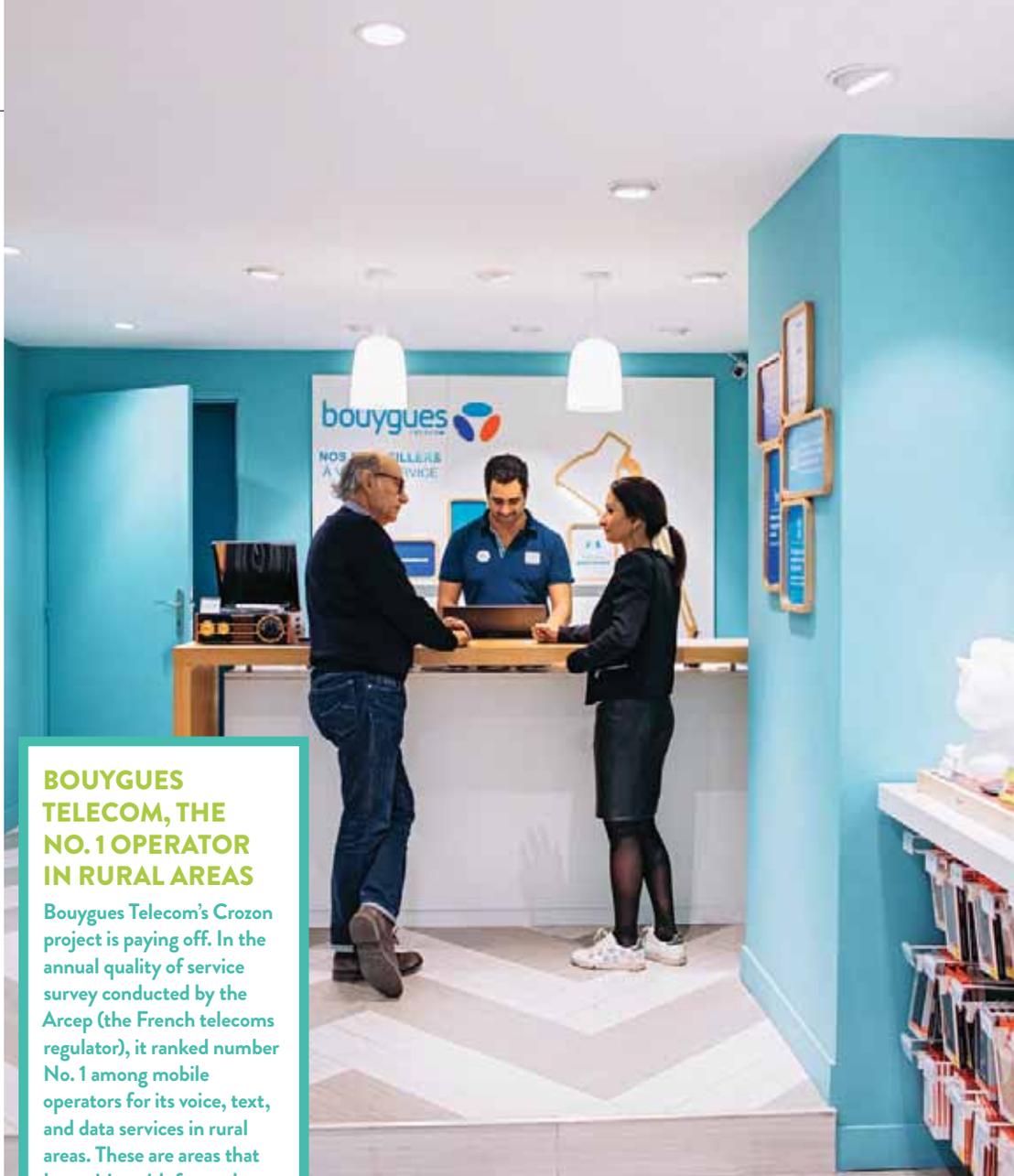
### What are the objectives?

Our objectives are to have a 15% share of the mobile market in sparsely populated areas and 1.5 million fiber customers by 2020. To reach those numbers, we can count on the solid values of the Bouygues group along with our new customer experience differentiation strategy.

At this Club Bouygues Telecom in Ajaccio, even accessories like this doormat with a greeting in Corsican are personalized.



In two years, Bouygues Telecom's 4G coverage in Corsica has risen from 55% to 97% of the population.



### BOUYGUES TELECOM, THE NO. 1 OPERATOR IN RURAL AREAS

Bouygues Telecom's Crozon project is paying off. In the annual quality of service survey conducted by the Arcep (the French telecoms regulator), it ranked number No. 1 among mobile operators for its voice, text, and data services in rural areas. These are areas that have cities with fewer than 10,000 inhabitants.

...

Island," where Bouygues Telecom has made a lot of progress with its mobile network. "In Corsica, our 4G coverage has increased from 55% to 97% of the population in two years," says Vincent Borychy, Bouygues Telecom's local business development manager. "We needed to open stores to become better known, to reassure our customers, and to change Corsicans' perception of Bouygues Telecom." As in Brittany, the key in the 4G market is name recognition and reputation. "Out of 325,000 inhabitants, we have 20,000 customers,"

notes regional manager Julie Guérin-Bouchet. "So there's a lot of room for growth. People are waiting. They've felt they have very few alternatives." Having stores is essential to developing good relations with customers and being aligned with Bouygues Telecom's overall sales strategy. It is an indispensable component of a strategy based on multiple channels, that is, physical, digital, and telephone. In fact, while the B&YOU 4G fixed plans with no commitment are sold only on the web or by phone, 65% of Sensation plans, which have



The third Club Bouygues Telecom in Corsica will open in Ajaccio in early 2019.



Absent from the island since 2013, Bouygues Telecom returned with a first store in Bastia in 2017 and second in Ajaccio in spring 2018.



Vincent Borychy at Ajaccio.

greater added value for the operator, are purchased in stores. “Our customers feel supported today,” adds Mossé. “In the past, they had to send their products to after-sales services in Toulon or Nice.”

### IN TOUCH WITH CUSTOMERS

And there is no intention of stopping now: a second store will open in Ajaccio in early 2019. “We have opened eight stores in France in 2018,” notes Borychy. “A total of 37 million people, or 57% of the French population, live in a Crozon area. We have to let them know we’re there, offering them an extensive, high-quality network.” Bouygues Telecom is therefore implementing a local marketing and personalization strategy in phase with the rollout of its mobile network. “We reach out to get to know our future customers by participating in marathons, music festivals, and other local events,” says Borychy. “Just recently, we launched a pilot operation in the

southwest using customers as ambassadors to speak with prospects over the Internet. Who better than our customers to talk about their experiences in the place where they live.” At Ajaccio, Vincent, Julie, and Frédéric are talking with Karim, the Club’s manager, about upcoming marketing activities to boost traffic in the store. “Let’s put the emphasis on the 4G Box. It’s an innovative offer that highlights our new mobile network,” suggests Karim. “Eighty percent of our fixed sales are with the 4G Box. Our customers find that it’s better than the other

“57% of French people live in sparsely populated Crozon areas. We have to let them know that we are there, with an extensive, high-quality mobile network.”

Vincent Borychy, local business development manager at Bouygues Telecom

boxes on the market.” Vincent is convinced: “Talking with the teams on the ground is crucial to the success of our actions. That’s why we’re implementing this local strategy.” Even if there is a long way to go, the Bouygues Telecom teams are confident. In 2019, all the sparsely populated areas of France will be covered by the operator. “Growing Bouygues Telecom’s mobile business depends on our being successful in the Crozon areas,” concludes Vincent. “We’ve got great days ahead of us.” ■  
—Thomas Vitry





# Paving the way with new partners



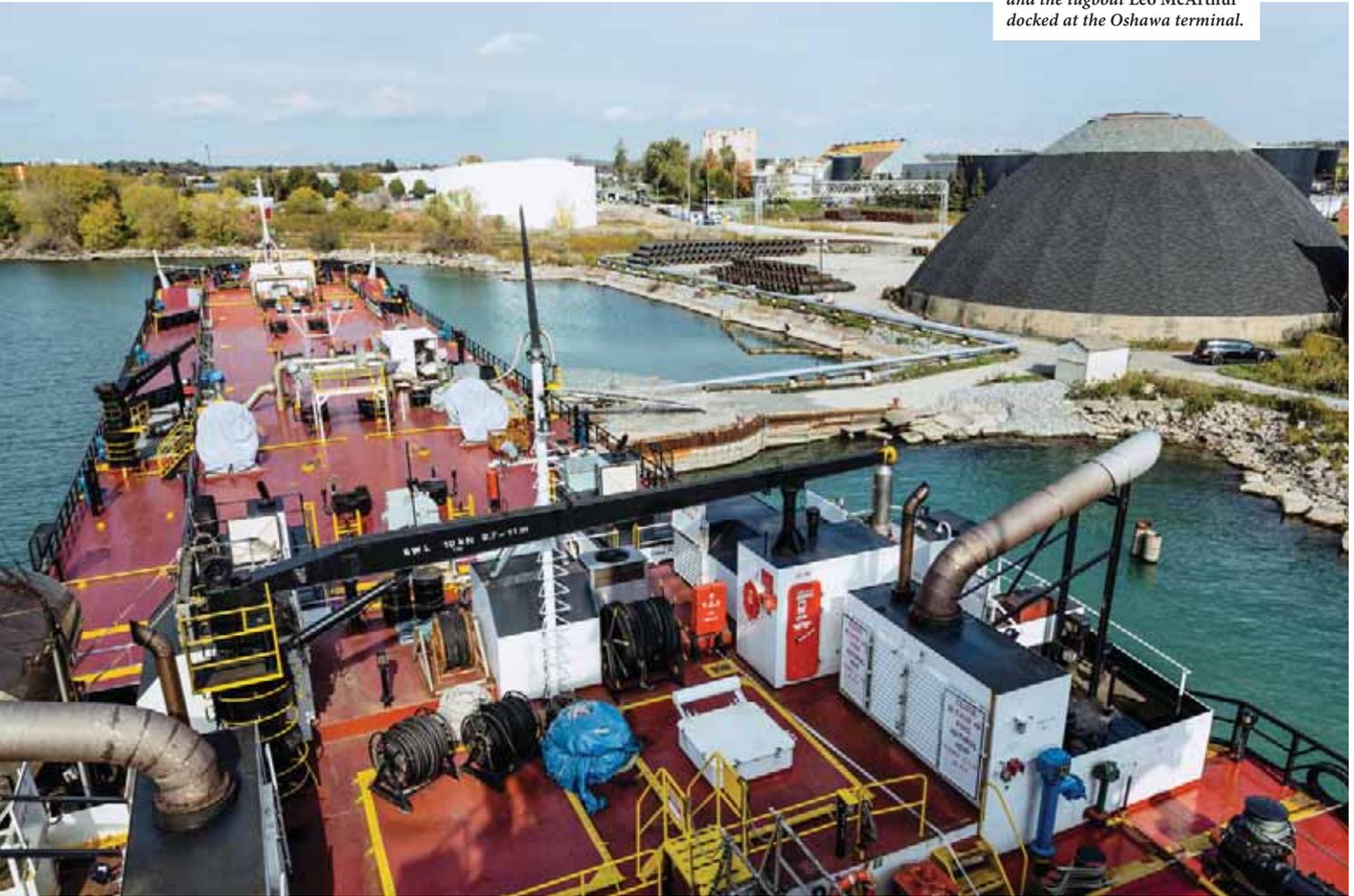
**CANADA.** In February 2018, Colas acquired the Canadian group Miller McAsphalt, a major player in road construction in Ontario and in bitumen distribution all across the country. An opportunity for Colas to strengthen its position in Canada and expand its bitumen business. Here we meet the new team.



*A Miller McAsphalt crew at work on the extension of the eastern section of Highway 401 at Toronto.*



The barge John J. Carrick and the tugboat Leo McArthur docked at the Oshawa terminal.



On this October morning, work is in full swing at the McAsphalt terminal in Oshawa, an industrial town on the bank of Lake Ontario. Founded in 1970 by Leo McArthur and John Carrick, McAsphalt is the largest supplier of bitumen, modified bitumen, and bitumen emulsions in Canada. Since acquiring the group in February 2018, Colas has owned 28 bitumen terminals spread across the country, from the Pacific to the

Atlantic, along with two barges and 200 freight cars for bitumen transport. Looming over the dock here in Oshawa is one of the barges, the *John J. Carrick*, 122 meters long and with a payload capacity of 11,500 tons. On board, Captain Mark Broennle is savoring the calm on this little inland sea, since when the wind comes up and the water gets rough and the temperature plunges below freezing, sailing on the Great Lakes can be a tough job. “Being a captain is like managing a little company... except



*Pumping the raw material to the McAsphalt plant.*



*On the barge, Gerald Flynn controls the transfer of the raw material.*



*In the plant packing unit, cartons are filled with the transformed emulsion.*

it's one that moves," he smiles. "You have to be tactful and know how to work under pressure by adapting each day to the weather conditions, which can slow the barge down and delay our deliveries." From his wheelhouse, he choreographs the ballet of operations that must be performed 24 hours a day, seven days a week, for six consecutive weeks, by the 15 members of the crew. When the barge docks, the pace is intense. Today, the men have eight hours to pump all the raw material to the ...



*When the order is ready, the product (asphalt, bitumen emulsion, etc.) is delivered directly to the customer.*



*Miller crews at work on Highway 427, north of the Toronto airport.*

...

plant, where the onshore team takes over. All the while, there are two imperatives: comply with safety standards and respect the environment.

#### THE RIGHT FORMULA

What makes McAsphalt special and explains its success is their development of products tailored to its customers' orders. "We prepare different formulations every day. We have more than 200 of them," says Niels Schonberg, a terminal installations manager. At the peak of the fall season, when the weather conditions are still good for road construction, as many as 40 employees can be working at the site, which operates around the clock, seven days a week. This afternoon, the team in the packaging unit is carefully pouring a crack-patching

“This acquisition offers the teams the opportunity to share their know-how and experience. It enables them to continue doing work of recognized high quality in complete safety and to strive for excellence while giving all their customers in Canada complete satisfaction.”

Louis Gabanna,  
Managing Director, Colas North America

product that is still hot as it comes out of the pipes into plastic containers, which are then bundled and loaded onto a truck. "The emulsion product is not stored here," notes McAsphalt production manager Jeff Haynes

"When it is ready, it is sent directly to the customer." Flexibility, innovation, and the ability to anticipate customers' needs are the values of this company, which its employees are proud to work for. ...



*Tom O'Callaghan, manager of the Highway 427 project.*

---

#### HIGHWAY 427

- > Started in 2017
  - > Finished in 2021
  - 
  - > Extension: 6.6 km
  - > Widening: 4.4 km
  - 
  - > 250 employees
  - 
  - > 15 new engineering structures
  - > 12 engineering structures renovated
- 



*Paul McCullowen uses a drone to track and check progress in the project.*

**HIGHWAY 404**

- > Started in May 2018
- > Finished in July 2021

---

- > Widening: 8 km

---

- > 50 employees

---

- > 1 engineering structure renovated



*Widening lanes on Highway 404, northeast of Toronto.*

*Workers laying a drainage pipe on a highway construction site.*



*Work on Highway 401, the busiest road in North America.*

**HIGHWAY 401 WEST**

- > Started in May 2018
- > Finished in July 2021

---

- > Renovation: 5.9 km

---

- > 80 employees



Paving a new section of Highway 407, north of Toronto.



**HIGHWAY 407 EAST – PHASE 2**

- > Started in 2015
- > Finished in 2019
- 
- > Extension: 22 km
- 
- > 30 employees



*Jennifer Wakefield is in charge of quality control in the Highway 407 project.*



...

**ON THE ROADS WITH MILLER**

In 1976, McAsphalt acquired Miller, a road construction company founded in 1917. This vertically integrated company uses McAsphalt products to build and upgrade roads and bridges throughout Canada as well as at Atlanta, Georgia, in the southeastern United States. Miller is working on numerous projects in Ontario, the Canadian province with the fastest-growing economy and with increasing infrastructure needs, particularly around Toronto, the fourth-largest city in North America. In 2017, Miller was awarded the contract for the 6.6-kilometer extension of Highway 427 as well as for the widening of 4.4 kilometers of lanes near the city's international airport. ...



