GLOBAL WIND POWER

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Izvorni naučni rad

Abstract

Development of wind energetics is nowadays the trend in the whole world. Regarding the global availability of the resource the wind energy is presently the most significant renewable resource in every country, that is used to produce electric energy. The energy consumption represents the amount of used energy in all areas of life as for instance electric energy, heating, transport. The world in 2023 is registering the record values of the installed capacity of wind energy. The use of wind energy in the world brings positive effects and represents the main point of prosperity which reinforces industrial competitiveness, secures long-term economic sustainability, new work positions, investments, decreases import accounts, price availability and clean energy. Problems and barriers of development of wind energy are connected mainly with the regulation of politics, environment, and the stability of network supplies.

Key words: investment opportunity, renewable energy sources, wind energy, wind power plant.

Introduction

There are wind plants in the world that are taken as the ecological solution of the problem with production of electric energy without consequences on the surrounding environment. Wind, as the source of energy is widely available in the world. Wind energy is a process when the wind it is used to produce electric energy, and it is one of the fastest growing forms of production of electric energy in the world. The wind power has been used more than 1000 years. Wind plants or turbines are placed on hills and appropriate places standing out above the surrounding terrain. Wind plants are often considered as the cleanest and most ecological source of electric energy. It is important to consider except the direct economic contributions also the improvement of environment, decreasing of the dependence on the import of energetic sources as coal, oil, wood mainly from the politically unstable regions.

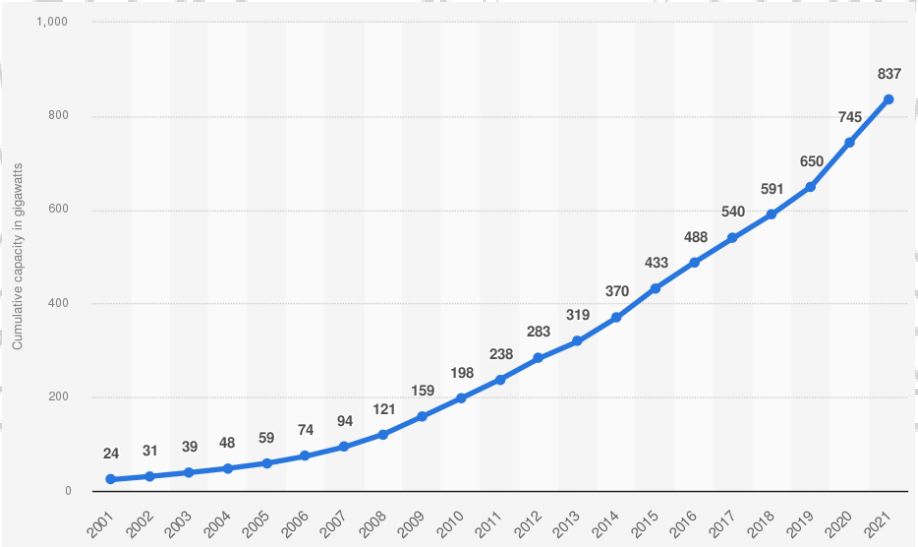
Wind power capacity worldwide

All wind turbines installed in the world until the end of 2022 have the potential to cover around 5% of world-wide consumption of electric energy. As the division of the installed power in the world, there is 73% of all power installed in the five most known countries interested in wind power – China, USA, Germany, Spain, and India.

We divide wind plants according to the installed capacity into:

- Micro plants – with capacity up to 30 kW
- Medium – sized plants – with the capacity up to 100 kW
- Big plants – with the capacity over 100 kW

Cumulative installed wind power capacity worldwide from 2001 to 2021*(in gigawatts)*

