



LUWA

MARCH 13TH, 2019

PRESS KIT



PLAN LUMIERES 4.0

Walloon motorways head into the future

TABLE OF CONTENTS

• Effective and flawless lighting:	03
securing installations and guaranteeing quality of service and performance;	
• The right lighting:	05
lighting at the right time and in the right place to maximize energy savings whilst guaranteeing user safety;	
• Innovative lighting:	07
incorporating the modernization program within a truly innovative process to make Wallonia's motorways the first connected motorways in Europe;	
• Sustainable lighting:	09
using long-lasting, recyclable materials whilst safeguarding the environment and biodiversity;	
• Focus on human and social vision:	11
promoting employment and social inclusion whilst creating a sustainable and secure working environment.	

The LuWa consortium has been designated at the end of an European call to tender launched as a negotiated procedure by the SOFICO, with the technical assistance of the Service Public de Wallonie (SPW – Wallonia Public Service) and the EIB Advisory Hub expertise.

PART 1. EFFECTIVE AND FLAWLESS LIGHTING

The foremost goal of the project is to improve user comfort and safety

Refurbishment of lighting on the structural network of motorways and major roads in Wallonia will provide transparent and recognizable night vision on roads. This result will be obtained through:

- Compliance with lighting levels in line with the route type or situation,
- The principle of lighting chromatism depending on the type and stratification of roads and spaces,
- Selection of a range of lighting furnishings based on road type and usage of spaces.

LED now allows for gradation of color cast without any visual interruption whilst maintaining an optimal recognition index.

Securing installations and guaranteeing quality of service

Electronic and mechanical securing of installations will ensure the safety of spaces and users and also maintain optimal quality of service for the duration of the contract.

In addition to replacement of 100% of lamps, the LuWa consortium's modernization plan will consist in:

- The replacement of 31% of supporting structures (26% during the modernization period and 4% at the end of the contract)
- The renovation or replacement of all control points (modernization of all high and low voltage substations, elimination of non-compliance, fitting of an entire electricity consumption metering system)
- The replacement of 20% of the underground network (11% during the modernization period and 9% during the contractual period)
- The replacement of all lamp components (LED banks, drivers) and remote management modules during the contractual period
- Complete replacement of lamp and remote management electronic components – drivers, LED panels and remote-control modules

Accordingly, the modernization program will maximize energy savings, namely through:

- The deployment of LED technology across the entire system as part of reconstruction during the first 42 months of the contract, which will optimize and vary lighting in accordance with time periods and traffic conditions, thereby optimizing consumption.
- A well-thought-out lamp replacement strategy to optimize rapid energy savings whilst limiting disruption to traffic flows,
- The deployment of remote management solutions across the park

Preventive Maintenance Strategy

The LuWa consortium is implementing ongoing preventive maintenance to guarantee:

- The safety of assets and persons, particularly during execution of the works:
 - Works carried out at night on all high-traffic routes;
 - Two time periods per day for all other routes;
 - Consolidated teams on all routes;
 - Coherency of works.
- Limiting of repair works liable to hinder service and traffic

MUSE® CMMS is the multi-domain CMMS (Computerized Maintenance Management System) software that will be used for the project.

MUSE® CMMS provides:

- Inventory, geolocation, and history of all logical and physical urban equipment;
- Fast and efficient planning and coordination of maintenance and operation works;
- Management of both estimated and metered energy use;
- Monitoring of the equipment operation and consumption;
- Generation of reporting and dashboards;

Curative Maintenance Strategy

The LuWa consortium is implementing curative maintenance designed to maintain or return equipment to a specified state to enable it to provide a designated service.

All of these curative actions are entered into MUSE® and recorded in the computerized database.

PROJECT KEY FIGURES

- Public/Private Partnership with a 20-year duration
- 100,000 lighting points replaced with LEDs during the first four years of the contract
- 2,700 kilometers of motorways and national roads (including 400 kilometers of interchanges), as well as motorway and vehicle-share parking areas
- 76% energy savings at the end of the contract
- 166,000 tons of prevented CO2 emissions during the contract
- Equipment availability rate over 99%
- 400 new jobs created in the region
- 100,000 vocational training hours
- SOFICO's budget: €600M over 20 years

PART 2. THE RIGHT LIGHTING

The LuWa consortium will implement a singularly innovative set-up to ensure the right lighting, in the right place and at the right time, through the use of a dynamic lighting system. The goal is to maximize energy savings whilst complying with required lighting levels.