Working alongside traffic in the Highway 401 East project.

#### HIGHWAY 401 EAST

- > Started in 2017
- > Finished in 2019
- 
- > Extension: 7.5 km
- 
- > 70 employees
- 
- > 3 demolition operations
- > 1 engineering structure renovated



“Our activities are complementary”



Frédéric Roussel

President, Colas Canada

#### How is the integration of Miller and McAsphalt into Colas going?

The integration is going very well and happening quite naturally. We share similar values and the ways we operate converge on a number of points. In addition, we are perfectly complementary geographically and in our businesses.

#### What is being done to share competencies?

We are exchanging the “best practices” of each company. Concretely, that means about one hundred employees from Colas Canada, Miller, and McAsphalt get together in groups to identify synergies and the best approaches, particularly in the technical, operational, and logistics areas. These working groups are an opportunity for the teams to meet and get to know one another. We are getting a lot out of them. We want to take full advantage of this acquisition to be more than the sum of two parties.

#### What is the biggest challenge in this integration?

The challenge is to integrate these two family-run businesses into an international group. To do that, our approach is to respect and preserve the culture and identity of each one. That’s why they are keeping their name, logo, and colors. And we are very happy to see that the employees are on board with the project.

...

Road-widening work is being done elsewhere too, such as on Highway 404, in the north, while new surfacing is being put down on Highway 407. “In all the projects, we make sure to respect our three main values: integrity, quality, and safety,” says Rob Rodgers, a manager in the Highway 407 project. In Ontario, one third of the road network is in need of repair. The roads suffer from the repeated freezing and thawing and deteriorate twice as fast as in temperate climates. On Highway 401, the busiest road in North America, one team is renovating a section to the west, while another is working on a bridge to the east. It is three in the afternoon, and heavy traffic is streaming past just a few meters from the men, who are also coping with the fickle weather. “To gain time before the winter period, when it’s impossible to work, and to minimize the impact on traffic, we also work at

night,” points out Sebastian Arangio, the project coordinator on the eastern section of Highway 401.

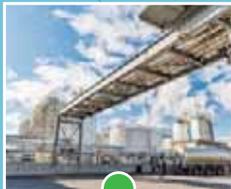
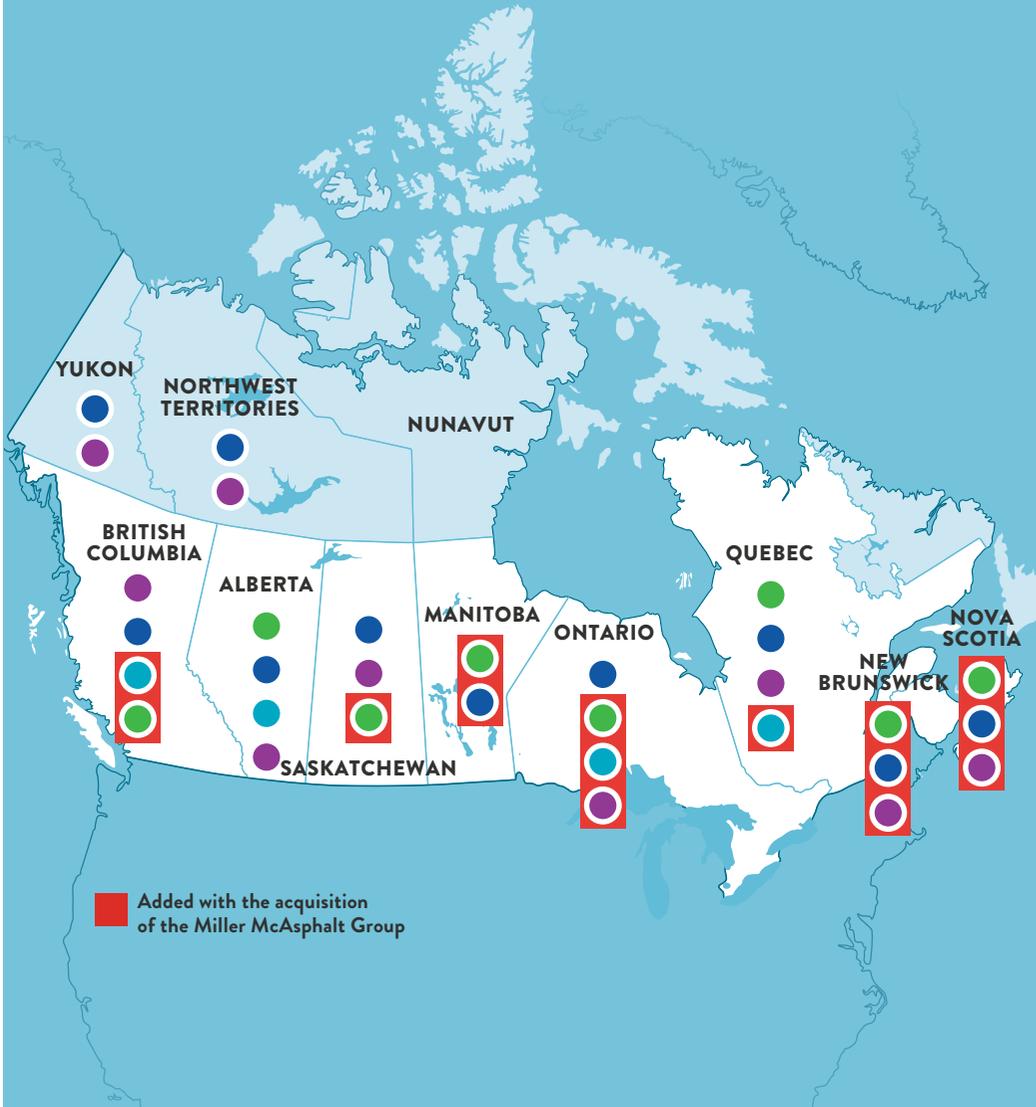
#### SYNERGY AND MATCHING CAPABILITIES

“We have already met with engineers from Colas Canada and talked with each other about our methods,” says Haynes with approval. To integrate Miller and McAsphalt in Colas Canada, the companies are exchanging best practices in numerous areas, including health, safety, and know-how. Over the next two years, new management systems will be introduced while respecting the cultures and brands of each company. Miller, McAsphalt and Colas Canada resemble one another, are complementary, and share the same values, all important factors in achieving their successful integration. ■

—Amandine Sand

# The expanded presence of Colas Canada

With the acquisition of the Miller McAsphalt Group, Colas Canada becomes a major player in road construction and bitumen in Canada.



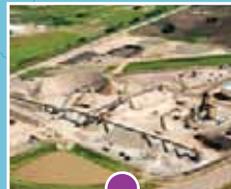
BITUMEN & EMULSION



ROAD CONSTRUCTION



ROAD MAINTENANCE



CONSTRUCTION MATERIALS



## KEY INFO



1917:  
Founding of A.E. Jupp Construction, which becomes Miller Paving in 1946

1962:  
Colas sets up operations in Canada



1970:  
Founding of Industries McAsphalt

1976:  
Acquisition of Miller Paving by McAsphalt

August 30, 2017:  
Memorandum of Understanding signed for the acquisition of the Miller McAsphalt Group by Colas

February 28, 2018:  
Closing of the acquisition



Employees post-acquisition: 8,000

The TF1 logo is displayed in white text on a blue and red rectangular background. The background of the entire page is a photograph of a modern office interior with a wooden conference table, several people working on laptops, and a large vertical garden wall.

# Making digital click with women

**ACQUISITION.** With the aufeminin group, TF1 is getting an international digital player with a portfolio of unique brands and content targeted on women. Here we explore this new universe.



*A stone's throw from the bustling Barbès neighborhood, My Little Paris develops its activities in surroundings that reflect its identity.*



“I’m a happy man at the head of aufeminin,” smiles Olivier Abecassis, named chairman and CEO of this French group in May 2018. Fully owned by TF1 since November, this gem of a business has been growing for a number of years, adding Marmiton (see p. 33) and My Little Paris (see p. 34) to its operations while expanding internationally. Although aufeminin is a multifaceted group that has reinvented itself several times, the original aufeminin website that spawned it has kept its authenticity and DNA – which means speaking with a woman’s voice. “There’s an activist dimension that I find very appealing,” notes Abecassis.

### AN ENGAGED COMMUNITY

Fashion, beauty, lifestyle, cooking, health, parenting, and social issues are all subjects the aufeminin group deals with on the web and social media such as Facebook, Instagram, YouTube, IGTV<sup>1</sup>, Triller<sup>2</sup>, TikTok<sup>3</sup>, and others. Video has been central to its strategy for three years. “When it comes to the social networks, we are way out in front. We’re the only French media on Triller and TikTok,” notes Laetitia Azi, video manager at aufeminin. All these communities offer a way to interact with large numbers of women of all ages. Together, they constitute the biggest community of women in France and Europe. Engaged and active, they are the source of aufeminin’s strength. “Our community is the key driver of My Little Paris,” says co-founder Anne-Flore Chapellier. “We are attentive to it. We hear from

1. Instagram’s stand-alone vertical video app.
2. An app for creating videos.
3. A Chinese social media app for sharing videos.

it constantly. All it takes is an email. It’s what our e-commerce launches are built on.” At My Little Paris, those launches have included My Little Box and Gambettes Box, with Gina to follow in 2019; at aufeminin, there are Gretel Box (healthy, tasty snacks) and Beautiful Box (beauty products). These boxes containing several items and sold on subscription are a way not only to diversify activities, but also to forge yet another link with the

community. More than just a package, what is sent each time is a story narrated by the box’s contents. My Little Paris is rounding out its offering with a range of makeup products under the My Little Beauty brand, while aufeminin is selling Joyce-branded makeup and Madeline-branded jewelry. To further reinforce ties with the community, aufeminin is making a move into “phygital” (a contraction of *physical* and *digital*): “instagrammable”...



Filming a video for a Marmiton partner.



## AUFEMININ IN FIGURES



Total audience:  
122.5 million unique  
visitors per month\*



**aufeminin.com**  
10 million unique  
visitors per month.  
The leading website  
for women in France

**marmiton.org**  
15 million unique  
visitors per month.  
The leading cooking  
website in France

**My Little Paris**  
a community of  
4 million women

\*According to Google Analytics,  
aufeminin group, without  
deduplication, December 2017.



## MARMITON, THE NO. 1 COOKING WEBSITE IN FRANCE

1999: Four friends decide to create a website. Travel? Cooking? They hesitate, but finally cooking wins out: marmiton.org it will be. They devote their evenings and weekends to the site until one of them decides in 2004 to work on it full-time. It's a place to share helpful ideas for everyday cooking that everyone can use: 70,000 recipes, all contributed by visitors to the site and tested by the Marmiton team. Little by little, new features are added: first videos, next an app, and then the Marmiton magazine in 2010. "The special issue launched for the site's tenth anniversary was such a success that at our community's urging, we decided to continue with it," recalls Claire Debruille, content director at Marmiton. "Today it's a bimonthly with a circulation of 160,000. It's surprising to go from digital to paper!" Several themed books have also been published, and Marmiton is available on Alexa, Amazon's virtual personal assistant. The 20-odd staff members of Marmiton have already met with the TF1 Licences team to talk about partnering in the future. A short program is also in preparation with the TV channel. All projects seasoned to perfection.

*Marmiton publishes the  
Marmiton magazine and  
produces numerous themed books.*



*Laetitia Azi,  
video manager at  
aufeminin.*

Anne-Flore Chapellier,  
co-founder of My Little Paris.



Jennifer Alimi,  
vice president of  
sales at aufeminin.

## BUILDING THE AUFEMININ GROUP

**1999:** Creation of the website [aufeminin.com](http://aufeminin.com) (including the forums), since renamed [aufeminin](http://aufeminin.com), with French, German, Italian, Spanish, and English versions.

**2006:** Marmiton joins the [aufeminin](http://aufeminin.com) group.

**2007:** The [aufeminin](http://aufeminin.com) group, owned at that time by the German group Axel Springer, continues to add content sites with the acquisition of the health and wellness media Onmeda.

**2014:** Acquisition of My Little Paris.

**2015:** Acquisition of US-based Livingly, offering lifestyle content and possessing digital expertise.

**2018:** TF1 acquires full ownership of the [aufeminin](http://aufeminin.com) group.



## MY LITTLE PARIS, A MEDIA AND E-COMMERCE GROUP

A stone's throw from Paris' bustling Barbès neighborhood, My Little Paris develops its activities in surroundings that reflect its identity: skylights, muted colors and Liberty prints, green plants, wooden tables, inviting cushions, and cheerful poetic drawings by the Japanese illustrator Kanako Kuno hanging everywhere. Here the company's 130 employees are inventing a free, agile and new way of communicating. The story began in 2008. Four friends decided to publish a newsletter containing fun and original ideas of things to do in Paris. It was not long before they were adding new topics: My Little Lyon, My Little Marseille, My Little Kids, My Little Wedding... Then came a version for men, Merci Alfred, and one for millennials, Tapage. In December 2011, My Little Paris launched an e-commerce operation called My Little Box, an attractively packaged selection of beauty and decorative items. It was an instant

success: the 2,000 boxes all sold in 45 minutes! The boxes are now shipped each month to 150,000 subscribers in France, Germany, and Japan. A year later came the launch of Gambettes Box, which contains two pairs of tights and is sent out each month. In 2019, Gina, a box of 100% organic feminine hygiene products, will be added to the lineup. The entrepreneurial spirit that has shaped the young company from the beginning shows no sign of fading. With Urban Lab, its consulting and creative agency, it is putting its skills to work with its partners and coming up with plenty of ideas for new projects. TF1 is already giving it a hand too. In the autumn, the channel showed the first TV advertisement for the Gambettes Box. Anne-Flore Chapellier, co-founder of My Little Paris is delighted: "We're now benefiting from a unique presence in three channels – television, digital, and e-commerce."

Beautiful Box  
(beauty  
products), one of  
the boxes sold by  
aufeminin.



The aufeminin  
group has  
500 employees,  
with revenues of  
€113.5 in 2017.



The Gretel Boxes from aufeminin, filled with healthy, tasty snacks and sold on subscription.



The My Little Paris offices.

...

moments aimed at influencers are organized for partner brands like Coca-Cola, Netflix, Weber barbecues, and Lavera cosmetics at the company's Paris headquarters, which are well suited for staging all kinds of events.

### A DIGITAL ECOSYSTEM

Creation of Studio71, buyout of Neweb, MinuteBuzz, aufeminin, and just recently, Doctissimo (a health and wellness site): TF1 is moving steadily ahead with its digital transformation. "With the acquisition of the aufeminin group, TF1 can now propose tailored offerings to its advertisers thanks to our diverse and very engaged communities," says Abecassis. "As for TF1, which remains highly dependent on advertising, our e-commerce business represents a new source of non-advertising revenue." And the aufeminin group? Well, it henceforth has the support of the largest seller of advertising space in the market. "We are now part of a powerful digital ecosystem that will enable us to respond to competition in a way nobody else can," notes Jennifer Alimi, vice president of sales at aufeminin. The teams are working on synergies and the pooling of resources. The studios of MinuteBuzz and Studio71 are already available to aufeminin, which is also sharing its

Facebook page with LCI to increase the visibility of both. The TV film on Jacqueline Sauvage, aired on TF1 in October, was heavily promoted by aufeminin, which is very involved in the issue of violence against women. The site invited the film's lead actress, Muriel Robin, to be its editor in chief for a day. There is no shortage of opportunities for synergy. For instance, aufeminin is hoping to

benefit from TF1's production know-how to create original series. TF1 is not done expanding in the digital world. In November, for example, it took a majority stake in Gamed!, a pioneer and expert in programmatic media buying, a highly efficient, selective, and automated technique the TF1 group plans to use to reach the audiences of all its digital entities. ■

—Céline de Buttet

●  
"The acquisition of aufeminin is a decisive new step in the TF1 group's transformation. We are strengthening our capacity to reach all audiences, and women in particular, and to offer new communications solutions to the brands."  
●

Gilles Pélisson,  
chairman and CEO of TF1





# So what's new in the property market?

**TRENDS.** The digital and ecological transition, the growing collaborative economy, demographic pressures, urbanization... Our society is constantly changing, and the apartments and offices developed by Bouygues Immobilier are evolving too thanks to many innovations. Here's a look at a few of them.

