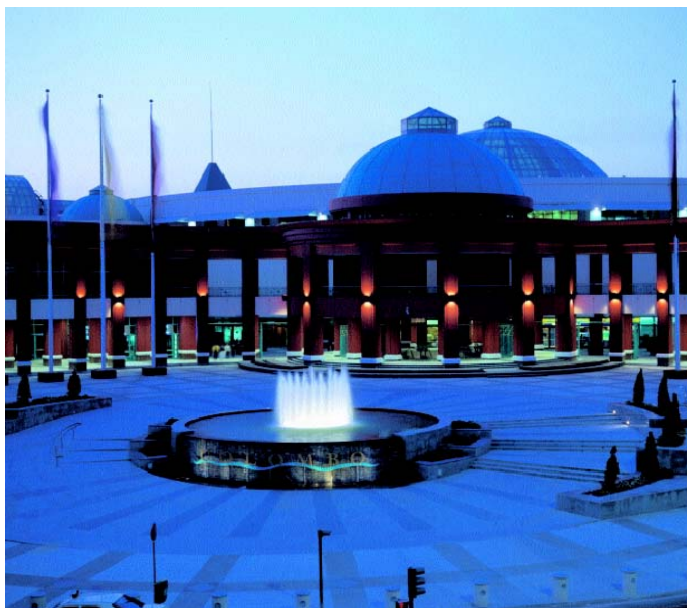


In Portugal, GreenLight Partner **Sonae Imobiliária** upgraded the Centro Colombo covered car park, one of the largest in Europe, by substituting the magnetic ballasts with electronic ones. These operate fluorescent lamps at higher frequencies and offer significant advantages compared to magnetic ballasts, inter alia lower power losses.



Centro Colombo
Av. Lusíada P-1500-392 Lisboa
Contact: Alberto Faias

After measurements, they claimed the following results:

- Lighting electricity savings: 400.838 kWh/year
- Reduction of electricity use in the areas covered: 11.5%
- Energy cost savings: 23.814 euro/year
- Internal Rate of Return of the investment: 20%

"The GreenLight Programme gives us the possibility to show our partners and clients our objective to reduce energy consumption"

Alberto Faias
Energy Manager
Sonae Imobiliária



Sonaecom, a Portuguese GreenLight Partner that belongs to the same Group of Sonae Imobiliária, decided to upgrade, in July 2004, their head office. For a total area of 4.760 m² they kept the same 26 mm diameter fluorescent lamps, powered by conventional magnetic ballast, but they installed in the same time a modern time scheduling control system.

After the preliminary data analysis the company claimed important energy savings:

- Lighting electricity savings: 198.598 kWh/year
- Energy cost savings: 13.902 euro/year
- Payback time: 4 months



An initiative promoted by the European Commission



The French GreenLight Partner, **SOPIC-Paris**, refurbished the lighting system for an offices facility, with an total area of 18.400 m².



They needed a 200 lx in the offices and 350 lx in the open spaces. The first idea was to use some 3x14W luminaires as they did in another building they have built. The goal was to find a lower power consumption and a better lightning. To fulfil their requirement they replaced the old lamps with new T5 fluorescent lamps. The luminaires are build with only 1x24W fluorescent lamp with 4000°K colour temperature and an 850 or 840 IRC to improve the lightning level up to 30%.



Furthermore, the price of a 1x24 W luminaire was 1.5 times cheaper than 3x14W luminaires.

In conclusion, using those 1x24W lamps they improved the lightning of their office building reducing in the same time the power consumption of each luminaire. Instead an electric consumption of 48W/m² per day they get only 27W/m² in their offices.

The company reported total lighting electricity savings of 100.000 kWh/year



In Belgium, **Stad Mechelen**, as a part of their commitment to the GreenLight Programme, refurbished in July 2004 the lighting system of the public swimming pool, building with a total area of 1.403m². In the past they have around 85 lx. They need to have 300 lx normally and 750 lx when there is a swimming competition. The base line lighting was equipped with halogen (low-volt. And line-volt.) and metal halide lamps powered by magnetic conventional ballast. For the post installation lighting system they used only 26 mm diameter fluorescent lamps, aluminised luminaire reflector and electronic dimmable ballast. They also installed a control system to dim the lamps' output in response to the daylight availability. Moreover, the new system was equipped with a time scheduling control device.

Besides improving the visual conditions, they reported the following savings:

- Lighting electricity savings: 23.720 kWh/year
- Energy cost savings: 1.942 euro/year



Gemmente, **Stad Sint Truiden** Belgium, GreenLight Partner since April 2004 upgraded the *St-Truiden Library*. They replaced the old luminaries with new more energy efficient ones using T5 lamps, geared by electronic ballast instead the old magnetic one.



After measurements they reported the following energy savings:

- Lighting electricity savings: 24.979 kWh/year
- Energy cost savings: 3.886 euro/year



In Germany, the GreenLight Partner **Stadt Frankfurt am Main**, elaborated a short study about planning the efficient lighting for classrooms.

The lighting measurements in bought older and recently modernised schools of the City of Frankfurt showed substantial excesses of the measured density of light demanded by standards. This does not only lead to substantial additional costs for electricity, maintenance, and less comfort at the PC stations, but the capital outlays could also have been considerably lower. As a consequence of those results, new planning methods and planning tools should be investigated and optimized.



