# Dali Urban

## THE MOST INNOVATIVE TURBINE DESIGN

# Highlights

The Dali Urban has been developed to perform optimally at low wind speeds. The duct accelerating the wind makes it possible to generate electricity from 2.9 m/s.

Patented venturi design ensures:

- Extremely low noise;
- Higher power output with significantly better ROI for customers;
- Possibility to use duct surface for advertising;
- No shadow flickering;
- No flying objects in case of blade breakdown, or ice on blades;
- Design benefits.

Because of the small rotor diameter, the installation of the Dali Urban is not associated with complicated permission procedures. In most locations, it can be installed without any building permission on a tower below 18 m*.

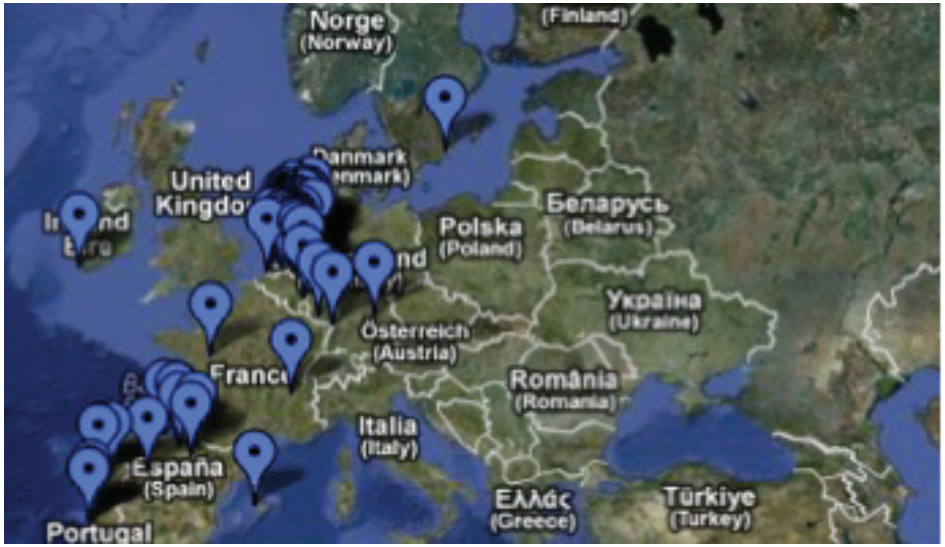
** Effective in Sweden. In other countries the legislation may vary.*

InnoVentum
power to the people

# Installed Base

Validated through the global installed base:

More than 300 wind turbines installed in six countries across Europe and additional installations on three further continents.


InnoVentum
power to the people

# Installation Examples

InnoVentum
power to the people

# Rooftop Installation

without mechanical intrusion of current roof structure

# Stand-Alone Installation

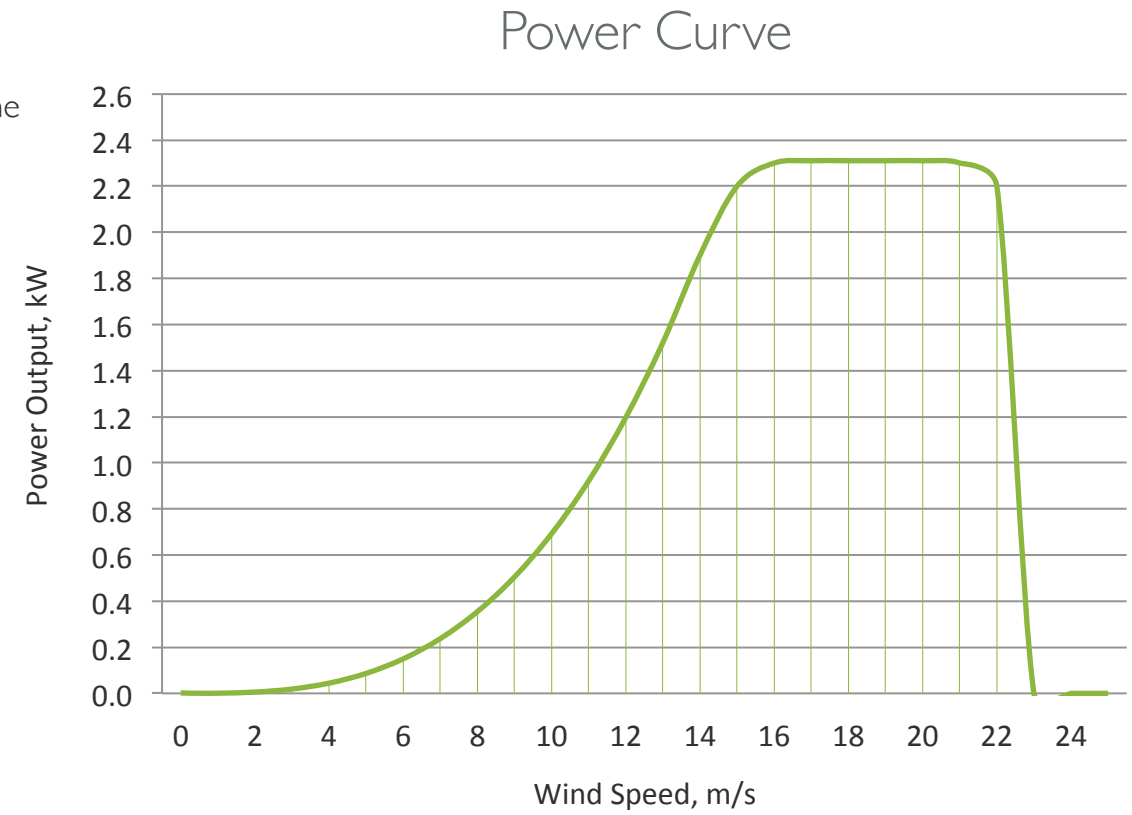
## on a patent- and design-protected wooden tower

