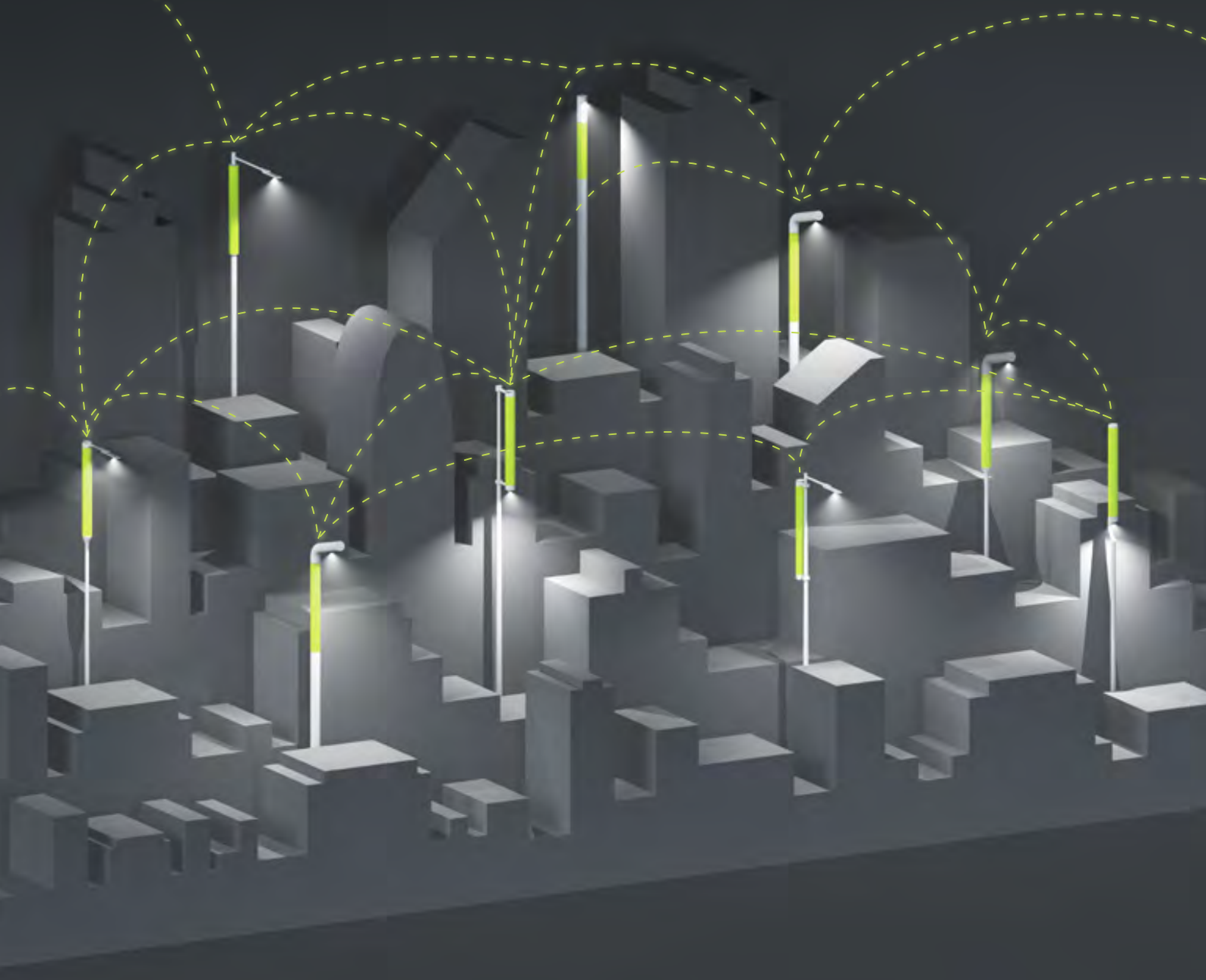
hei Smart & Solar
**Connecting the future.**

Solar
Solutions
Catalogue

EN

# 360 Degrees of Solar Independance



Street Lighting
Retrofit Lighting
Decorative Lighting
Info/advertising Boxes
Camera Poles
Smart City/IoT and Telecom Poles
Standard and Customized Solutions

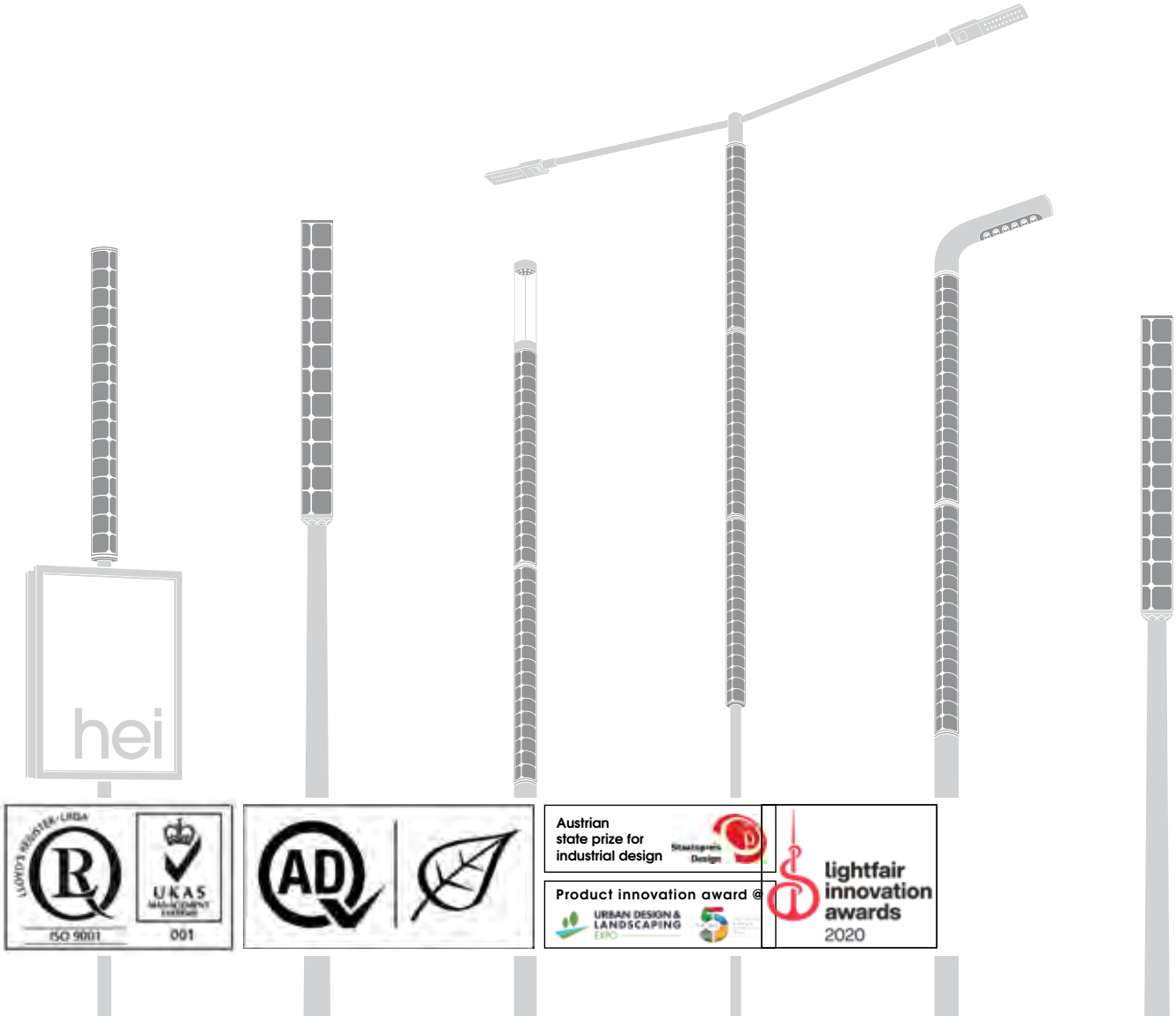
## Vertical Solar Masts

**Outdoor Lighting – Smart City / IoT – Telecom**

# Smart & Solar.
# **Connecting the future.**

**Solar Solutions Catalogue Ed. 1**

Publisher:
**HEI Technology International GmbH**
1140 Vienna / Austria, Ameisgasse 65
Tel.: +43 1 91 21 351-0
office@hei.at, www.hei.at



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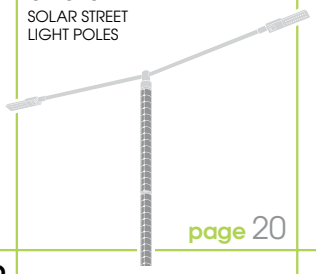
SOLAR STREET LIGHT POLES

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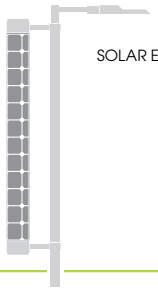
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hei

# **Smart & Solar.**
# Connecting the future.

**hei anatar**
solar light poles

Nad Al Sheba 3,
**Dubai, UAE**

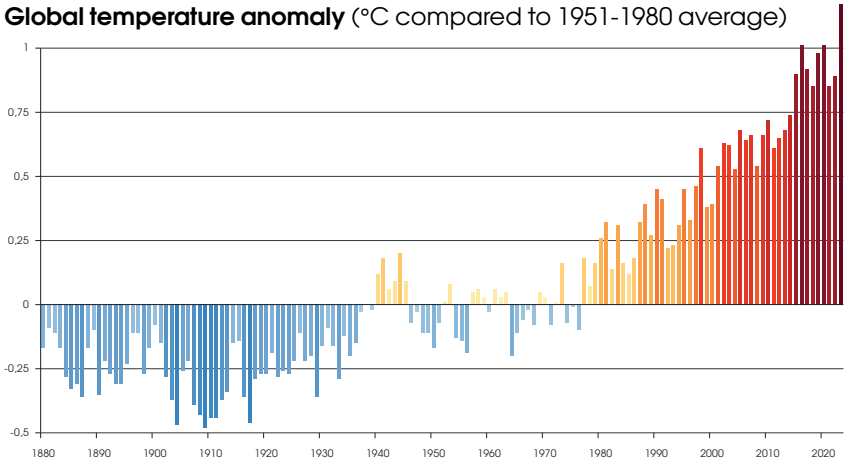
## **100% solar powered**
by **hei** power tube

# climate catastrophe

Last 10 years were the warmest on record.

## Temperature anomaly in 2023: 1,17 °C

**Global temperature anomaly** (°C compared to 1951-1980 average)




GISTEMP Team, 2024: GISS Surface Temperature Analysis (GISTEMP), version 4. NASA Goddard Institute for Space Studies. https://data.giss.nasa.gov/gistemp/

## Stop the madness!

There is clear scientific evidence that we are on a fast track into a global climate catastrophe. The year 2023 is confirmed to be the hottest in modern human history since global temperature data records begun and even much hotter years lie ahead of us.

UN Secretary-General António Guterres called on the world to "stop the madness" of climate change[1], underscoring the need to end the age of fossil fuel to protect mankind from climate change induced destruction.

–

[1] United Nation News, Oct. 30th, 2023
https://news.un.org/en/story/2023/10/1142987

**Sustainable outdoor lighting**

**Sustainable energy consulting**

2008 Vienna Future Prize
2008 Austrian State Prize Energy Technology
2006 Austrian State Prize Consulting
2006 R.I.O Award
2005 Energy Globe Austria

## 2001

Founder **Dr. Dieter Hornbachner** works on research projects for the European Space Agency

**hei power tube**

unprecedented approach to solar off-grid solutions

## 2008

**hei champ**
solar light poles

## 2009

Austrian State Prize

## 2010

Design Plus Award at light+building

## 2010

**hei mira**
solar light poles

## 2011

Best Austrian Young Enterprise - Eco-technologies

## 2011

**Bicycle pathway**
Doha, Qatar

## 2014

**hei champ** on display at Austrian Museum of Applied Arts - Contemporary Art

## 2014

**hei anatar**
solar light poles

# hei since 2001

## Two decades of climate-friendly product innovation

**Climate change is the biggest global threat for humanity and nature.** The good news is: "Stopping the madness" of climate change is feasible. We need to phase out coal, oil and gas. We need to switch to renewables in all sectors. The right sustainable technologies and green products are available.
**Time is of essence.** We need to act now and we need to act consequently. We can't delegate the transformation towards a climate neutral, sustainable energy systems to future generations. It's our responsibility to act here and now. **Let's do it!**

**hei**'s contribution: sustainable, climate-friendly product innovation since 2001!

**Welcome to hei!**
**Welcome to all-round solar solutions!**

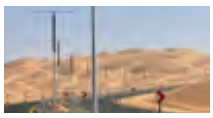
Dr. Dieter Hornbachner
Managing director and founder

**2016**
**Ghayathi highway**
Abu Dhabi, UAE

**2017**
**Al Bayt stadium**
Al Khor, Qatar

**2019**
**Nad Al Shiba 3**
Dubai, UAE

**2022**
**Tal Moreeb**
Abu Dhabi, UAE



**2018**
**Innovative Product Award**
at Urban Design & Landscaping Expo - The Big 5 Dubai

**2019**
**hei lukida**
solar light columns

**2024**
CONNECTING THE FUTURE
unique smart and solar solutions

**hei libertas**
solar energy tubes

**hei smart**
solar camera & IoT / smart city poles

**hei atlas**
solar info boxes

# Good reasons for a solar solution

## Become independent. Get resilient. Go off-grid.

It's time to go for solar. The **hei** self-sustaining vertical solar masts protect our climate and are a significant cost saver. The masts are **100 % solar powered** and don't need any electricity from the power grid. They save the costs of grid connection and grid infrastructure.

The **hei** vertical solar masts are environmental friendly and provide an important step towards resilient infrastructure. The **hei** solar solutions are the better choice. **The advantages are convincing:**

**Environmental Savings** | Sustainable, climate friendly, and resilient. **hei** vertical solar masts are fully solar powered. They thus don't cause any harmful $CO_2$ emissions for electricity production.

