

MAIN ADVANTAGES OF THE WINDMILL TOWER DEVELOPED BY "TECHALDO" RMA COMPANY COMPARED WITH THE COMMONLY USED WIND TURBINES (see Fig.1)

1. CAPITAL CONSTRUCTION

The reinforced concrete windmill tower furnished with the top-installed AEM for electricity generation is a capital structure designed for a rather long period of operation. This wind farm is equivalent to the prototype of power plants that operate in the world from the beginning of the last century to the present day.

2. DURABILITY OF THE FACILITY

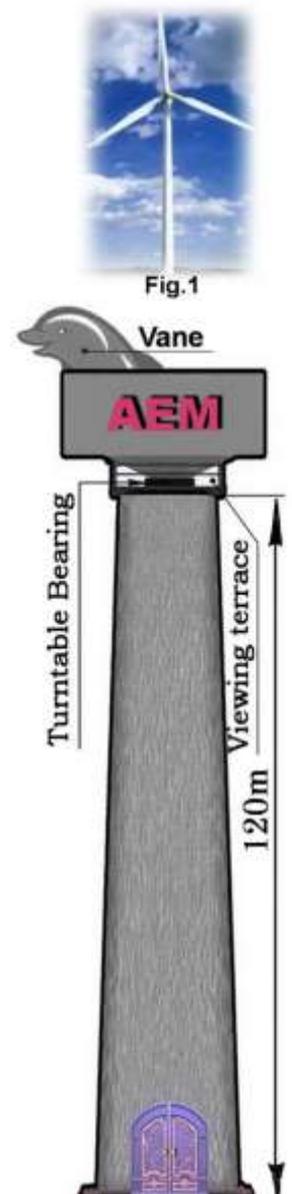
The reinforced concrete tower is made of high-strength reinforcing steel and high-strength concrete. AEM turbines are fabricated of light and high-strength sheet alloy Ti-6Al-4V. Today's strength characteristics of titanium alloys, taking into consideration actual wind loads imposed on the blades, have a multifold strength margin, which ensures a turbine life of more than 100 years. Long-term and reliable operation of the main systems and mechanisms of the AEM is ensured by continuous multi-channel vibration monitoring of wind turbines and tower supporting structures. Vibration analyzers automatically control the wear of the supporting bearings, and also provide a forecast for the remaining service life. Strict compliance with the bearings replacement schedule prevents turbine vibration as well as subsequent emergency situations, which is a guarantee of reliable operation of the main systems and mechanisms of the windmill tower for many decades.

3. OPERATIONAL COSTS

The bearing in the shock-absorbing bearing race is the only mechanical part that needs to be replaced every 7-10 years, lubricant in the bearing housings is to be replaced every 2-3 years, and cable conduits every 30 years respectively. These costs are regained within 1-2 operating days.

4. SAFETY OF THE FACILITY

AEM generates electricity silently. The process is harmless for animals and other living beings, including humans. It is also safe for birds because the air inlet windows are covered with the stainless wire mesh. Thus, AEM is intended for use both in residential areas and outwith.



5. AEM CONSTRUCTION EXCLUDES RADAR INTERFERENCE

The structural design of turbines excludes the windows of transparency along the entire trajectory of the blades' circular motion, which in turn excludes the appearance of the false radar signals. The said feature of the developed device operation removes the territorial restriction for the location of the high-rise tower with the AEM near the ground and sea-based air defense facilities, airports, etc.

6. ADDITIONAL EQUIPMENT

The towers are equipped with an elevator (spiral staircase) for moving of technical personnel and also for organization and conducting excursions.

7. AEM POWER OUTPUT

The power generating capacity depends on the geographical terrain, on the number of wind turbines installed in AEM and on the height of the reinforced concrete tower, which should allow for an average wind speed of at least 8 m/s. Depending on the demand for electricity the designed power generated is from 1.0 to 8.0 MWh.

8. AEM OPERATION MODE

AEM, operating in the automatic mode, generates as much electricity as the consumer needs for his in-house loads with allowance for accumulation of excess electricity and the readiness of the common grid to receive it. This is achieved by changing the wind turbines rotation speed in the preset automatic mode (in the range from 500 to 3000 rpm), which also functions as protection of AEM from storm winds over 20 m/s.

9. ADDITIONAL SERVICES

Depending on the location and the productive use, the windmill tower can be equipped with the high speed elevator to bring the visitors to the top of the tower, where they can enjoy the view of the city sights and the local landscapes from the viewing terrace, fenced with the special highly resistant glass.

NOTE:

In the proposed innovative project "HEALTH FARM - GREEN SKYSCRAPER" the maximum AEM power output is up to 120 MWh at the daily average wind speed throughout the year over 15 m/s at the height of 530 m (total planted area is 50 hectares).

In order to prevent both Pollutant-free plant products and 1750 service staff exposure to radio emission, the greenhouse-skyscraper design provides for screening of the building (placing metal gauze underneath the finish coat of the building's surface coating).

Exercising the designer supervision right, the author forbids installing on the building of various transceivers (antennas, radars, etc.).