A) Over dimensioning, possible optimization, computer simulation and practical examples. An example can be a standard classroom. This classroom (7.20m*8.40m*3m; working surface at 85cm) requires 300 lx. According to “AMEV-Guidelines for indoor lighting with artificial light in public buildings” as automatic calculated with Dialux 1.2 according to DIN, it was proposed: 8* 58W T8 (26mm) electronic ballast luminaires with 5.200 lm, *no consideration of the radiation characteristics*. One optimized design using Dialux could be achieved at little expense buy individual adjustments, showed the following equipment to be sufficient for 300 lx:

- 35 W T5 (16 mm) electronic ballast luminaires with 3.650 lm
- planning factor: 0.95
- boundary area in classrooms: 0.5 m
- broad-radiating luminaires
- arrangement in 2 rows of 3 luminaires plus 2 to illuminate the board
- improved distance between the rows
- average density of the light almost 400 lx

Even with a planning factor of 0.8 the optimised design with 8 T5 electronic ballast luminaires shows sufficient clearance for the demanded 300 lx. The savings in capacity and energy of this optimisation is about 30 %.

B) Examination of the results of the EDP planning tools in practice

In Frankfurt the practice of renovating classrooms shows that, regarding the planning factor, the density of light calculated with Dialux represents only the lower limits which are actually measured after implementation. Safety margins in the lighting layout beyond the planning factor are hardly justifiable if the plans are carefully cared out.

C) Radiation pattern and indirect proportion

A classroom of the HelmHolz School in Frankfurt was renovated as a model using suspended luminaires with flexible radiation pattern and a 10 % indirect portion. An indirect portion of up to 10 % improves the visual comfort of the room substantially, as was also found in different projects of the City of Frankfurt (inexpensive using perforated mirror). The total losses of 3 % (10% * 70% reflection on the ceiling) are kept within limits.

D) Warning of over dimensioning, adjustment to the age of the users
Lighting programmes should also include an alarm function for over dimensioning. Exceeding standard densities of light are not only expensive, but lead to impairments to the users as a result of the high brilliance difference between the PC monitor and the surrounding surfaces.

E) Remuneration of the planning service
For the planner, as with all planning services with remuneration according to HOAI, there is the question of conscience between offering a generous design or an economically optimised solution.

Concrete experiences show that there is a potential for obtaining substantial cost savings in investment and marketing through the individually optimized planning of luminaires without incurring greater expenses.



In Austria, the GreenLight Partner **Stadt Salzburg**, upgraded the *Old Town public lighting* by substituting 1.069 mercury lamps with metal halide lamps.

To carry out the planned project, the Engineering Department developed a lighting concept, which was approved by the provincial heritage agency and put out to tender. The new old town lighting concept was then implemented in cooperation with manufacturers Abele and Geiger and contractors BG – Light.



- Lamps: Ceramic metal halide (CMH)
- Power: 35W (instead of 80W) in the pedestrian precinct,
70W/50W (instead of 125W) in mixed traffic areas and squares
- Technology: High intensity discharge with adjustable light distribution





Previous
Steel plate
Exposed design
Improved insulation retrofitted from 1985
Diffuse scattering
Free standing in lamp space
Light to be dismantled: ½ hour work
Open
Individual glass to be fitted, opal glass (up to 40% less light)



New
Aluminium casting
Safety class IP 54
Degree of protection: totally insulated
Light directing with adjustable high-power reflector
Bulb lying in roof
Quick assembly replacement in 2 steps
Terminal compartment insulated and sealed
Sealed plastic bowl, textured glass

After measurements they reported the next savings:

- Lighting electricity savings: 243.000 kWh/year (50% energy reduction)
- Energy cost savings: 60.000 euro/year
- Payback time: 6 years



Salzburg Mayor receives the GreenLight plaque



In Belgium, **Stadt Turnhout** has re-lighted its sport hall in 2004 saving a total of 69 % on energy use and 91 % on toxic waste by using eco-lamps.



The mayor of Turnhout was pleased with the GreenLight logo, handed to him by an endorser.

“Energy efficient lighting was part of the durable policy the city was advocating.”



An initiative promoted by the European Commission

Winner of the
GreenLight Awards
2004



The **Stadt Zurich** is one of the building industry's biggest clients in Switzerland. As priority for the next 10 years the building department issued 7 milestones for environmental friendly and low energy building construction. The lighting in new buildings and in 50% of refurbishment projects should meet the MINERGIE specifications (www.minergie.ch) which are based on the recommendation SIA 380/4 "Electrical Energy in Buildings"



The Results:

- 15 new and refurbished projects with 71.000 m² in operation
- Power saving: 4,9 million kWh in 15 years(327.000 kWh/year)

Winner of the
GreenLight Awards
2003



In Norway, **Statoil** joined GreenLight in January 2001. As part of their commitment, they installed occupancy controls in their research centre. These controls turn off the lights once they have failed to detect occupancy for a set time. When occupancy is detected, they switch the lighting on again. Previously, the lights remained on the whole day in all offices and

laboratories with a common switching system. This was a waste of energy given that occupancy patterns were intermittent and unpredictable. Lighting electricity savings amount 219.000 kWh/year (Internal Rate of Return of the investment: 40%.) After this pilot project they lunched some others new ones, reporting the following achievements:

- *41 different facilities* with a total area of 19.854 m², upgraded in 2004:
 - Lighting electricity savings: 765.363 kWh/year
 - Energy cost savings: 29.242 euro/year
 - Payback time: 4,5 years
- *Forus West - Block B*, 4.500 m², upgraded in 2002:
 - Lighting electricity savings: 66.028 kWh/year
 - Energy cost savings: 9.631 euro/year
 - Payback time: 11 years
- *Forus East FH-D4+D5*, 1.291m², upgraded in 2002:
 - Lighting electricity savings: 12.512 kWh/year
 - Energy cost savings: 2.903 euro/year
 - Payback time: 9 years
- *Forus East FO-E3*, 1.376 m², upgraded in 2002:
 - Lighting electricity savings: 32.076 kWh/year
 - Energy cost savings: 4.733 euro/year
 - Payback time: 7 years
- *Kaarsto*, 1.515 m², upgraded in 2002:
 - Lighting electricity savings: 34.284 kWh/year
 - Energy cost savings: 4.720 euro/year
 - Payback time: 10,60 years