**hei** vertical solar masts save scare resources such as copper, as no expensive cables for grid-connection are required. No trenching also means less civil work, and less mineral construction materials.

**Cost Savings** | No electricity costs. No costs for cabling and grid connection. **hei** solar vertical masts save costs. They are quickly installed. You just need a simple foundation. That's it. No further civil work.

Trenching, low voltage (LV) cabling, substations and mid voltage (MV) transmission lines are obsolete. And for remote areas, off-grid is often the only way to bring light at affordable costs to public spaces.

**Time Savings** | You can't wait for time consuming and complex works like cabling and transmission line construction? Or to get a permission from your local power utility for grid-connection?

The **hei** vertical solar masts are a true time saver. They are installed quickly. Keep it simple and save time. No need to wait for months for permissions and grid-connection work/materials.

# Good reasons for the most advanced - hei

## The original masts. From the inventor. From **hei**.

Does quality, reliability and design matter? Then the **hei** vertical solar masts are a must! **hei** is the pioneer and inventor of vertically integrated solar masts. And thus has **the longest experience in designing vertically pole-integrated photovoltaics** in the world.

Back in 2008 **hei** introduced the first innovative vertical solar masts to the market. For more than 15 years **hei**, developed an outstanding and unique product portfolio of various products and types of solar masts. **Often copied, but never reaching the original quality**: the vertical solar masts from **hei**!

**Outstanding technology & product portfolio** | Over the years **hei** optimized all key components of **hei** vertical solar masts. The result: outstanding technology and a unique product portfolio regarding quality, efficiency and reliability.

All **hei** premium components are designed and also made in Europe. Only this guarantees the quality and reliability **hei** stands for.


see p. **10** - **hei technology**

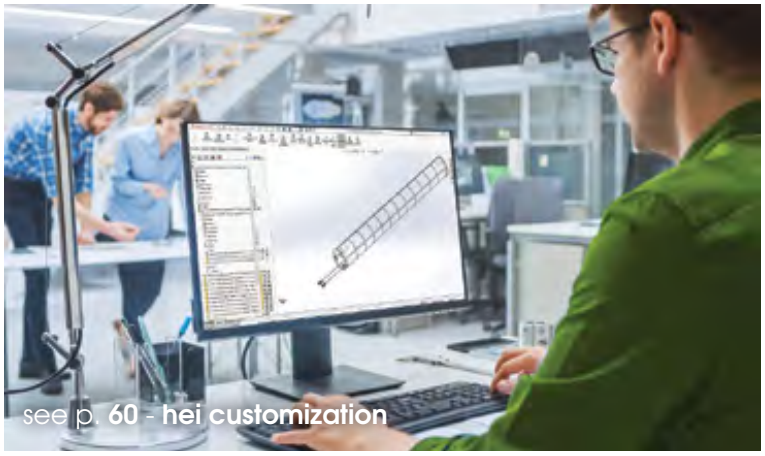
**Outstanding experience & reliability** | Your project deserves the best and most reliable products. Experience matters. Since 2008 **hei** accomplished projects successfully almost all over the world and in diverse climate zones.

From the hot deserts in the Middle East to the cold mountains in the European Alps. **hei** stands for excellent reliability in all climates.


see p. **50** - **hei references**

**World-class engineering & design services** | **hei** provides comprehensive and world-class engineering and design services for our clients. Lighting design, solar system design, remote control, connectivity, or customized pole design.

All services are provided for both standard as well as for customized solutions, such as the **tailor-made solar lighting poles for the FIFA football world** cup in Qatar 2022 (see p. 60).


see p. **60** - **hei customization**

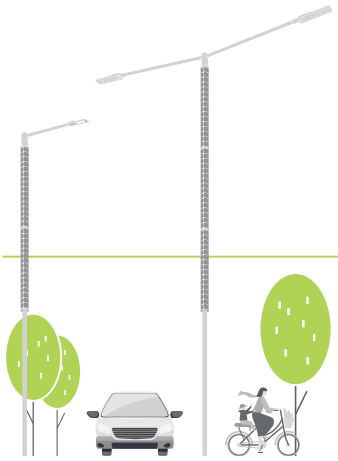
# hei vertical solar masts

## Outdoor lighting – smart City / IoT – telecom.

Dive into the extensive range of **hei**'s solar and smart solutions.
Dive into **hei**'s unique portfolio of vertical solar masts.

Our solutions are **a blend of innovation and versatility, designed to cater to diverse needs**; from the elegance and efficiency of street lighting to the high functionality required for smart city/IoT applications and telecom infrastructure.

Discover **hei**'s all-round solar solutions with it's unique features, standard as well as customized options; solar solutions which go beyond illumination, **shaping the future of sustainable urban and rural landscapes**.

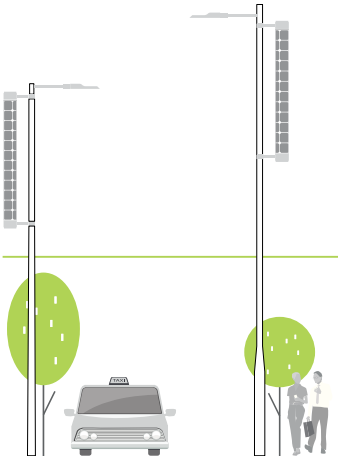


p. **20**

### Solar street lighting

**Off-grid street lighting solutions with hei solar light poles anatar.**

Various pole heights and lighting outputs. For illumination of pedestrian pathways, bicycle tracks, parking sites or main roads. The anatar solar light pole family provides the right solution for all outdoor lighting applications.

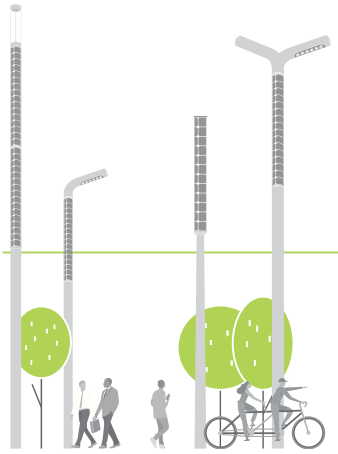


p. **26**

### Solar retrofit lighting

**Change to solar with hei solar retrofit solution libertas.**

Old street lights with faulty power cables? Upgrade the old poles to premium solar poles. Forget faulty cables, avoid costly civil work, go for a future-proof solar solution.

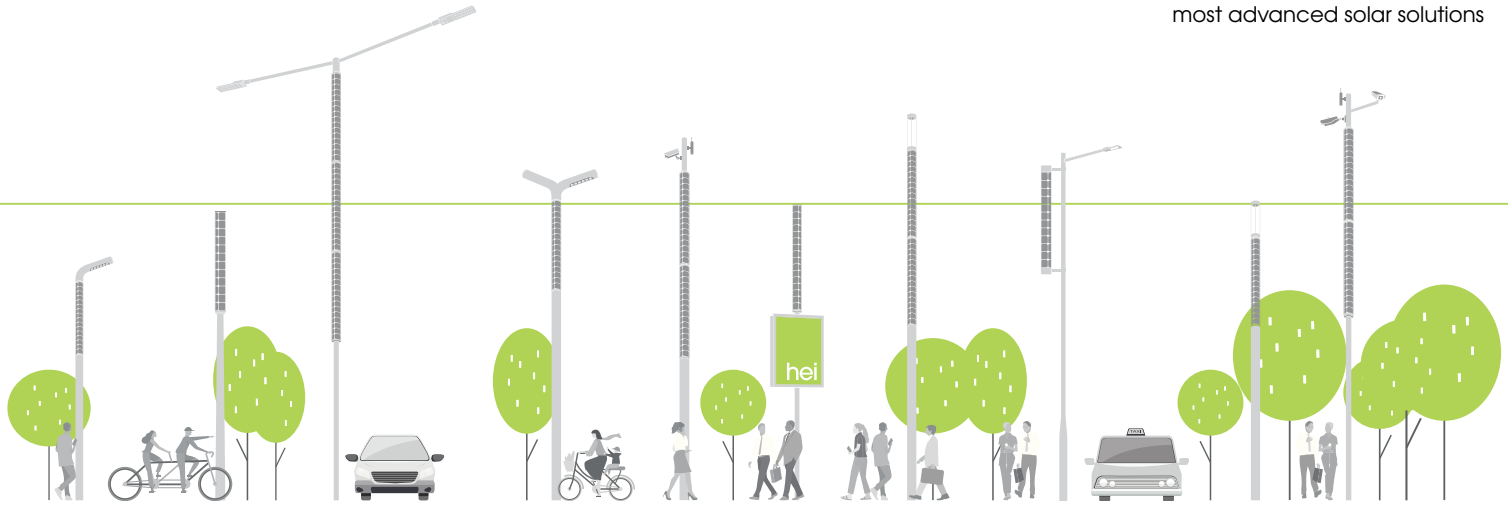


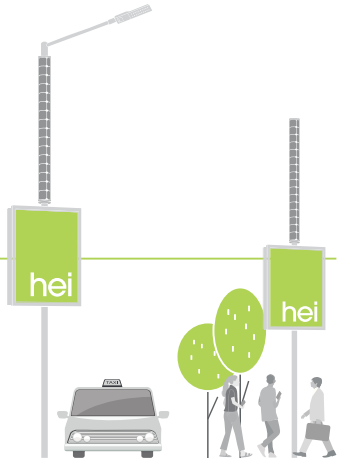
p. **30** p. **32** p. **38**

### Solar decorative lighting

**Environmental protection and beautification in one sweep.**

Climate protection from its most beautiful side: Avoid ugly solar lights with flat PV panels. Your streets deserve the most aesthetical solution. Illuminate your streets with **hei**'s decorative solar light poles: champ, mira, or lukida.

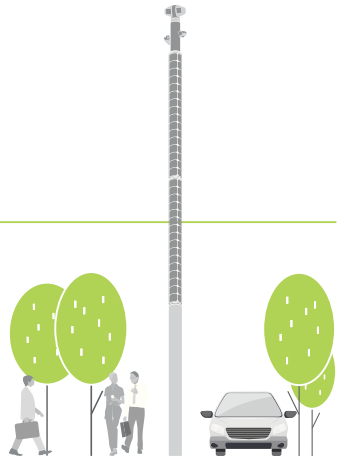



## p. 44 Solar info & advertising boxes

**hei solar info boxes atlas with full solar power supply.**

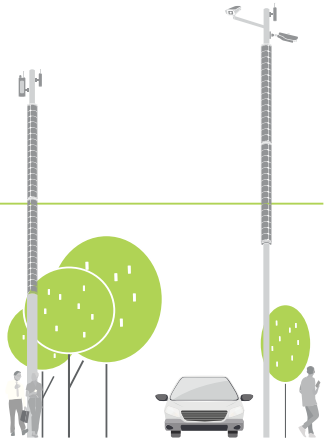
Available as stand-alone info box or in combination with **hei** solar street lights. Quick and cheap installation. No grid connection. For maximum flexibility and profitability.



## p. 46 Solar camera poles

**Maximum security for sensitive areas and critical infrastructure.**

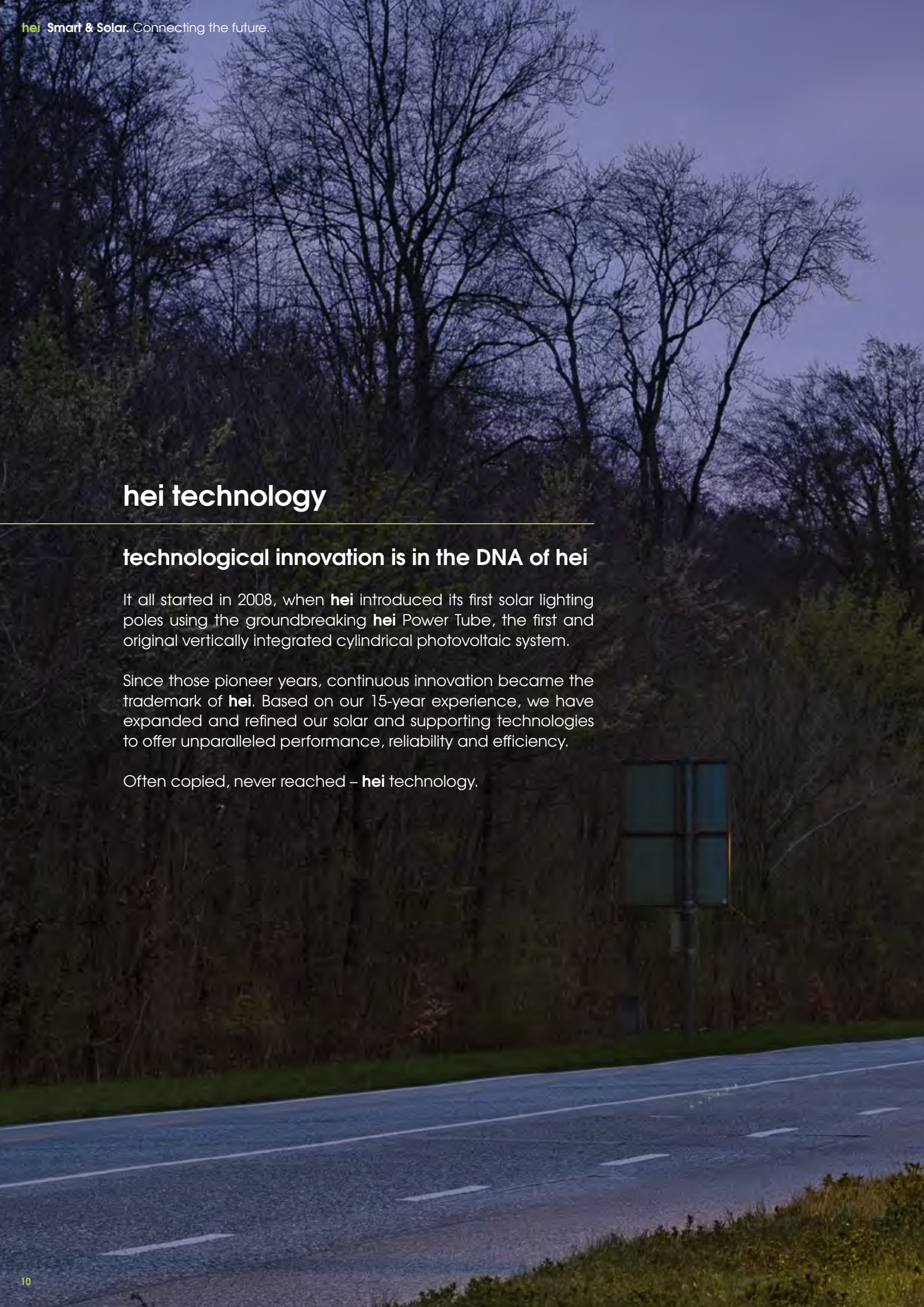
Solar powered camera poles for power grid-independent security solutions even in remote areas. Surveillance of public or private areas. Traffic or border observation. Monitoring of internal flows. Quick and easy installation. Resilient solar power supply without power grid.



