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[https://www.etneo.com/en/  
smart-energy/](https://www.etneo.com/en/smart-energy/)

Etneo Italia solutions  
and infrastructures  
for smart energy



The company, called Etneo Italia, is based in Novara, a Piedmontese city between Turin and Milan, the team works inside the Novara Technologic & Scentic Park, built by the architect Renzo Piano, a large example of sustainable building "ante litteram".

In our workshops and offices colleagues and collaborators translate into products the concepts strongly linked to the sustainability and improvement of production processes. We count customers among the most disparate sectors - automotive - electronic - mechanical....in addition to municipalities of various cities both in Italy and in Europe. In one sentence: we believe in technologies at the service of the person and in eco sustainability.



<https://www.etneo.com/company-2/?lang=en>

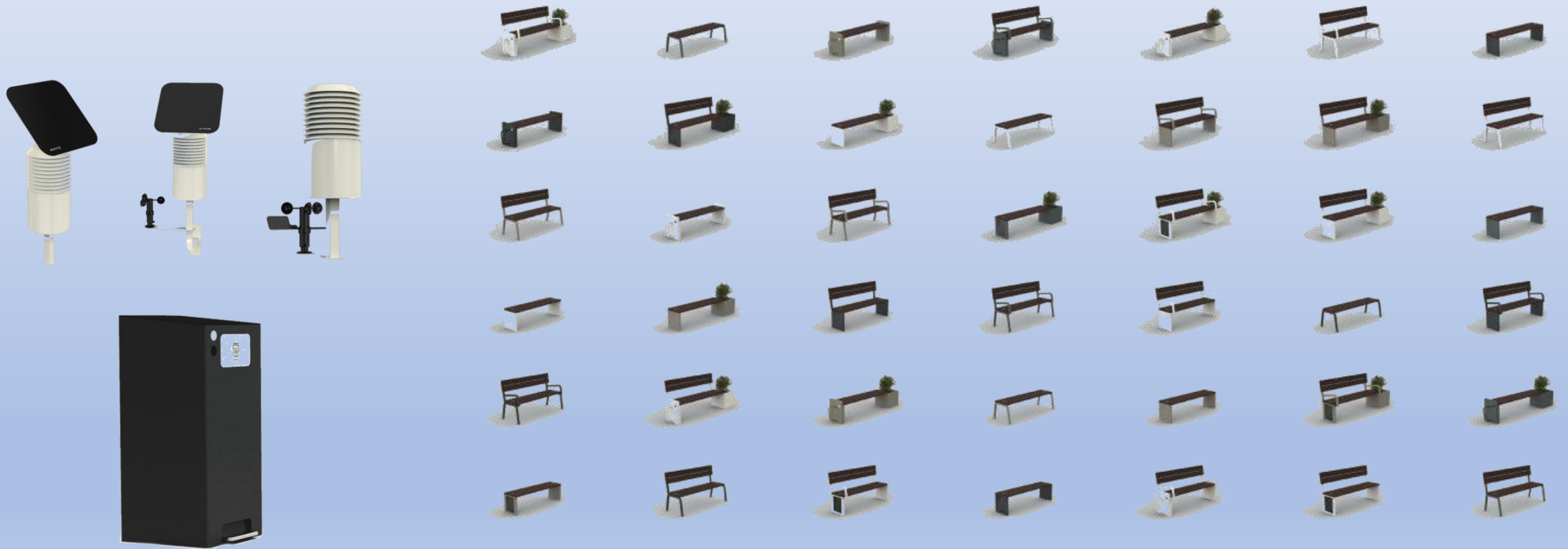
Etneo Italia is always looking for quality and proved solutions, to grant this key point to all its customers the company has developed a testing area on the roof of the buildings, over there is possible to make real time tests on solar, wind, energy storage etc...beside that all the energy generated is used to power the indoor led lighting for the mechanical and electronic department.



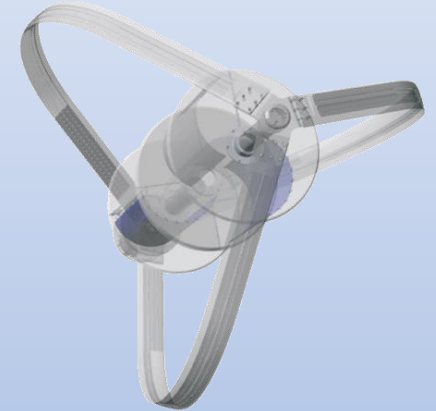
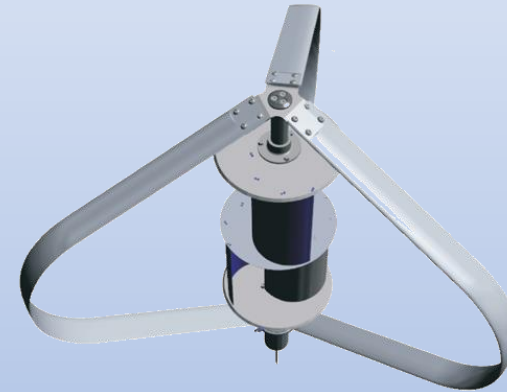
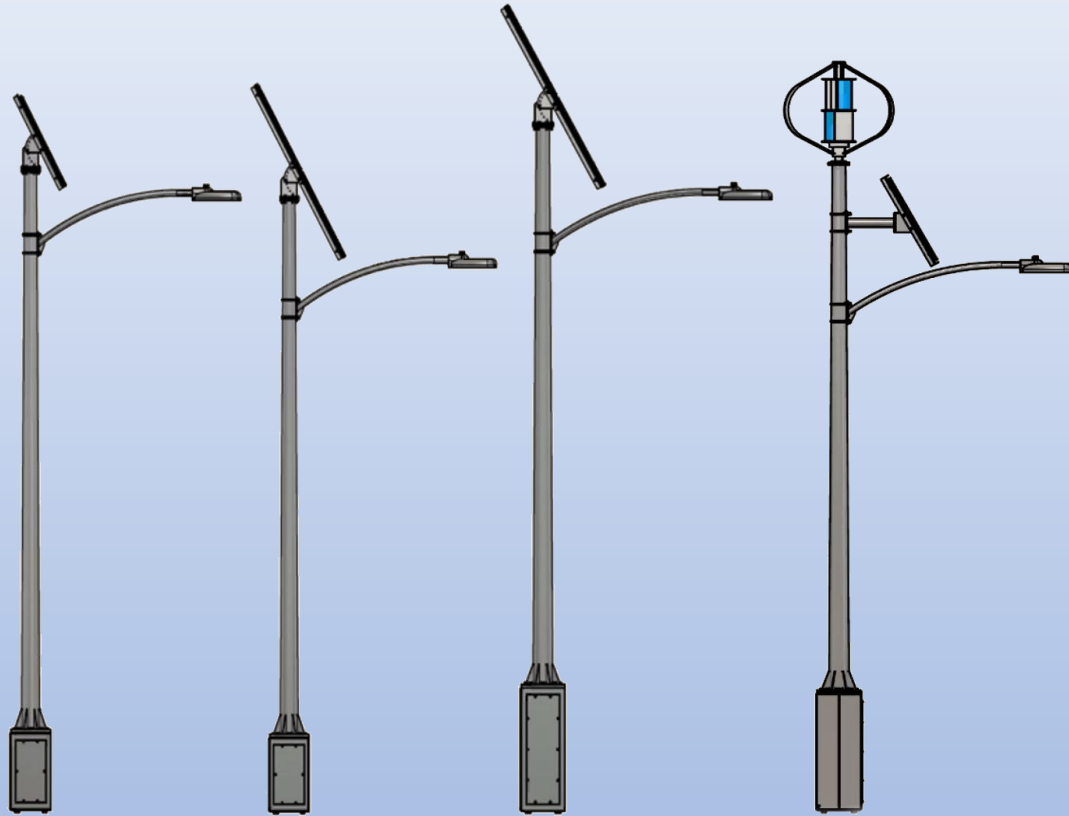
# What we can do to reduce the carbon foot print in developing projects...