To best meet intended energy performance targets, the LuWa consortium has structured its modernization program along the following three lines:

Carefully calibrating the power of lighting points according to the needs of «lighting in the right place»

The LuWa consortium is committed to providing the right lighting, at the right time and in the right place. To achieve this, the relevant detection systems that adapt to different configurations will be implemented.

The different use cases identified are as follows:

- Differentiated lighting of slip roads, where traffic is lighter than on the main road;
- Differentiated lighting when a vehicle drives in the wrong direction, to alert the driver and warn other users;
- Differentiated lighting for pedestrian crossings when in use;
- Differentiated lighting of motorway rest areas where night-time usage is low;
- Adaptation of lighting to vehicle volumes, correlated with their speed;
- Adaptation of lighting to specific situations: weather conditions, works, accidents.

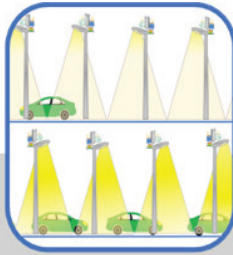
Adapting lighting to uses

The LuWa consortium will set in place an innovative solution combining energy savings and ease of use. This will be based on:

- Systematic nocturnal gradation, adapted to the various situations and days of the week.
- Dynamic gradation with presence detection on slip roads, which are very seldom used at night, and on pedestrian crossings and rest areas. This will draw the attention of drivers to the arrival of a new vehicle or to a pedestrian crossing the road. In the case of parking areas, a low lighting level can be maintained when not in use with immediate detection of a new user.
- Dynamic gradation linked to the number of users with a traffic-flow detection system. This gradation will enable the lighting level to be reduced if a road has little traffic.
- Dynamic gradation in the case of an incident: accident, works, exceptional weather.

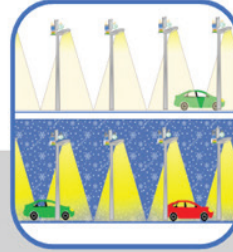
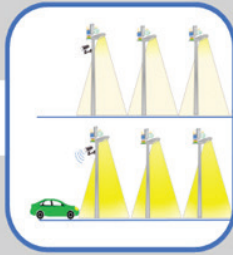
1

Adaptation of lighting
according to traffic



2

Adaptation of lighting
during bad weather



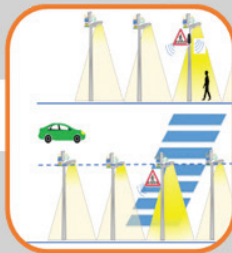
3

A vehicles arrives,
interchangers turn on



4

Users are warned if a vehicle
drives in the wrong direction



5

Users are protected
at pedestrian crossings



6

Lighting is increased in
the area of a road accident



7

Workers areas
are highlighted



Energy management

Energy consumption will also be monitored through the installation of energy control devices at all control points.

PART 3. INNOVATIVE LIGHTING

In addition to the lighting project, the Plan Lumières 4.0 forms part of a singularly innovative strategy to make Wallonia's motorways Europe's first connected motorways.

The consortium is proposing a number of additional innovative projects based around street lighting, to optimize energy savings without jeopardizing the safety or comfort of users whilst preparing the roads of the future:

- Optimization of energy savings by adapting lighting to traffic:
 - To the average traffic volume on major routes
 - To the presence of vehicles on slip roads
- The use of this infrastructure will pave the way for the arrival of connected and self-driving vehicles;
- Detection of vehicles driving in the wrong direction and alerts via a light signal at night;
- Improved use of motorway rest stations, making them more pleasant and economical through adapted lighting and monitoring of hazardous parking at a rest area's entrance and exit; emphasizing their historical and experimental aspects.

The systems are upgradeable and interoperable, to last the length of the contract, and respect the privacy of users through personal data protection.

Resources for innovative lighting

The LuWa consortium is undertaking a resolutely digital project, proposing a **Monitoring Platform** based on the MUSE® urban space management platform. This enables all aspects of the life of street lighting equipment to be monitored and will allow for the inclusion of new infrastructure in the structural network. With this platform, interactions are instant. All data collected is anonymized and analyzed and can prompt actions through either an automated or human-controlled process, in compliance with privacy protection regulations.

The monitoring platform is a combined Exchange Platform, CMMS, and Centralized Technical Management (CTM) system, capable of carrying out all operations in real time and with complete transparency. It will also virtualize all exchanges taking place between the various actors, thereby making considerable savings in terms of time and paper.