Mörbylånga, Sweden

Rotterdam, Holland

# Technical Specifications

| | |
|---|---|
| Rated / Max power output | 1.75 kW / 2.25 kW |
| Type | Horizontal axis venturi wind turbine |
| Estimated annual energy yield | 1 800* kWh at 6 m/s |
| Rotor diameter | 1.5 m |
| Number of blades | 3 |
| Blade material | Nylon, glass fiber reinforced |
| Blade type | 3D CFD Optimized |
| Expected lifetime | > 20 years |
| Rated wind speed | 13,5 m/s |
| Rated rotating speed | 1100 RPM |
| Cut-in wind speed | 2,9 m/s |
| Cut-out wind speed | 25,0 m/s |
| Braking method | Electric brake |
| Anti-twist mechanism | Trapezoidal screw mechanism |
| Duct material | ABS with stainless steel construction |
| Duct diameter (max) | 2 m |
| Turbine weight | 110 kg |
| Tower type: | 12 m Dali XII Wooden Tower |




* The figures are given for reference only and are no guarantee of the indicated annual energy yield.

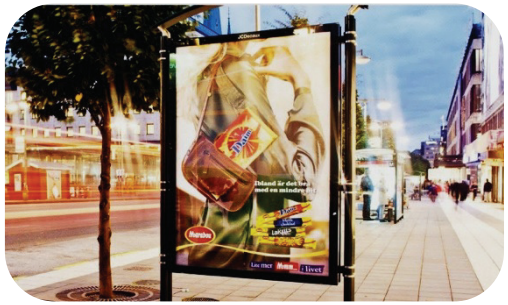
InnoVentum
power to the people

# Billboard Advertising vs. Dali Urban

For the same investment, you get:

## Outdoor advertising*

| | |
|---|---|
| 5 weeks | in Stockholm city center |
| 10 weeks | in Stockholm city, Göteborg city center, or Malmö city center |
| 14 weeks | outside city centers of the 3 main cities |
| 19 weeks | in all other larger Swedish cities |



## Dali Urban installation:

- at least 1040 weeks of outdoor advertising (product's lifetime)
- visible CSR contributing to a green image of your company
- a lot of attention and PR for an innovative wind turbine
- electricity from a renewable energy source


*Abribus by JCDecaux

# Dali XII

## a unique wooden tower

The Dali tower is inspired by the artwork of leading surrealist artists.