## p. 46 Solar smart city / IoT and telecom solutions

**Quick and easy roll-out of infrastructure without power grid limitations.**

Solar powered poles with data connection for various applications. Environmental sensors. Sensors for intelligent infrastructure. Wi-Fi hot spots for internet coverage. Solar powered telecom infrastructure and mobile base stations with full or hybrid solar power supply.



# hei technology

## technological innovation is in the DNA of hei

It all started in 2008, when **hei** introduced its first solar lighting poles using the groundbreaking **hei** Power Tube, the first and original vertically integrated cylindrical photovoltaic system.

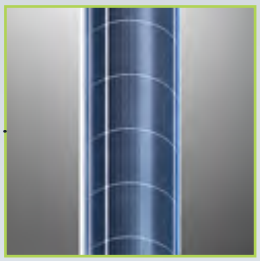
Since those pioneer years, continuous innovation became the trademark of **hei**. Based on our 15-year experience, we have expanded and refined our solar and supporting technologies to offer unparalleled performance, reliability and efficiency.

Often copied, never reached – **hei** technology.

# **technology**
## of **hei** vertical solar masts.

**High-efficiency LED luminaires**

**hei Power Tube**
High efficiency and maintenance-free photovoltaic module

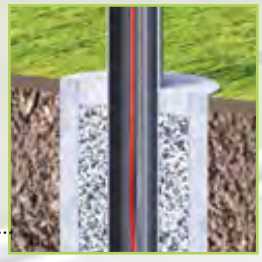


**hei Smart Control electronics**

**Maintenance door**

**Battery in pole**
Position option 2

**Sleeve foundation**
Installation option 2

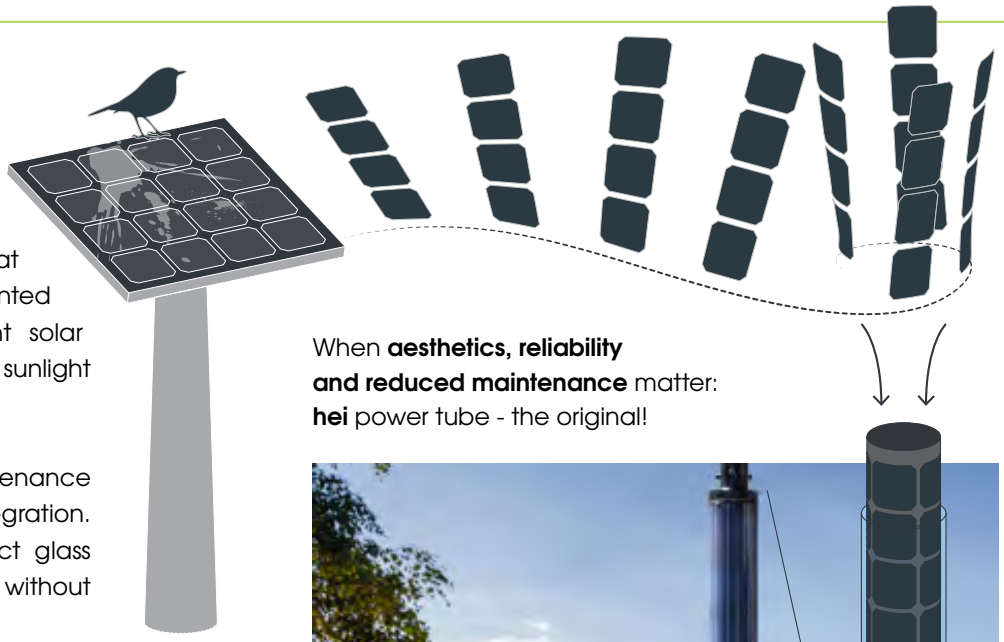


**Battery in earth pit**
Position option 1

# hei power tube

## Cylindrical photovoltaic modules for pole-integration.

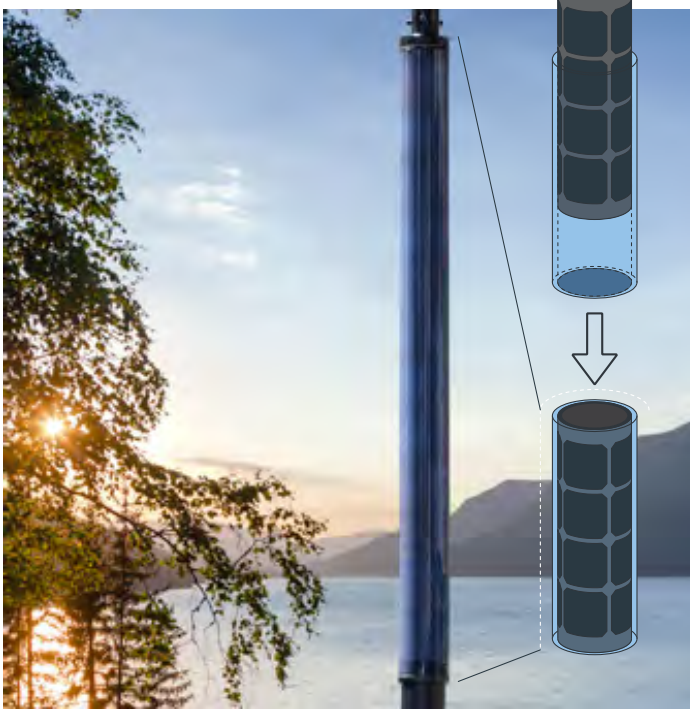
**Go for beauty.**
**Take the tube.**



**hei** vertical solar masts with aesthetic, cylindrically shaped **hei** power tubes instead of traditional flat PV panels. **hei** invented and patented This unique technology. Excellent solar yield due to omnidirectional 360° sunlight collection.

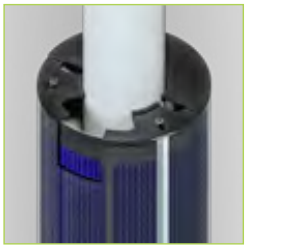
Reduced soiling and low maintenance requirement due to vertical integration. Incredibly reliable due to perfect glass tube encapsulation of solar cells without open photovoltaic module edges.

When **aesthetics, reliability and reduced maintenance** matter: **hei** power tube - the original!



- **Designed and made in Austria.** Quality manufacturing for a long lifetime.
- **High-efficiency silicon solar cells.** Silicon cells ensure maximum energy, minimum size.
- **Borosilicate glass tube.** Fully sealed solar cells, without naked edges, for harsh climates.
- **Backsheet colors.** Customizable backsheet color options for modules.
- **Less maintenance.** Low dirt or snow accumulation - low maintenance costs.
- **Plug & play technology.** Easy, quick plug & play installation.

**hei** power tube



pseudo tube

**Real hei power tube** or **pseudo tube?**

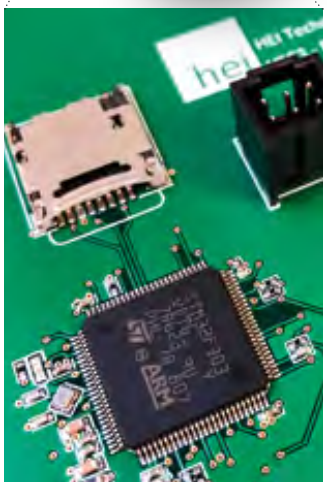
Most copycats of the **hei** power tubes are unreliable, bulky "pseudo tubes" made out of photovoltaic strips fixed by an aluminium cage.

The advantages of **hei** power tubes compared to pseudo tubes speak for themselves:

- **Higher reliability.** Perfect cell encapsulation. No internal cabling.
- **Higher efficiency.** No loss of active PV surface due to bulky aluminium cage.
- **Elegant, slim appearance.** No ugly cage.
- **Easy maintenance.** No obstruction of cleaning due to cage.
- **Environmentally friendly.** Without an aluminium cage, **hei** power tubes reduce their envronmental footprint.

# hei smart control electronics

## The hard and the brain of **hei** vertical solar masts.



Uncompromised quality designed and made in Europe. **hei** manufactures its own control electronics to maximize the performance of its vertical solar masts.

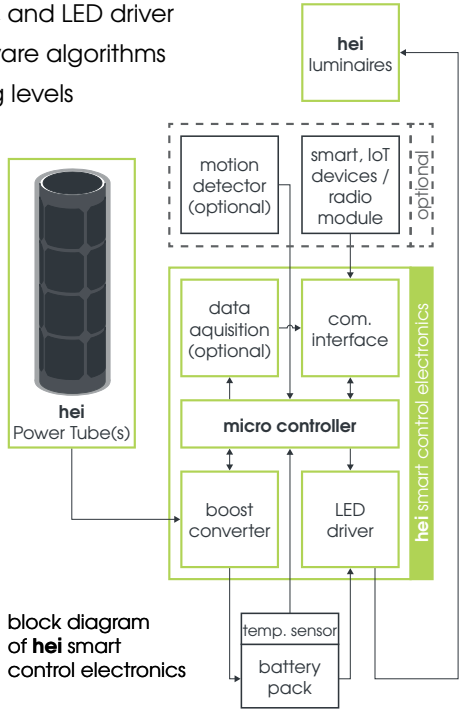
High-quality components along with long-term design experience and field testing guarantee outstanding excellent reliability and performance of **hei**'s vertical solar masts.

**hei** smart control electronics provides a unique combination of features:

- Integrated MPP tracker, battery charger, and LED driver
- Self-learning energy management software algorithms
- Self-adaptive control of lighting dimming levels
- IoT and remote control interfaces
- Thermal battery management
- Ultra-fast MPP tracking

**hei** smart control electronics manages the energy flow in the solar pole and keeps the self-sustaining system in an energy balance.

Hardware controlled by a microcontroller and advanced software algorithms guarantee paramount efficiency and system performance.




block diagram of **hei** smart control electronics

| Feature | **hei** Smart Control Electronics | Typical standard electronics |
|---|---|---|
| Designed, Made | Austria, Europe | |
| High-grade hardware components | ✓ | X |
| Smart, self-learning energy management software algorithms | ✓ | X |
| Control of light dimming levels | Self-adaptive | Basic for all seasons |
| "Don't turn-off" security lighting | ✓ | X |
| Works with different battery chemistries | ✓ | ✓ |
| Battery thermal management for extended lifetime | ✓ | X |
| MPP tracking for maximized solar yield | Ultra-fast | Basic |
| High solar efficiency even at cloudy weather conditions | ✓ | X |
| Highly efficient built-in LED driver | ✓ | X |
| Motion sensor interface ready for PIR and microwave sensors | ✓ | X |
| Radio module interface | ✓ | X |
| IoT ready | ✓ | X |
| Easy to integrate with LCS/CMS | ✓ | X |
| Plug & play connectors | ✓ | X |
| SD card data logger 10+ years | ✓ | X |
| User friendly configuration tool | ✓ | X |

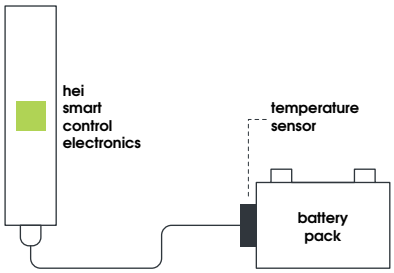
# hei battery technology

## **hei** battery lab for testing and quality control.

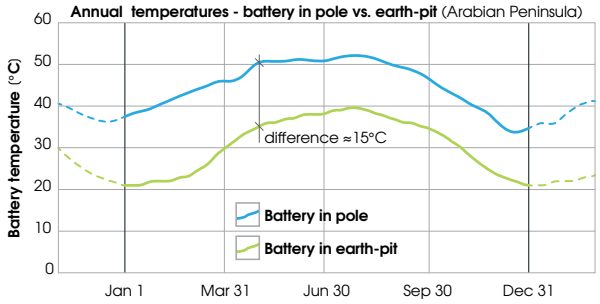
**hei**'s long-term experience makes a significant difference: **hei** battery selection, extensive testing, proper installation, and tender **hei** battery management by advanced **hei** smart control electronics are key for a reliable solar pole with long battery lifetime and low maintenance costs.

**No single-source** | Designed for standard 12 or 24V LFP batteries, **hei** vertical solar masts avoid proprietary types, ensuring ease and cost-efficiency in sourcing and maintenance. Alternatives like VRLA, SIB (sodium), LTO batteries are available upon request.

**Battery lab** | **hei** operates its own battery lab for stringent quality checks, testing and cycling batteries extensively to ensure longevity. Service for project partners includes battery lifetime assessments, even for self-sourced batteries.