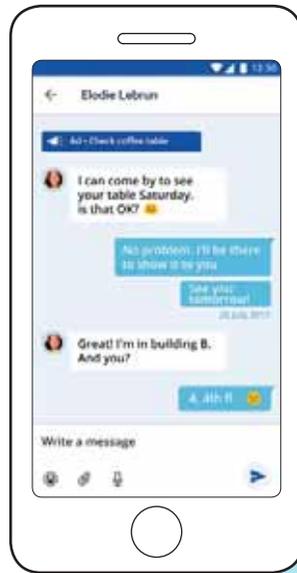
**“LIVE BETTER”  
IN THE CITY  
AND AT HOME**

“Our business is not limited to selling apartments. We offer a distinctive human and urban living experience,” says Laurent Tirot, executive vice president, Residential Property France at Bouygues Immobilier. To do this, Bouygues Immobilier carries out its mission of “providing better quality life” throughout the entire buying process, from the purchase to the delivery of its customers’ new home, and by offering connected, smart, and personalized living spaces that will be enjoyed day after day.

## FROM APARTMENT TO CONNECTED RESIDENCE

Homebuyers are offered a unique and innovative experience, from the reservation to the delivery of their apartment, with every step made easier by an array of digital tools such as virtual visits, 3D modeling, and touchscreens, among ...

Just left the office.  
I'm on my way!



I've already sold the shelves, but the table is still available.



### FLEXOM: THE APP FOR CONNECTED AND SMART APARTMENTS

- Manage one's apartment with one finger, even remotely: lights, security camera, alarm, rolling shutters, thermostat...
- Personalize the app with departure and arrival scenarios: turn off lights on leaving, increase the temperature in the apartment in the evenings...
- Manage one's energy expenses and buying power

...

others. Bouygues Immobilier agencies are designed to maintain the human contact that is essential to forging relationships of trust. Management of residential properties has been rethought in light of the new technologies now available – technologies that create social links while making people's lives easier. "What we are doing is bringing the digital city and the human city together. It's what is called 'phygital,'" explains Laurent Tiroit. Flexom and Entre Voisins, two applications developed by Bouygues Immobilier (see insets opposite), are already promising customers a uniquely convenient and pleasant experience.

### KOUMKWAT, THE REINVENTION OF APARTMENT SHARING

Have you heard about coliving? With this original approach to renting apartments, walls are torn down (at least metaphorically) and hybrid living spaces suitable for multiple uses are created. It is a new take on communal living that combines services, flexibility, and digital technologies. Bouygues Immobilier has created an operational subsidiary, KoumKwat, to promote this new concept of serviced apartments. In a building with about thirty coliving units, each resident has his or her private space – a bedroom and bathroom – and shares an apartment of over 150 m<sup>2</sup>. The common areas (laundry, gym, concierge office...) and services are managed by the building staff. A first proof of concept is to begin by year-end. Designed for active young people, this offer is based on the idea of community. "Between the end of their studies and the start of a stable professional and family life, this generation wants to be hypermobile,

### AMONG NEIGHBORS: THE MUTUAL ASSISTANCE NETWORK IN BUILDINGS AND NEIGHBORHOODS

- Communicate with one's neighbors through a private messaging system
- Post ads: babysitting, tools to lend...
- Manage shared spaces in the building: extra rooms, reception room...
- Get information about services available near one's apartment

ultra-connected, and free of constraints. They are looking for meaning and opportunities for sharing in their daily lives that come with a strong sense of belonging to a community," says Lucie Molina, coliving director at Bouygues Immobilier. Renters choose who they will live with using a digital app and go on to develop relationships by participating in organized events. KoumKwat also interacts with the local neighborhood through an outside cultural center that proposes a program adapted to the surrounding area. Lucie Molina sums it up this way: "A community is not decreed; it comes to life and thrives by nourishing the values of living together."



2017:  
600 Flexom-  
equipped  
apartments  
2018:  
4,600 Flexom-  
equipped  
apartments



**“We are using digital technologies to work at the neighborhood level”**



**Laurent Tiroit**

executive vice president, Residential Property France, Bouygues Immobilier

**How do digital technologies create connections?**

Digital technologies allow us to initiate and facilitate the collaborative economy and communication. People can share information and services easily and rapidly using smartphones. At Bouygues Immobilier, we are seeking to work at the neighborhood level by using digital systems and to create links and the exchange of services to improve our customers’ quality of life.

**How have residents responded to the Flexom and Entre Voisins apps?**

The feedback has been excellent. No matter what their age, all the residents feel comfortable using these apps. Entre Voisins encourages sharing between generations based on trust and sincerity. These apps are very beneficial for older people. They keep them from being isolated and help them to remain in their home and independent longer thanks to connected objects.



**“PAY-PER-USE” IN THE OFFICE MARKET**

**A**ctive in the corporate property market for decades, Bouygues Immobilier carries out efficient, ecological projects, including many “turnkey” ones. An excellent illustration is Sways, a project under way in Issy-les-Moulineaux, with delivery set for 2021. This flexible, autonomous, open, smart building reflects a new way of working, with high-performance digital connections guaranteed. In short, it points to a new lifestyle. The key innovation is “pay-per-use,” an offer that optimizes property overheads with quality services managed by outside companies. “Fifteen percent of the rent companies pay is for common areas that are used only a few hours a day,” notes Cédric de Lestrange, sales director, Commercial Property Regions at Bouygues Immobilier. With Sways, all the building “fundamentals” have been rethought so that the offering now includes hotel-like services (valet parking, room service, meeting rooms and amphitheatres of all sizes, available for any length of time…), eating and wellness facilities, shops, and places open to people from the outside as well. High-quality services are available to employees, with everyone paying what he or she consumes, while the company saves money by renting only its office space on each floor. In the Living Square, a centrally located area on the ground floor, there is a co-working space where people can get together and talk in pleasant surroundings. For companies, it is a way of investing in their image, greater productivity, and good working conditions for their employees. ■  
—Amandine Sand



*As of 2019, Dijon Métropole will be connected and smart.*



# The first smart city à la française



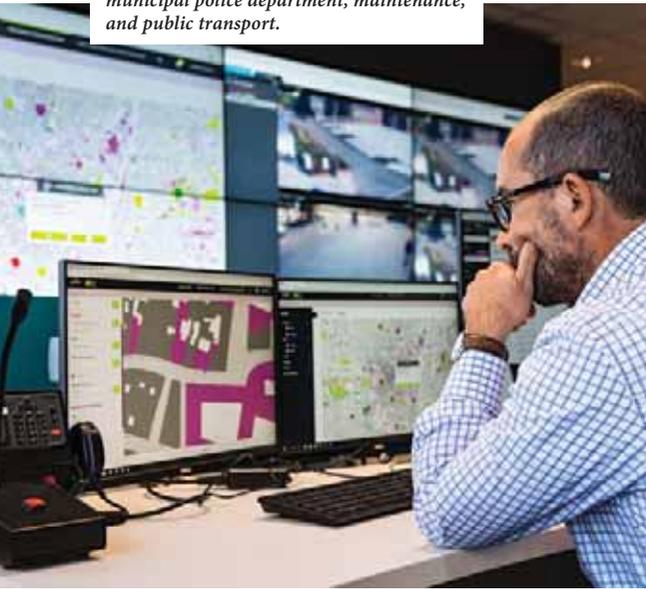
**DIJON MÉTROPOLE.** Bouygues Construction is helping this city in Burgundy to become smarter and more connected, two keys to attracting businesses and serving its citizens better. The future is already here!

**M**aking people’s lives easier, improving their living conditions, and supporting the community in its digital transition are the aims of OnDijon, the project for a smart and connected city that Dijon Métropole launched in 2015. Bouygues Energies & Services, a Bouygues Construction subsidiary, along with consortium partners Citelum, Suez, and Capgemini, has been contracted to design and set up a connected control center to supervise the urban equipment of 24 municipalities in the region and to operate and maintain it for 12 years. It has also been tasked with modernizing the public lighting, with a guarantee of a 65% reduction in energy consumption by the end of this €105-million contract. The first smart city project on this scale in France, it is bringing the introduction of organizational, technological, and economic innovations.

**DIGITAL TO SERVE CITIZENS**

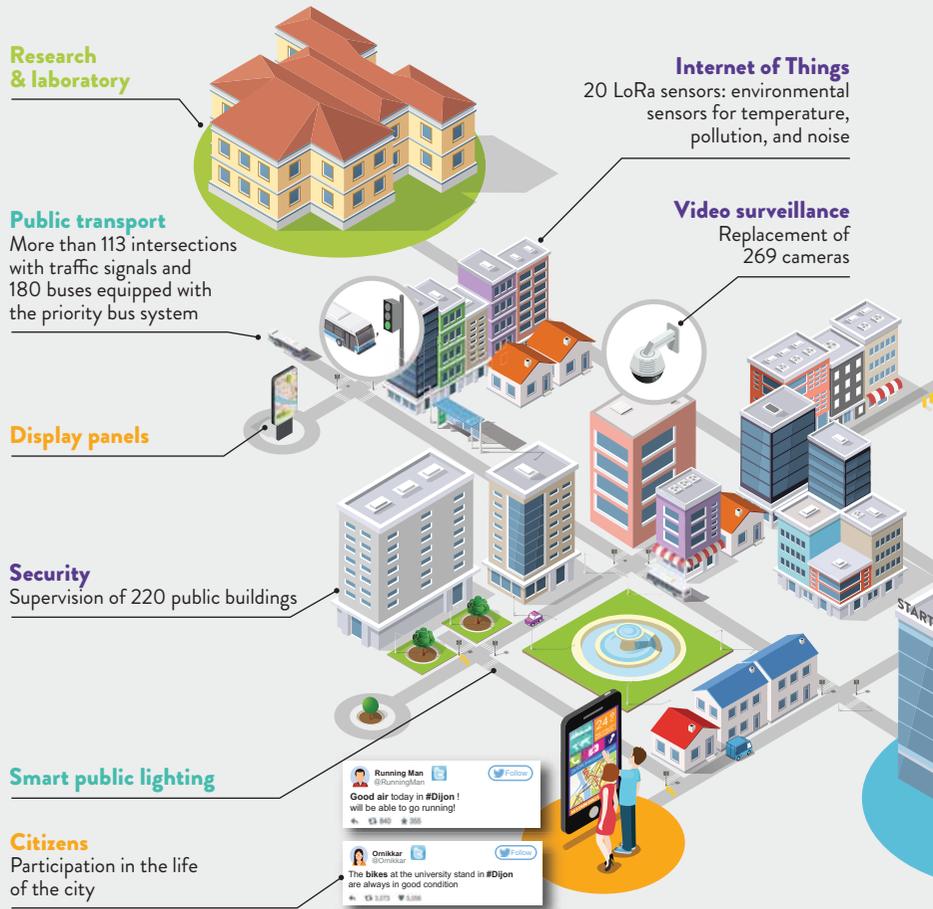
The first installation, which will become operational in the first half of 2019, is a new control center for the remote management of all urban equipment such as traffic signals, streetlights, and video surveillance systems. It will replace the six control centers in operation today, thus enabling the various municipal departments to work more efficiently with one another. “Our aim with the switchover to digital systems is to improve the quality of services offered to citizens and enhance safety in the public space through better coordination of our operations and equipment,” explains Christèle Tranchant, head of the OnDijon project for Dijon Métropole. The project has been designed to get community members more involved in the life of their region. Soon, via their smartphone, they will be able to report problems they notice in the street – a street light that’s not working, graffiti on a wall, a ...

Eventually about 40 people will be working in the “cockpit” each day to coordinate and organize services in the city such as the municipal police department, maintenance, and public transport.



## OnDijon, improving the quality of urban life

The OnDijon project will put a single supervisor in charge of the remote management of all urban equipment in the 24 municipalities of Dijon Métropole. The data collected will be open data shared to create new, useful services for residents.



...

garbage bag on the sidewalk... Comments Denis Hameau, a Dijon Métropole municipal councilor and a representative on the Higher Education and Innovation board: “The OnDijon project responds to our desire to promote participative democracy. With open data, we have the possibility of offering new digital services and giving citizens a large role in the decision-making process.”

### VALUE CREATION

The large quantities of data generated in the management of public services represent opportunities for economic growth in the region. By adopting an open data approach, OnDijon enables companies in the digital sector to imagine new applications that will be useful to the city and its citizens in areas like connected mobility, smart services, information sharing, and many others. Bouygues Energies & Services is thus helping the municipalities in the metropolitan area to develop and encourage initiatives like the Fab Lab, Living Lab, and incubators, from which innovations for startups will come. “Innovation competitions will be held periodically by the community to give a boost to these initiatives,” explains Étienne Dumas, director of the OnDijon project at Bouygues Energies & Services. The experience gained in data management will make Dijon Métropole a model internationally. And

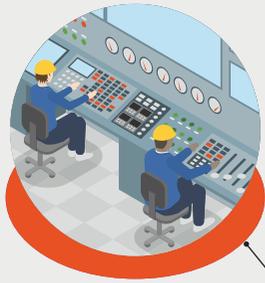
the city is eager to share what it is learning with other regions and the academic world. Adds Hameau: “Several engineering schools will be coming to Dijon and offering courses related to these developments,” thus turning the city into a laboratory to explore what smart cities can be.

### A PARTNERSHIP APPROACH

“We are an infrastructure and urban equipment operator, and we don’t claim to be doing it all by ourselves,” says Mickael Suchanek, head of Urban Services at Bouygues Energies & Services. That’s why to position itself in relation to new smart city players in the energy, telecom, and IT sectors, it

Soon a smartphone app will be available to communicate more directly with residents in the metropolitan area.





**Connected control center**

Uploading of data and supervision in real time 24/7



**Wi-Fi**  
in public places

**Smoother traffic flows**  
26 renovated and remote-controlled bollards



**Start-ups**  
Make use of data  
Create services



The 34,000 streetlights in the metropolitan area will be switched over to LED lamps and equipped with sensors to adjust lighting intensity according to the ambient light and activity on the street.



The OnDijon teams on the ground will be equipped with a portable system enabling them to organize and prioritize their work.

“The Dijon Métropole project is totally unprecedented in scope. It covers a very large range of services – mobility, security, lighting, streets, and interactive communication with users – all on the scale of 24 municipalities and over 250,000 inhabitants.”

François Rebsamen,  
Mayor of Dijon and president of Dijon Métropole

is relying on its capacity to choose good partners. At Dijon, it is teamed up with the EDF subsidiary Citelum, a specialist in urban lighting, along with Capgemini and Suez. Two of the Group’s subsidiaries are also taking part in the project: C2S, for IT systems security, and Axione, which is installing 140 kilometers of optical fiber cable. “This is the first smart city project of this scale in France, and all communities are paying very close attention to it,” adds Suchanek. Bouygues Construction’s objective is to reproduce this model elsewhere in France and other countries, each time adapting it to the local context. ■

— Isabelle Godar



## PRISM' IN FIGURES

7,500 m<sup>2</sup> of floor area

8 floors

A business center with  
17 conference rooms,  
a boardroom,  
a VIP restaurant,  
and a gym

A 120-seat auditorium

180 underground  
parking spaces,  
including 10 equipped  
to charge electric  
vehicles

*Prism' is constructed on  
a triangular sliver of land.*



# New headquarters for Colas

**OFFICES.** In late August, the 350 employees at Colas' headquarters moved into their new offices at the southern edge of Paris, opposite the suburb of Issy-les-Moulineaux. Spotlight on Prism', a building designed by Christian de Portzamparc.