Etneo energy division is now engaged in the development of 3 types of projects, with a single eco - sustainable smart vision

- Smart street furnitures



- Smart lighting poles

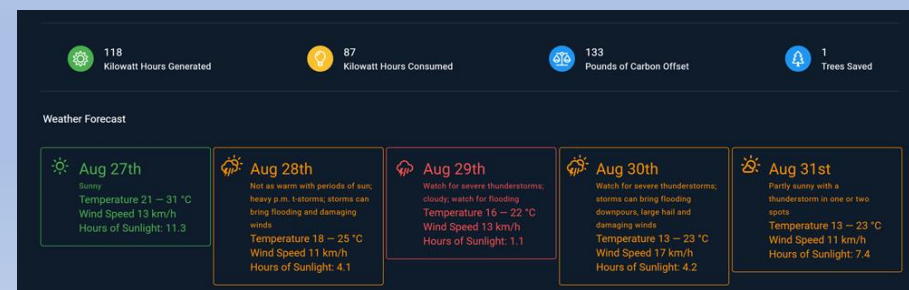
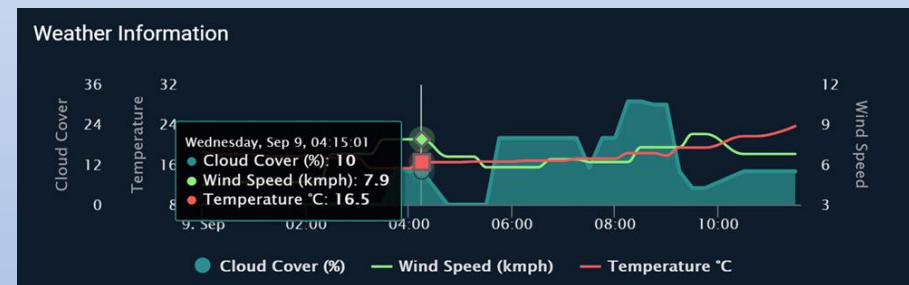
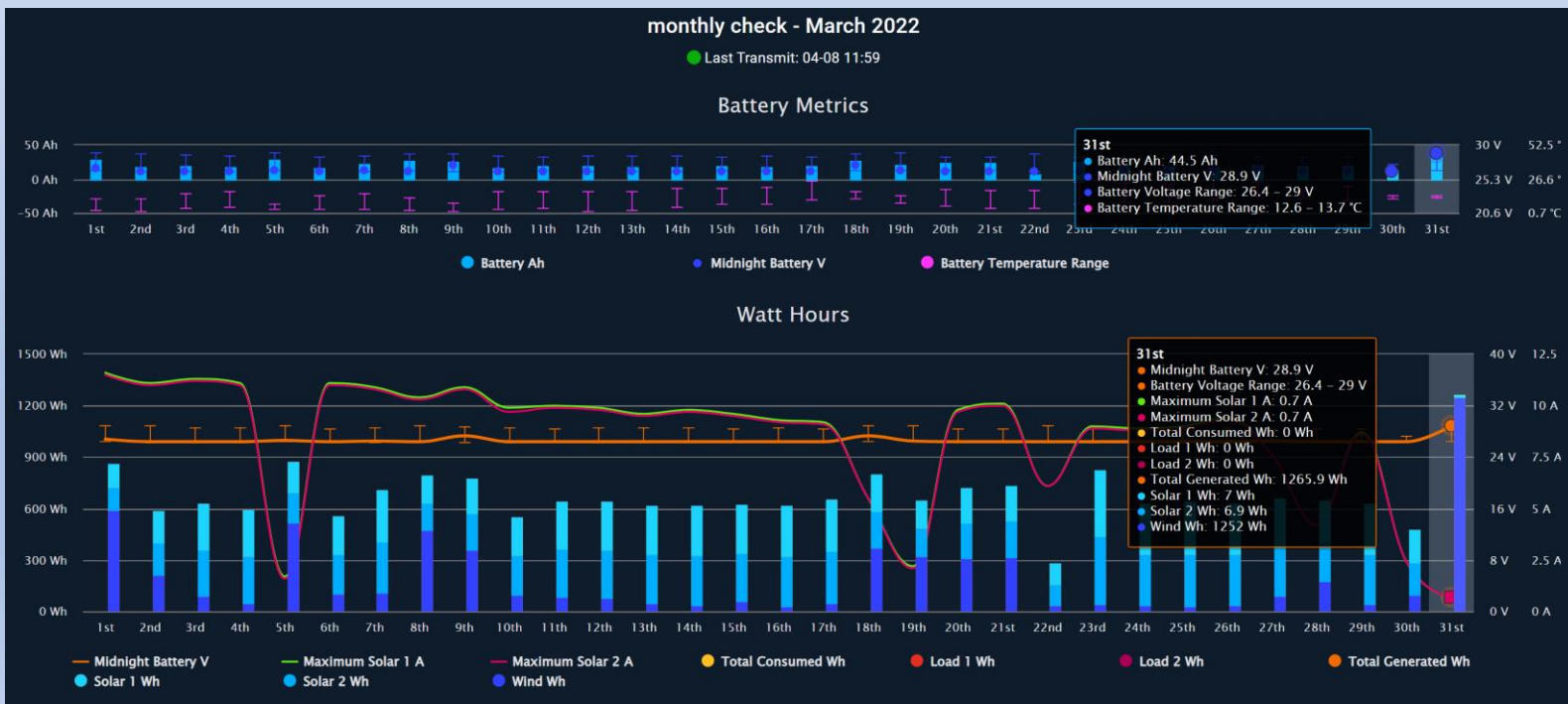


- Small smart wind turbines

The common thread is certainly the implementation of renewable energy's use for any product offered, from this point the development of the Smart Off-Grid product line starts for a long journey towards more efficient and inclusive solutions.

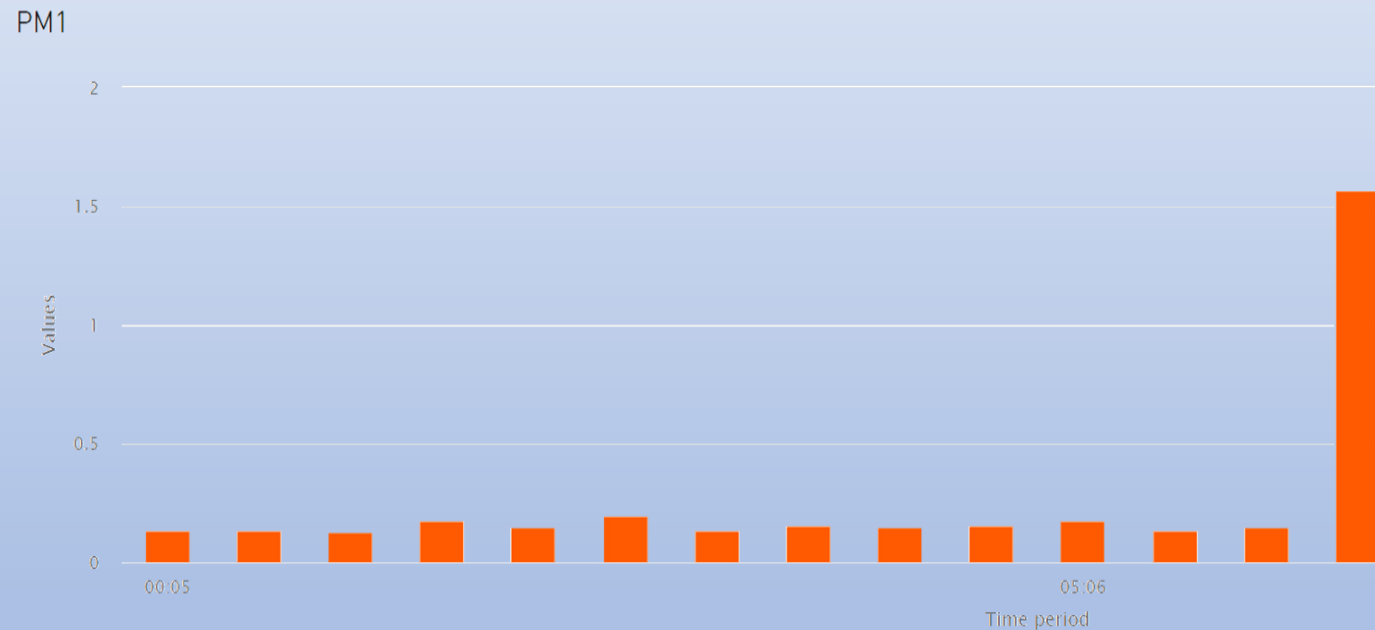
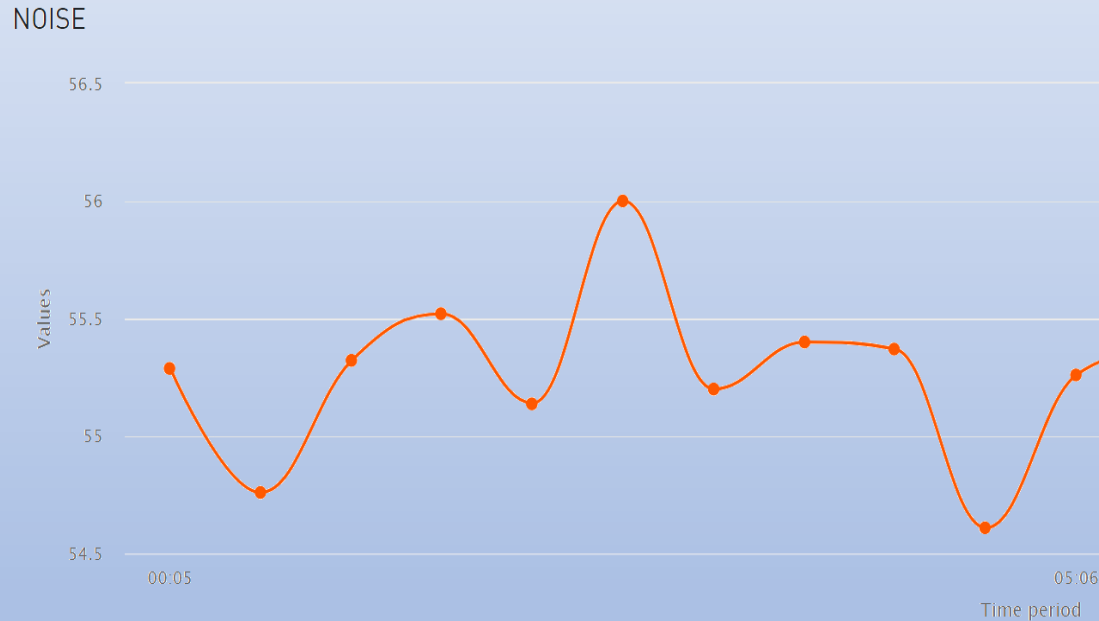
# DIGITALIZATION & DATA QUALITY

Wherever there are installations not connected to the electrical network, in isolated sites or in urban environments, remote control of the systems is essential for the verification of the proper functioning. Today the data acquired by remote control acquires an even larger value because it allows you to better manage your product park and because it offers the possibility, through its analysis, to develop other projects for example to improve quality of the air, livability of the environments, security and much more.