The CTM (Centralized Technical Management) system is composed of a module installed in each lamp, directly controlling its level of lighting in accordance with pre-programmed patterns, remote commands or, where sensors are installed locally, in accordance with external parameters such as traffic, weather conditions, the presence of works or in response to road incidents such as accidents.

The system will offer traditional remote management functionalities: energy savings through the dimming function, improved user service through the monitoring and steering of equipment and optimized preventive and curative maintenance for street lighting.



To accurately respond to each of these use cases, we have selected the following technologies:

- Doppler technology presence detectors for slip roads, specializing in the detection of medium to high speeds;
- Detection cameras for vehicles driving in the wrong direction, that are able to monitor a large area;
- PIR technology presence detectors for passengers, that are able to detect slow speeds;
- Presence detectors with both PIR and Doppler technologies at rest areas, to detect both passengers and slow vehicles, and vehicles moving at medium speeds;
- Sensors using Bluevia technology to analyze the speed of vehicles emitting Bluetooth and deduce occupation of sidewalks from this;
- Sensors communicating with latest-generation vehicles (connected vehicles) gathering information sent by these vehicles (weather from elements on the windscreen, broken-down vehicles encountered, etc): although not yet very widespread, this technology is developing rapidly.

Furthermore, information from the PEREX center, with the agreement of SOFICO, will be used to finely calibrate the lighting level in accordance with weather conditions, collected through the 52 weather stations installed by the PEREX center. Information being entered into the PEREX center on vehicle breakdowns and accidents will in like manner be used to over-illuminate the hazard area.

PART 4. SUSTAINABLE LIGHTING

The project is part of a genuine sustainable development strategy. In addition to energy savings, modernization choices will take into account the sustainability and lasting nature of materials and their recycling and the reduction of light pollution, preservation of natural areas and biodiversity.

The LuWa consortium is committed to an advanced sustainable development strategy:

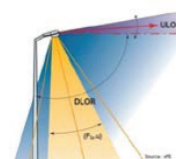
- By identifying and selecting materials that will be used for the project
- Through the choice of adapted vehicles that limit the impact of CO2 emissions on the atmosphere as much as possible
- The complete management of all collected waste to ensure that this is recycled or re-used
- By developing a close connection with territories in which the consortium will operate

Protection of biodiversity

Being mindful of the sensitivity of flora and fauna to light pollution, the LuWa consortium has had an Appropriate Incident Assessment carried out by the Department of Ecology of Liège University. This draws upon previously conducted studies, namely those of the SPW, supplementing these in the area of the protection of sensitive zones.

The LuWa consortium is taking into account these recommendations, namely through:

- The use of color temperatures of 2800K, which are less harmful for bat species, near to sensitive zones
- Choice of lamps with a zero ULOR, i.e. which do not light horizontally
- Making post heights as low as possible
- Reducing light intensity near to sensitive zones and switching off at certain times if necessary




Light flow reduction strategies are summarized below for motorways and national routes.

- From Sunday to Thursday: reduction of lighting by 30% from 10pm to midnight (i.e. 70% lighting), then by 50% from midnight to 6am;
- On Fridays and Saturdays: reduction of lighting by 15% from 10pm-11pm, then by 30% from 11pm to midnight and by 50% from midnight until the lamps switch off.

On access routes, reductions will be higher when no vehicles are present: reduction of 30% instead of 15%, 50% instead of 30% and 70% instead of 50% late at night. A presence detection system will enable the lighting level to be raised as vehicles approach to ensure their safety whilst minimally lighting access areas, where wildlife is more likely to be found than on the areas immediately bordering motorways.

Customized reduction strategies may be implemented in certain zones in light of the recommendations of the Ecology Department of Liège University.



The LuWa consortium has selected innovative solutions to achieve the best compromise between user safety and respect for the nocturnal cycles of flora and fauna in surrounding areas.

Color temperature and spectral distribution

The LuWa consortium is taking into account the impact of color temperature on animal life near to the structural network

Indeed, different groups of fauna react differently when exposed to artificial lighting at night. These reactions also differ depending on the type of lamp in question.

