



LED

**The future of
energy efficient lighting**

Whistler, BC
March 22th, 2010

Themen

- Introduction / General Preconditions
 - Company LEDworx
 - LED – Technology
 - LED Large Scale Products
 - Sales Strategies and Partnerships
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Introduction / Trends



Global increase of energy consumption

- Conscientious energy use
- Innovation (Green IT, solar technology, hybrid vehicles, LED)

Importance of light in the public sector

- Traffic safety – accident prevention
- Subjective perception of safety – crime rates
- Quality of life
- Lighting to enhance public spaces

Environmental protection

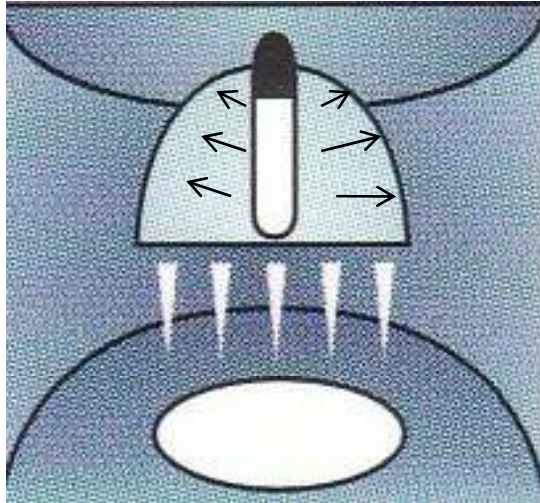
- Reduction of CO2 emissions
- “Light pollution” - “Dark Sky”
- Conservation of resources

LEDworx – Company Details

- **Development company based in Vienna**
 - **Founded 2005**
 - **Core competence: Development of large-scale LED illumination systems**
 - **LED street lighting**
 - **Industrial lighting**
 - **Production in cooperation with European partner companies**
 - **International sales and project activities**
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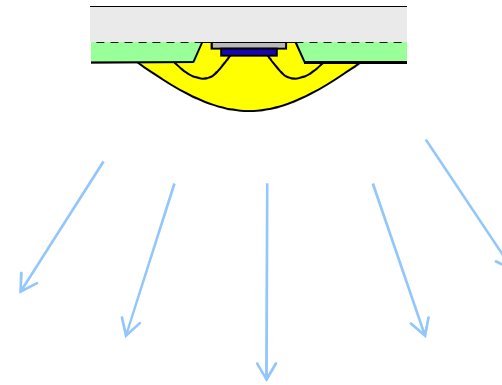
LED - Technology - Principal differences

Conventional lighting



- **Omnidirectional**
- **Electronics, gas, glass**
- **Reflector for light collection and diffusion**

LED lighting



- **Directed**
- **Electronic component (iridium – gallium - nitride)**
- **Optics for targeted light diffusion**

LED – Technology - Advantages

- Energy savings potential → reduction of electricity costs
 - Expected life time: > 50,000 hours (12 years) – Reduction of maintenance costs
 - Based on long term LEDworx product testing with certification bodies
 - Color temperature >5000K → daylight quality
 - Turn-on within fractions of a second → full power availability
 - Color rendering (high CRI, Ra value 75) → improved object recognition
 - No ultraviolet light component → no bleaching, less insects
 - Electric components
 - Significantly less hazardous waste disposal than with conventional energy-saving technology
 - Resistant to environmental conditions and vibrations
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- Optional integration of enhanced control

PRODUCTS

- Focus on industrial large scale lighting
- Street lighting
- Industrial application
 - Halls
 - Parking lots
- Beam lights
- Transport
 - Trains
 - Fire Fighting Vehicles



The HAWK EYE [3.0] LED Street Light

- 5 different performance variants
- 29 to 145 Watt (2,000 to 10,000 Lumen)
- Overall Performance: ~ 70 Lumen/Watt
- **DIFFERENCES:**
- Products certified following EU standards by certified inspectorates and governmental authorities (North America in progress)
- Conformity to EN 13201 standards
- Numerous international references
- Thermal overload protection
- Controllability: Voltage reduction and phase control
- Symmetric and asymmetric optical systems