In 2011, Colas was thinking about revamping its headquarters in the Paris suburb of Boulogne-Billancourt. But rather than undertaking such a complicated project on an existing building, the company decided to move. Colas asked Bouygues Immobilier to find the land in one of two suburbs, Boulogne or Issy-les-Moulineaux. It was tough task, and the possibilities were limited. One parcel was spotted, then another. Meanwhile, an architectural competition was held, and in January 2015 Colas selected the project of Christian de Portzamparc<sup>1</sup> (the 1994 Pritzker Prize winner). The project was moving forward, but negotiations to purchase the land ultimately came to naught. It was back to square one. Then Bouygues Immobilier turned up another parcel, a triangular sliver of land, which it bought in November 2015. In summer 2016, Bouygues Bâtiment Ile-de-France – Construction privée, a subsidiary of Bouygues Construction, began work. Once the parking garage and other technical rooms for the infrastructure were finished, construction of the building itself got under way, with one floor completed every

1. He also designed Galéo, the headquarters of Bouygues Immobilier in Issy-les-Moulineaux.

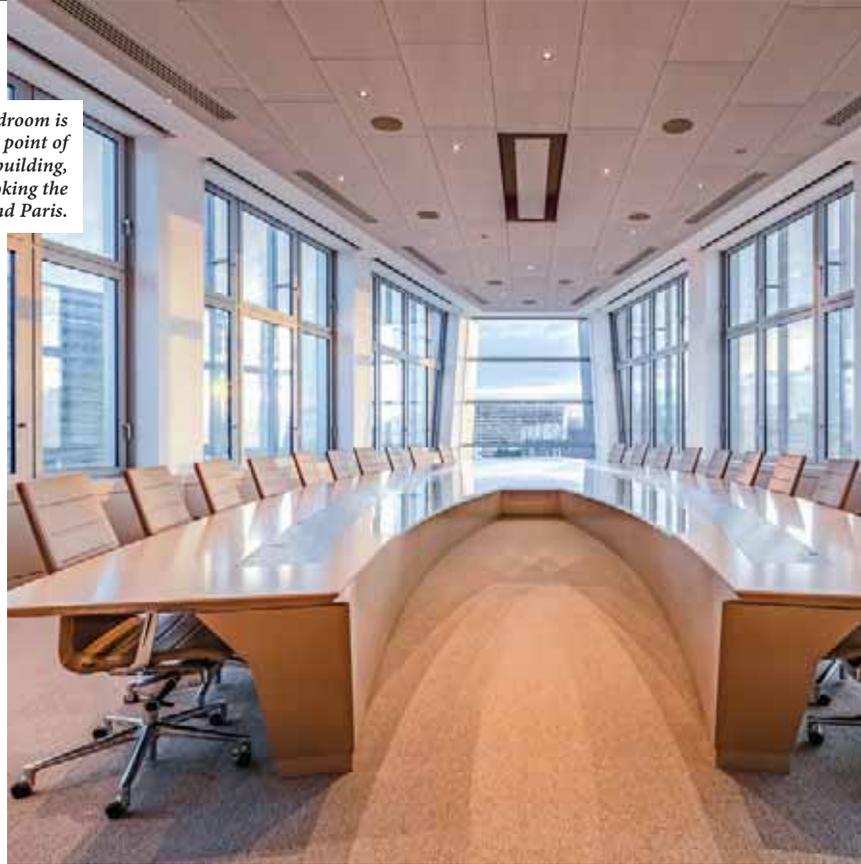
ten days. Smac, a Colas subsidiary, supplied the waterproofing. Previously, Colas Île-de-France Normandie had done the demolition and excavation work, and it would also be in charge of exterior installations. In other words, synergies in the Group were exploited to a maximum. "This operation was a sprint from the start," says Anne Vendeman, Green Office Development Manager at Bouygues Immobilier. "The challenge was to get all the land issues out of the way in record time and then meet all the specifications of the lessee, Colas<sup>2</sup> – and everything was to be top quality – within the allotted time. There was no room for delays of any kind in the calendar. We felt better once the property had been acquired. That was the crucial step."

## A GREEN DIAMOND

With a height of 36 meters, the sleekly designed, eight-story building offers a splendid view of the Eiffel Tower and the Ministry of Defense, another Bouygues Construction reference. Prism' has no vertical external walls, no straight interior walls, and the façade inclines at a different angle at each floor. Though it is relatively small, with a floor area of 7,500 m<sup>2</sup>, it was technically complicated to construct. "Cut like a diamond, with several prismatic faces, this building with a ship's-prow shape is like a taut sail," says Portzamparc. Adds Francis Castagné, construction manager at Bouygues Bâtiment Ile-de-France: "Its shell of inclined facets with slopes ranging from 3° to 6° has two layers, an inner one made of pale, ...

2. Colas financed all the installation work on the office floors.

*The boardroom is located at the point of the building, overlooking the beltway around Paris.*



...

powder-coated aluminum and an outer one of silk-screened glass. They give Prism' a transparent appearance and flood its interior with natural light." On the roof of this Green Office-rated building are 540 m<sup>2</sup> of photovoltaic panels and... two beehives. Producing more energy than it consumes, Colas' new headquarters is indeed a standout from an environmental viewpoint. It qualifies for three environmental certifications: Bepos Efficacité 2013, HQE "Exceptionnel" (2015), and Breeam International 2013 with an Excellent rating. Besides its solar-paneled roof, which supplies part of the required energy, a cogeneration plant fueled with colza vegetable oil has been installed. A big effort has also been made with the building's thermal and acoustic insulation. The hushed boardroom located at the point of the building is an example: without seeing the stream of cars below, it would be impossible to guess Prism' overlooked the highway that circles Paris.

### CUSTOMIZING THE SPACE

In the early days of September, there is a "back-to-school" atmosphere at Prism'. Divided into small groups of a dozen people, the staff is given a tour of the offices they are moving into. An open space layout was chosen for the offices – a change for employees who had been working for over 20 years in the same offices at the old Boulogne headquarters. But should a flexible plan with no assigned offices be adopted, as has been done successfully elsewhere in the Bouygues group? "The staff at headquarters are generally at their offices, so the management preferred an open-plan office, which allows easy communication between the teams," explains Mélanie Barcet, a project manager at Colas. But open plan does not mean vast, undivided areas. Open spaces on a human scale are located next to enclosed areas where people can work in calm surroundings. From the start of the project, workshops were organized with the space planner in charge of laying out the interior areas, and meetings were held to find out the needs of each department. Each management team then made its choices. "In the end, only about 15 people out of 350 still have a separate office," notes Fabrice Monnaert, head of Colas Projects. During a year and a half,

a 200-m<sup>2</sup> full-scale prototype was installed as a demonstrator at the former headquarters to give each department's managers the chance to come on a few days and try out the future installations to decide exactly what they wanted, in particular regarding furniture. As for the layout and equipment, Hervé Le Bouc, chairman and CEO of Colas, insisted that employees' well-being come first: the stairways, which are located in the center of the building, are visible through glass walls to encourage their use; the ergonomically designed offices allow employees to change their work position (sitting–standing) as they want; and the computer equipment has been entirely replaced. New services are available, too, like free coffee, a gym, and a concierge. There are green plants and terrariums everywhere: biophilia, or the art of bringing nature into interior spaces, creates a soothing atmosphere. The newly vibrant neighborhood around Prism' is enjoying a rebirth. And, like Colas, looking firmly toward the future. ■

— Céline de Buttet



*The headquarters team was divided into small groups for a tour of their new offices.*





“Its outstanding energy performance and state-of-the-art technologies make our new headquarters a symbol of Colas’ responsible development approach and its capacity for innovation.”

Hervé Le Bouc,  
chairman and CEO of Colas



*Hervé Le Bouc welcomes the staff to its new headquarters.*



*Visitors and staff are offered free coffee in the lobby.*



*Fabrice Monnaert, president of Colas Projects, and project manager Mélanie Barcet were in charge of the Prism’ project.*



**BOUYGUES  
CONSTRUCTION**

# The Australian Challenge



**DEVELOPMENT.** In the centers of Melbourne and Sydney, Bouygues Construction is meeting growing transport infrastructure needs while expanding in the building construction market and supplying turnkey solar farms. Here's a survey of its major projects.



*The Town Hall Station worksite is opposite Federation Square. This is one of the five metro stations that Bouygues Construction and its consortium partners are building in Melbourne.*



We're building an entrance to Town Hall Station here



The Victorian Government will help to build the new Town Hall Station entrance to the City Loop and deliver the new tram stop.

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**M**elbourne, cosmopolitan and the cultural capital of Australia. Street art and cozy restaurants are typical features of a metropolis whose population is expected to double by 2050. At City Square, in the City Loop, the spires of Saint Paul's Cathedral have loomed over a bustling worksite since early 2018. Bouygues Travaux Publics, teamed with local consortium partners Lendlease and John Holland, has been contracted to design, construct, and equip five stations and nine kilometers of tunnels in the project to extend the city's metro. "We are digging seven, 40-meter-deep shafts to build the underground stations," explains Raoul Fernandez, director of the Melbourne metro project. "These stations are exceptionally large. At 280 meters long and 30 meters wide, they are the size of the RER regional express stations in Paris." On the street, curious passers-by can view the progress in the work through observation windows. At a project information center, neighborhood residents can see a virtual reality presentation of the future tunnel boring machine at work. Four such machines will begin excavation in late 2019, with the tunnel slated to go into service in 2025. At the same

worksite, VSL is constructing some of the foundations and the diaphragm walls, which support the sides of the tunnel and help to keep the ground under the tunnel floor dry. It's not the first project for this Bouygues Construction subsidiary, which has been established in Australia longer than any other. "VSL has been present in the country since 1966 and has been a preferred partner when it comes to designing special construction methods," says Craig Commerford, managing director of VSL in Australia and New Zealand. And there is no shortage of infrastructure projects in this

country-continent, where the annual growth rate is about 3%.

### A LEAD ROLE FOR CIVIL ENGINEERING

At Sydney, Australia's most populous city, Bouygues Construction is working on two major motorway projects: WestConnex and NorthConnex. The first consists of constructing a 33-kilometer motorway to ease congestion and support the city's economic development. In summer 2018, Bouygues Construction Australia and its consortium partners were awarded package 3A of the WestConnex project,...



*In Melbourne's historical center, a 40-meter-deep shaft is being dug to construct the City Square underground metro station.*



### UNDERGROUND METRO

- > 5 stations and 9 kilometers of tunnels
- > AUD 6 billion (EUR 3.9 billion)
- > 4 tunnel boring machines starting late 2019
- > In service as of 2025

*An information center equipped with virtual reality goggles will be open during the entire project.*



*For the Bouygues Travaux Publics workers, the project that began in early 2018 will be completed in 2022.*



*In Sydney, the St Peters interchange being built by VSL is part of the WestConnex project. It has nine bridges for vehicle traffic.*



...

comprising a 7.5-kilometer tunnel that will link the M4 motorway at the level of the town of Haberfield to the new M5 motorway at the St Peters interchange (see map, p.53). It is also at this interchange, but in package 2 of this gigantic project, that the VSL teams are hard at work constructing the decks of the nine bridges at this highway hub.

This project recalls another major undertaking that Bouygues Construction Australia is carrying out north of the city. Since 2015, the Lendlease-Bouygues Travaux Publics consortium has been working in the

heart of the Pennant Hills nature reserve on the construction of a 9-kilometer twin-tube tunnel that will connect the areas west and north of the city. “With a height of 5.3 meters and width of 13 meters, the NorthConnex tunnel is the widest tunnel in Australia today. And it will also be the longest,” says Philippe Bouquet, chairman of Bouygues Construction Australia and NorthConnex Project Executive Engineering/Civil Tunnel/Planning. Underground, the workers are spraying concrete on the walls of the tunnel, which from now on will be excavated entirely ...

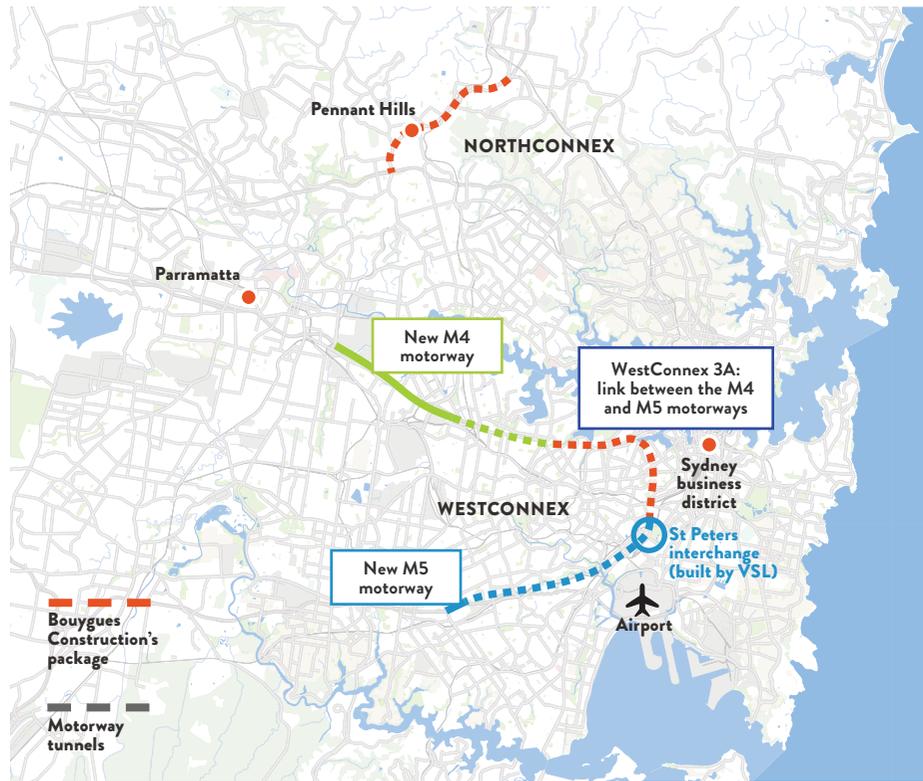




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### WESTCONNEX 3A

- > 7.5 kilometers of tunnels
  - > AUD 3.2 billion (EUR 2.3 billion)
  - > Delivery in 2023
- 



*Workers guide a concrete bridge segment into place. The crane lifting it has a capacity of 350 tons.*



#### Minorange bonus

See a video about the project on ByLink, the Bouygues group intranet:  
<https://bylink.bouygues.com>



*In the NorthConnex tunnel at Sydney, workers spray a layer of concrete on the tunnel walls to reinforce them.*

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#### **NORTHCONNEX**

- 9 kilometers of tunnels
  - AUD 2.6 billion (EUR 1.75 billion)
  - 1,500 site workers
  - Delivery in 2020
- 



*The tunnel breakthrough on October 8, 2018, was attended by Gladys Berejiklian, the Prime Minister of New South Wales.*



*With a height of 5.3 meters and a width of 13 meters, the NorthConnex tunnel is the largest in the country today.*



...

with 20 roadheaders, and finishing the digging of 82 cross-passages<sup>1</sup>. Completion of the NorthConnex project, set for 2020, will ease traffic flows, particularly by removing a portion of the truck traffic. As for motorists, they will avoid 21 traffic lights and cut a minimum of 15 minutes from their driving times. “The experience we’re gaining in NorthConnex is helping us in the WestConnex project, where similar techniques are being used,” concludes Bouquet.

### A MAJOR ACQUISITION

Photos of the company’s most impressive projects decorate the walls of the A W Edwards headquarters. Bruce, the grandson of its founder, Austin William Edwards, gazes at them with immense pride. He is the honorary

1. Passages between the tubes of a twin-tube tunnel.

chairman of this Sydney-based company with 269 employees, which carries out projects each worth between AUD 5 million and 300 million (between EUR 2 million and 200 million). The entrance to the famous Taronga Zoo, which houses 2,000 species of wildlife, the White Bay Cruise Terminal, and the renovated Queen Victoria Building containing 190 shops are among the company’s landmark projects in central Sydney. Founded in Australia in 1921, A W Edwards is recognized today for its know-how in the construction of hospitals, schools, and transport infrastructures. “We have the same values as the Bouygues group, with a strong commitment to technical excellence and innovation to benefit the customer, and the same pride in the company’s history and values,” says Greg D’Arcy, chairman and CEO of the company, which was acquired

by Bouygues Bâtiment International in May 2018. “All this is motivating for our employees.” A stable company with a family-based culture, it has been very successful developing relationships of trust with its customers. “The acquisition of A W Edwards gives the Bouygues group solid positioning in Australia’s building construction sector along with access to a new local network. It also represents an opportunity to develop our activities in this strategic and demanding market, which is strictly regulated,” says Nicolas Borit, chairman and CEO of Bouygues Bâtiment International. “It is a high-performing company with some outstanding projects to its credit.” At the present time, teams from A W Edwards are working on eleven projects in Sydney, among them a new hospital building in the suburb of Blacktown. This ...



A W Edwards is constructing the extension of the hospital in the Sydney suburb of Blacktown.