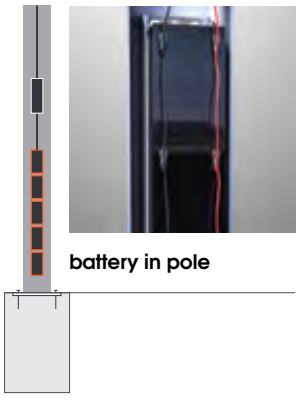


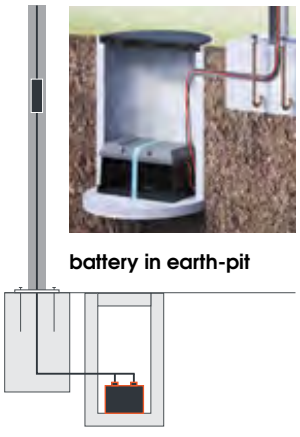

**hei battery thermal management (BTM)** | **hei**'s smart control electronics continuously monitor battery temperature, optimizing charging cycles, charging levels, and preventing overheating and deep discharge. **hei**'s careful management extends battery life and reduces maintenance costs.




**Seasonal temperature comparison** (Arabian peninsula) | Earth-pit installation keeps battery temperature below 40°C, up to 15°C cooler than the pole installation, significantly enhancing battery life. Earth pits are more effective in protecting batteries from extreme cold, as well.

**hei** premium selected | Quality LFP batteries offer a broad operating temperature range and a lifetime of typically 5 to 7 years. For optimal lifespan, pole installation is recommended in moderate climates, and earth-pit installation in very hot or very cold climates.

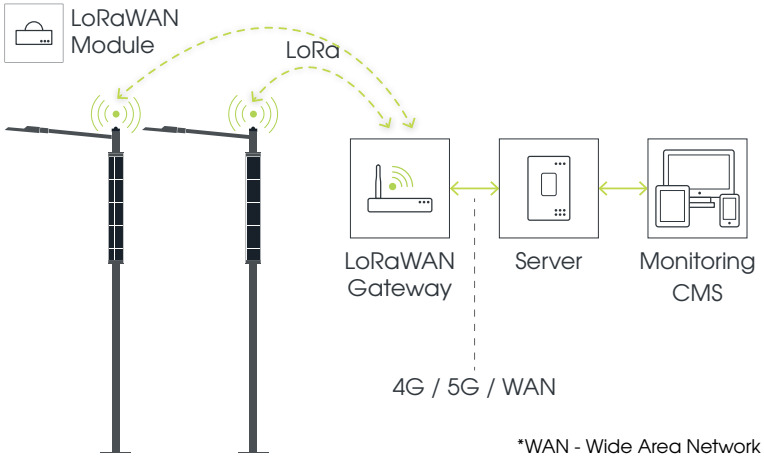


# hei wireless remote control
## Get connected.

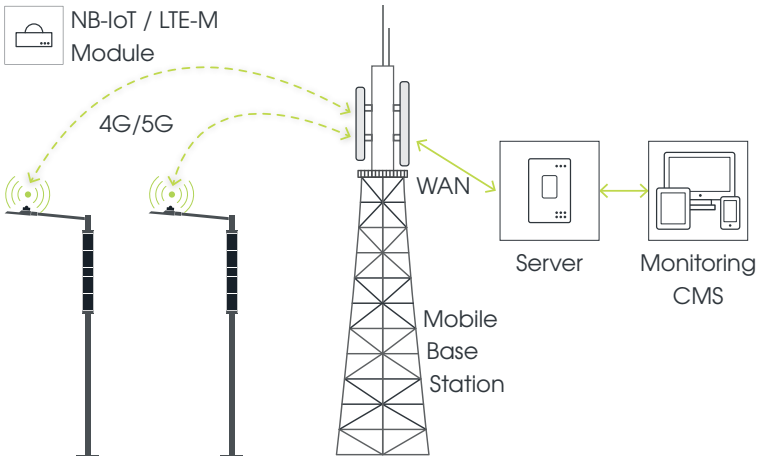
**hei** wireless remote control provides data transmission from sensors, communication between neighboring poles, as well as remote monitoring, maintenance and control of **hei** vertical solar masts.

Equipped with Zhaga or NEMA interface, **hei** vertical solar masts are a future-proof solution. Masts can be connected via gateways (TALQ optionally) to various central management systems (CMS).



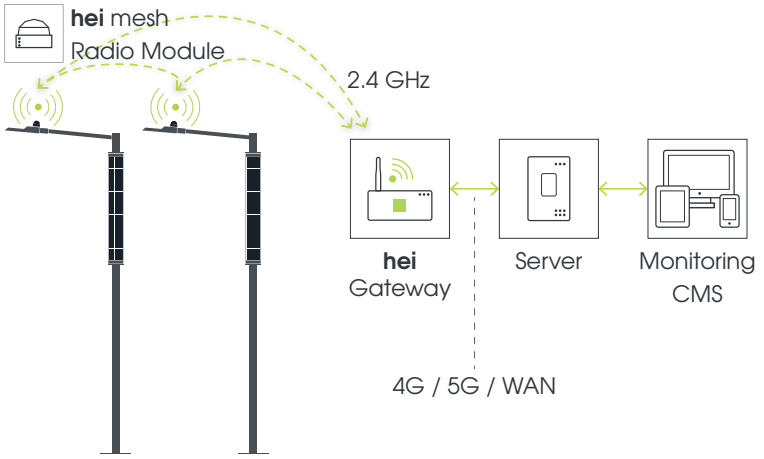

**LoRaWAN** | LoRaWAN wireless control offers long-range remote management of solar masts. It provides connectivity for remote solar masts without mobile communication coverage up to 2 to 5 km distance from the LoRaWAN gateway. It enables monitoring and maintenance while using low powerc and allows easy network expansion.

Not recommend for real-time applications and/ or locations with proper mobile communication coverage.




**NB-IoT / LTE-M** | For sites with proper mobile communication coverage. NB-IoT and LTE-M technologies provide reliable connectivity, energy efficiency, robust security, scalability, and remote management features. No installation of gateways required.

Factors like data rates, latency, initial investment, and regulatory compliance are crucial considerations for successful implementation.




**hei mesh network** | The **hei** mesh network guarantees reliable connectivity. The flexible self-configuring mesh architecture adapts to diverse configurations, supporting large-scale deployment, and seamless scalability. The **hei** mesh network supports direct and fast communication between poles thanks to a 2.4 GHz RF link. This can be used for **hei** light cloud solutions, for example.

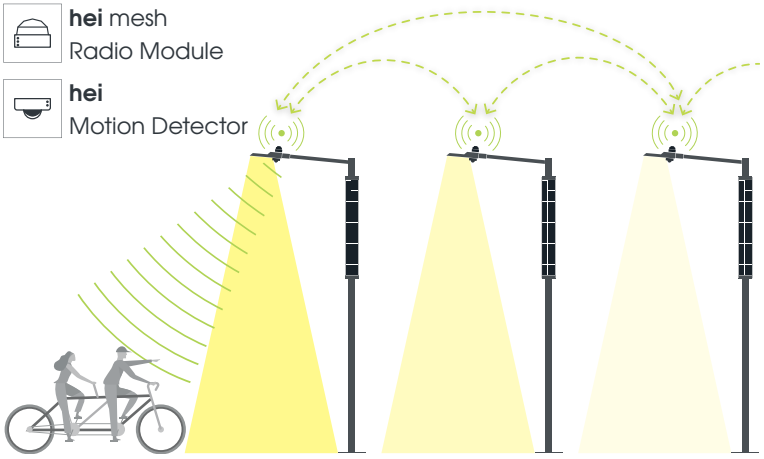
Gateway with data connection (4G/5G/WAN) to server required. No mobile coverage of solar poles needed.

# hei light cloud
## Connect & Detect.

Dimming without performance loss. The **hei** Light Cloud is a real-time detection and communication system between **hei** solar light poles. It helps to save energy and to reduce light pollution by dimming (or turning off) the solar poles.

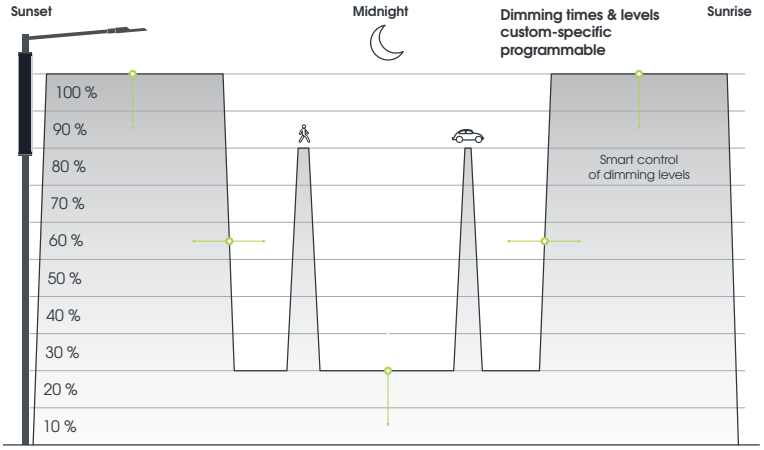
**hei Light Cloud** | Once a moving object like bicycle or a pedestrian has been detected, a defined number of solar light poles will be turned on for a defined period of time till the object has passed the solar light poles.

Advantages: Energy saving without performance loss. Proper illumination of the street ahead. Minimizing light pollution.




**Dimming profiles & object detection** | Each **hei** solar light pole is a self-sustaining, self-controlled system capable of adjusting lighting levels automatically in response to available solar yield. With programmable individual lighting levels and times, offering a broad spectrum of flexibility.

When combined with **hei Light Cloud,** pole dimming profiles are synchronized to ensure a smooth and pleasant operation.




**Detection** | For motion detection and light control via **hei** Light Cloud, communication between the poles is done by **hei** radio modules as part of the **hei** mesh network.

**hei** provides various motion detector types such as infrared, PIR or radar for demand controlled illumination of streets.

# hei solar lighting kits and poles

- Solar street lighting poles - anatar
- Add-on solar energy tubes - libertas
- Solar decorative light poles - champ and mira
- Solar decorative light columns - lukida
- Solar info boxes - atlas


hei
Outdoor solar lighting.
Smart city & IoT.
Telecom.

# anatar
## Solar street light poles

**Outstanding performance at minimum costs.** The **hei anatar** family consists of 10 different versions of self-sustaining and maintenance-free solar light poles, covering almost all kind of outdoor lighting applications such as pathways, secondary roads and highways. anatar is available as a single and double arm light pole with pole heights ranging from 4 m up to 14 m.

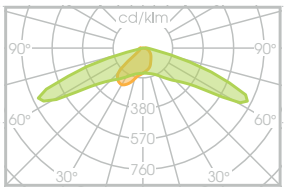
| | |
|---|---|
| Light source | **6 - 2x 20 high eff. LED units** |
| SOP Solar operating power | **20 - 2x 80 Watt** |
| Max. luminous flux @ SOP | **3,350 - 2x 13,050 lm** |
| Pole height | **4.0 - 14.0 m** |
| Luminaire height | **4.1 - 14.1 m** |


## GLOBAL WARMING MITIGATION - ENERGY AND $CO_2$ SAVINGS

Electrical energy consumption from grid and $CO_2$ emissions of one light pole per 30 years:

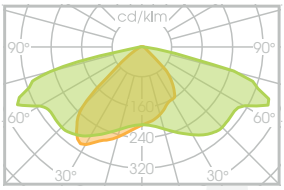
| | |
|---|---|
| **hei anatar** off-grid solar light poles | **0 kWh / 0.0 tons $CO_2$** |
| Standard cabled LED | **3,700 kWh / 1.9 tons $CO_2$ - 14,700 kWh / 7.4 tons $CO_2$** |
| HPS light (100W - 400W) | **13,100 kWh / 6.6 tons $CO_2$ - 52,600 kWh / 26.3 tons $CO_2$** |

Specific $CO_2$ emissions: 0.5 kg per kWh




**anatar 4000 - Lens C70**
Other lens types available

C90-C270 C0-C180




**anatar 8000 & 16000 - Lens C80**
Other lens types available

C90-C270 C0-C180

### anatar 4000
P100 - 160

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,350 lm** |
| Pole height | **4.0 / 5.0 / 6.0 m** |
| Luminaire height | **4.1 / 5.1 / 6.1 m** |

### anatar 4000
P200 - 215

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,350 lm** |
| Pole height | **5.0 / 6.0 / 8.0 m** |
| Luminaire height | **5.1 / 6.1 / 8.1 m** |

### anatar 4000 twin
P200 - 215

| | |
|---|---|
| Light source | **2x 6 high eff. LED units** |
| SOP Solar Operating Power | **2x 20 W** |
| Max. luminous flux @ SOP | **2x 3,350 lm** |
| Pole height | **5.0 / 6.0 / 8.0 m** |
| Luminaire height | **5.1 / 6.1 / 8.1 m** |


## anatar 8000
P200 - 215

| | |
|---|---|
| Light source | **10 high eff. LED units** |
| SOP Solar Operating Power | **40 W** |
| Max. luminous flux @ SOP | **6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **8.1 / 10.1 / 12.1 m** |

## anatar 8000 twin
P400 - 215

| | |
|---|---|
| Light source | **2x 10 high eff. LED units** |
| SOP Solar Operating Power | **2x 40 W** |
| Max. luminous flux @ SOP | **2x 6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **8.1 / 10.1 / 12.1 m** |

## anatar 8000
P400 - 215

| | |
|---|---|
| Light source | **10 high eff. LED units** |
| SOP Solar Operating Power | **40 W** |
| Max. luminous flux @ SOP | **6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **8.1 / 10.1 / 12.1 m** |

## anatar 8000 twin
P800 - 215

| | |
|---|---|
| Light source | **2x 10 high eff. LED units** |
| SOP Solar Operating Power | **2x 40 W** |
| Max. luminous flux @ SOP | **2x 6,700 lm** |
| Pole height | **10.0 / 12.0 m** |
| Luminaire height | **10.1 / 12.1 m** |


## anatar 16000
P400 - 215

| | |
|---|---|
| Light source | **20 high eff. LED units** |
| SOP Solar Operating Power | **80 W** |
| Max. luminous flux @ SOP | **13,050 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **10.1 / 12.1 / 14.1 m** |

## anatar 16000
P800 - 215

| | |
|---|---|
| Light source | **20 high eff. LED units** |
| SOP Solar Operating Power | **80 W** |
| Max. luminous flux @ SOP | **13,050 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **10.1 / 12.1 / 14.1 m** |

## anatar 16000 twin
P800 - 215

| | |
|---|---|
| Light source | **2x 20 high eff. LED units** |
| SOP Solar Operating Power | **2x 80 W** |
| Max. luminous flux @ SOP | **2x 13,050 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **10.1 / 12.1 / 14.1 m** |

# libertas

## Add-on solar energy tubes for retrofit solutions

NEW PRODUCT

All **hei libertas** add-on solar energy tubes share a common technology of vertical cylindrical photovoltaics, which house batteries and smart control electronics to provide energy to the luminaire for the whole night. The entire system is simply attached to a pole with a fixation mechanism, that can adapt to the majority of standard pole geometries, diameters and heights.