- Amphibious anurans (toads, frogs, tree frogs, etc.) are attracted by all lamps whereas urodela flee from them.
- Some bat species fly away from lamps, particularly those emitting UV, whilst other species tolerate lamps and use them to hunt their prey.
- Insects are strongly attracted by lamps emitting light in the blue and ultraviolet spectrum.
- Birds may be attracted by warm lights (longer wavelength) and strong lights, particularly during migration.

We are following the recommendations of the assessment carried out by aCREA at Liège University on the various animal-sensitive zones to nurture endangered species in their habitats.

An Appropriate Incident Assessment has therefore been conducted by the Science Director of the aCREA Research Unit, Liège University, which specializes in biology. The Unit confirmed the need for the proposed measures and specified the zones in which they are required.

To protect endangered Walloon species, particularly bats, and to preserve the balance of zones rich in biodiversity, the LuWa consortium is committed to reducing the impacts of light pollution through:

- The choice of street lights that are suitable for the protection of flora and fauna due to their height and lighting style;
- Adapting color temperature to 2800K to reduce species disturbance;
- The use of reduced lighting strength late at night;
- Switching off during mating and reproductive periods, and even year-round in highly sensitive areas;
- Adapted information for road users.

PART 5. FOCUS ON HUMAN AND SOCIAL VISION

400 Walloon jobs created

The project will generate around 400 positions in Wallonia. LuWa headquarters are located Chaussée de Marche in Wierde.

The LuWa consortium implements an integrated organization with three structures:

- **LuWa SA** is the dedicated company (SPV for « special purpose vehicle ») in charge of the contract management;
- **LuWa Construction** is the joint-venture in charge of the design and delivery of the equipment modernization program. It comprises of CITELUM Belgique and ENGETEC, CFE subsidiary. Its subcontractors will be JACOBS and GENETEC (for the street lighting works), NEWELEC (for the control points renovation) and TPF Engineering (for the project engineering);
- **LuWa Maintenance SA** is the company in charge of the operation and the maintenance of all the equipment. It will comprise of CITELUM Belgique, ENGETEC, GENETEC and JACOBS.

At each level, a strong management and key competences will be implemented. The consortium will benefit from the expertise of industrial groups, including Belgium or international leaders in the PPP different sectors (Citelum, EDF Luminus, EDF and CFE).

The LuWa consortium will be directed by Bertrand Vanden Abeele.

Bertrand Vanden Abeele graduated from the Solvay Business School and has an over 20-year work experience in the energy and urban planning fields in France and abroad. All along his career, he managed and developed complex projects for public authorities, within ENGIE first and more recently within EDF.

He will be assisted by a team of managers including Grégoire Peeters, Civil Engineer at ULB who will manage the construction joint-venture. Gregoire previously held different management positions in EDF Luminus, in production and retail.

To ensure the good operation of the project, Yves Skenderoff, who managed the technical aspect of the call to tender bid, has been appointed Director of Operations. Yves graduated in electrical engineering from a French Engineer School and was a Business Manager on large international street lighting contracts and PPP over the last 15 years.

A strong Health, Safety and Environmental commitment

All workers, whether employees or subcontracted staff, will follow an induction course incorporating all of the Health, Safety and Environmental rules followed by the project:

- Well-being in the workplace: understanding of installations, knowledge of all equipment and devices and other actions that ensure the well-being of all staff.
- Safety: presentation of risks inherent to jobs and training / awareness-raising on associated safety rules. Provision of compulsory protective equipment in accordance with the post held. Validation of skill-sets to ensure that internal rules are fully understood.
- Tidy work sites: presentation of the various elements making for a tidy work site. Identification of all waste present on work sites and associated recycling schemes. Awareness-raising concerning consortium rules on tidy work sites.

Alle medewerkers van de groep zullen worden opgeleid rond de vaardigheden en kennis nodig voor het vervullen van hun taken onder optimale veiligheidsomstandigheden.



Local and socio-professional inclusion

One of the flagship goals of the project is to create jobs in Wallonia, with priority given to individuals wishing to enter the job market.

100,000 hours of vocational training are planned during the course of the contract.

Part of the works will be executed by local socio-professional inclusion enterprises.

Priority will be given to two areas:

- service provision for components necessary for the reconstruction of public lighting installations and services carried out by protected workshops;
- hiring of inclusion personnel assigned to the market.

SOFICO

The Société Wallonne de Financement Complémentaire des Infrastructures (SOFICO) was created in 1994 by the Walloon government.

It provides missing links in the European road and riverine transport network crossing Wallonia.