## IN FIGURES



2018 revenues of the Bouygues Construction subsidiaries in Australia:

*Bouygues Travaux Publics:*  
AUD 540 million  
(EUR 347 million)

*VSL:*  
AUD 85 million  
(EUR 56 million)

*Bouygues Bâtiment International:* AUD 122 million  
(EUR 78 million)

*A W Edwards:* AUD 311 million  
(EUR 200 million)

*Bouygues Energies & Services:*  
AUD 122 million  
(EUR 78 million)



“Team spirit is a fundamental value for A W Edwards, as it is for the Bouygues group.”

Greg D'Arcy, chairman and CEO  
of A W Edwards

...

eight-story building will house emergency, intensive care, and pediatrics departments as well as eight operating rooms equipped with state-of-the-art technologies.

### SUNNY DAYS AHEAD

Since the signing of the Paris Agreements on climate change in December 2015, the Australian government has committed to including more green energy in its energy mix. The country enjoys lots of sunshine and has plenty of wide-open spaces, two factors conducive to rapid development of solar farms. “Bouygues Energies & Services partners with Bouygues Bâtiment International in designing, constructing, and commissioning such facilities and then maintaining them

for 25 years,” explains project manager Jérôme Aruanno. “This activity will account for 50% of the revenues of Bouygues Construction Australia in 2018, and it should continue to provide 25% of them in the coming years,” notes Seved Robin, CEO of Bouygues Construction Australia. Seven solar farms have already been delivered in Australia. One of them, a 550-hectare installation at Coleambally, New South Wales, has been in operation since last November. It was constructed in five months, with about 500 workers on the job at peak times. “With a capacity of 189 megawatts-peak, this solar farm built by Bouygues is the one supplying the most energy at the present time,” notes Aruanno. ■

—Laura Franchet

The dynamic and attractive city of Sydney has over 5 million inhabitants. The Harbour Bridge and the Sydney Opera House are two of its landmarks.



Bouygues Construction delivered a 550-hectare solar farm in the Australian bush last November.



**“Our challenges are on a par with the size of the country”**

**I T W**

**Seved Robin**

Chief Executive Office of  
Bouygues Construction Australia

#### **What is Bouygues Construction’s strategy in Australia?**

Bouygues Construction enjoys a positive image owing to its capacity to respond to its customers’ needs. In recent years, we have been awarded projects worth several billion euros in one of the world’s most dynamic markets. The challenges are on a par with the country’s size. Today we want to meet those challenges while ensuring the company’s long-term success with smaller-scale projects. With this strategy, we will be able to increase our revenues from 800 million Australian dollars in 2018 to one billion in the next few years.

#### **What are the issues when it comes to human resources?**

Australia has grown at a rate of 2% to 3% for the past 27 years. This prosperity has been accompanied by full employment. We are therefore investing more in management and training so that everyone fits in and is able to develop personally in his or her job. This policy is paying off, as Bouygues Construction now has a 550-strong workforce in the country.

BOUYGUES

# The Group grows in Europe

**MARKET.** In July 2018, Bouygues Construction and Colas Rail finalized the acquisition of Alpiq Engineering Services, a leading player in the energy, industrial services, and rail infrastructures sectors in Europe. Here's a closer look at this strategic move in promising sectors.

—Laura Franchet

*Stefan Vres, a technician at Alpiq InTec, now Bouygues Energies & Services InTec, and André Hablutzel, a Facility Management technician at Bouygues Energies & Services, work together at the Zurich fine arts museum.*



**A**fter obtaining the approval of European and Swiss competition authorities, Bouygues Construction and Colas Rail, the rail subsidiary of Colas, finalized on July 31, 2018, the acquisition from the Swiss group Alpiq of all the shares of Alpiq InTec AG and Kraftanlagen München GmbH, whose activities were previously grouped in Alpiq Engineering Services. Alpiq InTec and Kraftanlagen München provide a range of technical services in the sectors of building construction and energy, industrial, and transport infrastructures. With the acquisition, Alpiq InTec, renamed Bouygues Energies & Services InTec, and Kraftanlagen München became part of the Energies & Services division of Bouygues Construction, while the rail activities were integrated into Colas Rail.

## DEVELOPMENT OF ENERGIES & SERVICES ACTIVITIES IN SWITZERLAND

Five hundred people assembled at the prestigious Beaulieu Congress Centre in Lausanne on October 3 to discuss and learn more about an adventure on which the employees of Bouygues Energies & Services Suisse and Bouygues Energies & Services InTec are embarking together. Roadshows were held all across the country during more than a month so that the teams could get to know one another. “Working together, we have the keys to become a leader in building technologies and facility management<sup>1</sup> in Switzerland,” says Stéphane Schneider, CEO of Bouygues Energies & Services InTec and Bouygues Energies & Services Suisse. Being a well-established local company is indeed a plus when bidding for contracts in the country. “We have the same values of openness, reliability, and entrepreneurship as the Bouygues group,” ...

1. *Facility management* consists of activities related to safety and a company’s infrastructures: for example, maintenance of electrical, heating, ventilation, and air conditioning systems or elevators.

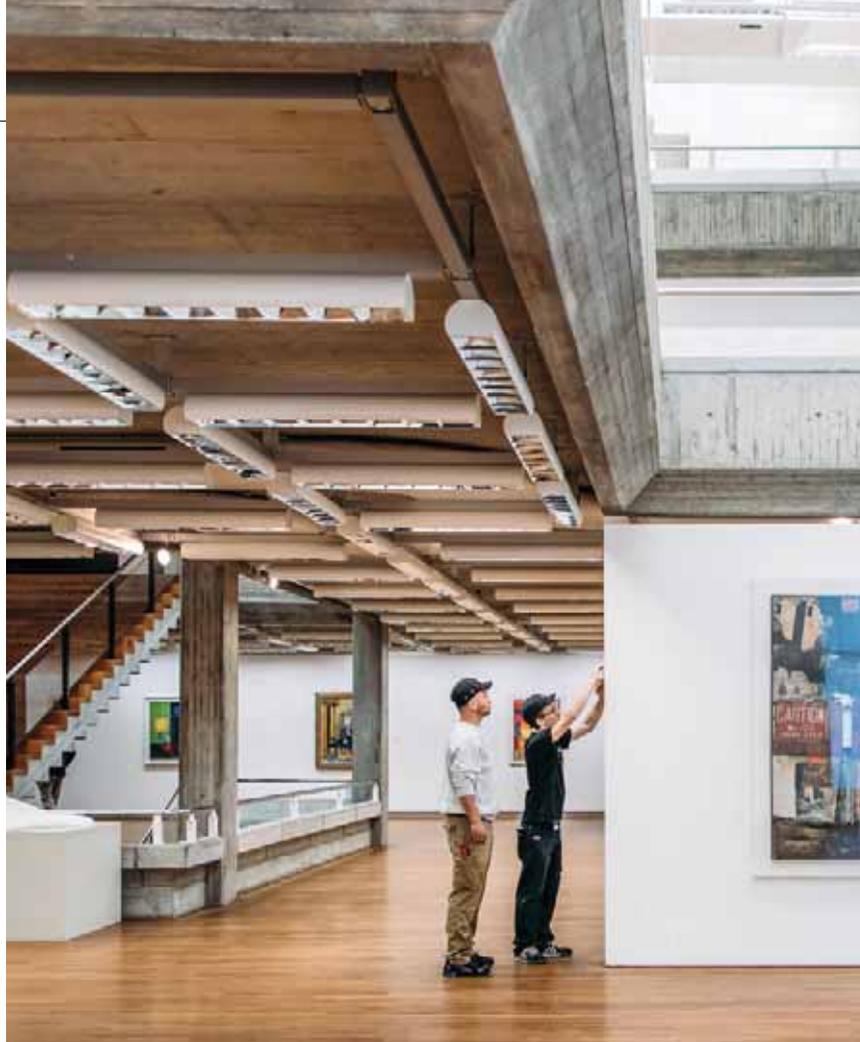


“Alpiq Engineering Services and Bouygues Construction share the same values and the same culture of innovation and operational excellence. By uniting our diverse capabilities and our complementary businesses, this acquisition makes Bouygues Construction a leading player in energy and services in Europe.”

Philippe Bonnavé, Chairman and CEO  
of Bouygues Construction

...

adds Damien Roulet, deputy general manager for the canton of Vaud at Bouygues Energies & Services InTec. And what is he expecting from this interaction between the teams? “By discussing and comparing working methods, we’ll become more competitive.” The blue and orange visual identity of Bouygues Energies & Services has been adapted to represent Bouygues Energies & Services InTec. It is now visible on 63 Swiss sites of the new entity and displayed on the building signage, vehicles, and work clothes. The intranet, social networks, and digital apps have also been harmonized. “Work tools will have to function in multiple languages and will be adapted and developed in English, German, French and Italian. It’s a real communications challenge,” notes Schneider. While the two entities are keeping their own legal structure, a single management organization for the Energies & Services business in Switzerland has been created. ■



## COLLABORATION ON THE GROUND: KUNSTHAUS ZÜRICH

Zürich’s fine arts museum, Kunsthaus Zürich, houses more than 4,000 paintings and sculptures as well as 100,000 works on paper. Bouygues Energies & Services InTec and Bouygues Energies & Services Suisse have been working together at this institution since 2006, with the former installing technical equipment for which the latter provides maintenance. The purpose of most of the equipment and installations is to maintain the temperatures required to preserve the artworks. A 24/7 emergency service has been set up. “If one of the cooling units breaks down, for example, I have to be there to take care of it within two hours,” explains Stephan Vres, a technician at Bouygues Energies & Services InTec. In March 2020, an extension to the museum will be completed, increasing its floor area to 39,000 m<sup>2</sup>. Bouygues Energies & Services InTec is currently designing equipment specifically to meet the customer’s requirements. André Hablutzel, a facility management technician, notes that “with this project, the number of maintenance personnel is going to double.”





*A project at the Zurich fine arts museum.*



“Germany is rethinking its energy mix. Its ecological transition is a source of opportunities for us there.”

Stéphane Stoll,  
Chairman of the General Management,  
Kraftanlagen München



*A meeting in Lausanne of staff from Bouygues Energies & Services Suisse and Bouygues Energies & Services InTec.*

## A BOUYGUES CONSTRUCTION FOOTHOLD IN GERMANY

Another new partner acquired by Bouygues Construction is Kraftanlagen München. Based in Munich and present throughout the country, this company specializes in mechanical engineering, industrial services, and the construction of conventional and nuclear power plants. Its largest project to date is a thermal power plant at Kiel, on the Baltic Sea coast, that emits 70% less carbon dioxide than conventional coal-fired plants. Partially funded by the European Union, it is one of the most modern plants in the world owing to its flexible energy production system. “Joining Bouygues Construction will enable us to create international synergies,” says an enthusiastic Joachim Gessner, finance director of Kraftanlagen München. “Like Bouygues’, our company culture is based on innovation, safety in the workplace, and protection of health.” Gessner is on the three-member board set up to run the company and decide organizational priorities. Another member is Stéphane Stoll, chairman

of the general management of Kraftanlagen München and former deputy CEO of Bouygues Energies & Services in charge of development, innovation and digital transformation. “With Kraftanlagen München, we are adopting a strategy of progressive integration. The idea is to gain an understanding of how the company functions internally before implementing operational synergies,” he explains. The third board member is Alexander Gremm, the director of operations. Born in the region of Munich, he has worked at Kraftanlagen München since finishing his studies, so he knows the company very well. “The acquisition is motivating for the employees,” he says. “We are eager to see this integration succeed.” ■

*The rail activities of Alpiq InTec have been integrated into Colas Rail.*



“This acquisition enables Colas Rail to grow in the Swiss and Italian markets in particular and to reinforce its presence in Central Europe and the United Kingdom. Alpiq’s recognized capabilities in electric power supply for rail transport are also going to round out Colas Rail’s portfolio of solutions and know-how and strengthen its leadership as a major player in the rail sector.”

Hervé Le Bouc,  
Chairman and CEO of Colas

## COLAS AND KUMMLER MATTER ON THE SAME TRACK

In this acquisition by the Group, the rail activities have been integrated into Colas Rail, which has not been present in Switzerland until now. Kummler Matter, a Swiss company founded over a century ago, constructs overhead and underground power transmission lines and contact lines for railways. The company designs, supplies, and installs about 90% of the catenaries in Switzerland’s urban transport market. “It’s a pleasure for us to become part of a company that speaks our language and knows our activities inside out,” says Stephan Güpfer, CEO of Kummler Matter. The company will keep its name, which is synonymous with reliability in the country. “We want Kummler Matter to retain its autonomy on the commercial front so as to preserve a solid customer base,” explains Jean-François Milleron, managing director, Europe Division, at Colas Rail. Meanwhile, Kummler Matter will be able to capitalize on Colas Rail’s international network to develop business in other countries, particularly in the design and supply of catenary solutions. Designed and

tested in Switzerland, these high-value-added technological products set it apart in the market. The company’s future projects include the supply of railway infrastructures in the Léman 2030 project, in which the Lausanne-Geneva route is being upgraded in anticipation of traffic doubling from today’s 50,000 to 100,000 passengers. There are already plans for joint undertakings with Colas Rail in France, too. Three other Alpiq InTec rail transport subsidiaries are joining Colas Rail. Prague-based Elektroline designs, produces, and installs catenary and signaling components for urban and railway transport markets in the Czech Republic and in some 20 other countries around the world. Alpiq Enertrans SPA, based in Milan and now called Colas Rail Italia, designs and installs electrical substations and catenaries for urban, railway, and high-speed transport in Italy and in a few targeted export operations. Last, Manchester, UK-based Lundy Projects designs, manufactures, and installs heavy metal structures for signaling and catenaries in the UK. Lundy Projects is now associated with Colas Rail UK. ■





## IN FIGURES

### Bouygues Energies & Services InTec



4,000 employees

CHF 1.3 billion  
(EUR 1.1 billion)  
in revenues in 2017

### Kraftanlagen München

2,200 employees

EUR 400 million  
in revenues in 2017

### Colas Rail

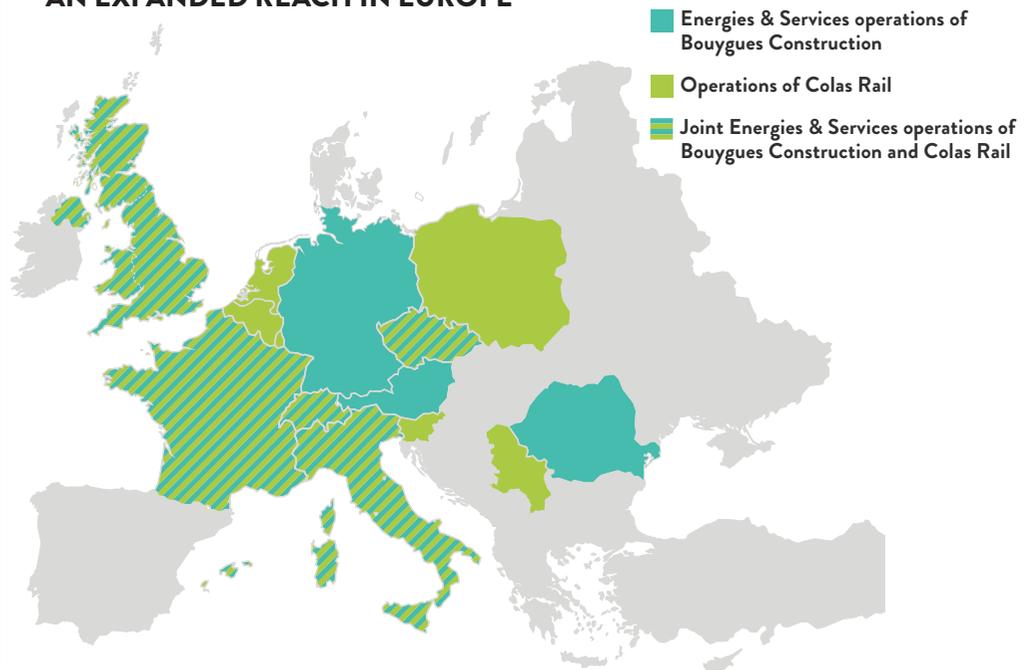
6,500 employees

EUR 950 million  
in revenues in 2017

# The new landscape after the acquisition

*Bouygues Construction strengthens its Energies & Services business by integrating the top five European players in this sector. For its part, Colas Rail expands in the key markets of Switzerland, Italy, Central Europe, and the United Kingdom.*

## AN EXPANDED REACH IN EUROPE



## A RANGE OF ACTIVITIES TO DRIVE FUTURE GROWTH

### BUILDING CONSTRUCTION



#### Buildings

> Facility management, security and automation, information technologies, digital modeling



#### Buildings – Energy optimization

> Photovoltaic systems, electricity storage, e-mobility

### INDUSTRIAL ENGINEERING



#### Electric power plants

> Planning and construction of power plants, construction and maintenance of installations to supply electricity and hot water



#### Industrial installations

> Industrial maintenance, process digitization and automation



#### Dismantling of nuclear power plants

### INFRASTRUCTURE



#### Energy

> High-voltage lines, transformer stations, network services, intelligent networks



#### Communication

> Laying of conduits and cables



#### Heat networks

> Generation, transformation, distribution, storage

### TRANSPORT



#### Traffic

> Traffic management systems and infrastructures



#### Transport

> Electric power lines for high-speed trains, catenary technology for tramways and trolleybuses, transformer stations for transport infrastructures

*In Paris, Green Office Enjoy has a mixed timber-concrete structural frame. It is constructed on a slab above railway tracks.*





BOUYGUES

# Building differently with timber

**MATERIAL.** Ecological and attractive, wood is growing in popularity. With timber becoming more common in construction, even for tall buildings, the Group is developing its capabilities to capitalize on this trend in France.