An initiative promoted by the European Commission

In Netherlands, the GreenLight Partner **StoraEnsoBerhuizer Papierfabrik**, upgraded in 2003 one of their facility by changing the old T12 fluorescent lamps and fitting based induction lamps with new T8 (26 mm diameter fluorescent lamp) powered by electronic ballast. The new luminaires were equipped with aluminised reflector. The lighting system was designed taking into consideration the day-light optimisation factor. As a consequence the lighting control system included above a general switcher, the daylight responsive controls.

After measurements they reported the following savings:

- Lighting electricity savings: 27.561 kWh/year
- Energy cost savings: 3.804 euro/year
- Payback time: 3,7 years

SUPER U

In France, GreenLight Partner, **Super U**, rethought their lighting concept for all new supermarkets. Until recently, all new shops were equipped with 26 mm diameter lamps, magnetic ballasts, and white-painted industrial reflectors. Luminaires were traditionally placed at a height of about 5m and distributed so that lighting levels exceed 1.000 lx on the floor. Their new lighting concept consists in lowering the fixtures and using 16 mm fluorescent lamps, electronic ballasts, and flat-bladed louvers. Lighting levels are reduced to 600 lx and 1/3 or 2/3 of the general lighting can be switched off when less light is needed.

The results below were reported for their shop in *Dannemarie*. The comparison is made versus a new installation that would have used the standard new lighting layout used before they joined GreenLight:

- Lighting electricity savings: 78.680 kWh/year
- Power reduction: 15.6 kW
- Reduction of electricity use in the areas covered: 36 %
- Energy cost savings: 5.901 euro/year
- Payback time: 3 years and 6 months

As a part of their new lighting concept they reported also the next savings for other upgraded shops:

- *Boofzheim* (2.218 m²) lighting electricity savings: 57.000 kWh/year
- *Bonne / Menoge* (1.229 m²) lighting electricity savings: 61.880 kWh/year
- *Vinzier* (2.097 m²) lighting electricity savings: 93.000 kWh/year
- *Ville* (2.680 m²) lighting electricity savings: 68.000 kWh/year
- *Mutzing* (1.990 m²) lighting electricity savings: 63.200 kWh/year



Super U Hartmann
42 r Belfort F-68210 Dannemarie
General Director: Bruno Mandroyant
Tel. 03 89 25 02 87



The **swb Bremerhaven Ltd.** Germany, as a part of their commitment at the GreenLight Programme, refurbished their public street lighting. By replacing the old HP Mercury lamps with new CFL self-ballasted ones and equipping the new luminaires with aluminised reflectors, they claim the following energy savings:

- Lighting electricity savings: 79.043 kWh/year
- Energy cost savings: 7.905 euro/year
- Payback time: 1 year (less than one year because the luminaires needed to be replaced)



◀ Before

After ▼



In Spain, the GreenLight Partner **TBK Sistemas de gestio**, upgraded the *Mesa direccion - Barcelona*. They changed 26 lamps from the old 36 W fluorescent lamps, with 13 new more efficient ones. The new ones have 4.000 running hours in compared with the old conventional ones. Whit half of the tubes they have increased with an average of 37% the lighting level, reducing in the same time with 50% the installed power demand (from 936 W to 468 W).

After measurements, with a total investment of 195 euro, the company reported the fallowing electricity savings:

- Lighting electricity savings: 1.420 kWh/year
- Energy cost savings: 115 euro/year
- Payback time: 1,68 years



TERRES & EAUX

The French GreenLight Partner, **Terres et Eaux**, installed a high efficient lighting system for their *shop in Amiens*. The total surface is composed from an total sales area of 2.300 m², plus the parking and the accesses areas. Mainly in all the cases they used high efficiency luminaires.

For the sales area the lighting system was composed from T5 lamps geared by electronic ballasts. The number of lamps was calculated taking into account a lighting level of 600 lx. The company achieved an electricity consumption of 14,5 W/m² or 2,5 W/m²/100 lx.



In Greece, the Ministry of Justice signed the GreenLight Partnership. The Ministry created **Themis SA**, an engineering company, to plan and oversee constructions and refurbishment of all its buildings. In a first pilot project they upgraded the lighting system for the *Courthouse of Athens*. After the rejection of changing luminaries or installing daylight sensors, due to building construction reasons, the only action adopted was timed switching of lights. The results were the following:

- Lighting electricity savings: 9.930 kWh/year
- Payback time: 2 years



Δεν υπάρχουν όρια.

Winner of the
GreenLight Awards
2005

In Greece, the GreenLight Partner **TIM**, upgraded three administrative buildings composed from offices (22.160 m²) and underground parking (33.600 m²) areas. Based on the same technical solutions, the new lighting system for all the three facilities tried to prove one more time, the major electricity savings potential of the newest technologies on the market.

Mainly for the offices areas they changed all 4x18W (T8) conventional ballast fixtures to 4x14W (T5) ones, changing in the same time the conventional ballasts to electronic ballasts. Moreover there were introduced local light sensors around T5 fixtures in order to perform dimming in the windows zone.