The HAWK EYE [3.0] LED Street Light



- All illumination classes (S and ME classes) following EU-Regulations EN 13201 possible
- Focus of deployment areas:
 - Residential areas (0-30 Km/h)
 - Through-roads (30-60 Km/h)
 - Pedestrian and cycle lanes
 - Park and car park illumination
 - Squares, industrial areas
- Current projects in: Austria, Germany, Italy, Hungary, Greece, Slovakia, Czech Republic, UAE, Liechtenstein

Example – Vienna

Project data:

Place: *Vienna*

Type: *ME4b*

Lamp: *HAWK EYE® 3.0 2M*

Replaces: Fluorescent bar *2x 58W*

Energy saving: ~ 48%



➤ **Same illumination values as previous installation**

Example - Budapest

Project data:

Place: *Budapest*

Type: *Through-road, LPH 12m*

Lamp: *HAWK EYE® 3.0 4M*
system power: 120Watt

Replaces: *NAV 169 Watt System*

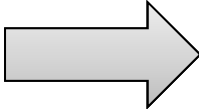
Energy saving: ~ 35%

- **Through-road in the city of Budapest.**
- **Conformity to EN 13201 standards.**



LED - Industrial beam lights

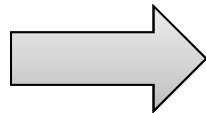


- Each module can be adjusted separately
- Shock resistance
- Short switching intervalls possible
- AC and DC input (e.g. for emergency case battery driven lighting in transformer stations)
- 7 times longer lifecycle
- main application area: front and object lighting (e.g. transformer stations, power plants)
- Reference: EVN (energy supplier) 
- Energy Saving: ~ 70 %




LED - Industrial light bar

- designed for an optimized light distribution in halls with a height of 8-12 meters
- reduce the necessity to replace the light sources to minimize interruptions of the work flow at floor level
- light guidance by lense technologies to concentrate entire available light on the work surfaces
- 7 times longer lifecycle
- main application area: maintenance and production halls and facilities
- Reference: Czech Railways
- Energy Saving: ~75 %
- Payback time:



LED – car park light

- designed for use in multi-storey and underground car parks
- light distribution with a beam angle of 120 degrees is optimized for this application area
- universal adapter for all common suspension systems
- Higher protection category IP65 and longer lifecycle
- Example: Vienna Parking Center 
- Energy Saving: ~70 %



Transport Applications

- Train front light
- Significant reduction of maintenance costs
 - Shock resistance
 - > 75.000 hours lifetime

- Energy saving:
 - Upper Beam: 75%
 - Lower Beam: 84%



MARKET



- **Lighting Market General Facts:**
 - **19% of the world-wide electricity consumption ascribed to lighting**
 - **20% of all LEDs are used in the outdoor lighting market**
 - **LED market growth in 2009: 15%**
 - **growth levels of 40-50% being expected for the years following economic downturn.**
 - **street lighting segment to become the second largest LED application (after backlights) by 2013**
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MARKET POTENTIAL



- **Market Potential LED based industrial lights**
 - **European Union: 50 Million street lights, 5% exchange rate every year: 2,35 Mio. replaced and/or newly installed**
 - **North America: 60 Million street lights...**
 - **Car Parks**
 - **Industrial areas**
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SALES - STRATEGY



- **Analisis Sales Process**
 - **Existing long term sales partnerships**
 - **complex projects (light planning, electrical engineering, architectural issues, regulations)**
 - **Conclusion: Channel Sales**
 - **Types of typical Partners**
 - **Energy Suppliers**
 - **Municipal Companies**
 - **Electrical engineering companies**
 - **Distributors**
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SALES – PARTNERS



Existing

- Central and Eastern Europe
 - Austria
 - Germany
 - Italy
 - Swizerland, Liechtenstein
 - Czech Republic
 - Slovakia
 - Croatia
 - Bosnia Herzegovina
 - Romania
- UK
- United Arab Emitates

in Development

- Europe
 - France
 - Netherlands
 - South Africa

Target Markets

- North America
 - Canada
 - USA
- Europe
 - Russia
 - Ukraine
 - Bulgaria

NEXT STEPS

- **Ongoing product development and enhancements**
 - **Further performance improvement**
 - **Controllability via data interface**
 - **UL certification in progress**
 - **Increase of serial production capacities**
 - **Creation of further distribution partnerships**
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LEDworx - Contacts



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Thank you for your attention !