The modularity of the system and its compatibility with highly efficient **hei** anatar luminaires ensure that **hei libertas** can bring sustainability and reliability to almost any existing or new lighting installation.

| | |
|---|---|
| Technology | **Silicon solar cells** |
| Nominal power of PV cells | **238 Watt peak** |

lightfair innovation awards 2020

Area and Outdooor lighting

**Lens C80**
Other lens types available




C90-C270 C0-C180

**+ anatar 8000**
LUMINAIRE

mounting clamp
simple installation, fits most poles

**hei** smart control electronics

LFP batteries
long life

**hei** power tube
cylindrical photovoltaics

**libertas** P200 - 215

**libertas** P400 - 215

## GLOBAL WARMING MITIGATION - ENERGY AND $CO_2$ SAVINGS

Electrical energy consumption from grid and $CO_2$ emissions of one light pole per 30 years:

| | |
|---|---|
| **hei libertas** add-on solar energy tubes | **0 kWh / 0.0 tons $CO_2$** |
| Standard cabled LED | **6,400 kWh / 3.2 tons $CO_2$** |
| HPS light (250W) | **32,900 kWh / 16.5 tons $CO_2$** |

Specific $CO_2$ emissions: 0.5 kg per kWh

# Solar retrofit of (old) street light poles

## Change your light poles from grid power supply to full solar.

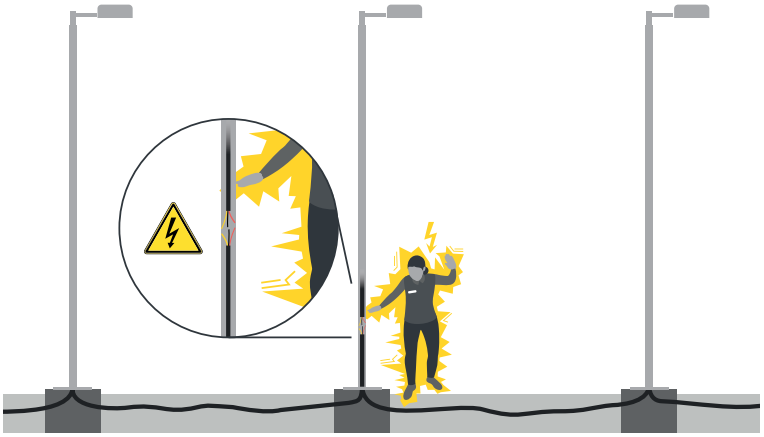
The **hei** solar retrofit of already existing street light poles is a cost saver and provides a fast track option towards a resilient and environmental-friendly infrastructure. The **hei** retrofit solution impresses with its simplicity: just install **hei** libertas solar energy tubes on the old street light poles and exchange the old luminaire by the highly-efficient LED luminaire **hei** anatar. Done.

Two simple steps. Easy & fast. The old street light pole becomes a fully solar-powered, future-proof, modern lighting solution within minutes. No electricity grid and cables required anymore. No costly trenching for cable exchange. No street closures because of construction sites.

**hei** libertas - a true win-win-win solution:
Environmental saving. Cost saving. Time saving.

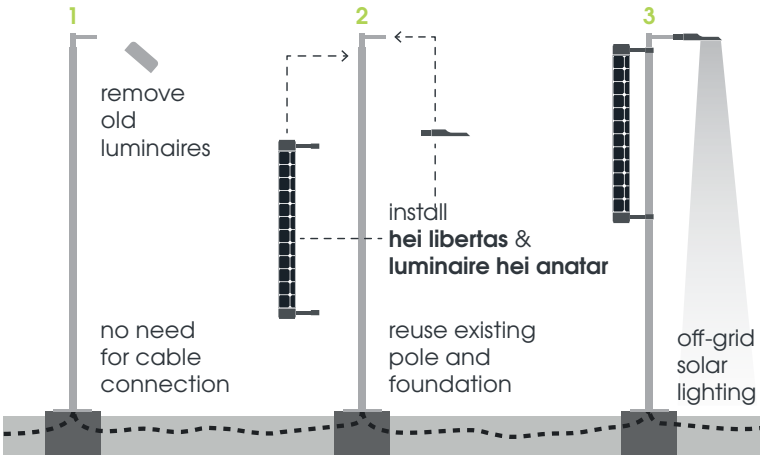
**The problem** | Earth cables are aging and get faulty a couple of decades in the ground. Exchanging them is expensive, as it requires civil work and resurfacing of the street.

Sometimes cables can be stolen by copper thieves. Electricity from the grid often causes $CO_2$ and other emissions at the power stations. Grids may fail and cause black-outs.



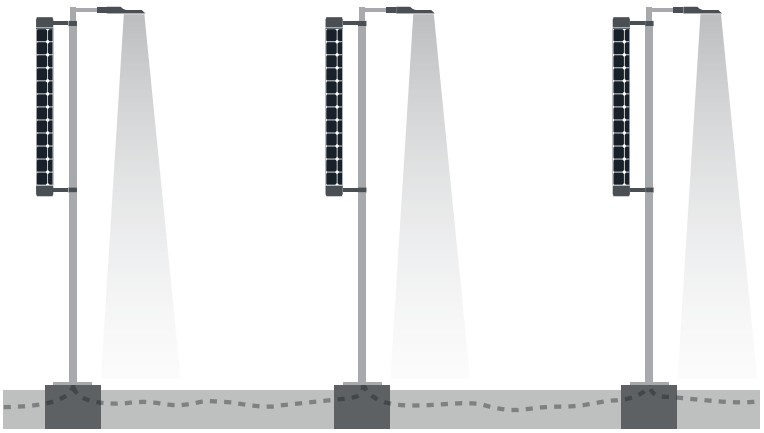
**The solution** | Changing of the power supply of existing light poles from power grid to solar with the **hei** solar retrofit solution libertas. Simple and quick installation on an existing street light poles.

Reuseing of existing poles and foundations. No grid cabling required anymore. And copper thieves will despair.




**The hei way** | The old, faulty cable can stay and continue rotting in the ground. No cable exchange required. No trenching. No resurfacing of streets. No congestions because of construction sites.

Save costs, time and nerves by changing to solar. Nice side effects: resilient and environmental friendly infrastructure.

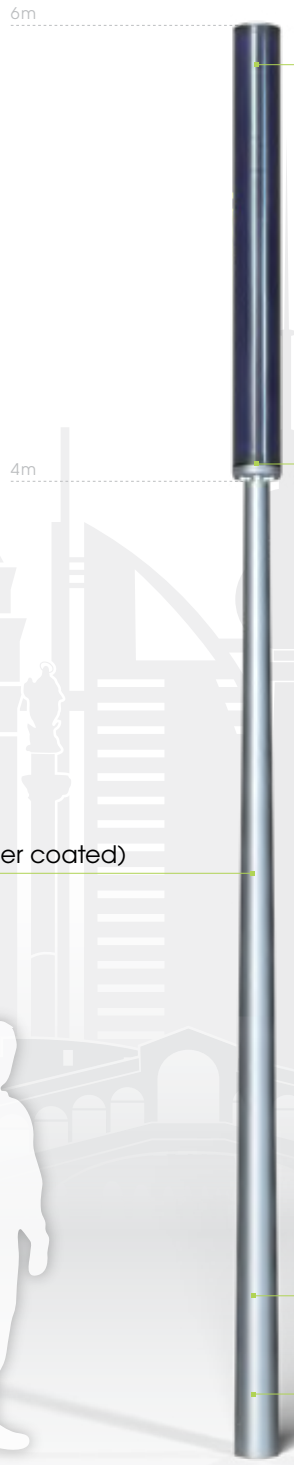


# champ
## Solar decorative light poles

**hei champ**, **our pioneer** of integrated outdoor solar lights with outstanding design. A decorative, award-winning solar light pole for professional architectural outdoor lighting applications such as squares, promenades and boulevards. **100 percent self-sustaining.** First solar light pole worldwide with integrated cylindrical photovoltaic element.

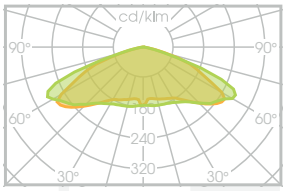
**Winner of the Austrian state award for excellent industrial design.**

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar operating power | **24 Watt** |
| Max. luminous flux @ SOP | **3,800 lm** |
| Pole height | **6.05 m** |
| Luminaire height | **4.0 m** |



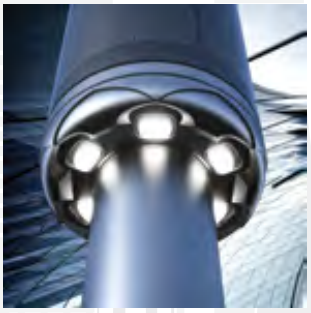

**hei** power tube

**champ 4000 - Lens C45**
Other lens types available




C90-C270 C0-C180

luminaire (circular light distribution)



**champ 4000**
P200 - 215

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| Solar Operating power | **24 W** |
| Max. luminous flux @ SOP | **3,800 lm** |
| Pole height | **6.05 m** |
| Luminaire height | **4.00 m** |
| | **8** |

various pole finishes (painted or powder coated)

conical steel pole (hot-dip galvanized)

battery inside pole (optional)

*earth-pit installation for very hot and very cold climates recommended*

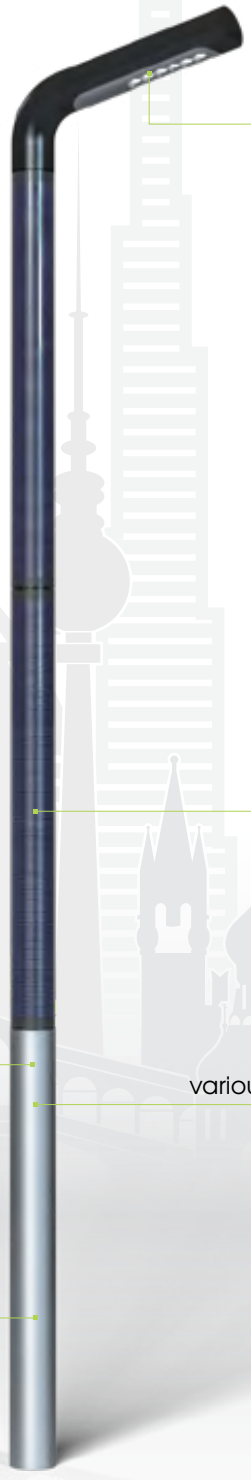
**Austrian state prize for industrial design**

# mira
## Solar decorative light poles

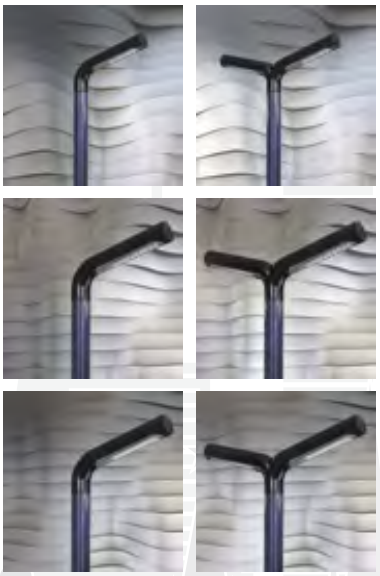
**hei mira** is a family of **decorative, self-sustaining and maintenance-free** solar light poles for outdoor lighting applications such as residential streets, bicycle tracks or parking sites.