For the underground garages it was changed the ballast from conventional to electronic on 2x58W fixtures the system being equipped in the same time with timers.

From the first estimations they claimed the next savings for the entire project (three administrative buildings plus an operations centre):

- Lighting electricity savings: 806.250 kWh/year
- Energy savings for lighting 40%
- Energy cost savings: 110.977 euro/year
- Payback time: 2,7 years



Pathe is a leading movie theatre operator in Europe. With more than 280 screens in France and Netherlands, the company is expanding into other high potential markets, including Italy. Cinema audiences have been on a strong upward trend in all major European countries for several years.

The cinema theatre **Tuschinski** in centre Amsterdam is one of the most famous and beautiful cinemas in Netherlands and also supposed to be the most beautiful in Europe. In 2002 the theatre is reopened after a renovation of the interior and technical installations, including the lighting installation. Very innovative in the use of LEDs in the more than 500 decorative luminaires in the main theatre. The LEDs are used to replaced the incandescent lamps and are even dimmable. This dimming includes the colour shift to more warm light, typical for incandescent lamps. In order to reach this, a special “light source” consisting of white and yellow LEDs was constructed. In the big lantern on the ceiling the incandescent lamps were replaced by a combination of long life fluorescent lamps and long life incandescent lamps. The incandescent lamps are only used at the start and the end of the dimming.



Beside improved visual comfort, the company reported the following savings for the total area of 1.700 m²:

- Lighting electricity savings: 96.360 kWh/year
- Energy cost savings: 104.810 euro/year





UniCredito Italiano

In Italy, the GreenLight Partner **UniCredito Italiano S.p.A.**, upgraded the lighting system for *Centro S. Elia*'s corridors and garages.



They reported the following savings:

- Electrical consumption 2001: 403.100. kWh (the equivalent of 1.465 luminaires)
- Energy and maintenance savings: 14.385 euro
- Investment value: 56.000 euro
- Contract duration: 4 years



Vennootschap Mechelse Veilingen

To save on energy and maintenance costs, the Mechelse Veilingen (fruit- and vegetables auction) renovated its lighting. Before the relighting exercise, the lighting of the 16.000 m² warehouse consisted of hermetically sealed luminaires with two 58W tubes. The temperature in these luminaires typically rises, thereby reducing the lifetime of the tubes which in turn leads to high maintenance- and operating costs. Next to this, the original luminaires were photo-metrically inefficient.



The warehouse has been renovated with compact luminaires with wide angle distribution reflector en electronic ballast. De 1x58W tubes are equipped with PET-foil, preventing glass to fall on the merchandise in case a tube breaks. In the auction-hall, luminaires with MICROLUM®-reflector and electronic ballasts have been installed.

The renovation has resulted in a functional building, properly- and energy-efficiently lighted. The payback term for the entire exercise amounts to only 2,4 years.



Vesta Forsikring is Norway's third-largest company in the area of non-marine general insurance. As a part of their commitment to the GreenLight Programme the company installed a new lighting system for their head office building, by replacing lighting fittings. This solution results in a somewhat longer payback time. This was better than expected. When the internal rate of interest is above 20% and the cost of the equipment will be recouped in under half of its life time it is still financially justified to implement the project.

Vesta claims the following results:

- Lighting electricity savings: 75.400 kWh/year
- Payback time: 7,4 years



In France, the GreenLight Partner **Ville de Lyon**, upgraded in 2003 the public lighting in two different areas of the city.

The first project takes into consideration the *Highway A6-A7*. The baseline lighting was installed on concrete pillars of 30 m high equipped with a mobile corona which was refurbished. By replacing this corona fixtures they reduced the number of luminaires by 1/3 getting in the same time a better visual comfort. The system was also equipped with a day light responsive control system.



An initiative promoted by the European Commission

Baseline lighting:

- Pillar 30 m high
- Mobile corona 4,80m diameter, 2m high
- 1.000 kg weight
- 22 HP Sodium projectors 8.800 W
- Total installed power: 26.400 W

Post-installed lighting:

- Pillar 30 m high
- Mobile corona 4,50m diameter, 0.5m high
- 400 kg weight
- 7-8 HP Sodium projectors 4.200 - 4.800 W
- Total installed power: 13.800 W



After the first estimations the following savings are claimed:

- Lighting electricity savings: 51.282 kWh/year
- Energy cost savings: 6.330 euro/year

For the other project, *Quai Saint Antoine*, they refurbished the street public lighting for a area of approximately 1.600 m². All the high pressure mercury lamps (250 W and 525 W) were changed with high pressure sodium (white, 400 W) and metal halide (220 W and 140 W) ones, powered by electronic dimmable ballast. The day light responsive lighting control system was also doubled by time scheduling devices. They dimmed the lighting power level with 25% for the late night hours.



Baseline lighting:

- 15 HP Mercury 250 W
- 11 luminaires / 2 lamps HP Mercury 525 W

Post-installed lighting:

- 11 luminaires / 1 lamp HP Sodium 400 W
- 10 luminaires / 2 lamps metal halide 220 W
- 6 luminaires / 2 lamps metal halide 140 W

Above doubling the lighting level when the system is working at 100% of its capacity, they claimed the next savings:

- Lighting electricity savings: 9.000 kWh/year
- Energy cost savings: 700 euro/year



In France, **Ville d'Ilkirch-Graffenstaden**, as a part of their commitment to the GreenLight Programme decided to upgrade the lighting of their main facilities and also the public lighting. For the first pilot project the company rethought in 2004, the lighting system for the two classrooms (1.600 m²) of a public school. They replaced 14 old luminaries of 162 W powered by ferromagnetic ballasts with 88 W luminaries equipped with electronic ballasts and aluminised optical reflectors.