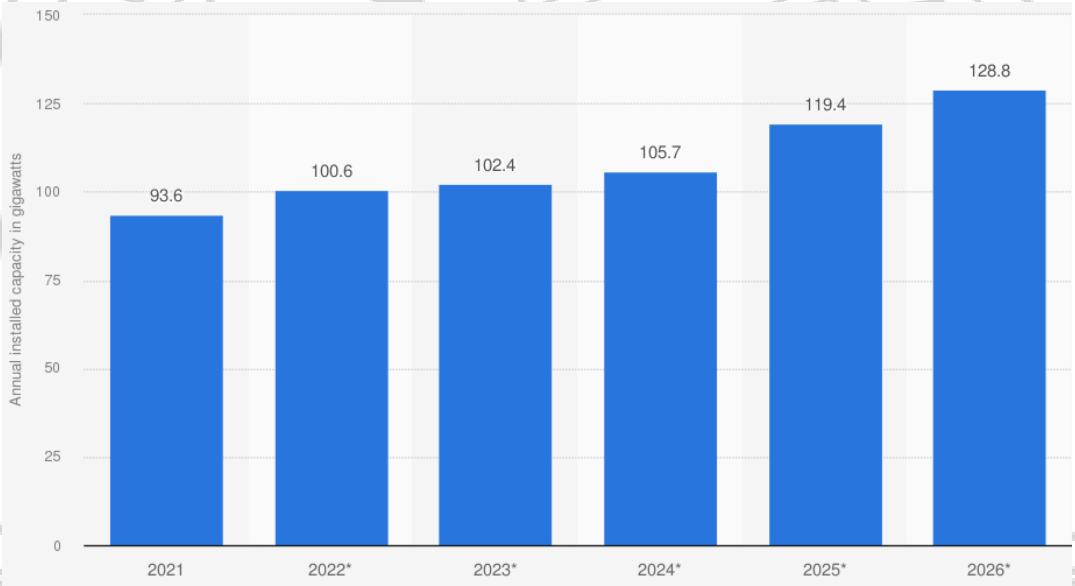


Source: GWEC. (April 4, 2022). Cumulative installed wind power capacity worldwide from 2001 to 2021 (in gigawatts) [Graph]. In Statista. Retrieved March 27, 2023, from https://www.statista.com/statistics/268363/installed-wind-power-capacity-worldwide/

The cumulative capacity of installed wind power worldwide amounted to approximately 837 gigawatts in 2021. Onshore wind power accounted for the majority of total wind power capacity, at about 780 gigawatts that year. The largest wind power market in the world is China, with a capacity of over 237 gigawatts of wind power installed. Future of renewables emerging markets such as those in Latin America and Southeast Asia are expected to drive the upcoming wind development market. Additional government support and policies will allow for faster market growth in these regions. Global renewable energy generation as a share of total generation continues to grow as renewable technologies become more cost-effective (Statista 2023).

In 2023 all around the world there have been the record values of the installed capacity of wind power observed. The overall potential of wind energy in the world leads to the construction of wind plants. The support of renewable energy sources has been in the last ten years one of the key pillars of energetics in many countries. The production of this clean energy is growing every year and therefore the wind energy is nowadays one of the fastest developing renewable source of energy. The biggest interest in the use of the energy from wind is in countries which have the suitable wind conditions for the construction of wind plants and above all the developed industry.

Projected global annual wind power capacity in 2021 with forecast until 2026 ***(in gigawatts)***



Source: GWEC. (March 28, 2022). Projected global annual wind power capacity in 2021 with forecast until 2026 (in gigawatts) [Graph]. In Statista. Retrieved March 11, 2023, from https://www.statista.com/statistics/185547/global-wind-market-forecast-by-annual-capacity-since-2010/