# DIGITALIZATION & DATA ANALYTICS

In the graphic we just show two examples of particulate matter and noise monitoring made with a solar bench, easy reports show the situation where the products are installed, to be aware of how much pollution/noise is there and to start take some measures to prevent worse situations in the future.

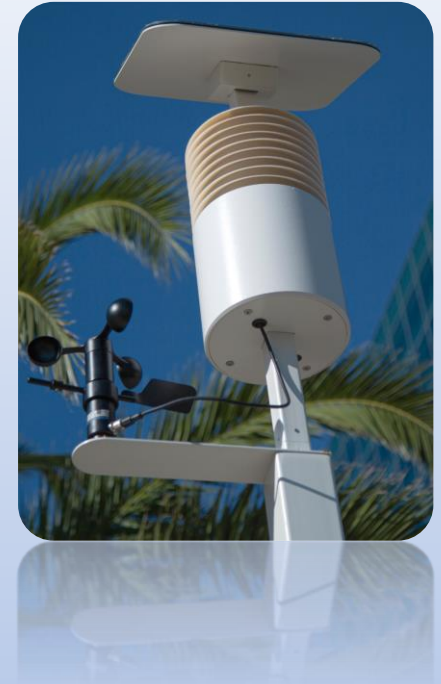


Minimum noise	<b>54.61 dB</b>	15.09.2022 06:36
Maximum noise	<b>56.4 dB</b>	15.09.2022 09:36
Average noise	<b>55.42 dB</b>	

Minimum PM1	<b>0.13 ug/m3</b>	15.09.2022 03:05
Maximum PM1	<b>1.57 ug/m3</b>	15.09.2022 08:36
Average PM1	<b>0.3 ug/m3</b>	

## SMART STREET FURNITURES

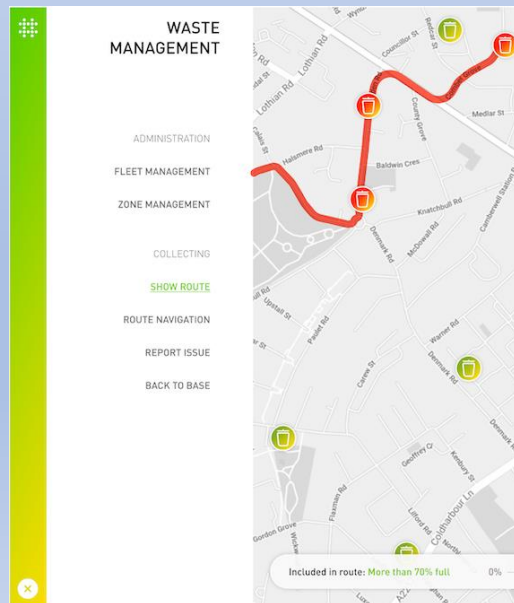
We are now living in a world where people are looking for services related to the devices they use everyday, as mobile charging or electric vehicles charging, so products that invite those people to use them being inclusive, products that can be monitored and be used by owners able to understand data and to re-use them for new projects or offers, multifunction system with both physical and digital purpose. In the next pages we will introduce you to the world of Smart benches and Smart sensors for air quality pollution control.





# SMART STREET FURNITURES

Manage waste at best!! With the Intelligent RFID closing system, public waste containers are protected from unauthorized openings. Each residential bin is connected to the dashboard of Solos, where using the waste management app, waste collection companies can monitor the garbage level in each container and create optimal collection paths. The waste management app in combination with the land compaction system can save millions of euros every year and reduce CO2 emissions.

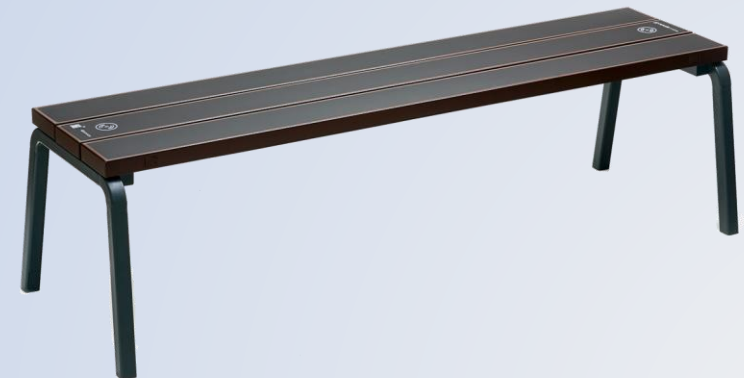


# SMART BENCHES

## Smart solar bench model Classic and Classic+

The new digital benches with solar on the seat and on the backrest can be equipped with:

- 2 wireless mobile charging docks
- 4 USB port type A and C
- Li ion battery pack
- Led light on the bottom with daytime activation settings
- Battery status with led on the seat
- Air dissipation fans
- Grid connection (where needed)
- Heating on the seat (where needed)
- Wi-Fi hot spot (where needed)
- GPS position and PTH sensors
- Smart platform for data analytics & reports



# SMART BENCHES



## Smart solar bench CLASSIC+



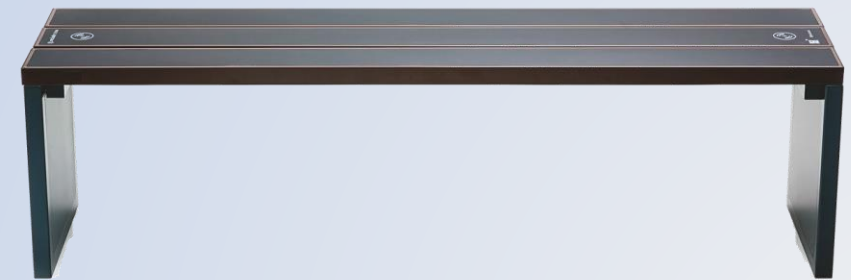
SMART BIN & SMART BECNH FOR SMART CITIES

# SMART BENCHES

## Smart solar bench model City, City+ and City LCD

The new digital benches with solar on the seat and on the backrest can be equipped with:

- 2 wireless mobile charging docks
- 4 USB port type A and C
- Li ion battery pack
- Led light on the bottom with daytime activation settings
- Battery status with led on the seat
- Air dissipation fans
- Grid connection (where needed)
- Heating on the seat (where needed)
- Wi-Fi hot spot (where needed)
- GPS position and PTH sensors
- LCD and LCD +AI camera (for LCD model) for marketing campaigns
- Smart platform for data analytics & reports



# SMART BENCHES



## Smart solar bench CITY+



OVERVIEW

[SELECT PRODUCTS](#)

USERS

[STATUS REPORT](#)

## 1. AB122100012

Last Report	18.03.2022 08:58
Battery status	61%
Total number of wireless chargings	531
Total energy produced	6.06 kWh
Total sitting count	534 people

## CITY BENCHES ON TURISTIC PORT



Last Report	18.03.2022 08:49
Battery status	58%
Total number of usb chargings	20
Total number of wireless chargings	291
Total energy produced	4.72 kWh
Total sitting count	50 people

# SMART BENCHES



## Smart solar bench CITY LCD



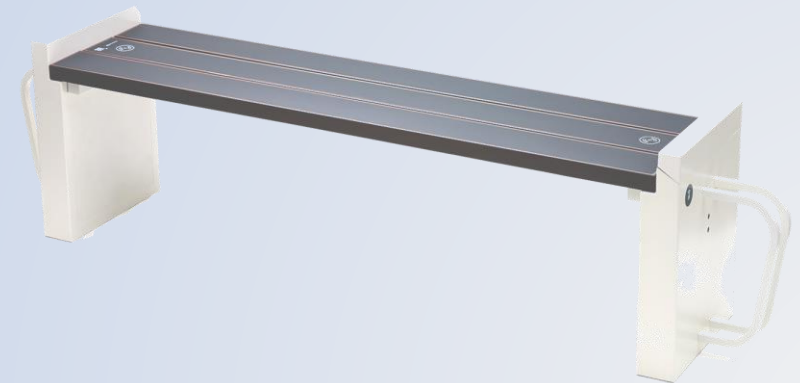
**SMART LCD FOR DOOH  
AND BRAND AWARENESS**