Besides improved visual conditions, from a lighting level of 220 lx to 255 lx (300 lx at the installation, but taking into account the performance losses after one year of working), the company reported the next energy savings:

- Lighting electricity savings: 2.070 kWh/year, about (30% less than before)
- Energy cost savings: 310 euro/year
- Payback time: 4.5 years.



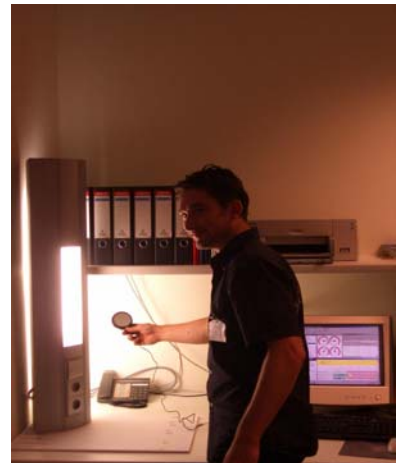
Virga Jesseziekenhuis
HASSELT

Virga Jesse is a public hospital in Hasselt - Belgium, that offers classic medicines and high quality care. As a part of their commitment to the GreenLight Programme, they rethought the old lighting system. The energy consumption of the lighting installation represents approximately 42,2 % of the total energy consumption of the hospital. The total lighting installed power is 402.978 W, which for a total of 3.276 burning hours a year represents an yearly electrical consumption of 1.320.156 kWh/year. In previously executed projects, the lighting installations was optimised. Approximately 55 % of the installation has been equipped with electronic ballasts high efficiency luminaries. As a consequence of this they used a lower power input per lamp and less luminaries. The energy consumption of the new light installation was reduced with 50 %.



The total energy savings reported, are as follows:

- Lighting electricity savings: 363.043 kWh/year (27.5% of the total energy consumption of 1.320.156 kWh)
- Energy cost savings: 32.311 euro/year



In the future the remaining 45 % of the lighting installation will be optimised in the next projects, another 26.436 euro could have been saved yearly. The energy consumption can be reduced with 22.5 % (=297.035 kWh). Supposing that 50 % energy of this part can be saved by using electronic ballasts and energy efficient luminaries.



Winner of the
GreenLight Awards
2004

The Norway GreenLight Partner, **Vital Eiendomsforvaltning AS**, replaced the T8 lamps with new T5 ones:

Baseline installation 2 x 36W T8
 1 x 36W T8 30,8 w/ m²

Post installation 1 x 49 W T5
 1 x 28 W T5 10,2 w/ m²

Total area: 13.000 m²

- reduced installed kW by 60 %
- reduced running hours by 20 %
- reduced energy consumption by 67 %

Total yearly energy consumption (lighting):

- Baseline 1.200.000 kWh
- Post installation 400.000 kWh
- Payback time: 4 years





The GreenLight Partner **Vodafone (Greece)**, upgraded in 2003 the *Kifissos Opening Center*, office building with a total area of 7.000 m². The company decided to partially follow the recommendations of a study of CRES and exchange the magnetic ballasts of operations building with electronic non-dimmable ones. They also used new lamps TCL 55 W to replace the old ones.

After measurements, with an initial cost (including equipment and installation) of 76.000 euro the company reported the following savings:

- Lighting electricity savings: 142.560 kWh/year
- Energy cost savings: 9.267 euro/year
- Payback time: 8,20 years



In a second project in 2004, *Vodafone House* (building with a total area of 17.500 m²), they installed the same TCL 55 W lamps, powered by electronic ballast. In this case the company reported as follows:

- Lighting electricity savings: 135.011 kWh/year
- Energy cost savings: 9.675 euro/year
- Payback time: 4,5 years



Vodafone (Portugal), also a GreenLight Partner, decided to adopt new lighting solutions for their main building in Lisbon for the spring of 2005.

Vodafone Portugal decided the renewing of the outdoor lighting system for an entertainment place and a square by installing day light responsive lighting control systems.

After the estimations they claim the next energy savings:

- Lighting electricity savings: 32.285 kWh/year
- Energy cost savings: 3.850 euro/year
- Payback time: 4,5 years

For the indoor lighting for an entertainment area of 23.404 m² they will replace the old lamps with more efficient 26 mm fluorescent ones powered by dimmable ballast (before electronic non-dimmable). The lighting control system will be also equipped with localised manual switchers and occupancy responsive devices. In this case the estimated savings are:

- Lighting electricity savings: 315.814 kWh/year
- Energy cost savings: 31.581 euro/year
- Payback time: 4,8 years





Together with Austrian Energy Agency, the GreenLight Partner **WIPARK Garagen AG** (Austria), evaluated the energy savings technologies that were already applied in the majority of their car park facilities, in the last years. Those technologies are mainly summarised but not limited to the following:

- Time driven part-load [1/3,2/3,3/3] control of car park lighting system
- Light sensors driven lighting controls [1/3,2/3,3/3] in open designed car parks with a large amount of daylight.
- Sensitive motion detectors in the lower level of the car parks
- Dimmable and non-dimmable electronic ballasts

Latest optimisations resulted in more than 30% energy savings in the last year's activities [2003] by implementing central voltage controllers at remaining installations with magnetic ballast conceptions. Summarising the basic facts, the optimisations of 6 car parks by implementing intelligent central voltage controllers have resulted in annual savings of more than 25.000 euro which means a return on investment of 100% within 1.66 years (average).

