



Energy Efficiency

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PICTURES HMMC

# Ecology First - Hyundai saves 45 %

*Hyundai Motor Manufacturing Czech (HMMC) is perceived by the experts as the most modern car manufacturing plant in Europe. Since the very beginning of construction in 2007, environment management has been one of the plant's priorities.*

The HMMC plant, a fully-owned subsidiary of Seoul-based Hyundai Motor Co., spreads out on a 200-hectare area in the industrial zone of Nošovice in the Moravian-Silesian region of the Czech Republic.

The production capacity of the plant is massive: in 2012 it produced 303.000 Hyundai cars for European markets. Beside cars, the plant has a capacity to produce 530 000 transmissions in a year. With 3.500 employees, working safety and optimal workstation lighting is essential for the well-being of the employees. Having 28.3 hectares of buildings and halls, electricity used on lighting is big part of the operational costs of the plant.

## ECOLOGY FIRST

Ranked as the world's most innovative automaker in 2012\*, Hyundai is also an innovator and promoter of environmentally friendly solutions. With its motto "Ecology First", the company is trying to clearly demonstrate its attitude towards global problems in the field of climate change. Environment Management is proactively pursued and energy savings is a big part of the efficacy and environment friendliness in the whole Hyundai corporate, not only in this factory.

## LESS ENERGY, MORE SAVINGS

To reduce energy consumption and to create a more flexible lighting solution, the company decided to replace

the existing lighting system in the production halls. Other investor requirements for the new lighting were reliability, automatic control with manual modes, central administration from PC's, well-arranged visualization of the lighting system, scheduled lighting scenes and easy maintenance.

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The project started by replacing almost a thousand discharge lamps with fluorescent luminaires which immediately reduced the power consumption by 22 %. Each fluorescent luminaire is equipped with three Helvar EL2x54iDim DALI ballasts. The power consumption was further reduced by 30 % with the intelligent lighting system that was designed and installed by DNA, the Helvar System Partner in Czech Republic.

The backbone for the lighting system are the Helvar DIGIDIM 910 Routers that deliver information from the thousands of DALI components to the control unit that sends commands to the luminaires according to the received information. The luminaires are controlled one by

## System facts

- 2853 x EL2x54iDim DALI ballasts
- 24 x DIGIDIM 910 Routers
- 8 x DIGIDIM 498 8 channel Relay Units
- 7 x DIGIDIM 942 Input Units
- Helvar Designer Software
- Helvar TouchStudio Software



*The luminaires are controlled one by one at each workstation or as groups in areas like corridors based on time schedules and information from the daylight and motion sensors.*



one at each workstation or as groups in areas like corridors based on time schedules and information from the daylight and motion sensors. For example, at lunch hour the corridors are lit brighter and the workstations are dimmed down. The system can be programmed in daily, weekly and monthly basis up to 5 years in advance, with planned downtime and holidays.

“*The annual savings on electricity compared to the original lighting system is calculated to be over 3.3 Million CZK - about 137.000 EUR.*”

### EASY VISUALIZATION TO CREATE MORE CONTROL

Despite the fully automatic and programmed system, the lighting can also be controlled manually using control panels or from the central PC's. The whole system is visualized in a computer showing the current state of each individual luminaire or groups and allowing to modify the system parameters without the need of expert knowledge of

the system programming. The users can program, control and monitor the whole system according to their own requirements. Up-to-date information about all luminaires and the system status are clearly graphically displayed to the user only a few seconds after the application is started.

The intelligent lighting management system and efficient components from Helvar created an optimal lighting solution that fulfilled all of the investor's requirements and needs for the plant's lighting. High variability of configuration options of the whole system provides a very efficient system operation and maximum savings on the consumed electricity.

The annual savings on electricity compared to the original lighting system is calculated to be over 3.3 Million CZK (about 137.000 EUR) – that is 46 % less energy used for lighting.

\*) *Boston Consulting Group: The Most Innovative Companies 2012*



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#### Original lighting system

- 961 discharge lamps 400 W 3.5 A with consumption of 449 W
- Total installed power consumption: 961 pieces \* 449 W = 431.5 kW
- Annual operation: 7,000 hours
- Annual consumption: 431.5 kW \* 7,000 h = 3,020,500 kWh = 3,020 MWh

<sup>1)</sup> at the price 2.40 CZK / 1kWh

#### New lighting system

- 961 pieces of fluorescent lamps with consumption of 349 W
- Total installed power consumption: 961 pieces \* 349 W = 335.4 kW
- Annual operation: 7,000 hours
- Savings with the DALI control: 30 %
- Annual consumption of electricity: 335.4 kW \* 7,000 h \* 0.7 kWh = 1,643,460 kWh = 1,643 MWh
- Annual savings on electricity<sup>1)</sup>: **3,304,896 CZK = 46 %**