Completed projects:

- The E25-E40/A602 link in Liège
- The E429/A8 motorway between Ghislenghien and Hacquegnies
- The Canal du Centre and the Strepv-Thieu boat lift
- The new Ivoz-Ramet and Lanaye locks

Current projects:

- The Couvin motorway bypass (E420/N5)
- The new Ampsin-Neuville lock

The SOFICO is also prime contractor for the structural road network that includes Walloon motorways and national roads spanning approx. 2,300km. It finances, maintains, refurbishes and manages this network, particularly through revenues from the lorry per-kilometer charging system. It is assisted in this role by SPW Mobilité et Infrastructures.

It also manages Walloon motorway rest area franchises.

To address the need to ensure the smooth flow of increasingly congested traffic at the entrance to major cities, SOFICO prioritizes intermodality, the implementation of vehicle-share parking along major routes and initiatives linked to the smart motorways project.

Twice a year, the SOFICO releases an awareness campaign on road safety rules or on the correct use of traffic infrastructures. Each year, the campaign is available for a month on the 300 display signs running alongside the national motorways and roads in Wallonia.

SOFICO is also active in the telecoms field and manages the Walloon fiber-optic network.

The SOFICO develops it with the aim to manage the traffic on hydraulic ways and motorways, to meet the needs of smart roads, to deploy it in low profitability areas or even to market it to operators.

The SOFICO also offers spaces on its infrastructures to enable mobile phone operators to install their antennas in order to have a better coverage in the Region.

The SOFICO takes part in the development of renewable energies along the roadway infrastructure that it manages: installation of wind turbines on motorway rest areas, operation of waterfalls to produce electricity, development of the low emission infrastructure project (IBE)...

For 25 years, SOFICO has been working towards a more mobile, connected and green Wallonia.

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SERVICE PUBLIC DE WALLONIE (SPW)

The SPW Infrastructures is a main Walloon player in the fields of design, financing, management and operation of quality infrastructures for the economic and social deployment of Wallonia.

It provides quality, safe, accessible to all and environment-friendly infrastructures to citizens and companies.

It notably manages:

- Road and motorway networks including their equipment, infrastructure and annexes with a security and mobility aim;
- Road and motorway traffic including road information;
- Electrical, mechanical and electromechanics works and associated;
- The RAVel network including its deployment, investments and its promotion;
- The development, maintenance and operation of the optical fiber and telecommunication network.

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CITELUM

EDF Group subsidiary, Citelum develops its smart lighting expertise in the fields traffic lights, artistic lightings and connected urban services: video protection, traffic management, smart parking, electric vehicles charging points, Li-Fi, air quality sensors and the digital services management platform MUSE®.

Over 1,000 cities and industries in the world have already trusted Citelum: Mexico City, São Luis, Santiago de Chile, Copenhagen, Barcelona, Naples, Dijon, Sète...

With 2,500 employees, the Group generated a turnover of 318 million Euros (75% out of France) in 2018.

For this renovation and main Walloon motorways and roads lighting network connection project, Citelum will bring forward its smart lighting, connected objects integration and centralized urban space management expertise and will deploy the multi-trade digital platform MUSE®.

More information on www.citelum.com

Twitter : @Citelum

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LUMINUS

Luminus is an electricity generator and provider of energy and energy services. The company is the foremost provider of land-based wind and hydro-electric energy in Belgium. Luminus also plays a key role in security of supply for Belgium through several natural gas power plants that compensate for the fluctuating nature of solar and wind energy.

With an installed capacity of 2,054 MW as of September 2018, it accounts for around 10% of total installed capacity within the country. It sells electricity, gas and energy services to two million private and business clients, representing a market share of around 20%.

The company invests in order to address energy concerns of the future by offering its clients innovative energy efficiency solutions and is continuing its developments within the renewables sector.

It has around 2,000 employees. Four the seventh year in a row, our company is classed among the 64 Belgian companies ranked as a Top Employer. It draws upon its substantial local presence and the expertise of the EDF group, one of the major players in the global energy sector.

More information on www.edfluminus.be

Luminus is proud to contribute to the LuWa project along with the EDF Group and with its subsidiary Nevelec.

Nevelec is a family business which has continued to expand and now employs over 150 individuals in Liège, Manage and Brussels. Nevelec, which is part of the Luminus group, offers a complete range of services in the electro-technical sector (particularly medium and low-voltage, switchboards and automation). It will bring its know-how to the project during phase 1 by surveying, overseeing and executing refurbishment of 491 of the medium-voltage substations. During phase 2, it will be tasked with preventive and curative maintenance of the substations. In total it will create 20-25 jobs for the public/private partnership.