Together with these energy savings projects in many cases they combined these actions with improvements in lighting quality. Recently practice measures there were:

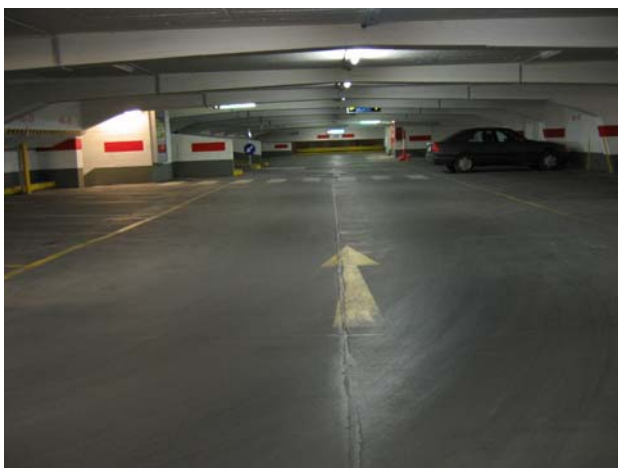
- implementation of high quality long life tubes with constant line output over their life span.
- lighting optimisation in key areas e.g. entrance, exit areas etc.
- recurrent painting of walls and renovation of floors for a higher degrees of reflection
- pilot implementation of integrated reflector tubes.

Beside a better visual comfort, the company claims the next savings for a total number of 22 parking houses:

- Lighting electricity savings: 140.000 kWh/year
- Energy cost savings: 22.000 euro/year
- Payback time: 2,6 years (average)

As an estimation, about 50.000 to 70.000 euro energy costs were saved during the last two to three years. According with an energy price of 12 cent/W, lighting electricity savings of about 500.000 kWh/year were achieved. During the next two years they expect about 60.000 kWh/year additional savings.

Before ▼



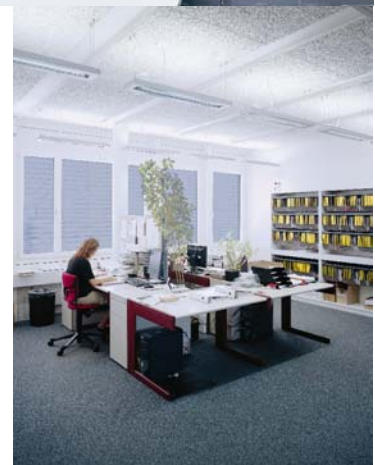
After ▼



The GreenLight Switzerland Partner, **Zehnder Group Produktion Gränichen c/o**, upgraded their main production and offices facility lighting system, for a total area of 8.683 m². The old lamps were replaced with new, more efficient ones powered by electronic ballasts. As lighting control devices, they used manual switchers, time scheduling and daylight responsive systems. The lighting level was increased from 185 lx to an average of 229 lx.



After measurements, besides a much better visual comfort, they claimed lighting electricity savings: 535.887 kWh/year i.e. 46,5% on lighting-related electricity consumption.