## Benefits of the Dali XII Wooden Tower:

### MODULARITY

Volume of wood 1.2 $m^3$

Modules no longer than 2 m

Can be transported on a trailer

### DURABILITY

Sustains wind gusts of up to 60 m/s

Lifetime > 20 years

### NOISE & VIBRATION ABSORPTION

The timber used for the Dali tower reduces the noise of small wind turbine installations

### EASE OF TOWER ERECTION

For turbines weighing less than 80 kg, the Dali tower is erected without any heavy equipment such as a crane

InnoVentum
power to the people

# Development of Our Wooden Towers

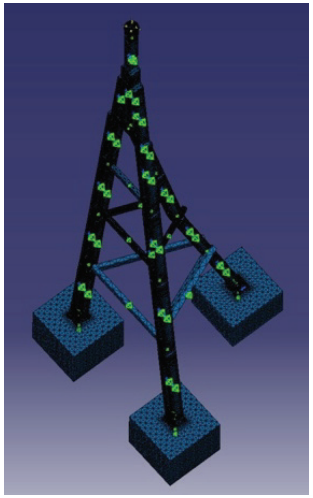

More than 6000 engineering hours were put in the development of InnoVentum wooden towers.

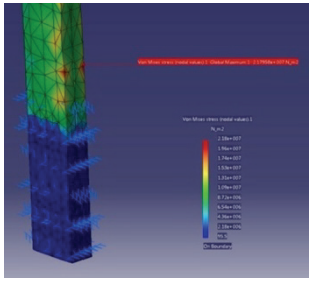
All models were tested in 1:10 scale prototypes for design validation

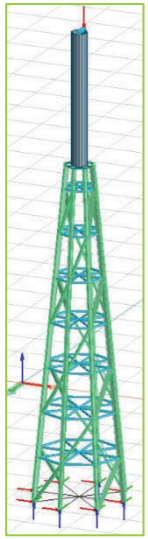
The Dali XII tower was tested full scale in-house for the measurement of all critical parameters and the initial patent application was submitted early 2012.

The Dali XII tower was further tested on site.

After 12 months of testing, a second generation of the Dali XII was developed resulting in an international patent application early 2012. Since then there were multiple installations performed across several countries with excellent results.







InnoVentum
power to the people

# Wooden vs. Steel Towers

Production of a steel tower requires a lot of energy and is associated with sizeable emissions of $CO_2$. For example, the production of steel for one 12 meter tower causes the emission of 4 tons of $CO_2$ and requires energy equivalent to 400 litres of oil. By contrast, wood material for such a tower is provided by 2 trees that have absorbed at least 1 ton of $CO_2$ during their 45 years of growth – based on energy from the sun.

Steel towers, especially hollow tubular designs, are known for amplifying the noise and vibration coming from the generator while wooden towers absorb them.

Steel towers are known for corrosion problems, especially in humid climates and in installations with close proximity to the sea.

Steel prices in the world market are increasing at a record pace, which makes the production of steel towers more and more costly – in addition to complex logistics.

As opposed to steel, wood is a renewable material, which makes it a sound choice from the point of view of sustainability – approved by Mother Earth.

| | WOODEN TOWER | STEEL TOWER |
|---|---|---|
| $CO_2$ | ABSORBS | EMITS |
| NOISE FROM TURBINE | ABSORBS | AMPLIFIES |
| CORROSION | NOT SUSCEPTIBLE | SUSCEPTIBLE |
| MARKET PRICE | STABLE | FLUCTUATING |
| MATERIAL IS.. | RENEWABLE | NOT RENEWABLE |

# Upgrade your tower to a PowerTower!

The Dali XII wooden tower allows for safe and efficient mounting of 6 to 8 PV panels delivering from 1400* kWh annually in addition to the wind turbine energy production.

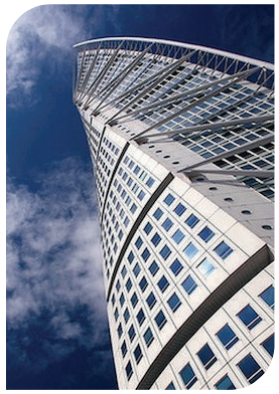
Wind and solar power harvesting technologies are highly complementary (day – night, summer – winter) providing green energy day and night, all year round.

* - calculated at the latitude of Malmö

InnoVentum
power to the people

# Interested? Contact us!

sales@innoventum.se
InnoVentum AB in Sweden
Turning Torso office 275
Lilla Varvsgatan 14
21115 Malmö, Sweden
Office phone: +46 40 30 59 66



Julien Daligault
julien@innoventum.se
InnoVentum in France
15 Rue De Mortain
FR-50600 Saint-Hilaire du H
+33 6 51 01 76 87

InnoVentum
power to the people