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CFE

CFE, founded in 1880 is a Belgian industrial group active in three different divisions; the Dredging, Environment, Offshore and Infra activities are carried out by DEME, the Real Estate Development and the third division Contracting encompasses the group's construction, multitechnics and rail activities in Belgium, Luxembourg and Poland.

MOBIX, an integral part of the CFE group, represents a turnover of more than 70 million euros and employs almost 600 people for the whole of Belgium. MOBIX is positioned as a multidisciplinary entrepreneur and has two divisions: on the one hand the Rail division, which brings its expertise in the field of catenaries, signaling, laying of tracks and securing, on the other hand the division Utilities specializes in the placement of public lighting, the installation of gas distribution networks and high, medium and low voltage networks.

[More information on www.cfe.be](http://www.cfe.be)

For this renovation and street lighting connection network of the Walloon motorways and national roads, Mobix-Engetec will bring forward its experience and skills in the replacement and follow-up of a street lighting network.

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DIF

DIF is an independent infrastructure fund manager, with €5.6 billion of assets under management across seven closed-end infrastructure funds and several co-investment vehicles. DIF invests in greenfield and brownfield infrastructure assets located primarily in Europe, North America and Australasia through two complementary strategies:

- DIF Infrastructure V targets equity investments in public-private partnerships (PPP/PFI/P3), concessions, regulated assets and renewable energy projects with long-term contracted or regulated income streams that generate stable and predictable cash flows.
- DIF Core Infrastructure Fund I targets equity investments in small to mid-sized infrastructure assets in the energy, transportation and telecom sectors with mid-term contracted income streams that generate stable and predictable cash flows.

DIF has a team of over 110 professionals, based in eight offices located in Schiphol (the Netherlands), Frankfurt, London, Luxembourg, Madrid, Paris, Sydney and Toronto.

[More information](http://www.dif.eu) on www.dif.eu

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OTHER OPERATIONAL PARTNERS

To carry out the services, the LuWa consortium will be supported by the following operational partners: Genetec and Jacobs for the street lighting works and maintenance, TPF for engineering and analysis.

GENETEC

The Genetec company is mainly active in street, ornamental, sportive and architectural lighting, traffic light systems, phone networks, teletransmission, distribution networks and ventilation systems.

Created in 1986 by André Hallaux and its wife, GENETEC has initially developed its activities in air treatment, heating, ventilation and heat pumps. Thanks to its 16-year experience within the Yvan Paque group, André Hallaux developed in 1993 street lighting and traffic light systems activities that will become the core activities of the company. Its main clients are: SPW, SOFICO, ORES, the Brussels-Capital Region, STIB, Defence, Proximus, Tecteo. In 2014, Sébastien and Delphine Hallaux take over the company's management. Genetec is a company that stands out in its sector in Wallonia. Indeed, it has preserved a strong family environment despite its important growth since 2000. Its financial independence, agility, flexibility and the quality of its operations and workers are its main pride.

JACOBS

Hubert JACOBS establishments are historically a family company created in the 1950's in the fields of private and public works. In June 2003, the company appointed a new manager, Pierre-Yves Paque, with a strong experience in electrical and street lighting operations.

Long term specialized in civil engineering for companies such as the Association Liégeoise d'Electricité (ALE-TECTEO), the Association Intercommunale pour le Démergement et l'Épuration (AIDE), Belgacom or Electrabel, the JACOBS company extended its activities in the field of installation and maintenance of street lighting by creating a new department within its organization.

TPF

TPF was created in 1991. Originally, its activity mainly focused on energy and third-party financing principle. TPF rapidly grew on the engineering market. Through the years, the group successively developed in Europe, Asia, Africa and in America thanks to numerous acquisitions to become a well-known international player. It is part of the most important multidisciplinary companies in the fields of construction, transport, water and energy infrastructure.

TPF Engineering is the Belgian engineering department of TPF group. It comprises of 3 divisions: Stability and Civil Engineering, Special Technics and Construction. TPF Engineering has a large experience in classical specific technical equipment: heating, air conditioning, electrical installations, (high, medium and low voltage), low current electrical installations: telephony, anti-intrusion systems, access control, fire detection, structured wiring, architectural lighting...

