



# *TimberTowers for Wind Energy Plants of the Multi-Megawatt Class*

*Holger Giebel, Sandro Mainusch*

# The Company

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## **Corporate purpose of TimberTower GmbH:**

- Development
- Distribution
- Manufacturing
- Assembling

of TimberTowers including foundations for wind energy plants.

# Our Mission

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For a long time, wood used to be the first choice in the construction of wind-driven equipment – nowadays, it hardly plays any role in wind turbine construction. This is about to change with the introduction of the TimberTower on the market.



# Key Facts

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- TimberTower GmbH is a spin-off of a Hamburg civil engineering office that operated since 2002 in the field of wind (foundation and tower development and construction supervisory, services)
- TimberTower GmbH founded in march 2008 in Hannover
- Managing Directors: Gregor Prass, Sandro Mainusch, Holger Giebel
- Investors: MBG, KfW, hif, NBank, private investors

# The Market

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- Average annual growth over past 5 years: 30%
- Growth forecast: 20% p.a. until 2012
- Construction of approx. 100,000 wind energy plants worldwide by 2012
- Achievable market potential for timber made towers: 20% equivalent to 20.000 towers
- TimberTower will be No. 1 supplier in timber design and manufacturing for wind energy towers
- TimberTower will support all aspects from design to assembling

# Why using a TimberTower?



The demand on new tower concepts is market driven:

- sustainable
- cost efficient
- local production content
- transportable

The TimberTower combines the market requirements as a product





# Main advantages

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## **Energy production in tune with nature:**

The TimberTower is a 99 per cent natural product. It is carbon-neutral and easily recyclable.



## **Groundbreaking cost effectiveness:**

Depending on size and location, the TimberTower can produce savings of up to 20% for each project.



## **A logistic revolution:**

Delivered on-site in 40 ft containers, the TimberTower allows for easy access to almost any location worldwide.

# Construction



## Technical Characteristics:

- The tower is a closed polygonal hollow body
- The material is a composite from cross-laminated timber and surface material components
- Prefabrication of timber panels including fasteners in the production process
- Heights of up to 160 Meter are feasible
- On-site assembling





# Advantages timber vs. steel

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- Better damping over steel
- Higher fatigue strength
- The weight specific strength of timber is higher than the weight specific strength of steel
- The fire resistance of timber is higher than fire resistance of steel, as steel loses its strength quicker
- The durability of timber is increased when surface coated and used sub consequently in an protected environment

# Certification of wind energy plants

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## **Wind Energy Plants need to be type certified!**

- Certification basis is IEC 61400
- The certification based on the Germanischer Lloyd (GL) rules
- Additionally in Denmark and Germany has to be followed a typ certification on the Guidance Material for Wind Energy Plants of DIBt (Deutsches Institut für Bautechnik)
- Type certification by German TÜV is completed for the first wind energy plant with an TimberTower

# Cross-laminated timber

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- Cross-laminated timber is produced from cross-wise laminated spruce board layers.
- The cross-wise arrangement of longitudinal and lateral slats reduces moisture expansion and shrinkage of the panel to an insignificant minimum and produces a considerable increase in static load capacity and strength of shape.
- The exclusive use of kiln dried timber with a wood humidity of 12% (+/- 2%) excludes destructive vermine, insect or mold infestation.

# Cross-laminated timber

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- In the production of the solid wood components, great emphasize is laid on the employment of contemporary, energy efficient and environmentally friendly production methods.
- The solid wood panels are conform to emission class E0. This allows for their clean thermal disposal, as residue-free as for non-laminated wood.
- The PEFC Certificate of Endorsement of our timber suppliers guarantees that the raw material used in our product has been produced in ecologically, economically and socially sound ways.