# SMART BENCHES

## Smart solar bench model Cyclo and Cyclo+

The new digital benches with solar on the seat and on the backrest can be equipped with:

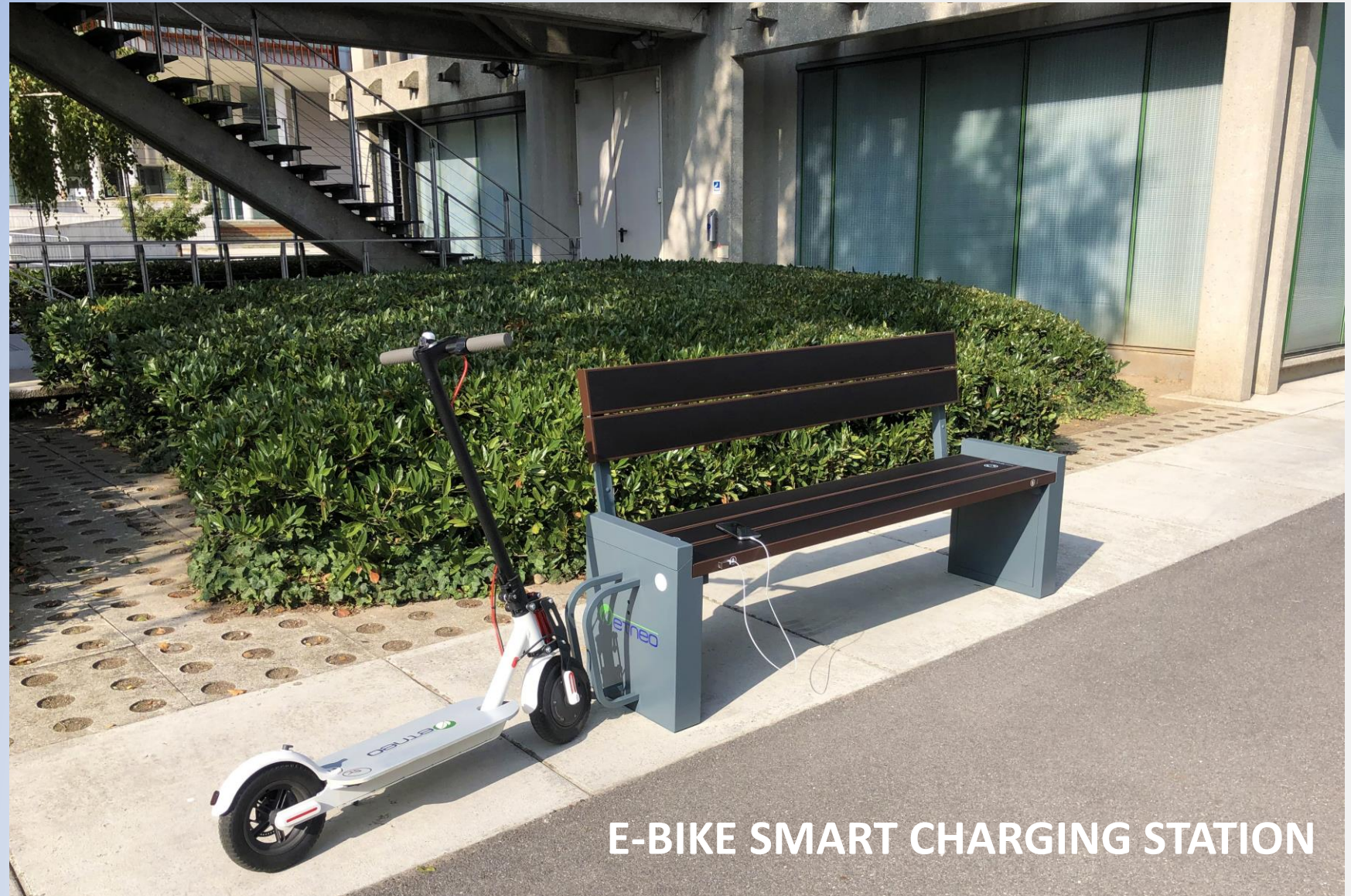
- 2 wireless mobile charging docks
- 4 USB port type A and C
- Li ion battery pack
- Led light on the bottom with daytime activation settings
- Battery status with led on the seat
- Air dissipation fans
- Grid connection (where needed)
- Heating on the seat (where needed)
- Wi-Fi hot spot (where needed)
- GPS position and PTH sensors
- Smart platform for data analytics & reports
- E-bike and e-scooter charging and maintenance tools with air compressor





# SMART BENCHES

## Smart solar bench Cyclo+



E-BIKE SMART CHARGING STATION

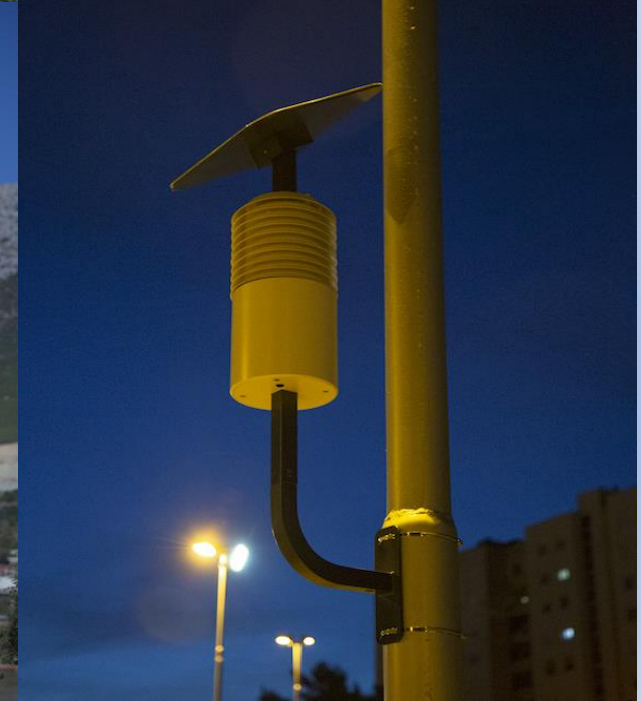
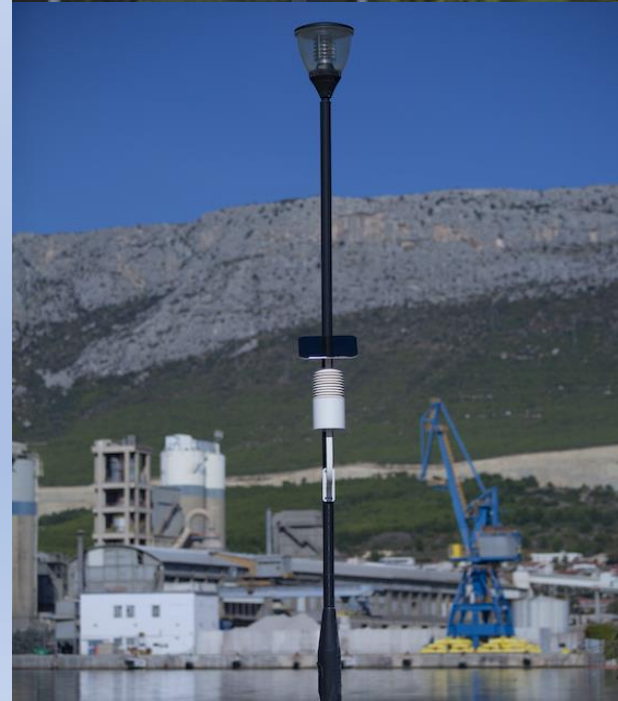
## SMART AIR SENSORS

What are we monitoring with the Aerys air quality sensors?

PM1, PM2.5 and PM10 particulates;  
gaseous pollutants of nitric oxide (NO),  
nitrogen dioxide (NO<sub>2</sub>) and tropospheric  
ozone (O<sub>3</sub>);

air pressure, humidity and temperature,  
together with speed and wind direction.

Aerys electrochemical sensors are  
evaluated by the Municipality of  
Research Center (JRC) of the European  
Commission for Reliability.