**Award-winning, protected design.** Full solar power supply, no grid-connection required. **mira** solar light poles are available in various heights and luminaire wattages.

| | |
|---|---|
| Light source | **6-2x 20 high eff. LED units** |
| SOP Solar operating power | **20 - 2x 80 Watt** |
| Max. luminous flux @ SOP | **3,300 - 2x 13,200 lm** |
| Pole height | **4.0 - 14.0 m** |
| Luminaire height | **3.8 - 13.7 m** |



luminaire (lengthwise light distribution)



**hei** power tube

steel pole (hot-dip galvanized)

various pole finishes (painted or powder coated)

battery inside pole (optional)

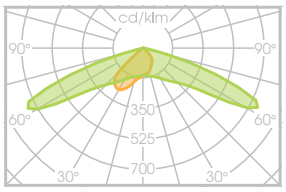
*earth-pit installation for very hot and very cold climates recommended*

## GLOBAL WARMING MITIGATION - ENERGY AND $CO_2$ SAVINGS

Electrical energy consumption from grid and $CO_2$ emissions of one light pole per 30 years:

| | |
|---|---|
| **hei mira** off-grid solar light poles | **0 kWh / 0.0 tons $CO_2$** |
| Standard cabled LED | **3,700 kWh / 1.9 tons $CO_2$ - 14,700 kWh / 7.4 tons $CO_2$** |
| HPS light (100W - 400W) | **13,100 kWh / 6.6 tons $CO_2$ - 52,600 kWh / 26.3 tons $CO_2$** |

Specific $CO_2$ emissions: 0.5 kg per kWh




**Lens C70**
Other lens types available

C90-C270 C0-C180

### mira 4000
P100 - 160

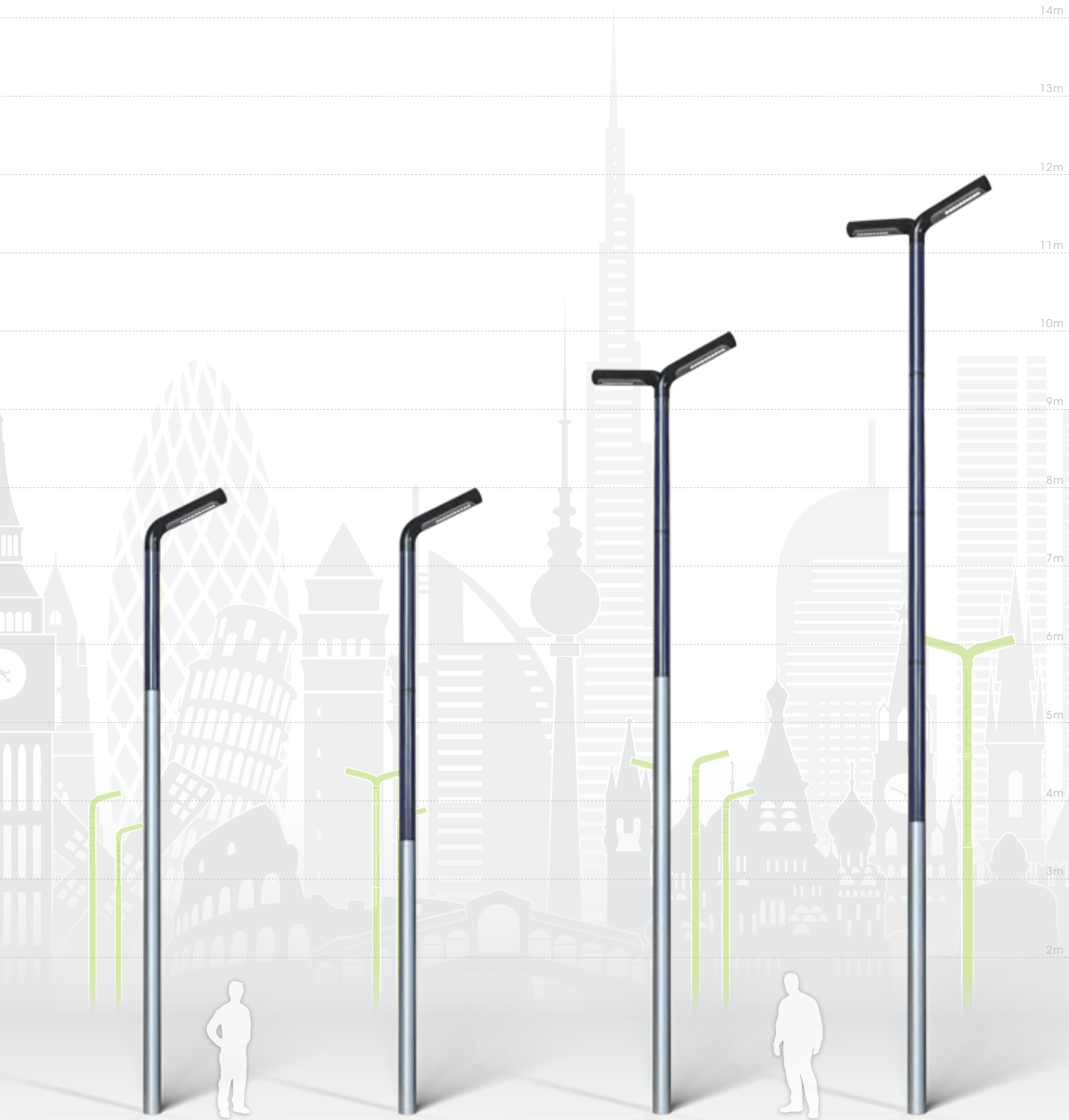
| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,300 lm** |
| Pole height | **4.0 / 5.0 / 6.0 m** |
| Luminaire height | **3.8 / 4.8 / 5.8 m** |

### mira 4000
P200 - 160

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,300 lm** |
| Pole height | **5.0 / 6.0 / 8.0 m** |
| Luminaire height | **4.8 / 5.8 / 7.8 m** |

### mira 4000 twin
P200 - 160

| | |
|---|---|
| Light source | **2x 6 high eff. LED units** |
| SOP Solar Operating Power | **2x 20 W** |
| Max. luminous flux @ SOP | **2x 3,300 lm** |
| Pole height | **5.0 / 6.0 / 8.0 m** |
| Luminaire height | **4.8 / 5.8 / 7.8 m** |




**mira 8000**
P200 - 215

| | |
|---|---|
| Light source | **10 high eff. LED units** |
| SOP Solar Operating Power | **40 W** |
| Max. luminous flux @ SOP | **6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **7.7 / 9.7 / 11.7 m** |

**mira 8000**
P400 - 215

| | |
|---|---|
| Light source | **10 high eff. LED units** |
| SOP Solar Operating Power | **40 W** |
| Max. luminous flux @ SOP | **6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **7.7 / 9.7 / 11.7 m** |

**mira 8000 twin**
P400 - 215

| | |
|---|---|
| Light source | **2x 10 high eff. LED units** |
| SOP Solar Operating Power | **2x 40 W** |
| Max. luminous flux @ SOP | **2x 6,700 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **7.7 / 9.7 / 11.7 m** |

**mira 8000 twin**
P800 - 215

| | |
|---|---|
| Light source | **2x 10 high eff. LED units** |
| SOP Solar Operating Power | **2x 40 W** |
| Max. luminous flux @ SOP | **2x 6,700 lm** |
| Pole height | **10.0 / 12.0 m** |
| Luminaire height | **9.7 / 11.7 m** |


## mira 16000
P400 - 215

| | |
|---|---|
| Light source | **20 high eff. LED units** |
| SOP Solar Operating Power | **80 W** |
| Max. luminous flux @ SOP | **13,200 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **9.7 / 11.7 / 13.7 m** |

## mira 16000
P800 - 215

| | |
|---|---|
| Light source | **20 high eff. LED units** |
| SOP Solar Operating Power | **80 W** |
| Max. luminous flux @ SOP | **13,200 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **9.7 / 11.7 / 13.7 m** |

## mira 16000 twin
P800 - 215

| | |
|---|---|
| Light source | **2x 20 high eff. LED units** |
| SOP Solar Operating Power | **2x 80 W** |
| Max. luminous flux @ SOP | **2x 13,200 lm** |
| Pole height | **10.0 / 12.0 / 14.0 m** |
| Luminaire height | **9.7 / 11.7 / 13.7 m** |

# lukida
## Solar decorative light columns

**hei lukida**, a family of **aesthetic columns** with integrated photovoltaics and luminaire for decorative outdoor lighting applications, **when design matters.** Available in various heights, diameters and wattages. For public and private lighting applications such as gardens, parks, boulevards, and secondary roads.

**Winner of the Innovative Product Award at Urban Design & Landscaping Expo 2018 as part of BIG 5 Dubai.**

| | |
|---|---|
| Light source | **6-8 high eff. LED units** |
| SOP Solar operating power | **20 - 35 Watt** |
| Max. luminous flux @ SOP | **3,150 - 5,350 lm** |
| Pole height | **4.0 - 12.0 m** |
| Luminaire height | **3.9 - 11.9 m** |

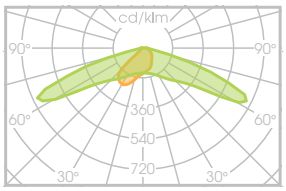
**Product innovation award @**
URBAN DESIGN & LANDSCAPING EXPO

## GLOBAL WARMING MITIGATION - ENERGY AND $CO_2$ SAVINGS

Electrical energy consumption from grid and $CO_2$ emissions of one light pole per 30 years:

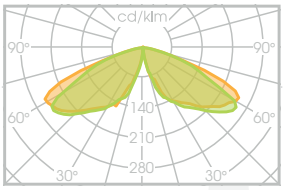
| | |
|---|---|
| **hei lukida** off-grid solar light columns | **0 kWh / 0.0 tons $CO_2$** |
| Standard cabled LED | **3,700 kWh / 1.9 tons $CO_2$ - 6,400 kWh / 3.2 tons $CO_2$** |
| HPS light (100W - 400W) | **13,100 kWh / 6.6 tons $CO_2$ - 23,000 kWh / 11.5 tons $CO_2$** |

Specific $CO_2$ emissions: 0.5 kg per kWh




**Single - Lens C70**
Other lens types available

C90-C270 C0-C180



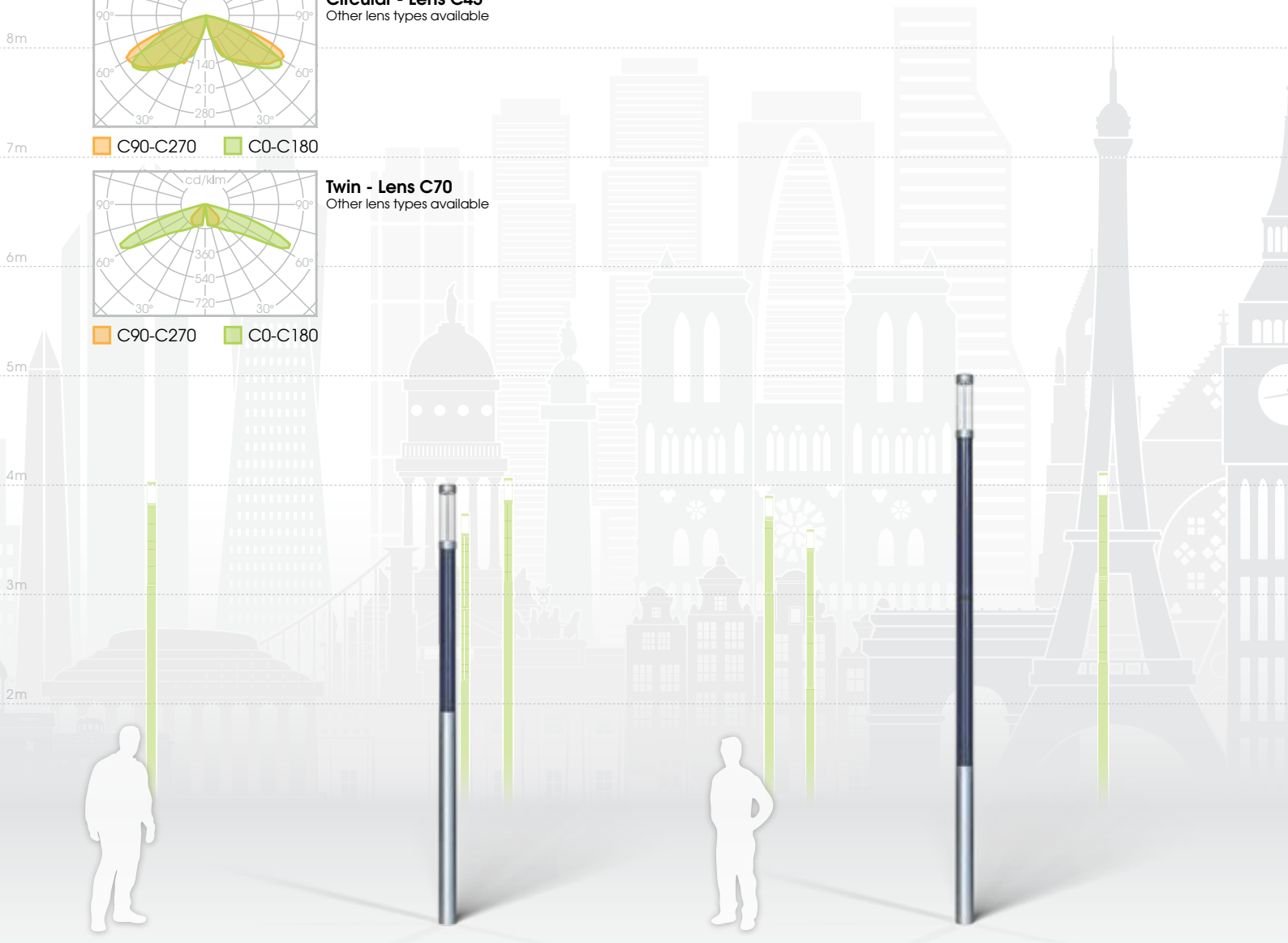

**Circular - Lens C45**
Other lens types available

C90-C270 C0-C180




**Twin - Lens C70**
Other lens types available

C90-C270 C0-C180



### lukida 4000
P100 - 160

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,150 lm** |
| Pole height | **4.0 / 5.0 / 6.0 m** |
| Luminaire height | **3.9 / 4.9 / 6.4 m** |

### lukida 4000
P200 - 160

| | |
|---|---|
| Light source | **6 high eff. LED units** |
| SOP Solar Operating Power | **20 W** |
| Max. luminous flux @ SOP | **3,150 lm** |
| Pole height | **5.0 / 6.0 / 8.0 m** |
| Luminaire height | **4.9 / 5.9 / 7.9 m** |


## lukida 8000
P200 - 215

| | |
|---|---|
| Light source | **8 high eff. LED units** |
| SOP Solar Operating Power | **35 W** |
| Max. luminous flux @ SOP | **5,350 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **7.9 / 9.9 / 11.9 m** |