**W**ith sales totaling €1.6 billion and almost 2,000 companies active in the French market in 2016, timber construction is expanding in all building sectors, from housing and offices to public facilities. Its dynamic growth could well make it a €2-billion business by 2020. Softwood coming from spruce or pine trees is preferred to the family of hardwoods like oak. “Softwood is easier to work with and produced in larger quantities in our forests in Europe,” explains Julien Brisebourg, a timber specialist in the central technical department at Bouygues Immobilier. The first advantage of timber is its small carbon footprint. “It is a natural carbon sink. It stores carbon dioxide from industrial activities rather than emitting it, and producing and transforming wood consume little energy,” points out Christophe Lemaître, head of Timber Construction at Bouygues Bâtiment Ile-de-France. Using precut and prefabricated 3D and 2D timber structures results in less noise annoyance for people living nearby because the elements are assembled by screwing or nailing them together. This also means cleaner and safer worksites for ...

*Bouygues Immobilier received its first low carbon certification (BBCA) for a residential building with its Sensations project in Strasbourg.*

•••

the workers. Timber is generally 10% to 20% more expensive than concrete, but since the elements are cut to the required dimensions, there is less waste and building times are shorter. Timber is excellent thermal insulation, thus keeping building interiors warm in winter and cool in summer. So that sums up the advantages. As for its uses, timber is mainly employed in the construction of the structural frame, floors, stairwells, and elevator shafts, often in combination with other materials such as concrete or metal.

### CAPITALIZING ON THE GROUP'S KNOW-HOW

A responsible and engaged company, Bouygues Bâtiment Ile-de-France is investing in new construction methods using timber as a building material. To support this initiative, it has created a new division, Bouygues Bâtiment Ile-de-France Construction bois, staffed with engineering, production, and purchasing teams. This division has unique expertise in all aspects of timber construction – addition of floors, combined timber-concrete construction, façades, installations, and modular construction, among others – and in all types of products. It has a policy of seeing that its timber purchases do not create risks for forests, for the people who depend on them, or for the biodiversity they support. These concerns have led to a partnership with the WWF France, renewed in 2017, whose aim is to help Bouygues Construction be a responsible timber purchaser. At Bouygues Immobilier, a unit specializing in timber construction has been created in the central technical department.

“My role is to stay in contact with everyone working in this area and to support the operational teams, from the initial architectural sketches to the handover of our projects,” says Brisebourg. Projects are being developed with the idea that they will serve as demonstrators to illustrate the Group’s capacity to build with timber, to construct tall buildings with it, and to do this in cities. This forward-looking approach will enable the Group to deliver buildings that qualify for environmental certifications like the *Bâtiment bas carbone* (BBCA) rating awarded to low carbon buildings.

### MULTIPLE TECHNICAL CHALLENGES

Constructing tall buildings with timber gives the Group the opportunity to propose new technical solutions. For the office building



*The seven-story Green Office Enjoy in northwestern Paris has a coworking space and 64 parking places.*

project Green Office Enjoy in the Clichy-Batignolles development zone (ZAC), slated for delivery in December 2018, acoustic tests were done with the Scientific and Technical Center for Building (CSTB). “Dry screed was put on the floors, and a heavy raised floor was placed between each of the building’s six stories to obtain acoustical performance equivalent to concrete construction,” explains José Maria Sales, project director at Bouygues Immobilier. At Strasbourg, the structural frame and façades of the 38-meter-high Sensations building, which contains 146 apartments, are made of timber. Full-scale tests were conducted to see how fire could spread across the façades. “These tests will allow us to make the adjustments needed to meet the recommendations issued by timber





## TIMBER CONSTRUCTION IN FRANCE

€1.6 billion in revenues



1,981 companies



12,820 specialized jobs

24 million hectares of forests (overseas dependencies included)



31% of the land is covered with forests

Sources:

Ministry of Agriculture and Food (2016) / Syndicat Français de la construction bois (2016)

Located in the 13th arrondissement of Paris, the 50-meter-high Tour Commune will house 210 apartments (artist rendering).



construction professionals in association with the CSTB and the Institut Technologique Forêt Cellulose Bois (FCBA) in 2017. And they will also serve as case studies for future projects carried out across France,” explains Philippe Michel, technical director, East Region, at Bouygues Immobilier. Last December, this project was awarded the BBCA rating, making it the first low carbon certification Bouygues Immobilier has received for a residential building. Meanwhile, Bouygues Construction delivered Catalpa, its first sustainable modular timber-frame building, to the French Army in 2016, just seven months after the order was placed. In this project, Bouygues Construction combined quick execution with high-quality results. The next challenge? The Tour Commune in Paris, on which work began



“A timber construction industry is taking shape in France”



Marcel Chouraqui

Managing director of Adivbois

### What does your association do?

Created in 2015, it supports the Timber Industry Plan sponsored by four ministries that is designed to help achieve the carbon neutrality targets for 2050. With our 150 experts, we assist companies that are constructing buildings with a minimum of ten floors. That is the case with the Bouygues group in partner projects like the Tour Commune in Paris and Sensations in Strasbourg.

### How is the timber construction industry changing?

In some projects today, 50% of the timber comes from France. Wood has been produced in other countries, in Austria and Canada, for

example, for a longer time. France is catching up, and the industry is taking shape. Over the past three years, we have identified 24 regions for the construction of demonstrators, which makes France a leader in construction with this material.

### How is wood used for interior installations?

Building with wood offers an opportunity to approach our surroundings in new ways. We are interested in looking at the impact of wood on well-being, health, productivity in the office, and other things. Studies show that consumers have a very favorable opinion of wood in their home or workplace.

in 2018. A total of 1,500 m<sup>3</sup> of timber will be combined with steel to construct the structural frame of this 50-meter-high building – a true technical feat. “The next step is to use more French timber in the projects,” says Brisebourg. “In the Vendée region, the Piveteau group is investing in the largest plant in France for the production of wood paneling for floors and walls.” Technical improvements are indeed driving growth in the timber construction market in France. More and more projects are being undertaken in anticipation of low-carbon regulations, while shareholders and investors in green funds are ready to raise their bets on ecological building construction. As a result, supply and demand will continue to grow at an equal pace. ■

— Laura Franchet and Amandine Sand



## IN FIGURES



789 students sponsored  
since 2005

375 graduates already  
employed

€1,500 to €5,000 a year  
per scholarship recipient



60 scholarship recipients  
of 12 nationalities in the 2018  
selection (the 14th selection  
since the beginning)

100 scholarship recipients  
per year as of 2019

640 applications  
submitted in 2018



12 members on the board  
of directors, including  
4 experts in the field  
of education



*The Francis Bouygues Foundation  
provides assistance to deserving  
high school graduates  
from low-income families.*

BOUYGUES

# A bright future ahead

**EQUAL OPPORTUNITY.** The Francis Bouygues Foundation helps high school graduates who are eager to pursue a higher education but lack the financial means to do so. They are scholarship winners... and much, much more!

**B**ecome an engineer, a neurosurgeon, an investigative journalist, an anthropologist, a fashion designer, a university professor... the sixty 2018 scholarship winners have dreams they are determined to make come true. And the Francis Bouygues Foundation, chaired by Jean-François Guillemin<sup>1</sup>, is there to give them a hand. Since 2005, it has been offering increasing support to worthy high school graduates from low-income families<sup>2</sup>, who are selected for their excellent academic performance and ambitious career goals. Each year in February, a letter presenting the Foundation is sent to many high schools and information and guidance centers across France as well as to French high schools abroad. The aim is to give everyone a chance. Candidates submit a written application, and those shortlisted appear before a jury consisting of three members of the board of directors, which is made up of Bouygues group executives and experts in the field of education. The winners ...

1. Chairman of the Foundation since 2017 and a former corporate secretary of the Bouygues group.
2. Their family's annual income must not exceed €20,000.



To find out more

[fondationfrancisbouygues.com](http://fondationfrancisbouygues.com)

[facebook.com/  
fondationfrancisbouygues](https://facebook.com/fondationfrancisbouygues)

## MORE SCHOLARSHIP WINNERS

At the ceremony to welcome the 14th group of scholarship recipients on October 23, 2018, Martin Bouygues announced that in view of the Foundation's success and the positive comments from students and sponsors, the board of directors of the Francis Bouygues Foundation had decided to help more young people by increasing the number of students selected each year from 60 to 100, starting in September 2019.

## “It was my primary guidance counselor who spoke to me about the Foundation”

### COMMENT

**Célia Yu**

Financial auditor in Paris. Master 2 Accounting Control Auditing. Université de Paris-Descartes (2017).

“When I was a high school student in Aulnay-sous-Bois, I wanted a job where I could work with numbers. It was my primary guidance counselor who spoke to me about the Foundation. My sponsor, Luis Murça [deputy director, Accounting, at Bouygues SA], was always there to give me support, but without

forcing me to do anything. He even welcomed me to his department for my first-year internship. No one in my family had gotten a higher education, so it was great to have Luis as a role model. In addition to the financial aid, the support of a sponsor is a valuable resource.”



Selection **8**

...

receive a scholarship, which is reviewed each year. However, the support given to these students is not only financial; it also comes in the form of people. This is what makes the Foundation unique. Each scholarship recipient is assigned a sponsor, most of whom are Group employees. “The Foundation would be nothing without them,” insists Christel Navarro, the Foundation’s general secretary. By drawing on their professional experience and diverse backgrounds, they guide their protégés, encourage their efforts at

self-improvement, and open their networks to them. “These are important connections and often wonderful human adventures that are shared,” says Guillemin. “The best proof of our institution’s success is the fact that many scholarship recipients want to become sponsors later on. I have confidence in this generation, which is demonstrating solidarity. They will pay back what they have received a hundred times over.” ■  
— Marie-Sophie Boissy, Céline de Buttet, Laura Franchet



The 2018 selection with Martin Bouygues and Jean-François Guillemain.

Selection **5**

**“The Foundation’s moral support is as valuable as its financial support”**

**COMMENT**

**Juned Mohammad**

Data scientist in Paris. Grenoble INP – Phelma (2014), Essec (2015).

“I decided while I was in middle school in Sarcelles that I wanted to go to engineering school. But that was going to take financial resources that we didn’t have at home. So I looked on the Internet for scholarships that I could apply for. Thanks to the Foundation, I was able to start my preparatory classes without worries. My sponsor, Yann Le Coniac [a former Bouygues Construction employee], helped me gain self-confidence and opened doors for me. That included doing my site worker

internship in the Philharmonie de Paris project. Next, an internship in California and a stint as an International Corporate Volunteer in Malaysia broadened my horizons. My primary motivation in seeking sponsorship was financial, but a decade later, the Foundation has brought me much more. I would say to a young person who is applying that the Foundation is a springboard and that the moral support it offers is as valuable as the financial support.”



“That talented and hardworking young people would not be able to pursue a higher education for social or financial reasons has always seemed extremely unfair to me. Our Foundation is a way of helping some of them.”

Martin Bouygues



Selection

7

**“This experience with the Foundation has been enriching from both the human and professional standpoints”**

#### COMMENT

**David Mugisha**

Consultant Engineer in Paris. CentraleSupélec (2017).

“After getting my high school diploma in Burundi, I obtained a scholarship to do my preparatory classes at the Lycée Sainte-Geneviève in Versailles. But then came the question of what to do next. The head of studies told me about the Francis Bouygues Foundation. During the interviews, I was surprised by how open and ready to listen the interviewers were. Besides the financial aid, the support of my sponsor, Frédéric Gardi, the director of Innovation 24 [the Group’s optimization unit], was a plus.

We took the same track, and like him, I’m an IT engineer and plan to go into research and development. In particular, he gave me advice about the school I should go to – I’m a graduate of CentraleSupélec – and the internships I should do. My experience with the Foundation gave me a reassuring framework and was enriching from both the human and professional standpoints. I’m currently working for Accenture in Paris and – why not? – thinking about becoming a sponsor myself in a few years.”



**“My sponsor was always there to keep me going and advise me”**

**COMMENT**

**Justine Machart**

Midwife in Lens. State Diploma – Université de Lille (2017).

“I’m 23, and I work as a midwife in a public hospital thanks to the diploma I obtained in late 2017. I’m originally from the little town of Noeux-les-Mines, in northern France, and I lived with my father, who was raising

three children. The Foundation enabled me to have housing near the university and the Jeanne de Flandres maternity hospital in Lille. The courses weren’t easy. Sometimes I felt like giving up. But my

sponsor, Christel Navarro [general secretary of the Foundation], was always there to keep me going and advise me. There’s nothing to lose in trying your luck with the Foundation. It can only turn out well.”



**“It was such a good experience that I did it two more times!”**

**COMMENT**

**Christophe Buysens**

Director, Project Works Management at Linkcity North-East (Bouygues Construction). Student sponsor for the 5th, 9th, and 11th selections.

“I got started as a sponsor a bit by chance. They asked me to take over for a sponsor who was leaving the region. The idea appealed to me. At the time, I was already working as a volunteer with an organization that helped seniors get back in the workforce. Being a sponsor was such a good experience that I did it two more times! The first person I sponsored is no longer studying on a scholarship. He has graduated and is working in Dublin. The second is a student-civil servant, so she no longer has a scholarship. That leaves the third, who is still in school, but I’m still in touch with each of them. I arranged to have lunch twice a year with all of them together and invited my oldest son, who is the same age and dealing with the same issues at school as they are, to join us. My wife, who also works at Bouygues, is a sponsor too.”



# Special care in a unique hospital



**LONDON.** In 2020, a centre for cancer treatment with high-energy proton beam therapy will open in the UK capital. Bouygues UK, with consortium partner Bouygues Travaux Publics, is designing and building this facility, which is as exceptional as it is complex.





*The extension of the University College London Hospitals will house a centre for treating cancer patients with proton beam therapy. It will also have eight operating theatres and 107 beds.*



*During the construction of the upper floors, a mobile crane installed the proton beam therapy equipment on the fourth basement level. A protective covering was spread over and removed from equipment as necessary.*





It is five o'clock on a September afternoon, and the streets of Fitzrovia are bustling. School children in uniforms, blue-collar and white-collar workers, and stunningly dressed young women pass one another on the pavements of this central London neighbourhood. Behind a small red brick building housing a pub, the first floors of the future proton therapy centre of University College London Hospitals (UCLH) are under construction. The centre is scheduled to open in July 2020, and when it does, it will be one of only two such facilities in the UK offering this advanced technology for the treatment of cancer (see interview, page 79). A few streets from the present UCLH complex, Bouygues UK and Bouygues Travaux Publics, working together in an integrated consortium, are constructing a new building. It will have 107 hospital beds on its upper floors, eight operating theatres, and a centre for proton therapy treatment on the basement levels. The demolition, excavation, and construction of the foundations began in 2015 and lasted 18 months. During the project as a whole, almost 400 workers were on the job at the busiest periods.