## SMART AIR SENSORS

Aerys air quality devices can be equipped with:

- Solar panel or grid connection
- Li ion battery pack
- Stand alone pole or retrofitting solution on existing poles
- PM or GAS monitoring and PTH
- Wind speed sensors
- Smart city platform for data analytics and reports
- QR code and NFC tag on the pole for people to check air quality independently

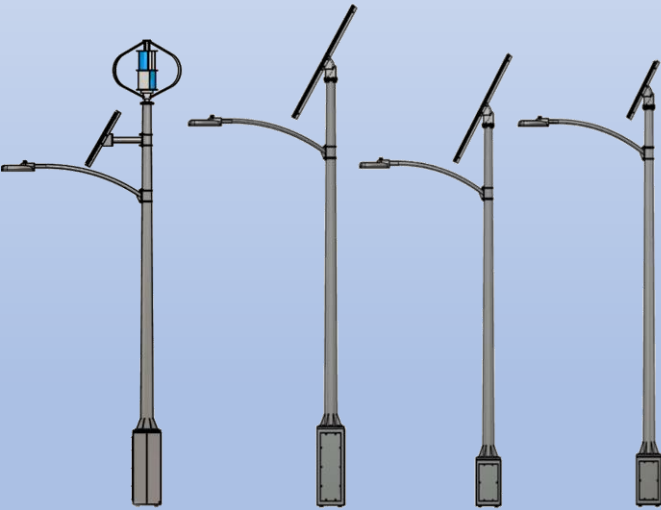


# SMART STREET POLES

Public lighting has a cost of both pole and electricity, but much more maintenance weighs on the costs of the administrations, nowadays it is useful to think about lighting poles that are not limited to illuminating but able to offer additional services in order to become a more useful and profitable investment where possible. Taking advantage of sun and wind allows to create countless solutions with a higher investment cost but with enormous benefits.

## APPLICATION:

Highways, streets and urban avenues, sidewalks, cycle paths or pedestrian paths...



## POSITION:

Temperature, solar radiation, cloudiness, hours of daily light...



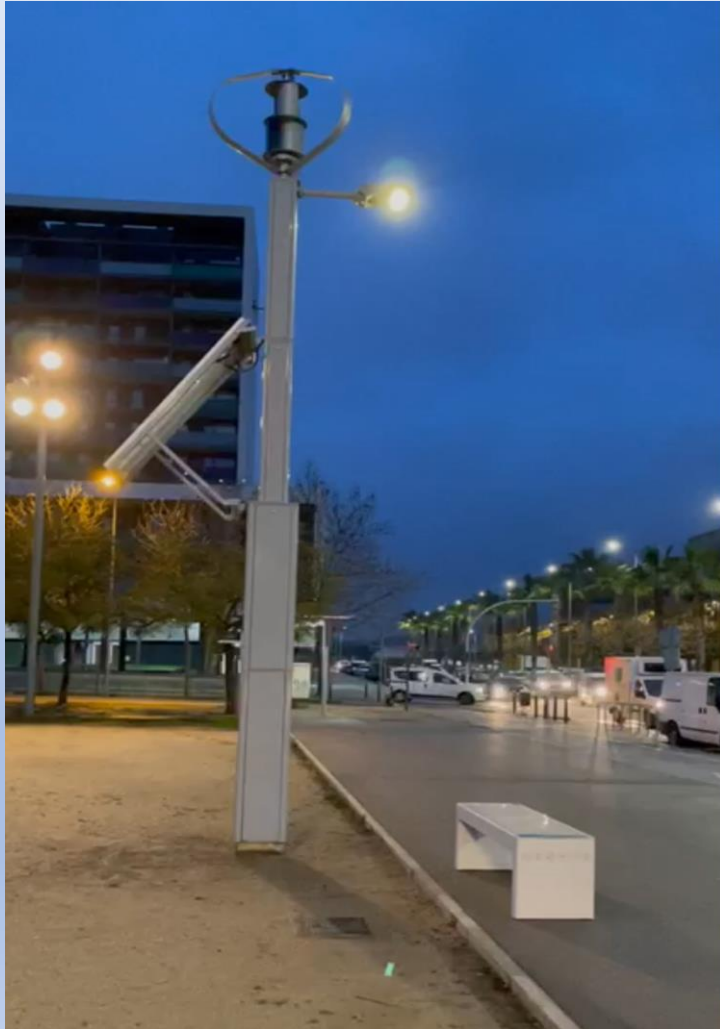
## BUDGET:

Large or small, defined project or in the course of work, demonstration of operation or definitive installation...



# SMART STREET POLES

Sea area: modular pole for lighting – Highway: hybrid pole for street checks – Mountain: fire risks area



## Smaller batteries and longer life

Smaller and less expensive batteries can be used with Illumient as seasonal events and extreme climatic conditions are managed by the Smart Off-Grid system. Power, battery management and proactive maintenance guarantee a longer life and efficiency.

## Higher time and reliability

The 24x7 monitoring of Illumient, automatic notices and alarms, remote management, proactive maintenance and the service of experts guarantee high performance and reliability. The lights remain on with the longest life possible of the system.

## Continuous service and support on each system

With other types of lampposts, there is minimal or absent support. Illumient comes with a superior service for the peace of the mind and the long life of the system.

## Maximum power for all environments

With this model we increase the generation of energy by adding solar panels and batteries, when necessary, to obtain the most certain power. This guarantees that mission-critical installations provide the bright light possible.

## Durable in colder climates

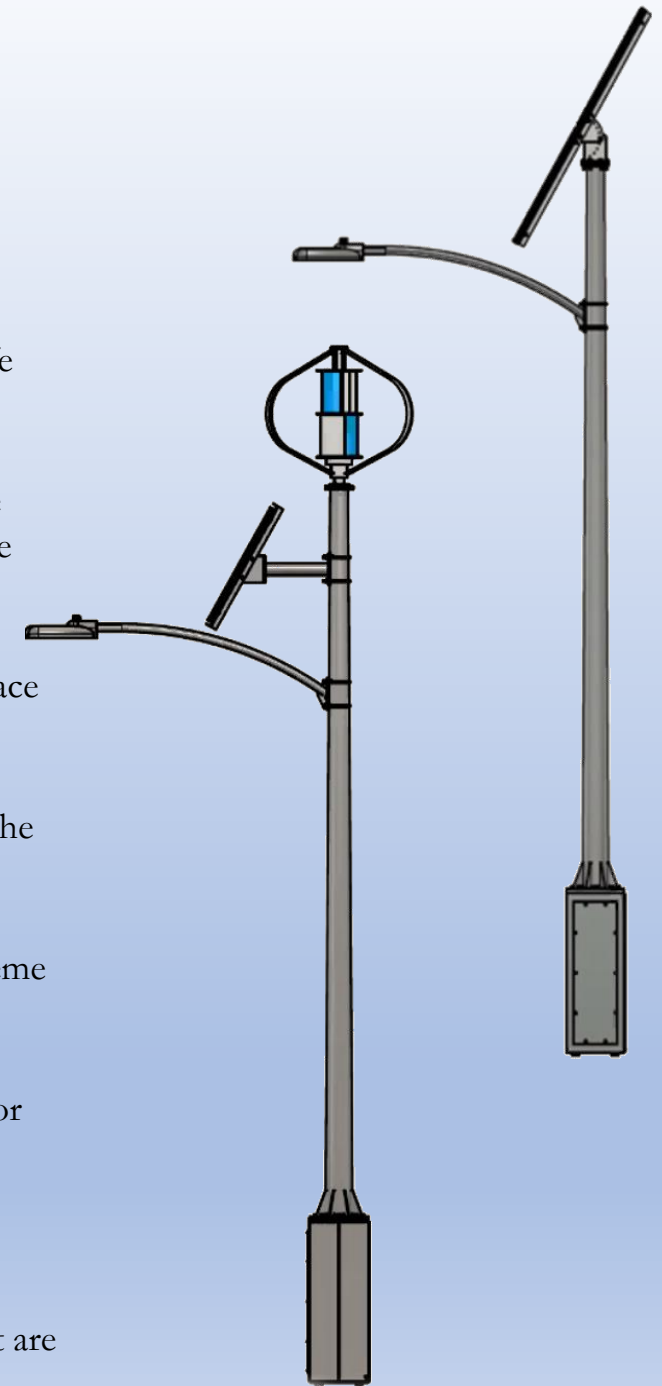
This model of pole uses lead -acid batteries (AGM), which have shown that they are durable in installations with extreme temperatures of  $-40^{\circ}\text{C}$ , allowing a great variety of installation opportunities with reduced ecological footprint.

## Lower installation and maintenance costs

Precabled devices and the availability of a smartphone app for validation simplifies the installation without the need for specialized personnel. The data chronology and information on real -time components allow the resolution of remote problems for 70% of the problems that reduce maintenance costs.

## Scalable

The flexibility of the addition of panels and solar batteries on the Road Road product allows a more scalable line. Together with the multiple road design options, this offer guarantees that the power and aesthetic needs of the project are insured.





## Smaller batteries and longer life

Smaller and less expensive batteries can be used with Illumient as seasonal events and extreme climatic conditions are managed by the Smart Off-Grid system. Power, battery management and proactive maintenance guarantee a longer life and efficiency.



## Expert engineering

The pole is supplied with a wisely designed battery cabinet that allows the use of lithium -ion batteries in areas where lighting in colder temperatures is needed, protecting the integrity of the battery and extending its duration over time.



## Higher time and reliability

The 24x7 monitoring of Illumient, automatic notices and alarms, remote management, proactive maintenance and the service of experts guarantee high performance and reliability. The lights remain on with the longest life possible of the system.



## Continuous service and support on each system

With other types of lampposts, there is minimal or absent support. Illumient comes with a superior service for the peace of the mind and the long life of the system.