## lukida 8000
P400 - 215

| | |
|---|---|
| Light source | **8 high eff. LED units** |
| SOP Solar Operating Power | **35 W** |
| Max. luminous flux @ SOP | **5,350 lm** |
| Pole height | **8.0 / 10.0 / 12.0 m** |
| Luminaire height | **7.9 / 9.9 / 11.9 m** |

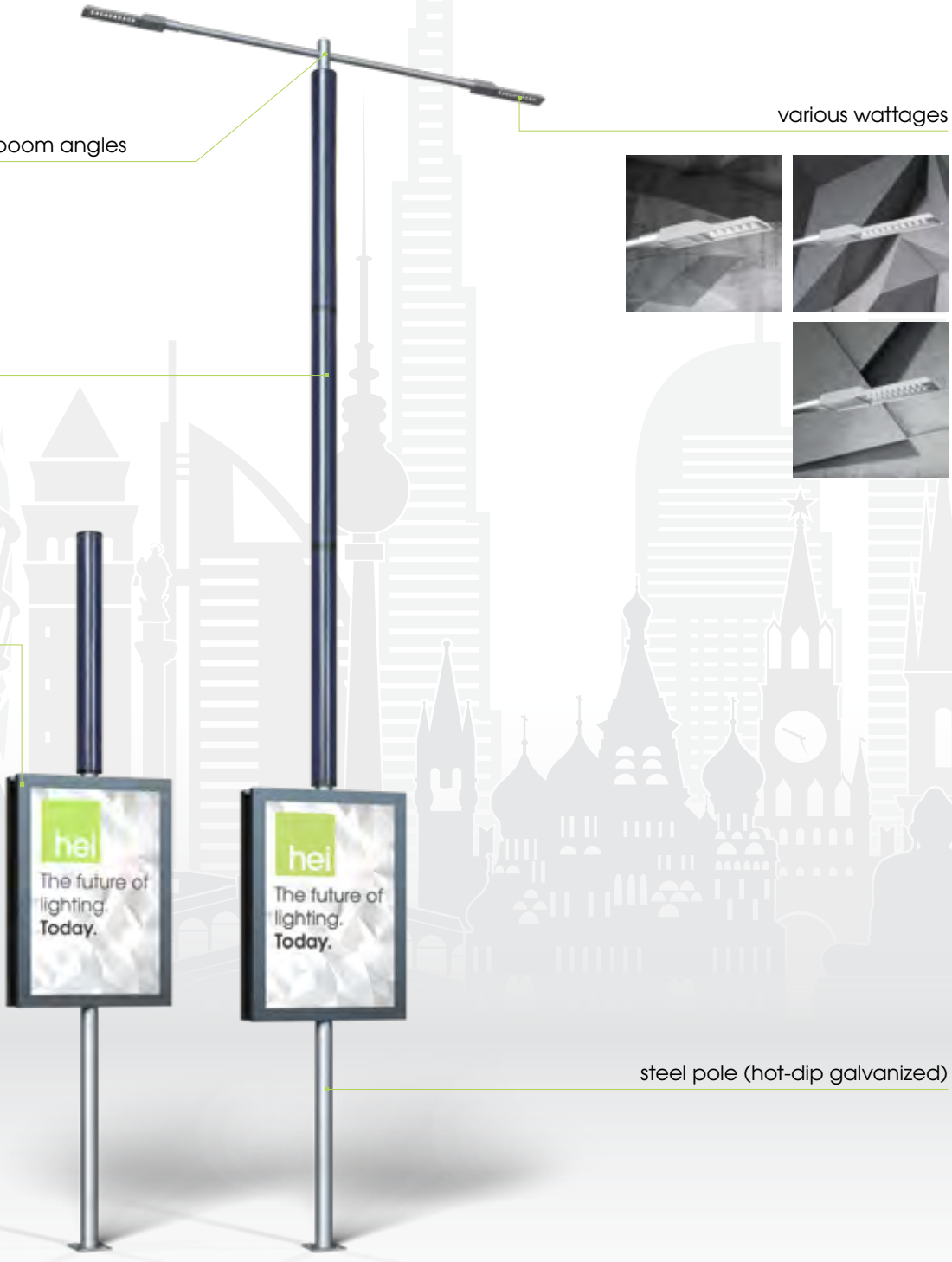

hei
The future of lighting.
Today.
hei
The future of lighting.
Today.
hei
The future of lighting.
Today.
hei
The future of lighting.
Today.

# atlas
## Solar info boxes

**hei** solar info boxes, sunny and commercially highly profitable solutions, available also in combination with solar street light poles. Self-sustaining solar power supply for minimum initial installation costs, avoiding expensive grid connection.

A product family which enables **new financing models** for both advertising companies as well as municipalities: refinancing the light poles by renting out the info boxes as advertising space.

| | |
|---|---|
| Light source | **10-2x 20 high eff. LED units** |
| SOP Solar operating power | **40 - 2x 80 Watt** |
| Max. luminous flux @ SOP | **6,450 - 2x 13,000 lm** |
| Pole / Stand height | **2.2 - 14.0 m** |
| Luminaire height | **8.1 - 14.1 m** |
| Info box LED power | **20 Watt** |
| Info box luminous flux | **3,050 lm** |
| Info box luminous efficacy | **153 lm/W** |



# hei smart & solar

- Solar camera poles
- Solar smart city / IoT and telecom solutions


hei
Outdoor Solar
Lighting.
Smart City
& IoT.
Telecom.

# hei smart & solar

## Smart / IoT and telecom solutions for resilient and flexible infrastructure.

Providing grid-connected supply for smart poles and telecom infrastructure is often expensive and time consuming. Permissions for cable-laying, trenching, and resurfacing often cause unpredictable delays, extra costs and project risks.

**hei** smart solar poles do not need power grid. They can be installed easily and quickly even in remote areas, at predictable costs. **hei** smart solar poles thus allow for a fast roll-out of infrastructure without the limitations of a power grid.

**hei** smart solar poles can support a wide range of applications, including cameras, Wi-Fi hotspots, environmental sensors, and telecommunications devices.

**Get independent. Go smart & solar**. The advantages are evident: no dependency on the grid means flexibility, resilience against grid black-outs, reduced project risks, time and cost savings.

**hei smart solar camera pole for traffic surveillance** | Fully solar powered camera pole for traffic surveillance. Slim design with **hei** power tubes and backlighting (optional) guarantees paramount aesthetics and low wind load.

Poles can be installed quickly next to roads without costly trenching. Data transmission is done by a wireless radio link.

**hei smart solar urban furniture for public transport infrastructure** | Design study of a solar powered smart pole for bus stops with lighting, traffic information and Wi-Fi hotspot for internet coverage. In combination with seating, the solution becomes a contemporary urban street furniture.

Data connection by either 4G/5G mobile coverage, radio link or glass fibre.

**hei smart solar poles, project reference** | Customized decorative **hei** solar smart pole with needle-shape for landscape design at **Al Bayt football stadium, Qatar**, venue of the **FIFA world cup 2022**.

The smart needle pole includes pole-integrated lighting, camera and loudspeakers for surveillance and public announcements, respectively. Data connection by glass fibre cable.

# **hei** smart pole applications

Solar street light pole with Wi-Fi hotspot and info box

Solar camera pole


Would you like more than just environmentally friendly street lights? You are very welcome! Various equipments can be integrated to transform a humble light pole into a multifunctional, solar powered, smart city furniture.

A solar powered weather station? No problem! A solar powered Wi-Fi hotspot? Sure! Traffic signs, cameras, loudspeakers, communication and sensor modules, etc. can be added and powered by the sun.

- IP camera
- Remote lighting control
- Surveillance camera
- Wi-Fi hotspot
- Wind meter, sensors
- LED lighting
- Traffic signs
- Loudspeakers
- Mobile phone charging station
- Backlit info boxes

Customized **hei** smart & solar poles with pole-integrated compartments for cameras and Wi-Fi.

# hei reference projects

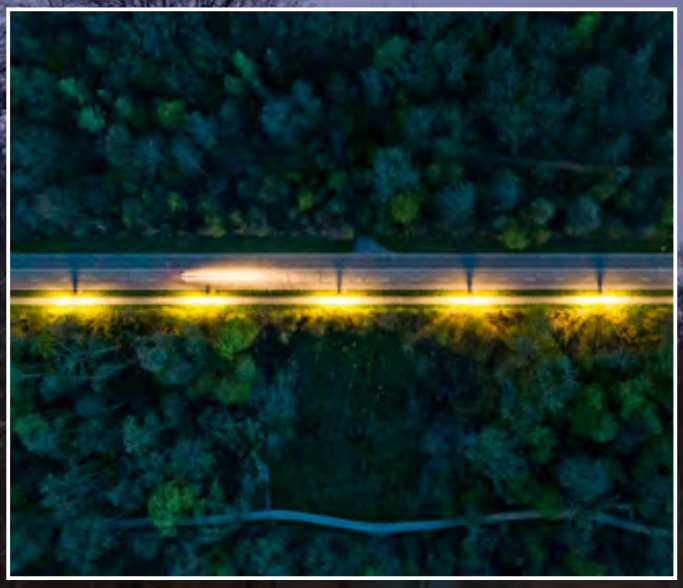
## more than 15 years of successful project execution worldwide

Since the foundation of the company, **hei** has evolved into a global leader in providing highly efficient solar lighting products for virtually any kind of outdoor lighting applications. From illuminatig the smallest parking lot to providing lighting to huge public squres, we have introduced efficient and environmental-friendly solar lighting to the world.

Our ambitious design approach can only be fulfilled by products of utmost efficiency, long life-expectancy, minimal maintenance requirements and the least possible operating costs. These are the reasons why our customers all over the world opt for our products.

Research Technology and Innovation Park,
American University,
**Sharjah, UAE**

Tal Moreeb road,
**Abu Dhabi, UAE**



Schweizerhalle,
**Basel, Switzerland**

Palm Jumeirah
West beach,
**Dubai, UAE**

Nad Al Sheba 3,
**Dubai, UAE**

Ghayathi highway,
**Abu Dhabi, UAE**

Oceans Garden,
**Kobe City, Japan**

Walkway
**Saint-Ambroix, France**

Royal Abby of Santa Maria de Poblet,
UNESCO World Heritage Site,
**Catalonia, Spain**