### EXTRAORDINARY EXCAVATION

Last June and July, the cyclotron (the particle accelerator that produces the proton beam) along with

the equipment for one of the four treatment rooms was delivered to the worksite. The cyclotron arrived at the end of a 640-kilometre journey from Germany, where it was manufactured. Amazing from the standpoint of its weight (70 tonnes) in relation to its size (that of an automobile), it was lowered into its concrete enclosure by a 750-tonne mobile crane. Owing to the building's location in the city centre, the related space constraints, and characteristics of the proton therapy technology, the treatment centre has

been placed in the basement<sup>1</sup>. Almost 80,000 cu. metres of materials have been extracted in digging a huge hole the size of 650 London buses! "This is the deepest excavation ever done in London", says project director Charles Pérès. The dense urban environment and the close proximity of the surrounding buildings have not made the task any easier for the workers from

1. The expertise of Bouygues Travaux Publics in civil engineering was crucial to the very deep excavation work for the underground portion of the project. ●●●



## KEY INFO

Architect:  
STW Architects

20 types of façades



Employees at peak periods: 400

Number of apprentices in the project: 40

Customer:  
University College London Hospitals



First patient admitted:  
14 July 2020



Contract amount:  
£208 million (€232m)

Environmental certification targeted:  
BREEAM Excellent



The concrete structure that houses the cyclotron was built on the building's fourth basement level because of the radiation it will emit.

Steve Meecham, civil engineering works manager.



As many as 400 employees are working on the site at peak periods.

...

Bouygues Travaux Publics. “We have dug the foundation down to a depth of 28 metres, through the water table, and within just 10 metres of a London tube line. To get to that depth, we had to construct a diaphragm wall shored up by four levels of struts<sup>2</sup>”, adds Steve Meecham, civil engineering works manager. As a consequence, and to meet requirements related to radiation absorption, walls and slabs up to 2.50 metres thick were built around the cyclotron. “The quantity of concrete per surface area is huge, with 80% of the volume located in the lower levels of the building. It’s as though we were constructing a mini nuclear power plant.”

#### FLAWLESS COORDINATION

Complete lines of piping awaiting installation lie along the corridors on the lower floors. Altogether, more than 8 kilometres of pipes and a large number of electrical conduits will be incorporated in the concrete structure to meet multiple needs, including the colossal cooling

2. Wooden or metal elements used in the shoring of excavation pits and as temporary supports.

“In our consortium, Bouygues UK’s experience in hospital construction, with six references in England, is combined with the expertise of Bouygues Travaux Publics in civil engineering and the construction of nuclear infrastructures.”

Gérald Farque,  
Operations Director at Bouygues UK

capacity required for the operation of the cyclotron and the treatment rooms. The delivery and installation of the last pieces of proton therapy equipment had to be organised so as to disrupt the other activities on the site as little as possible. Because of the number of operations going on simultaneously and the diversity of the work, a digital mock-up is being used to facilitate coordination among all the people involved. “We took an innovative approach from the start of the work by using a very advanced version of a digital mock-up, with 3D

up to 6D modelling. The last will be for the maintenance of the structure”, explains Gérald Farque, operations director at Bouygues UK. “It’s going to be widely used in the industry in future years.” In this complex project, the Bouygues Construction teams’ commitment is total. Charles Pérès sums it up this way: “Working on a project whose purpose is to improve the chances of recovery of young patients is a privilege at the same time as a source of motivation shared by everyone.” ■

— Isabelle Godard



## HOW DOES A CYCLOTRON WORK?

The cyclotron is a particle accelerator that produces a beam of protons (the nucleus of a hydrogen atom is a proton). Cooled to a temperature of  $-269^{\circ}\text{C}$  by liquid helium, it accelerates protons of ionized hydrogen gas to velocities as high as 73% of the speed of light. Guided by magnets along a beam to the treatment room, the protons are targeted with extreme precision on the patient's tumour and thus do not damage healthy tissue.



**“Having a proton beam therapy centre is going to change the lives of British families”**



**Dr Yen-Ch'ing Chang**

Radiotherapy Department, UCLH



*Installation of the last gantry in one of the four treatment rooms. This device measuring 5 metres in diameter delivers the protons produced by the cyclotron.*

### **How does proton beam therapy improve cancer treatment?**

Proton beam therapy is an alternative type of radiotherapy that has the advantage of not affecting the healthy tissue around the tumour. This is particularly important when treating children and adolescents, who are continuing to grow. In difficult to treat tumours it can reduce the probability of a relapse, and it can reduce long-term side effects such as having less impact on fertility than conventional radiotherapy may have.

### **What are your expectations from this proton beam therapy centre?**

Having a proton beam therapy centre available at the UCLH is going to change the lives of British families, who until now have had to travel to other European countries or America, which is very disruptive of their family life. We will be able to treat nearly 750 patients a year and many more young people and adults whose cancers are in virtually inaccessible areas or located near a vital organ, including tumours of the brain, in the pelvic region, or around the spinal cord.



LES RIVES  
DE L'ORNE

Caen Plage

Deeigual

H&M  
NEWYORKER  
MANGO

Colas workers are laying 4.5 kilometers of tracks for the new tramway in the city center.

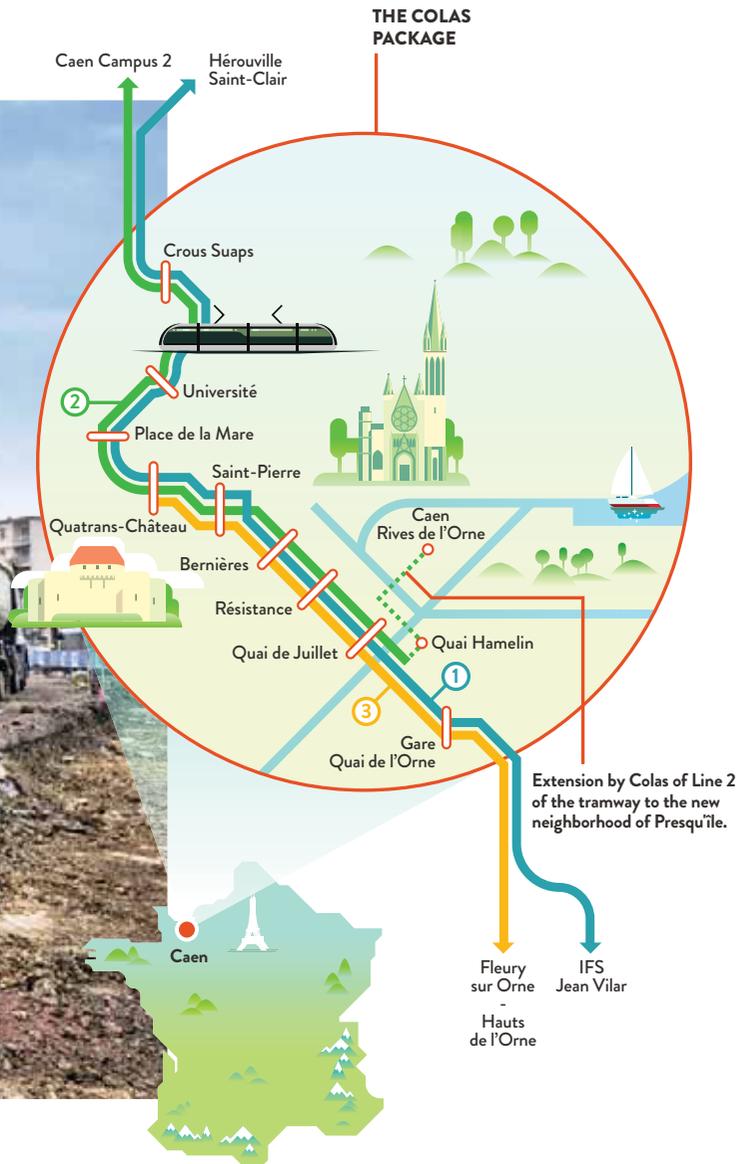


# A fresh start for the Caen tramway

**NORMANDY.** Colas is carrying out a major infrastructure transformation project in the center of Caen. Come September 2019, some 60,000 passengers will begin riding a new tramway here each day. Three Colas entities have teamed up in an integrated unit to meet the tight deadlines in tough working conditions.



Earthworks are under way near the fortress of William the Conqueror following the demolition of the old tracks.



Standing at the end of Allée du 6 Juin, the medieval fortress erected by William the Conqueror looms over the worksite of the new “iron” tramway. Working in the fog and drizzle typical here in Normandy, the Colas team has multiple jobs to do, from demolishing the former rubber-tire tramway track to laying the rails for the new line. On December 31, 2017, that old tramway, the “reserved lane transport”, stopped running between the half-timber houses, ending a short life that began in only 2002.

Why? Repeated malfunctions and premature wear of the rolling stock. The municipality of Caen la mer divided the construction of the new tramway into three packages. “Colas was awarded the 4.5-kilometer middle section, valued at €36 million,” says project director Laurent Lecomte. “The new tramway follows the same route as the former one. It’s the first time we’ve come back to the heart of a city to replace an existing tramway.” Six hundred meters of track are also being added in the project to connect to a new maintenance center, whose

construction began in October 2017. The transport network is going to be extended to the recently developed neighborhood of Presqu’île, meaning that Colas will be building two new stations in addition to renovating the nine others. The Colas teams have 18 months to complete all the studies and the work. “We have about half the time we would in an ordinary construction project,” notes Lecomte. In this undertaking, where the calendar is tight and meeting the deadlines is crucial, the idea is to make something new out of what was already



## WHAT ARE “GREEN TRACKS”?

Colas Rail has proposed using its patented “Green Tracks” technique to create grass-covered tramway platforms at several locations in the project. These platforms are made of precast concrete troughs laid on an unpaved base that are then filled with soil deep enough for grass to grow without watering.



### Minorange bonus

Watch a video of the work on ByLink, the Bouygues group intranet portal: <https://bylink.bouygues.com>

*A track-laying crew fixes the rails in place by pouring concrete around them with a long hydraulic arm.*

there – except for the 23 future trams, which Alstom is designing and building (see inset, page 19).

## HARD AT WORK ON ALL FRONTS

In the streets of the old town, which boasts of having one hundred bell towers, work is in full swing. Elsa Demarest, assistant project manager, makes note of what is under way at the moment: to the north, near the former Crous station, the crews are nudging the rails into position centimeter by centimeter using a jack. A little further along, another group is using a concrete pump<sup>1</sup> to fix the tracks in place. Near the university, several workers are sloping the earth along the track while others cut up the cables of the old tramway. “To reach them, we have to cut up the concrete by blocks, since using a hydraulic breaker would make too much noise in the city center,” explains engineering office manager Pierre-Yves Lemesle. The cables will be replaced by multi-tube frames, which will form the new tramway’s nervous system. “With every ...



*Colas workers have completed the earthworks on the street running down to the Crous station.*

1. A concrete pump consists of a long hydraulic arm mounted on a truck that pours concrete into hard-to-access areas such as the gap between the tracks of a tramway. The arm has a reach of several meters.

The lead contractor has designated ambassadors to report back any questions from people living near the project.

Teams from Colas began laying rails in June 2018. The tramway is slated to go into service in the fall of 2019.



Left to right: Pierre-Yves Lemesle, Laurent Lecomte, Camille Ray, Etienne Batard, and Elsa Demarest. They are part of Colas' integrated, multiskilled team that is carrying out the project.





...

scoop of the shovel, we measure the complexity of the networks that were packed beneath the old tramway. We have to be very meticulous and adapt to the discoveries we make in the project,” says Etienne Batard, sequencing, steering and coordination manager. Elsa heads down to Place de la Mare, where sanitation work is in progress. The streets are narrow, but traffic continues to flow despite all the activity. “This is called ‘tunnel’ work, with a lane for traffic on each side. There’s just one way in and out,” explains Elsa. A Colas subsidiary, Aximum, was contracted to supply the temporary signaling. Elsa continues walking toward the local church, Eglise de Saint-Pierre. Before the Colas teams arrive and get to work, a reinforced concrete slab supported by 200 micro-piles is being laid. The slabs and surfacings in the area around the church must be identical to those in the adjacent street, where the city of Caen has a project under way.

### IMPACT OF SYNERGIES

Based in temporary quarters set up in the Presqu’île district of Caen, Colas Projects, Colas Rail, and the Colas Île-de-France Normandie agency in Caen are operating as a unified structure, managing a total of about 100 people. The workforce is a multi-skilled team specialized in demolition, construction of reinforced concrete or asphalt platforms, track-laying, and erection of overhead power lines. “In this project, the quality, health, safety and environmental rules that are applied include best practices acquired in large-scale projects as well as those used in local agencies,” says



### TRAMS FROM ALSTOM

The first of the 23 trams that the municipality of Caen la mer ordered from Alstom in November 2016 were delivered in October 2018. Citadis X05, an innovative 33-meter-long tram, can transport 210 passengers in optimal comfort thanks notably to its large windows – they cover 45% of the tram’s surface – and its USB charging sockets, a first in France. Eight of Alstom’s twelve sites in France are involved in the production of the trams.

QHSE officer Camille Ray. “It’s a very educational project. We all need to share our skills so that we go beyond our usual ways working,” adds Lemesle. In this project, phasing and coordination are essential. “We share a common interest, so we need to tell each other about our respective needs and limitations,” says Lecomte, noting that this is something he stresses to his teams. For Colas, it is an opportunity to pool resources; for the customer, it

is a guarantee of having just one contact to speak to. Elsa continues her walk through the worksite, answering questions from people living in the neighborhood. At the beginning of the project, the lead contractor designated ambassadors to relay the questions asked by Caen residents during the work. “This contact with the final users is very motivating for the teams,” says Elsa. ■

— Laura Franchet



*When the tramway in Dubai went into service in 2014, it was the first one in the world without catenaries.*

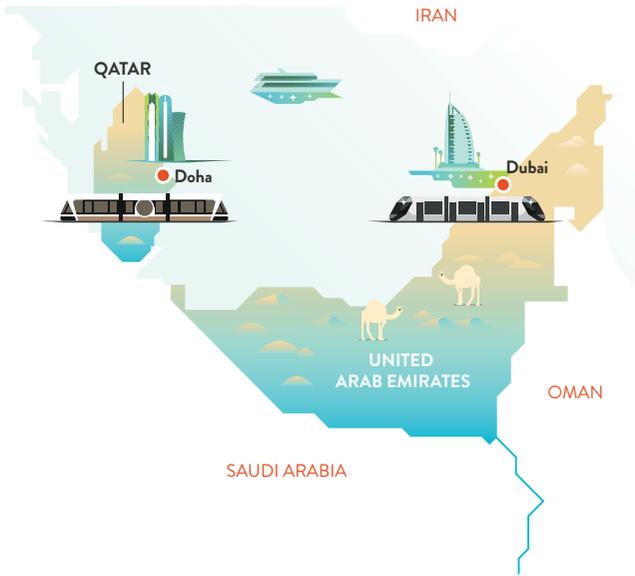
The ALSTOM logo is displayed in a blue and orange color scheme. The background of the entire page is a photograph of a tram in a workshop, with electrical control panels and a large 'W' visible.

# A track record in the Gulf States



**TRANSPORT.** After delivering the tramway in Dubai in 2014, Alstom is now building an extension to the metro there for the Expo 2020 and a tramway in Qatar for the 2022 World Cup. Extraordinary projects advancing at an exceptional pace.

RTA



Night has fallen on the port of Jebel Ali in Dubai's industrial zone, but on the dock where the *Tortugas* is moored, the activity is still intense. This huge freighter sailed from the German port of Bremerhaven some twenty days ago carrying in its hold the first train for the metro that will connect the city to the site of the Expo 2020 world fair in just 16 minutes. A pleased team from Alstom watches as the five cars are unloaded. From here they will be transported to the depot for initial testing, a critical step in a project that has been advancing at a whirlwind pace, virtually around the clock, and in which almost 10,000 people are working.