## Drawing that reduces the possibility of theft or vandalism

Using lithium ion batteries, this solution eliminates floods and vandalism concerns by installing the cabinet containing battery and electronics in the upper part of the pole, out of course by the acqa and unauthorized.



## Smaller foot print

Without the electrical panel at the base of the pole and with smaller batteries, the poles can be shorter and that picture hidden under the solar panels, so the overall physical imprint of the system is smaller, making the Cammi solution a good measure for A thinner aesthetic on the sidewalks or other applications.



## Lower cost

Simple Illumient installation, removal of remote problems and maintenance, lithium -ion batteries, a small battery framework and management and cloud -based control and ensure that the Cammi series is more convenient for a variety of reduced scale applications.



## Lithium ion batteries

Smaller and light than lead batteries, the lithium -ion batteries allow more versatile designs, allowing the installation of the batteries at the top of the pole for a cleaner aesthetic.



# SMART LIGHTING POLES

Cold areas lead acid in the pole – railway areas all in the box – parks or cycle and pedestrian paths





# SMART MODULAR POLES

## Benefits and advantages of a modular pole

- Easy to move and to install because is a 4,5m to 6m pole height made by 1,5m height parts
- Container because all the electrical parts goes inside avoiding any other box aside the pole
- Can be powered with up to 4 solar panels and 1 wind turbines for a total power of 2kW with extendable storage capacity up to 8kWh
- Is able to give power, mainly in 24V, to all possible devices.
- Can be used and tailored for several different applications
- Always with remote control



## SMART SMALL WIND TURBINES

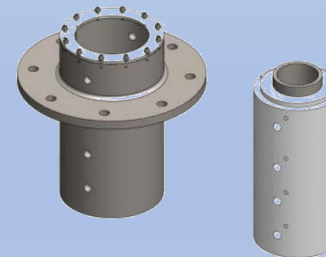
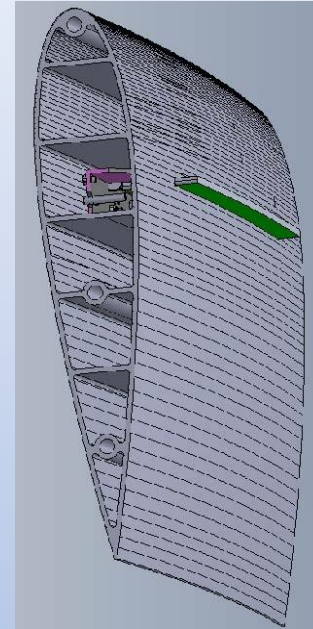
The only renewable source complementary to the photovoltaic solar one is the wind source, small generators with vertical axis suitable for both urban and suburban areas have become a product that is no longer niche but compensatory, the absence of sun at night and in the winter months or with mere solar hours pushes towards new solutions where batteries make the difference.



## SMART SMALL WIND TURBINES

All the turbines of the DS series are silent products, they have a low number of rpm (DS3000: 230 RPM) and are all equipped with a damper to absorb any excess vibration of the turbine itself. For the low RPM the turbines are always visible to avoid any impact with birds that mainly have their migratory flights at higher areas.

A further series of innovations made on the model DS3000 and DS25 consists in the addition of an inclination sensor: automatic parking activated upon rotor running more than 20 degree inclination condition that sends the turbine into protection mode and a system of increased production which, from 15 to 18-20m/s of wind speed, reduces production at 2.5kw without putting the turbine in protection. DS25 model has a new innovational baffle plate design in the Darrieus blades, it stretches out automatically from blade upon high wind conditions, and destroy the air dynamic performance of the blades which reduced the rotor speed.



## SMART SMALL WIND TURBINES

### Vertical axis wind turbine model DS300

**Model:** hybrid with double blades system

**Power:** 300/500W nominal/maximum

**Maximum wind resistance:** 60m/s

**Voltage:** 24V compatible with lead acid and Lithium battery packs

**Generator:** permanent magnet with high temperature level resistance

**Braking:** automatic braking system to preserve battery life

**Dimensions:** 1,26m height and 1m diameter

**Weight:** 25Kg

**How to use:** stand alone power plants with energy storage in 24V mixed with solar panels, compatible with both lead acid and lithium battery packs

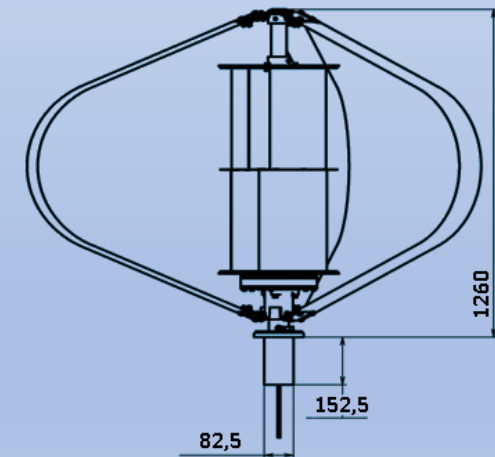
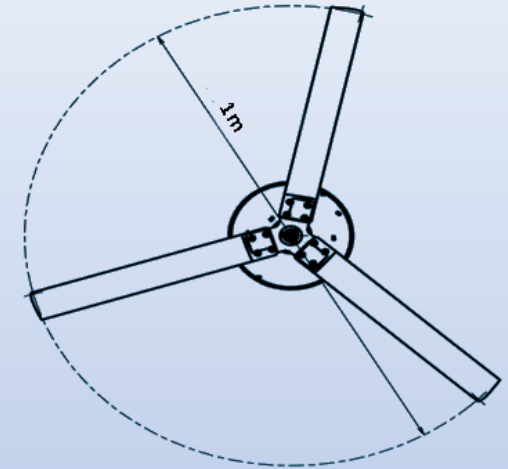
**Life time:** 20/25 years

**Noise:** silent, less than 60dB

**Materials:** steel and aluminum

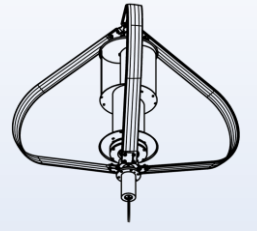
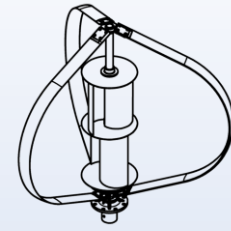
**Product management:** through remote control where possible

**Applications:** sea & coastal areas, mountain & hills areas, cities and building roofs.

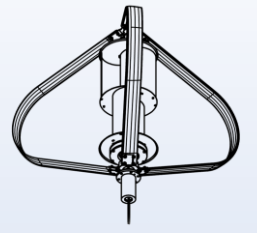
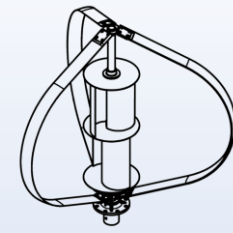


## SMART SMALL WIND TURBINES

Hybrid installation for residential areas with ground pole and ground structure for solar panels, the system is equipped with 3,4kW of solar power and a 7kWh storage with Lithium battery pack.



## SMART SMALL WIND TURBINES



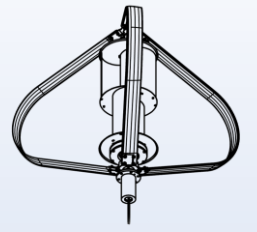
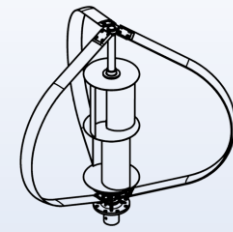
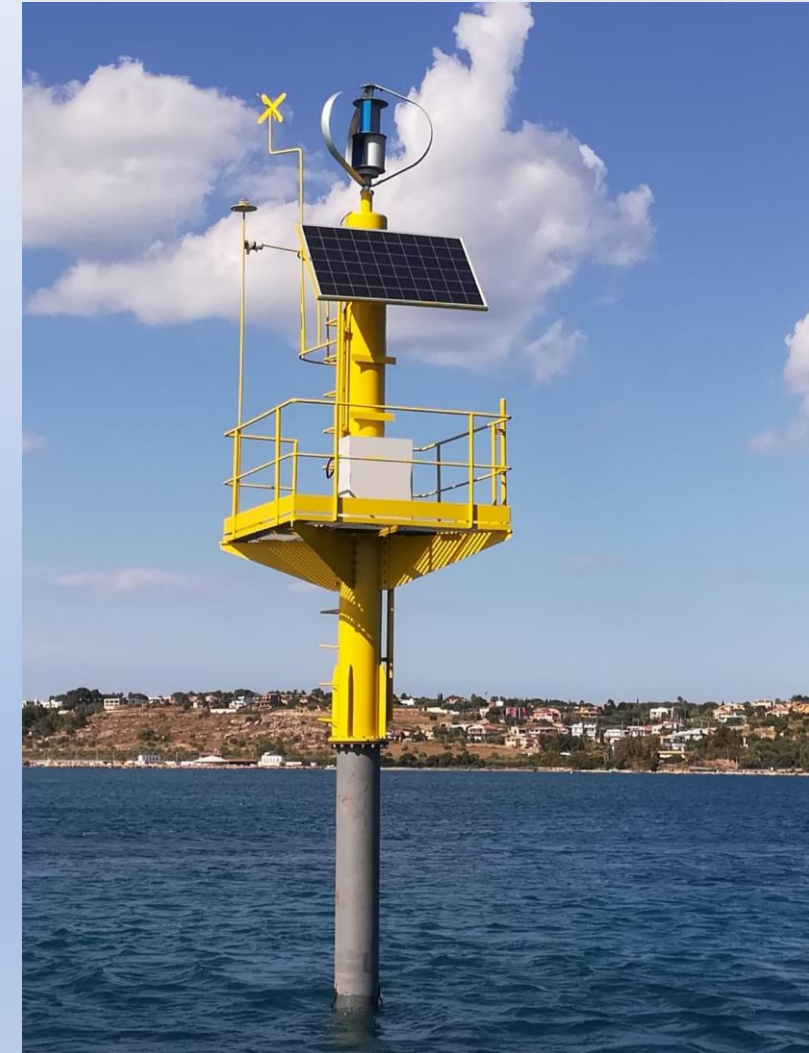
Botel 2.0 is a tourist structure installed on Lugano lake in Porto Ceresio, in addition to being floating it is totally autonomous thanks to the energy generated by the sun and the wind.