Bicycle pathway to Hamad International Airport (HIA),
**Doha, Qatar**

Mona Vale,
**Sydney, Australia**

Al Amal Hospital,
**Dubai, UAE**

Al Noof Kindergarten,
**Sharjah, UAE**

Park
**La Coquille, France**

Katara Cultural Village,
**Doha, Qatar**

Energybase,
**Vienna, Austria**

Government district,
**Tamar, Hong Kong**

Public space,
**Troinex, Switzerland**

Roadway,
**Therdbo, Australia**

Hatta waterfront
**Dubai, UAE**

Pathway,
**Philadelphia, USA**

School for girls,
**Ras Al Khaimah, UAE**

Luce Galatasi,
**Athens, Greece**

Parking lot
**Mannheim, Germany**

Waterfront City,
**Beirut, Lebanon**

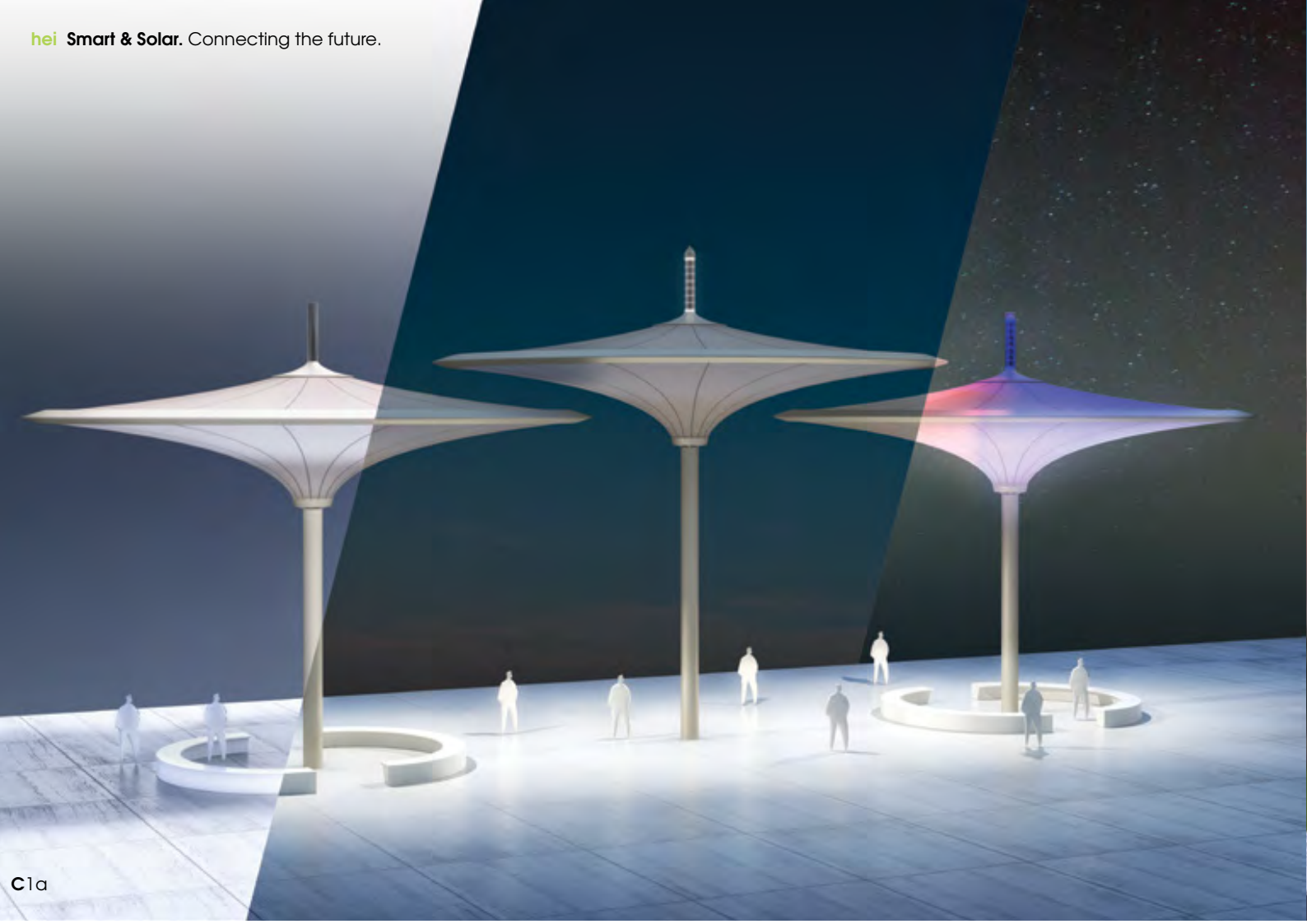
Matznerpark,
**Vienna, Austria**

# hei customized solutions

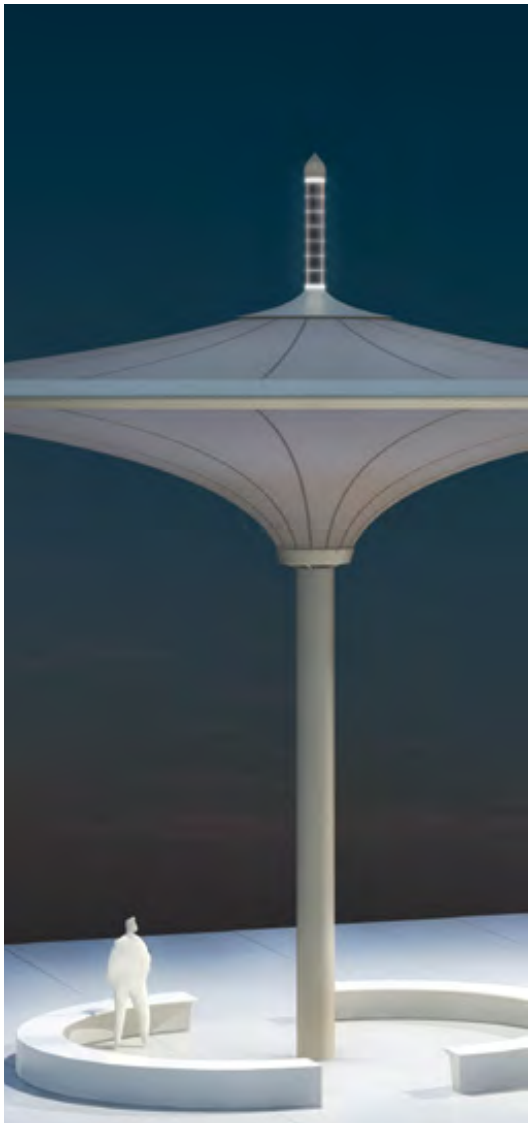
## tailor-made vertical solar masts

**hei** is your experienced partner for customized and project-specific solar solutions with vertical solar masts. **hei** designs, engineers and manufactures all high-tech components of a solar pole on its own – luminaire, photovoltaics, as well as electronics hardware and software. This gives **hei** the freedom, experience and know-how of almost unlimited product customization.

If you do not have a specific design in mind, our experts will come up with a site-specific design solution that will meet your requirements perfectly.



**C**1a



C2a

C2b

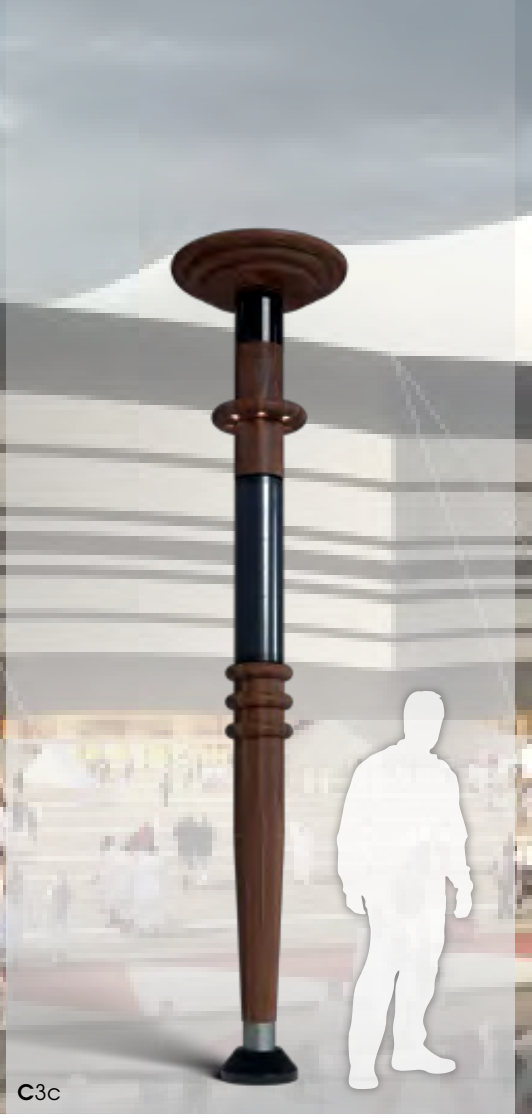
C2c

C2d

C2e

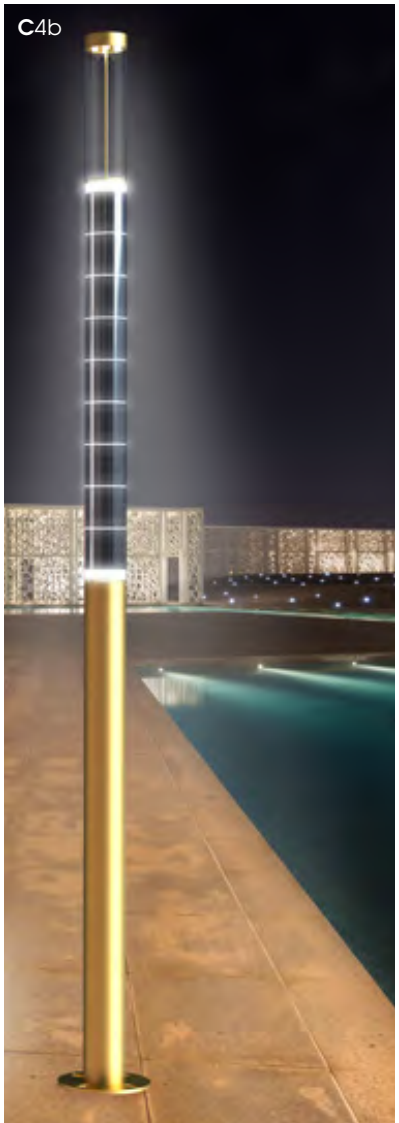
C3a


C3b



C3c

C4a



C4b

C4c

C4d

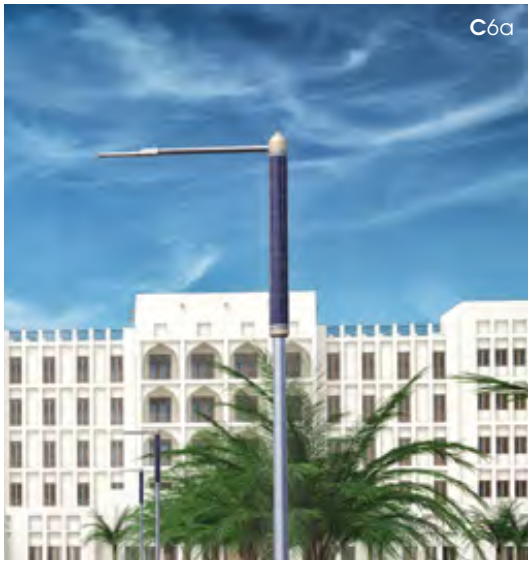
Al Bayt Stadium,
Al Khor,
**Qatar**

**C**3d


**C**3e

**C**3f


**C**5


**C**6a

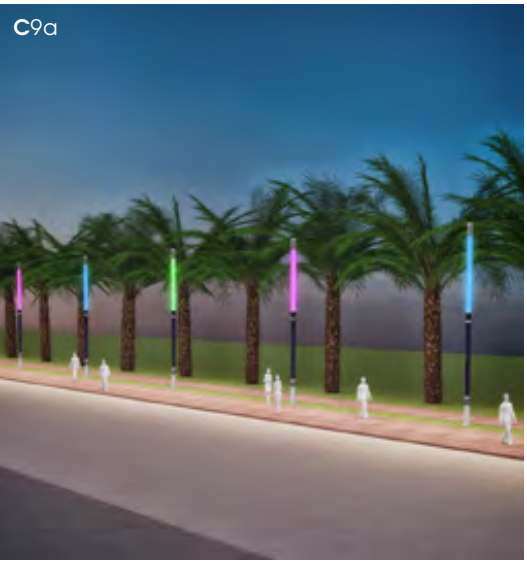

**C**6b


**C**6c

C7

C8a

C8b



C9a

C9b

C9c

C9d


C10


C11a


C11d


C11b


C11c

**hei** is your partner
even in the most extreme conditions.

**C**12
Mona Vale,
**Sydney, Australia**

**Nad Al Sheba 3, Dubai, UAE**
Blaž Grudnik Tominc / HEI Technology International GmbH

**Palm Jumeirah, Duai, UAE**
HEI Technology International GmbH

**American University, Sharjah, UAE**
Blaž Grudnik Tominc

**Basel, Sweitzerhalle**
Foscograph

**Ghayathi Highway, Abu Dhabi, UAE**
HEI Technology International GmbH

**Kobe city, Japan**
GBP / Studio Moritake

**Al Amal Hospital, Dubai, U.A.E.**
BMTC / Azi Raza

**Philadelphia, USA**
HEI Technology International GmbH

**Matznerpark, Vienna, Austria**
Zankilla

**Catalonia, Spain**
HEI Technology International GmbH

**Al Noof Kindergarten, Sharjah, UAE**
BMTC / Azi Raza

**Beirut, Lebanon**
HEI Technology International GmbH

**Mova Vale, Sydney, Australia**
Philip Gray / www.philipgray.com

**Athens, Greece**
HEI Technology International GmbH

**Bellinzona, Switzerland**
Savenergy / Daniel Fosco

**Bycicle pathway, Doha, Qatar**
Lumatron / Geoff Sharp

**Al Qarain School, Sharjah, UAE**
BMTC / Azi Raza

**Wasit Jogging Track, Sharjah, UAE**
HEI Technology International GmbH

**School for girls, Ras Al Khaimah, UAE**
BMTC / Azi Raza

**Katara Cultural Village, Doha, Qatar**
Lumatron / Geoff Sharp

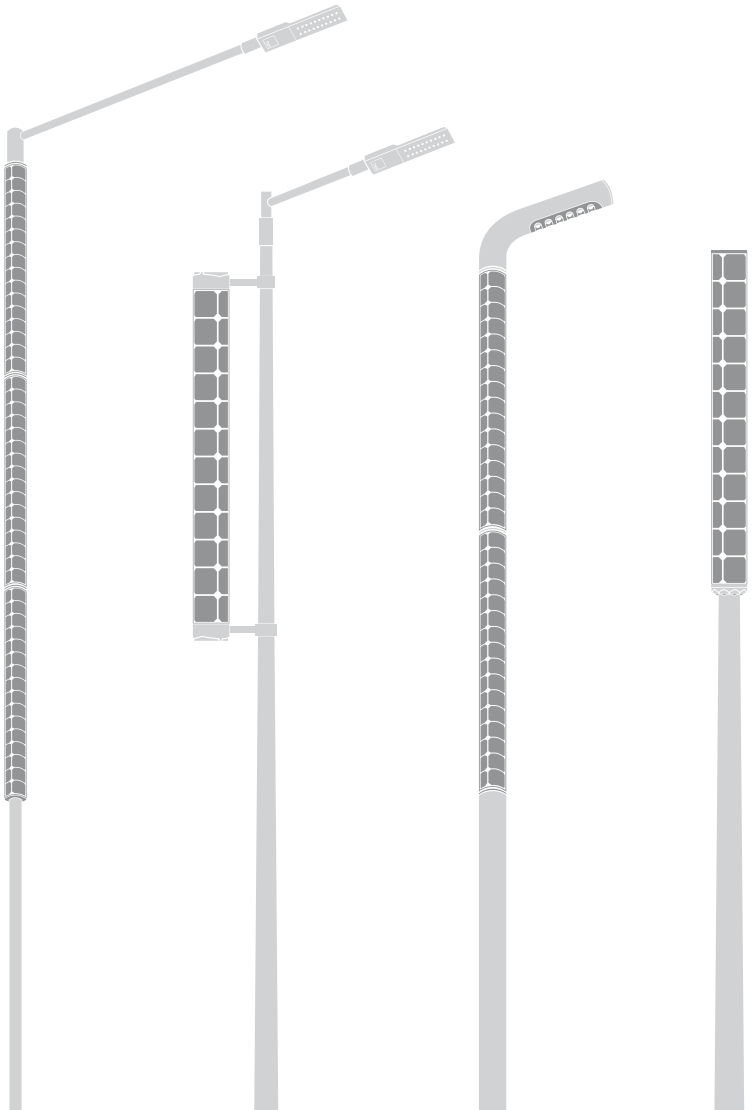
**Thredbo, Australia**
Zachary R. Simpson

**Energybase, Vienna, Austria**
HEI Technology International GmbH

**Tamar, Hong Kong**
Flora Lighting / Leo Lee

**Troinex, Switzerland**
DTI Energies / Frederic Bonna

**Mona Vale Storm, Sydney, Australia**
Radius / Glenn Nicholls / AP/ picturedesk.com



Visit us at
www.hei.at

# hei
# VERTICAL SOLAR MASTS

Solar Solutions Catalogue