#### OBJECTIVE 2020

"What's extraordinary in this project is the deadlines," exclaims Agathe Alcaras, Exceptional Transport Systems manager at Alstom. And with good reason. In 2016 the ExpoLink Consortium, led by Alstom<sup>1</sup>, was awarded the contract for the extension of the existing metro line in Dubai with one absolute imperative: the trains had to be running when Expo 2020 opened in October 2020. Seven

1. The ExpoLink Consortium is made up of Alstom, Acciona, and Gülermak.

*Delivery of the first metro train on the Jebel Ali docks in the emirate of Dubai.*



spectacularly large stations are being constructed in the project in addition to the train line, of which more than three quarters will be elevated on viaducts and another portion underground. "The project's second part involves improvement of the present line," says Jean-Marc Decloquement, ExpoLink Consortium project director. With an expected influx of 25 million visitors to the fair and an overall 40% jump in passengers, the Dubai Road and Transport Authority (RTA) has decided to increase the number of trains in service. Alstom will therefore supply 50 additional trains that will run on the existing line. The project





*The tramway will ultimately connect the Marina to the Mall of the Emirates, one of the largest shopping centers in Dubai.*



*The connection between the metro and tramway lines. The tramway transports nearly 21,000 passengers a day.*

will require doubling the supply of electrical power on the line by adding three more main substations and upscaling the signaling system as well as all peripheral infrastructures: vehicle storage, the depot, and the control center. “One difficulty has been to create an interconnection at the Nakheel Harbour & Tower station between the existing red line and the future line. It’s a project within a project,” adds Decloquement. A switching system has been installed so that trains can turn around while the work is going on, the infrastructure has been partially demolished, and a viaduct has been constructed to connect the ...



**Minorange bonus**

Watch a video about the project on ByLink, the intranet portal of the Bouygues group: <https://bylink.bouygues.com>



### MAXIMUM PREVENTION FOR ZERO ACCIDENTS

Almost 10,000 employees are building the Dubai metro line, and they are often working outdoors. Since the heat is intense, especially between the months of March and October, the ExpoLink Consortium has installed perceived temperature sensors and issued related recommendations. When the highest alert level is reached, work is halted. During the hottest periods and the month of Ramadan, much of the work is done at night. Also, during the summer there is a pause in activities outdoors between noon and 3:30 in the afternoon.

...

existing line to the extension. As a result, transport service has been maintained during the 15 months of the project, with a replacement bus also operating.

### A DIAMOND ON RAILS

Dubai is the only place in the world where the police drive Lamborghinis! Here the extravagance is such that

even the tramway is a gem of technology – provided by Alstom. The first tramway in the Gulf States, which went into service in 2014, has 11 trains with diamond-shaped noses that run on an 11-kilometer line through the Marina, passing near the palm-shaped archipelago Palm Jumeirah. “The customer wanted the best there is,” says Frédéric Sanchez, head of the maintenance project, which Alstom manages. Alstom therefore used a “full technology” approach, equipping the stations with platform screen doors and driver-assistance and train alignment systems. To ensure precise stopping, a signaling system derived from the one used in metros was chosen, which required exceptional installations in some cases. It is also the only tramway in the world whose power supply is entirely at ground level (Alstom’s APS system) to avoid spoiling the view with catenaries. In addition to the 700 cameras mounted inside the trains and stations, no section of the tracks is accessible to pedestrians for

*The ExpoLink teams will build almost 15 kilometers of tracks and seven metro stations in an exceptionally short time.*

safety and security reasons. And like the metro, trains are divided into three classes: Gold, Silver, and Family.

### A PEARL OF A WORLD CUP

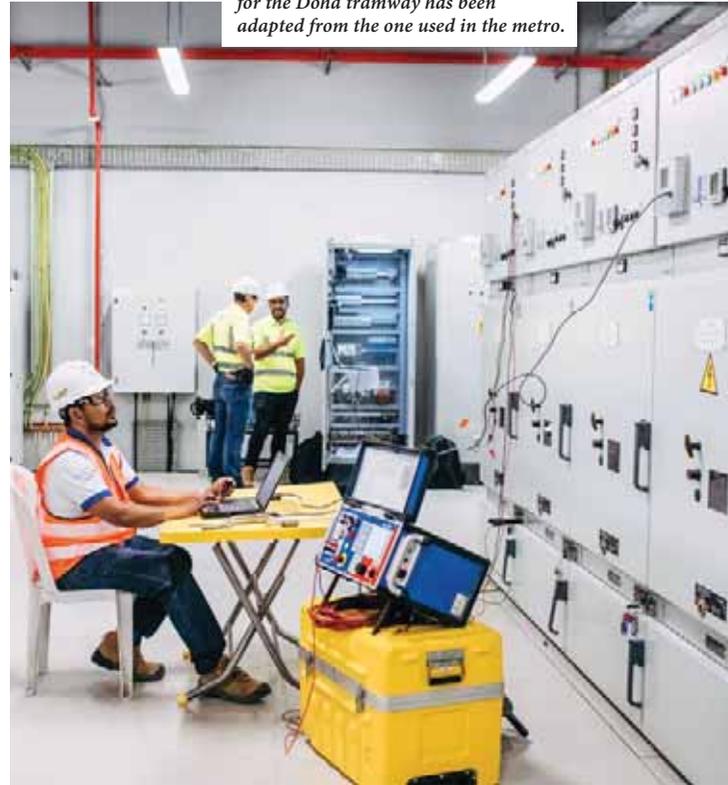
Meanwhile, preparations are under way in Qatar for the World Cup of soccer, which will be held there in 2022. The stadiums are being erected on virgin land in the desert. To connect Doha to Iconic Stadium<sup>2</sup>, in the new city of Lusail, Alstom is constructing a 23-kilometer tramway on which its latest generation of trams, the Citadis X05<sup>3</sup>, will run. The trams’ design, inspired by the traditional boats here, is an allusion to the history of Doha, in past times a small town where pearl divers lived that has become one of the region’s ultramodern megacities. Half the tramway line is being built

2. Iconic Stadium, one of eight being built for the World Cup, will be the venue for the opening match and the final.
3. The X05 tram, the latest addition to Alstom’s Citadis range, is being delivered to the cities of Caen, Nice, and Sydney.

“One-third of the expatriates working on Alstom projects in the Persian-Arabian Gulf come from the Middle East and Africa. We are very proud of this intraregional mobility. It allows us to take a local approach and be in closer touch with our customers because of the language and the culture.”

Didier Pflieger, Senior Vice President, Middle East and Africa, at Alstom

The signaling and power supply system for the Doha tramway has been adapted from the one used in the metro.



In the Gulf States, weather conditions are sometimes extreme.



underground where it passes near The Pearl, an artificial archipelago covered with luxury tourist residences. And there's more extravagance here too: Alstom is constructing 28 tramway stations, and those underground will be among the most imposing in the world. An illustration of the nation's slogan: "Qatar deserves the best." ■  
— Isabelle Godar



A Citadis X05 tram is prepared for initial testing at Lusail.



*Aerial view of a caisson  
at the Monaco site.*



**BOUYGUES**  
CONSTRUCTION

# “Caissons ahoy!”



**MONACO.** Hemmed in between the sea and the mountains on two square kilometers of land, the Principality is pursuing its development policy by extending the Anse du Portier into the sea. Bouygues Travaux Publics, a subsidiary of Bouygues Construction, has been awarded the contract for the maritime infrastructure work. Here’s a look at some of the innovative construction methods being used.



**A** September morning at the Grand Port Maritime of Marseille. About 150 employees of Bouygues Travaux Publics are working in the bright sunshine right now, but this is in fact a worksite that never sleeps. Eighteen reinforced concrete caissons are being precast here, and when joined together, they will form a protective belt – a rampart against the sea – for the future eco-neighborhood of Anse du Portier in Monaco. “It is a project with a full range of work – maritime, mechanics, civil engineering, and others,” says Geoffroy Broudy, the person in charge of the maritime aspects of the precasting and movement of the caissons. In the port of Marseille, 32,000 m<sup>2</sup> of water have been reserved for the floating dock that is used for the precasting of the caissons. Quayside, there is a 10,000-m<sup>2</sup> working area for preparing the iron reinforcement, assembling formworks, and adding the final elements to the caissons.

### MARCO POLO, A CUSTOM PROTOTYPE

A giant stands in the port: a floating dock, 51.30 meters wide, 25.50 meters high, and weighing 4,559 tons. Its name is *Marco Polo*. “This equipment is unique in France. It was designed and built specifically for the requirements of this project,” says Broudy. On this floating dock, each caisson is precast in less than a month. The

*Workers surrounded by the iron reinforcement on the floating dock.*



workers movements amid the forest of iron rods that form the caisson’s framework are precisely choreographed. It is essential that the workers preparing the iron reinforcement and those installing the formworks do their jobs at exactly the same pace as the caisson walls are being poured. “The teams work in shifts, 24 hours a day, seven days a week,” says Eric Cheype, construction manager for the civil engineering in the precasting operations. “With sliding formworks, given the large number of concrete walls that must be made at the same time, it is practically impossible to suspend the precasting once a caisson is started.” As construction proceeds and the caisson grows ●●●



*The floating dock Marco Polo was designed specifically for the requirements of this project.*



## IN FIGURES



Area of the extension:  
60,000 m<sup>2</sup>



18 caissons 28 m on a side  
and 26 m high  
10,000 tons  
3,800 m<sup>3</sup> of concrete



9 days of concreting  
without interruption  
for one caisson



1 floating dock,  
the *Marco Polo*:  
51.30 m wide  
25.50 m high  
4,559 tons



Project delivery date:  
2020



**“We are doing  
biological monitoring  
of the ecosystems”**



**Christophe Hirsinger**

Director of the Monaco offshore  
extension project

### **How have you prepared this project from the environmental standpoint?**

We have carried out an environmental impact study in which we identified the protected marine species found at the site. Starting in autumn 2016, we moved 143 large noble pen shells and transplanted over 500 m<sup>2</sup> of *Posidonia oceanica* seagrass in the Larvotto Marine Reserve and along the Fontvieille seawall.

### **What environmental measures have been taken at the worksite in Monaco?**

We have developed a plan to control turbidity that is enabling us to limit the propagation of fine particles in the water. Underwater protective screens have been installed, and sensors continually measure turbidity and luminosity. We have also put up a noise barrier along the waterfront and installed hydrophones in the Larvotto Marine Reserve and underwater in the work area. Last, each day teams of divers do biological checks of the transplanted ecosystems and the worksite.



...

heavier (it will weigh 10,000 tons on reaching a height of 26 meters), it gradually sinks to a depth of more than 20 meters. And then, Eureka! Thanks to Archimedes' Principle, the finished caisson floats free of the dock. *Marco Polo* then rises again and work begins on another one. The completed caisson is towed quayside, where the Jarlan concrete posts that will form the breakwater are added at its top. The caisson is then stored until it is towed to Monaco by sea. From start to finish, an unprecedented operation.

### THE ENVIRONMENTAL IMPERATIVE

After a three-day, 200-kilometer journey along the coast, the caisson arrives at the worksite in Monaco. Starting in September 2018, the caissons have been progressively placed on an underwater foundation made of 1.5 million tons of rock. This is done by filling the caisson with seawater and then ballasting it with quarry materials. "Setting the first caisson in place was a crucial step,"

“This project is in a whole other dimension: everything is bigger and the requirements are very strict.”

Éric Cheype,  
Construction Manager for  
the caisson civil engineering

points out project director Christophe Hirsinger. “That caisson marked the culmination of two years of work – from dredging the sea floor to laying down the rock – all of it invisible from the surface.” That “crucial step” took place on an early afternoon in September. The same operation will be repeated until July 2019. “The civil engineering work on the superstructure of the caissons will begin in May 2019, when the access to them is

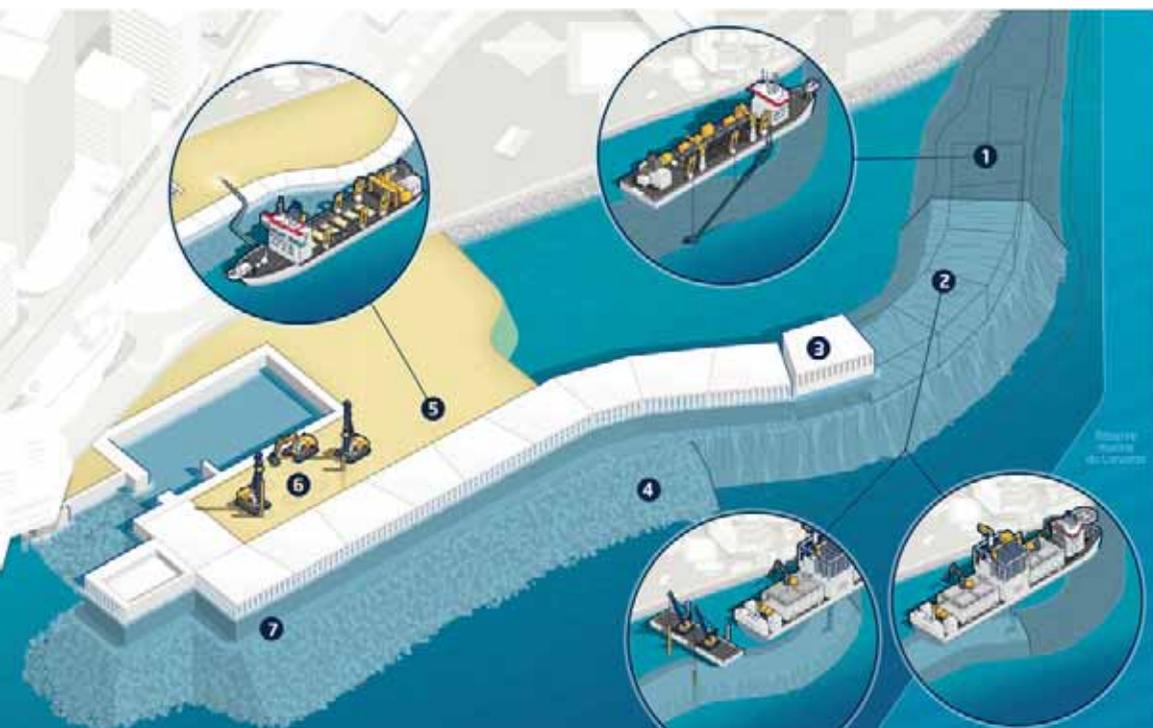
finished.” Mid-2020, the infrastructure work will wind up and construction of the Anse du Portier eco-neighborhood will get under way (see inset opposite). Located between the Larvotto Marine Reserve and the Spélugues coral reef, the project is being closely monitored in relation to the environmental objectives set by the Principality. A variety of measures are being taken to preserve marine life, maintain water quality, and reduce the noise and vibration caused by the work (see interview, p. 95). The environmental challenge is being dealt with even in the design and construction of the caissons at Marseille, as Broudy explains: “The external faces of the caissons have grooves 15 millimeters deep so that plants, algae, and invertebrates can attach to them. Artificial plant beds and low rock walls will be installed to encourage colonization by various species.” The Monaco extension project is thus being carried out with respect for the marine ecosystem. ■

—Amandine Sand

## L'ANSE DU PORTIER

This new eco-neighborhood will be built on 6 hectares of newly created land extending into the sea. A total of 60,000 m<sup>2</sup> of luxury apartments and villas will be constructed, and the Grimaldi Forum will be enlarged by 3,500 m<sup>2</sup>. The development will also include a public carpark, a yacht basin, gardens, and public spaces and facilities.

Below, Prince Albert II, Guy-Thomas Levy-Soussan, Administrator of SAM Anse du Portier, Serge Telle, Minister of State of Monaco, Monsignor Barsi, Martin Bouygues, and Philippe Bonnaville, Chairman and CEO of Bouygues Construction, attend the inauguration and christening (opposite) of the first caisson to arrive from the port of Marseille.



### STEPS IN THE WORK AT MONACO

1. The sea floor is dredged to remove silt and expose the bedrock.
2. The bedrock is covered with special gravel to serve as a foundation for the caissons.
3. The 18 trapezoidal-shaped caissons towed to the site are put in place.
4. An underwater embankment is constructed to prevent erosion of the foundation by strong waves.
5. The area behind the caissons is filled with 450,000 m<sup>3</sup> of marine sand extracted in northern Sicily.
6. The sediment is treated to prevent liquefaction and fill is added.
7. Geotextile is installed and a berm is constructed for additional anti-erosion protection.



#### **HONG KONG-ZHUHAI-MACAO BRIDGE**

On October 23, the world's longest sea bridge, connecting Hong Kong to Zhuhai and Macao, was inaugurated. Bouygues Travaux Publics, Dragages Hong Kong, and VSL, subsidiaries of Bouygues Construction, built a 9.4-kilometer section linking the island of the international airport to the limit of Hong Kong's territorial waters.