## SMART SMALL WIND TURBINES

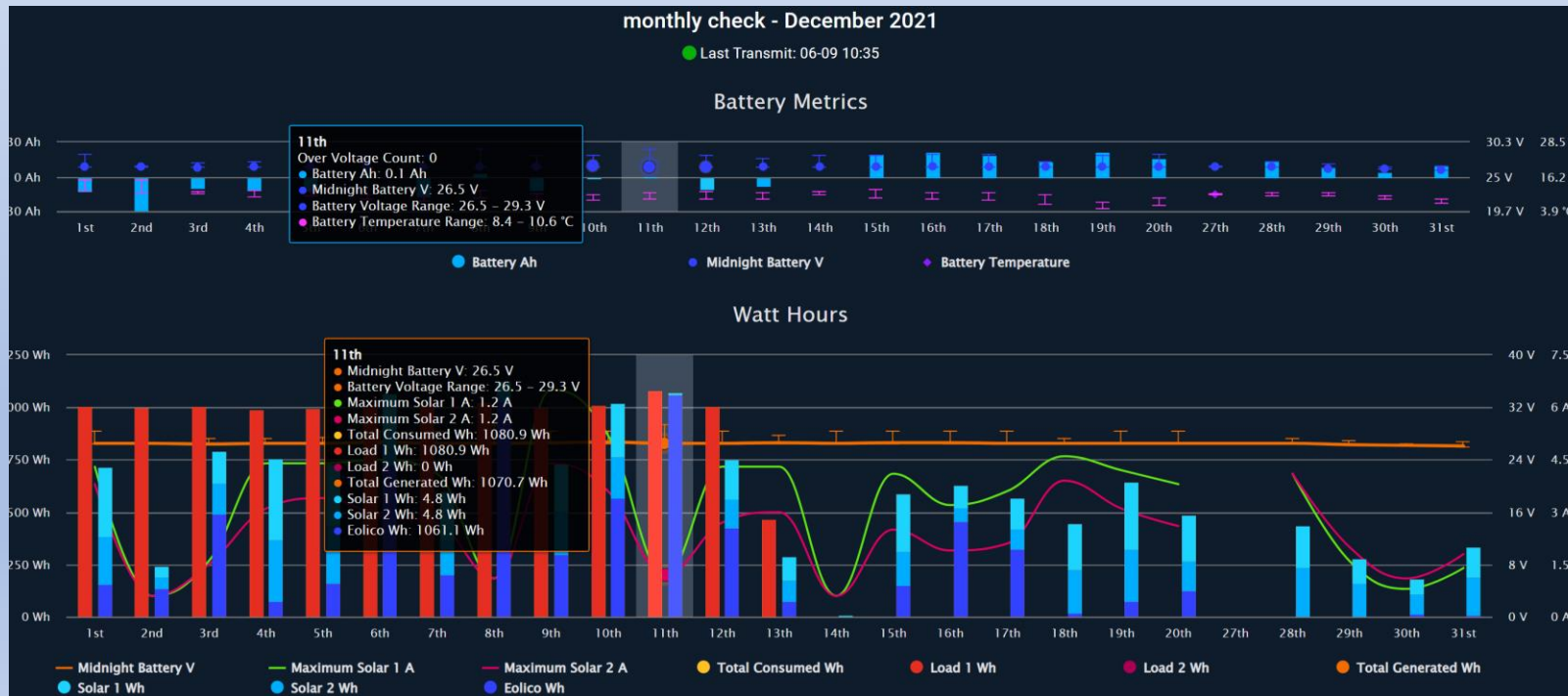
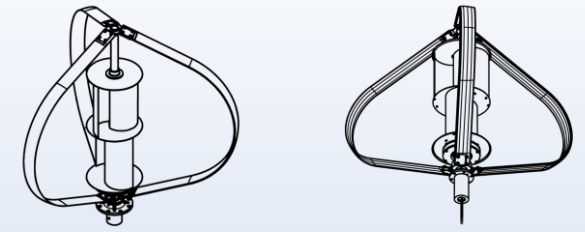
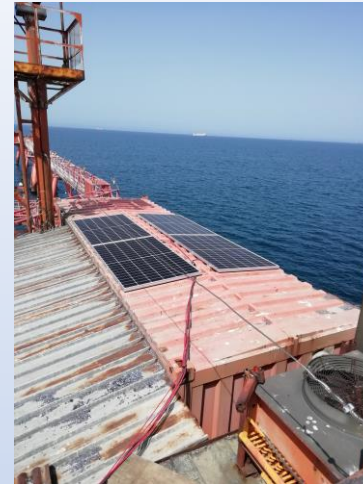
Special poles made for mountain and sea areas, where weather conditions can be critical there is no problem using a robust wind turbine that is perfectly adapted to turbulent wind and strong gusts.

This kind of installations can be equipped with remote control and weather forecast to know how to manage the charging and never leave the installation without energy.



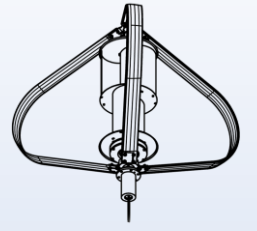
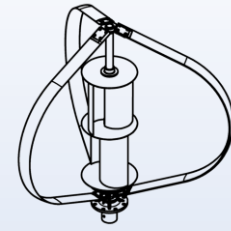
# SMART SMALL WIND TURBINES

Special system for Boat control sensors and navigation help with remote monitoring to maintain and always be aware about renewable energy data generation





## SMART SMALL WIND TURBINES



Special installations like towers with multiple turbine or architectural integration solutions.



## SMART SMALL WIND TURBINES

### Vertical axis wind turbine model DS700

**Model:** hybrid with double blades system

**Power:** 700/1000W nominal/maximum

**Maximum wind resistance:** 60m/s

**Voltage:** 48V compatible with lead acid and Lithium battery packs

**Generator:** permanent magnet with high temperature level resistance

**Braking:** automatic braking system to preserve battery life

**Dimensions:** 1,6m height and 1,9m diameter

**Weight:** 60Kg

**How to use:** stand alone power plants with energy storage in 48V mixed with solar panels, compatible with both lead acid and lithium battery packs; grid connected with solar inverter, solar panels and Lithium battery pack.

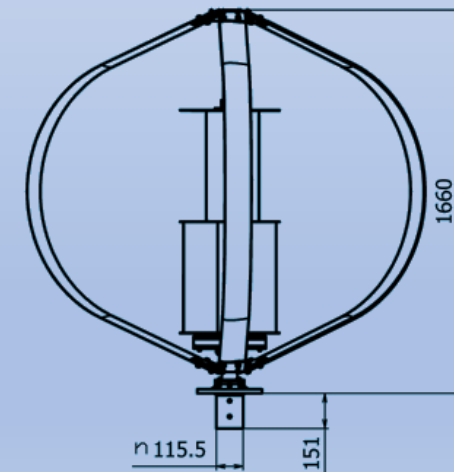
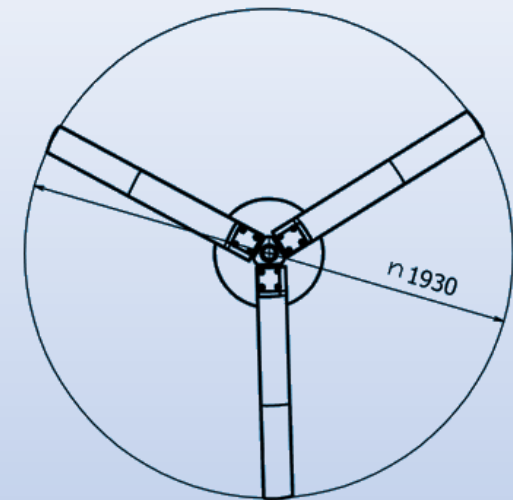
**Life time:** 20/25 years

**Noise:** silent, less than 60dB

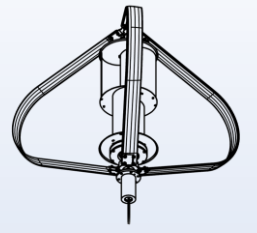
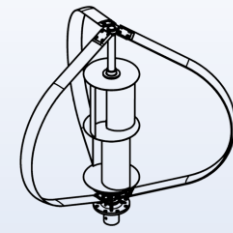
**Materials:** steel and aluminum

**Product management:** through remote control where possible

**Applications:** sea & coastal areas, mountain & hills areas, cities and building roofs, small TLC installations.

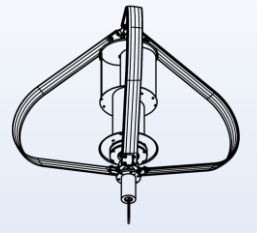
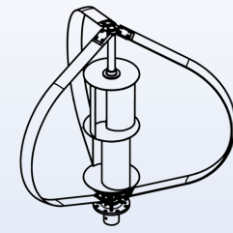


Hybrid installation for residential areas with ground pole and ground structure for solar panels, the system is equipped with 3,6kW of solar power and a 10kWh storage with Lithium battery pack.