# Cross-laminated timber



# Partners of TimberTower

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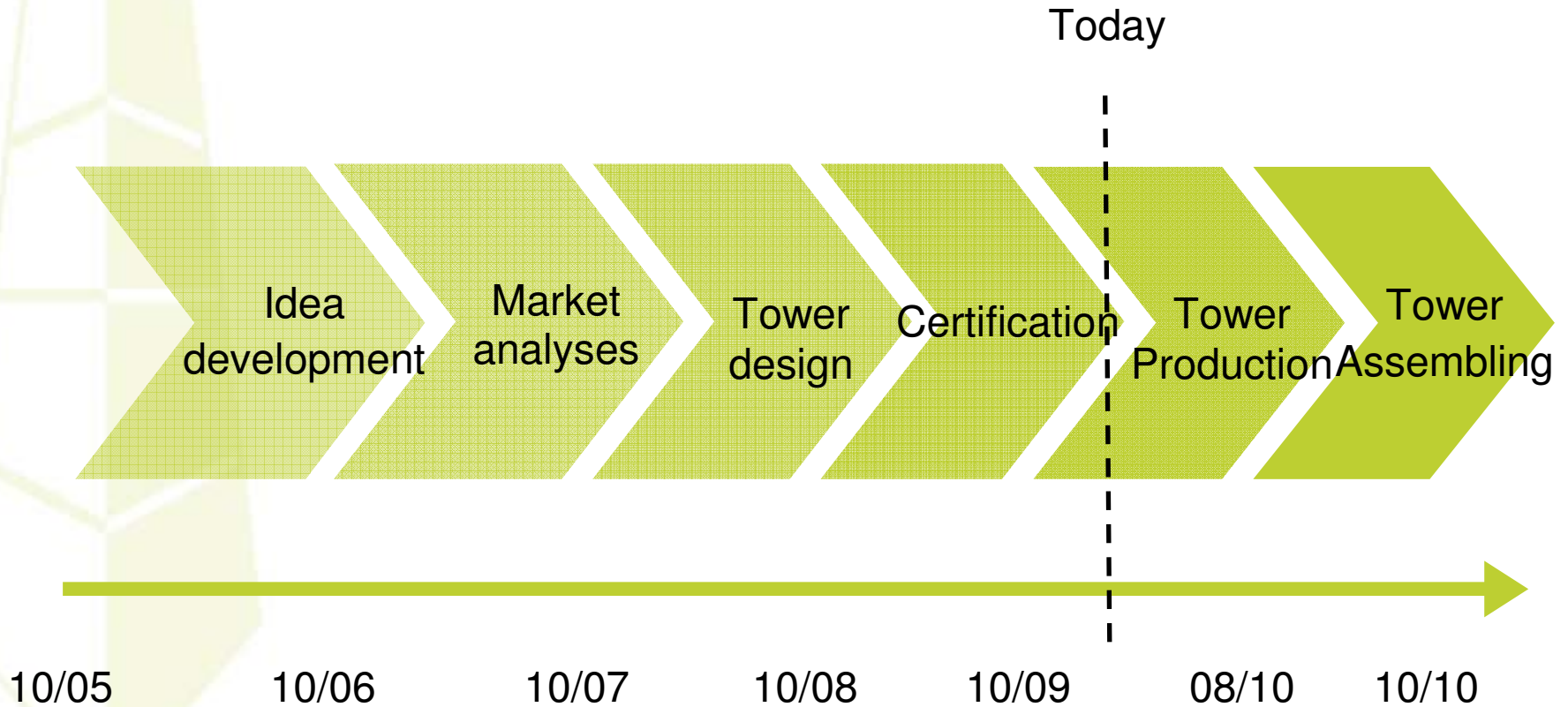
## **Projektpartner:**

- Vensys Energy AG: Supplier of wtg´s
- KLH Massivholz GmbH: Supplier of timber
- Cordes Ing. Holzbau GmbH: Tower assembling
- Purbond GmbH: Supplier bonding technology
- Sika Deutschland GmbH: Supplier surface protection

## **Scientific support:**

- University of Hannover
- MPA Wiesbaden

# Development timeline



# TimberTower



**proven by Nature**



**strong by design**