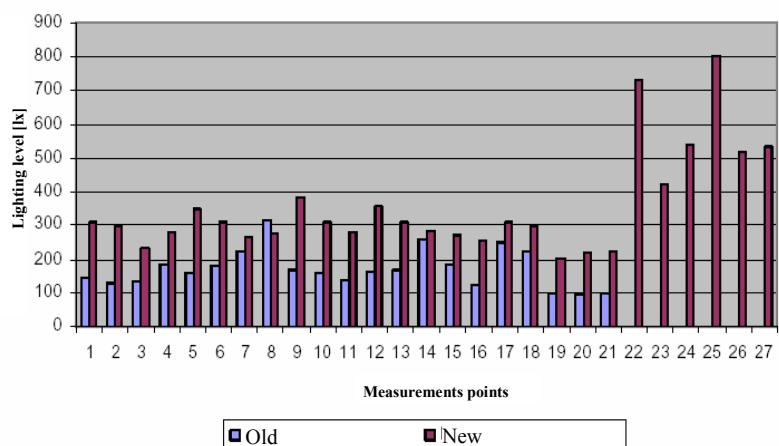


Post-installation lighting for offices ▲

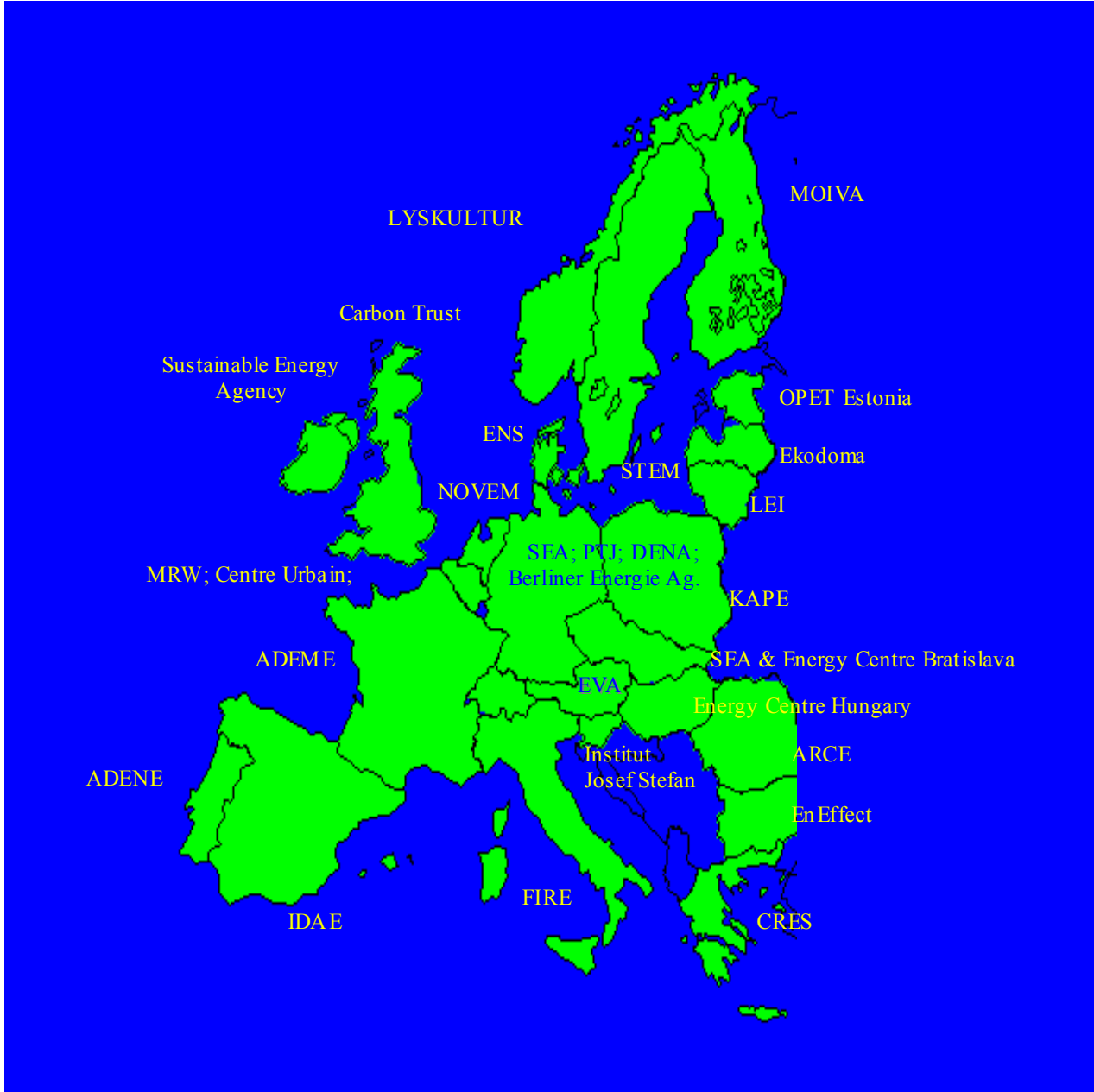


◀ Post-installation lighting for the production area

Lighting level Old / New



GreenLight National Contact Points in 26 countries



For more information on the European GreenLight programme,
please contact the persons below or visit our web site:

www.eu.greenlight.org

GREENLIGHT MANAGER

P. Bertoldi
DG JRC – TP450
I-21020 Ispra
Tel.: +39 0332 78 9299
Fax: +39 0332 78 9992



EUROPEAN COMMISSION
JOINT RESEARCH CENTRE



A - AUSTRIA

Georg BENKE
E.V.A.
Otto-Bauer-Gasse 6 - A-1060 Wien
Tel.: +43 1 586 15 24 31
E-mail: benke@eva.ac.at

B - BELGIUM

Claude RAPPE
Ministère de la Région Wallonne
DG TRE
Avenue Prince de Liège, 7
B-5100 JAMBES
Tel.: +32 081 33 56 28
E-mail: c.rappe@mrw.wallonie.be

Eddy DERUWE

Centre Urbain/Stadswinkel asbl
Boulevard Anspach-laan 59
B-1000 Brussels
Tel.: +32(0)2/219.40.60
E-mail: centre.urbain@curbain.be

Geert FLIPTS

Ministerie van de Vlaamse Gemeenschap
Afdeling Natuurlijke Rijkdommen en Energie
Koning Albert II-laan 7 - B-1210 Brussel
Tel.: +32 02 553 46 15
E-mail: geert.flipts@cwbl.vlaanderen.be

BG - BULGARIA

Dr. Zdravko GENCHEV
Mailing address: 1606 P.O.Box 85
Office: 1, Hristo Smirnenki Blvd., III floor
1164 Sofia, Bulgaria
Tel.: +359 (0)2 963 1714
Fax: +359 (0)2 963 2574
E-mail: zgenchev@eneffect.bg

CH - SWITZERLAND

Paul SCHNEITER
S.A.F.E. Schweizerische Agentur für Energieeffizienz
Frohmoosstrasse 32 b
CH-8908 Hedingen
Tel.: +41 1 761 04 29
E-mail: paul.schneiter@energieeffizienz.ch

CZ - CZECH REPUBLIC

Juraj KRIVOSIK
SEVEN, the Energy Efficiency Center
Americká 17 - CZ-120 00 Prague 2
Tel.: +420 2 2425 2115/2424 7552
E-mail: juraj.krivosik@svn.cz

D - GERMANY

Gillian GLAZE
PTJ
Forschungszentrum Jülich GmbH
D-52425 Jülich
Tel.: +49-2461-61-5928
E-mail: g.glaze@fz-juelich.de
Annegret-Cl. AGRICOLA
DENA

Chausseestraße 128a
D-10115 Berlin
Tel.: +49 30 726 16 56 51
E-mail: agricola@deutsche-energie-agentur.de

Mrs. Kerstin KALLMANN
Berliner Energieagentur GmbH
Rudolfstr. 9 - D-10245 Berlin
Tel.: +49 30 29 33 30 33
E-mail: kallmann@berliner-e-agentur.de