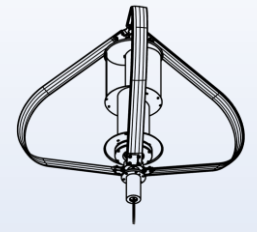
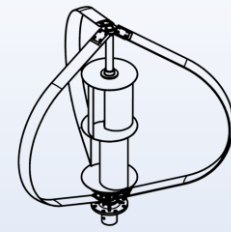
## SMART SMALL WIND TURBINES

Croatian school educational project for students to better understand the possible use of wind turbines with lithium battery pack.

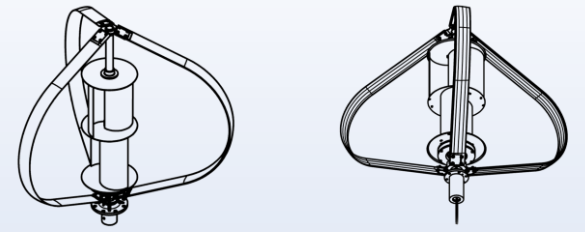


## SMART SMALL WIND TURBINES

Installations on flat roofs for a municipality building in south of Italy and for the Energy Center of Politecnico of Turin University

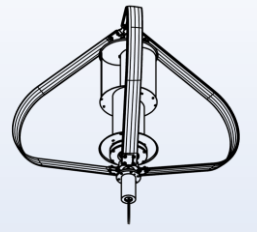
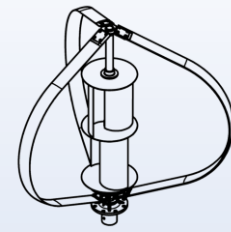


Installation made for Snam rete gas to power their smart pipe site with sensors and remote control for maintenance.



## SMART SMALL WIND TURBINES

Vertical axis wind turbine model DS700 TLC hybrid off-grid installation.



# SMART SMALL WIND TURBINES

## Vertical axis wind turbine model DS3000

**Model:** hybrid with double blades system

**Power:** 3000/3800W nominal/maximum

**Maximum wind resistance:** 60m/s

**Voltage:** 48V compatible with lead acid and Lithium battery packs – 230V with Huawei inverter – 380V with 3 sets of turbines and Huawei inverters

**Generator:** permanent magnet with high temperature level resistance

**Braking:** automatic braking system to preserve battery life

**Dimensions:** 4,15m height and 4m diameter

**Weight:** 680Kg

**How to use:** stand alone power plants with energy storage in 48V mixed with solar panels, compatible with both lead acid and lithium battery packs; grid connected.

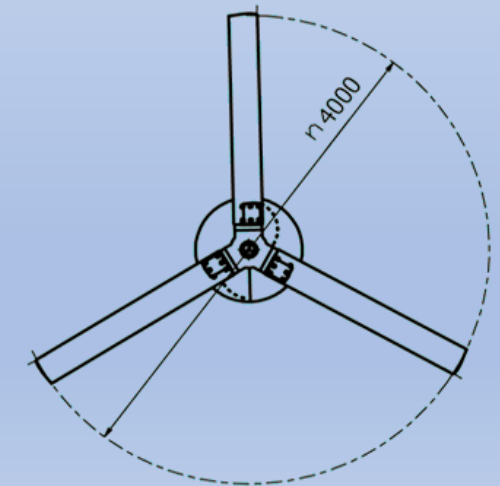
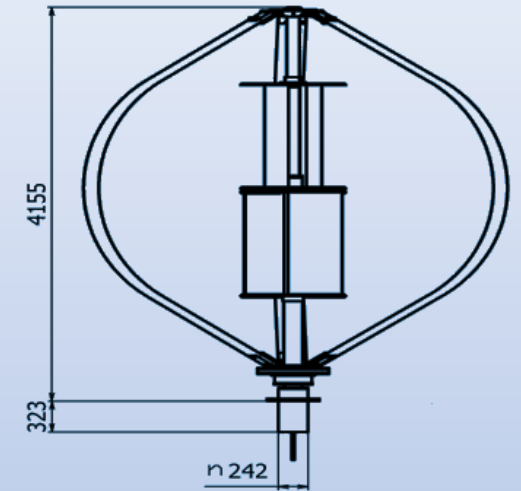
**Life time:** 20/25 years

**Noise:** silent, less than 60dB

**Materials:** steel and aluminum

**Product management:** through remote control where possible

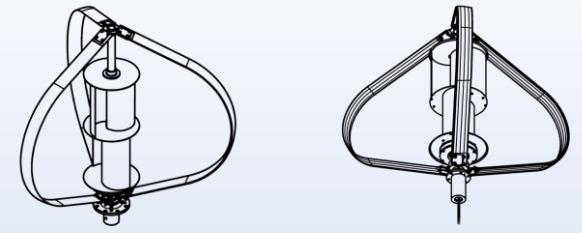
**Applications:** sea & coastal areas, mountain & hills areas, small wind farms.



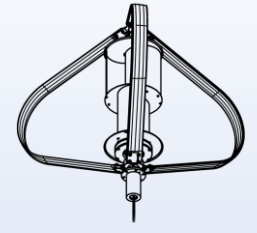
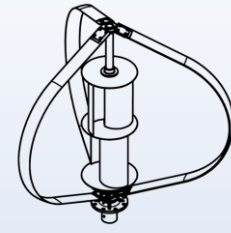


## SMART SMALL WIND TURBINES

Scientific technology park with six 3kW wind turbines and small wind farm with six 3kW wind turbines installed with grid connection.

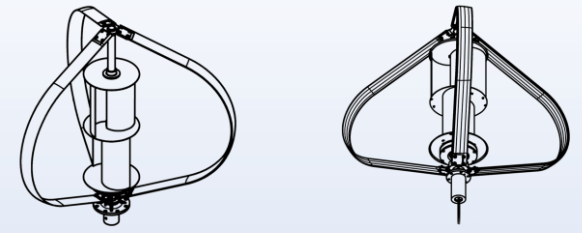


The biggest “small” wind farm ever... with small wind turbines, made by an energy provider in areas where big wind turbines had not enough space. Close to a sunflower field to demonstrate that installations of wind turbines do not disturb crops, 432 wind turbines for 1,2MW of energy.



## SMART SMALL WIND TURBINES

Cold climates in South pole and Norway, both remote areas where only sun was not enough to for the energy needs. Compensation is the key!



## SMART SMALL WIND TURBINES

### Vertical axis wind turbine model DS25

**Model:** hybrid with double blades system

**Power:** 25kW/30kW nominal/maximum

**Maximum wind resistance:** 60m/s

**Voltage:** 380V with Huawei inverter

**Generator:** coreless permanent magnet with high temperature level resistance

**Braking:** automatic braking and aerodynamic braking system

**Dimensions:** 10,8m height and 10,5m diameter

**Swept area:** 96m<sup>2</sup>

**Tower height:** 10 to 15m

**Weight:** 1,5ton

**How to use:** grid connected

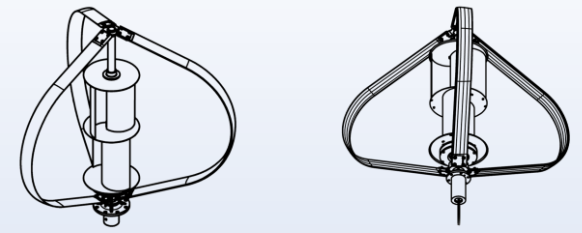
**Life time:** 20/25 years

**Noise:** silent, less than 60dB

**Materials:** steel and aluminum

**Product management:** through remote control where possible

**Applications:** sea & coastal areas, mountain & hills areas, medium/big wind farms.



Vertical axis wind turbine model DS25, now we just bring you in to the future with the brand new model 30kW hybrid wind turbine for wind farms and PPA (power purchase agreement) business models.

