# STORM's Wind Power

**STORM's Wind Power** designs and supplies high-capacity vertical-axis wind turbines (**VAWT**) of its own design, which compare favourably with the designs of the world's leading manufacturers of high-capacity wind turbines, the absolute majority of which are horizontal-axis turbines (HAWT) with three-blade rotors.

STORM's Wind Power brings to your attention a comparison of the Turkish project, implemented jointly with Siemens, and our - even if still existing only in the form of calculations and drawings. The article about the 1 GW Wind Power project is used and it gives an opportunity to compare the projects of the consortium **Siemens-Türkerler** and **Storm's Wind Farm Project**.

... "In 2017, the Ministry of Energy and Natural Resources of Turkey launched a project to invest up to $US 1 billion in wind energy. The project is named **YEKA** (in Turkish: Yenilenebilir Enerji Kaipaka Alanları, or use of renewable energy resources), it involves the construction of wind farms in five different regions in the country with a total capacity of 1,000 MW and at least 3 billion kWh of energy generated per year.

On August 3, 2017, the German-Turkish consortium **Siemens-Turkerler-Calon** offered the lowest price of **$0.0348 US per kilowatt** hour to supply electricity to the national grid. The consortium will carry out R&D for ten years, designing wind turbine blades, generator design, material technology and production methods, software and innovative gearboxes. The R&D activities will be carried out by fifty engineers and technicians, consisting of 80% of Turkish domestic engineers, with a budget of $ 5 million per year.

**STORM's Wind Power** designs and manufactures **vertical axis wind turbines** of its own patented design. They have much more compact bases, which are manufactured mainly from concrete directly at the turbine's installation site, their generators are located directly at the base and do not require lifting to a height for maintenance, their design uses direct drive of the generator rotor, no gearbox is required, and their own configuration of wind wings instead of huge heavy blades.

This makes it possible to build more single-power turbines with longer service life and safe maintenance at lower altitudes. The vertical type of turbine allows you to expand the working range of wind speeds and thus increase annual electricity production at the same rated capacity. Lower maintenance costs allow **STORM's Wind Power** turbines to compete in the spot electricity market even at prices below **$0.01 per kilowatt hour**.

The follow table contains comparative characteristics of wind farms and turbines **HAWT 10MW** designed by leading world manufacturers and designed by **STORM's Wind Power VAWT 20 MW**.

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**HAWT 10 MW wind farm  project from Siemens** (above)

**Storm's VAWT 20MW  project** (above)

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**Comparison table**

| # | Indicator | Siemens-Turkeler | Storm's Wind Project |
|---|---|---|---|
| **General characteristics of the project** | | | |
| 1 | Costs | $ 1 billion. | $ 1 billion |
| 2 | Total capacity | 1,000 MW | 1,000 MW |
| 3 | Annual electricity production | 3 million MWh | 5 million MWh. |
| 4 | Wind turbine type | HAWT 10 MW | VAWT 20 MW |
| 5 | At wind speed | 11 m/s | 10 m/s |
| 6 | Number of installations | 100 | 50 |
| 7 | R&D budget<br>For years | $50 million<br>10 years | $ 100 million<br>5 years |
| 8 | Test samples in operation | No data. | Yes, $60 million. |
| 9 | Price of electricity | 0.0348 US$/kWh<br>at least | 0.0177 US$/kWh<br>Max. |
| **Characteristics of the turbine** | | | |
| 10 | Type of turbine | HAWT 3 blades | VaWT 3 wings |
| 11 | Gearbox | Yes | No |
| 12 | Bearing lubrication | Oil | Water |
| 13 | Generator cooling | Air | Water + air |
| 14 | Rated power | 10 MW | 20 MW |

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| | | | |
|---|---|---|---|
| 15 | At wind speed | 11 m/s | 10 m/s |
| 16 | Annual electricity production | 30 000 MWh | 100 000 MWh |
| 17 | Owned area | 24000 m2 | 48000 m2 |
| 18 | Diameter or width x height | 180 m | 300 x 220 m2 |
| 19 | Weight of the turbine with foundation | 4000 Ton | 2300 Ton |
| 20 | Price of the turbine (estimate) | $10,000,000 | $20,000,000 |

For investment or engineering proposals/offers please feel free contact our CEO, Ingo Storm

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