Uwe SCHMIDT
Saarländische Energie-Agentur GmbH
Altenkesselerstr. 17
D-66115 Saarbruecken
Tel.: +49-681-9762-176
E-mail: schmidt@sea.izes.de

DK - DENMARK

Peter BACH
ENS
Amaliegade 44
DK-1256 Copenhagen
Tel.: +45 33 92 68 18
E-mail: pb@ens.dk

Casper Kofod
Energy Piano
L.F. Cortzensvej 3
DK-2830 Virum
Tel.: +45 40 45 98 76
E-mail: epiano@image.dk

E - SPAIN

Teresa Herrera PEREZ
IDAE
C/Madera 8
ES-28004 Madrid
Tel.: +34 91 4565042
E-mail: herrera@idae.es

EE - ESTONIA

Villu VARES
OPET Estonia
Paldiski Road 1
EE-10137 Tallinn
Tel.: +372 6621612
E-mail: villu@eeri.ee; villuv@online.ee

EL - GREECE

Ilias SOFRONIS
CRES
19th Km Marathon Ave.
GR-19009 Pikermi
Tel.: +30 10 6603 287
E-mail: sofronis@cres.gr

F - FRANCE

Hervé LEFEBVRE
ADEME
500, route des Lucioles
F-06560 Sophia-Antipolis Cedex
Tel.: +33 4 93 95 79 58
E-mail: herve.lefebvre@ademe.fr

FIN - FINLAND

Heikki HÄRKÖNEN
MOTIVA
P.O. Box 489 - FIN-00101 Helsinki
Tel.: +35 89 8565 3109
E-mail: heikki.harkonen@motiva.fi

HU - HUNGARY

Tibor BERTOK Jr.
Energy Centre Hungary
Ráday u. 42-44 - H-1092 Budapest
Tel.: +36 1 456 4311
E-mail: tibor.bertok.jr@energycentre.hu

I - ITALY

Elisabetta RHO - Mario DE RENZIO
FIRE
Via Flaminia 441 - I-00196 Roma
Tel.: +39 06 36002543
E-mail: isnova@isnova.it

IRL - IRELAND

Mr. Chris HUGHES
Sustainable Energy Authority of Ireland
Glasnevin - Dublin 9
Tel.: +353 1 8082076
E-mail: Chris.Hughes@sei.ie

LT - LITHUANIA

Romaldas SKEMA
Lithuanian Energy Institute
Breslaujos 3, - LT-44403 Kaunas,
Tel./Fax: +370 37 401 802
E-mail: skema@mail.lei.lt

LV - LATVIA

Dagnija BLUMBERGA
Ekodoma
Zentenes Street - LV-1069 Riga
Tel.: +371 721 05 97
E-mail: dagnija@btv.lv

NL - THE NETHERLANDS

Marion BAKKER
Novem bv
PO Box 8242
NL-3503 RE Utrecht
Tel.: +31 30 2393 677
E-mail: m.m.c.bakker@novem.nl

NO - NORWAY

Kaare M. SKALLERUD
Lyskultur
P.O. Box 65 - N-1321 Stabekk
Tel.: +47 32 21 35 53
Mobile: +47 915 123 33
E-mail: greenlight@lyskultur.no

P - PORTUGAL

Diego BEIRAO
ADENE
Estrada de Alfragide, Praceta 1, 47
PT-2720-537 AMADORA
Tel.: +351 214 722 800/40
E-mail: diego.beirao@adene.pt

PL - POLAND

Ms. Karolina LOTH
KAPE
ul. Nowogrodzka 35/41 (XII p.)
PL-00 691 Warszawa
Tel.: +48 22 622 27 97
E-mail: kloth@kape.gov.pl

Bartłomiej Grygiel (m)
Polish Foundation for Energy Efficiency
Centrum in Katowice
ul. Wierzbowa 11 - PL-40-169 Katowice
Tel./fax: (+48 32) 203-51-14
E-mail: b.grygiel@fewe.pl

RO - ROMANIA

Corneliu ROTARIU
Romanian Agency for Energy
Conservation (ARCE)
16 Blvd. Nicolae Balcescu
Bucaresti, Romania
Phone: +40213136002
Fax: +40213145929
E-mail: corneliu_rotariu@yahoo.com

S - SWEDEN

Kalle HASHMI
STEM
P.O. Box 310 - S-631 04 Eskilstuna
Tel.: +46 8 747 86 98
E-mail: kale.hashmi@stem.se

SI - SLOVENIA

Tomaz FATUR
Jozef Stefan Institute - Energy Efficiency
Centre
Jamova 39 - SI-1000 Ljubljana
Tel.: +386 1 588 52 10
E-mail: tomaz.fatur@ijs.si

SK - SLOVAKIA

Mario POLONYI
Slovak Energy Agency
Bajkalska 27 - SK-827 99 Bratislava 2
Tel.: +421 2 58 248 203
E-mail: Mario.polonyi@sea.gov.sk

Vladimír HECL
Energy Centre Bratislava
Bajkalská 27 - SK-821 01 Bratislava
Tel.: +421 2 58 248 472
E-mail: office@ecbratislava.sk

UK - UNITED KINGDOM

Dr M J Perry
ECA Support Programme Manager
Building Research Establishment (BRE)
Garston Watford WD25 9XX
Phone: 01923 664875
Fax: 01923 664097
Email: perrym@bre.co.uk

The GreenLight Programme is an initiative of the European Commission Directorate General Energy & Transport. It is managed by the European Commission's Joint Research Centre (JRC). The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.



An initiative promoted by the European Commission

Mission of the JRC

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