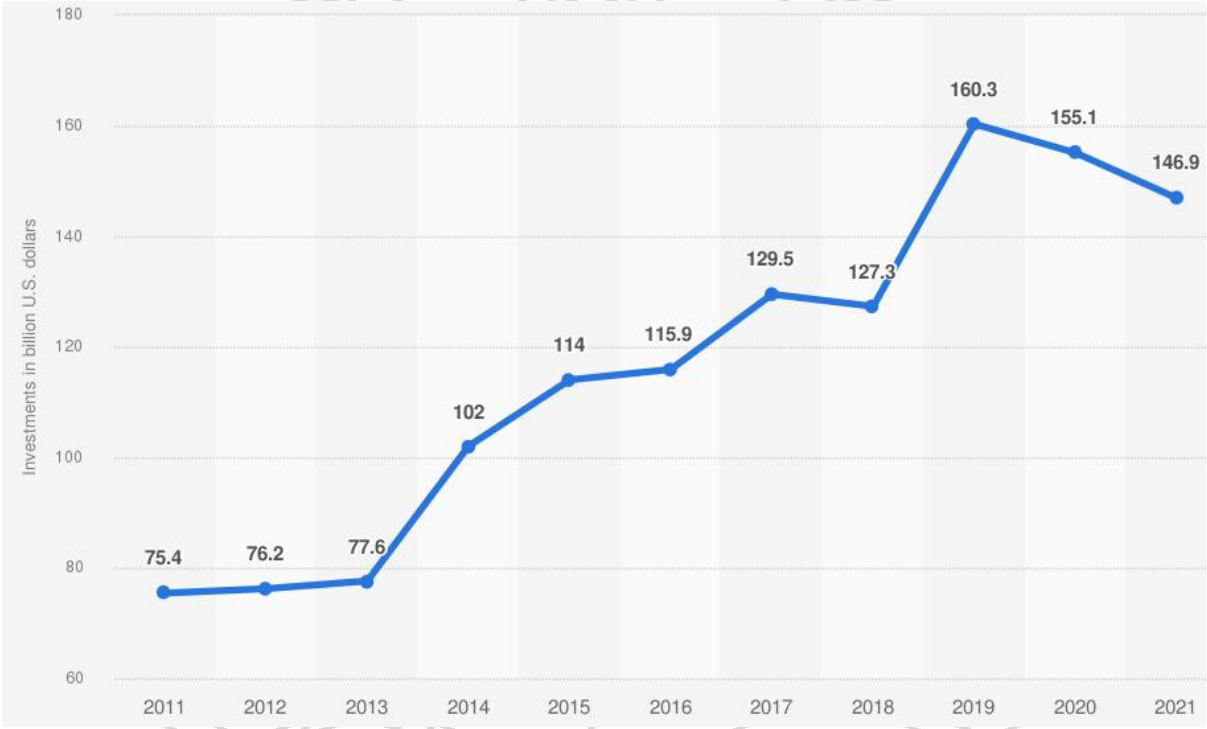
New installations of wind power worldwide amounted to around 93.6 gigawatts in 2021. An upward trend in new wind power capacity additions is expected, with new additions forecasted to reach 128.8 gigawatts in 2026.

Investments in wind energy worldwide

The enough amount of electricity for the price that will provide not only the competitiveness of economy, but also its availability for the citizens has except of other things the influence on the standard of living of inhabitants in the world as well as on reaching its comparable level with developed countries.

The use of wind energy requires a good analysis of its economic effectiveness. Investing into wind energy is one possibility how to decrease its dependence on the constantly changing prices of energy on the markets and stock exchange markets. When deciding about the investment into wind energy, entrepreneurs and an investor has to count or at least assess return on this type of investment or the possibility to gain the price of the necessary energy.

Value of investments in wind energy worldwide from 2011 to 2021*(in billion U.S. dollars)*



Source: REN21. (June 14, 2022). Value of investments in wind energy worldwide from 2011 to 2021 (in billion U.S. dollars) [Graph]. In *Statista*. Retrieved March 11, 2023, from https://www.statista.com/statistics/186821/global-investment-in-wind-technology-since-2004/

Global investments in wind energy technologies reached roughly 147 billion U.S. dollars in 2021. Investment has increased considerably over the past decade. In 2011, wind energy investments amounted to 75.4 billion U.S. dollars. Overall, China, the United States, and Europe have made the largest new investments in renewable energy, including but not limited to wind. China currently leads with the highest capacity additions of wind power worldwide. In Europe, onshore wind power has been an important industry many countries and have also become a leader in the development of offshore wind technologies. For example, Germany is has long been one of the forerunners in new wind installations in Europe (Statista 2023).

Wind industry brings the direct economic advantages to countries which provide social and economic advantages to their citizens mainly by providing them work positions and

investments. The use of wind energy in the world brings positive effects and represents the central point of prosperity which reinforces industrial competitiveness, ensures long-term sustainability of economy, new job positions are created, decreases import accounts, price availability and clean energy.

Main barriers of the wind energy development are connected mainly to the regulation of politics and administration, various criteria of fulfilment conditions and approvals, the environment, and the stability of net supplies.

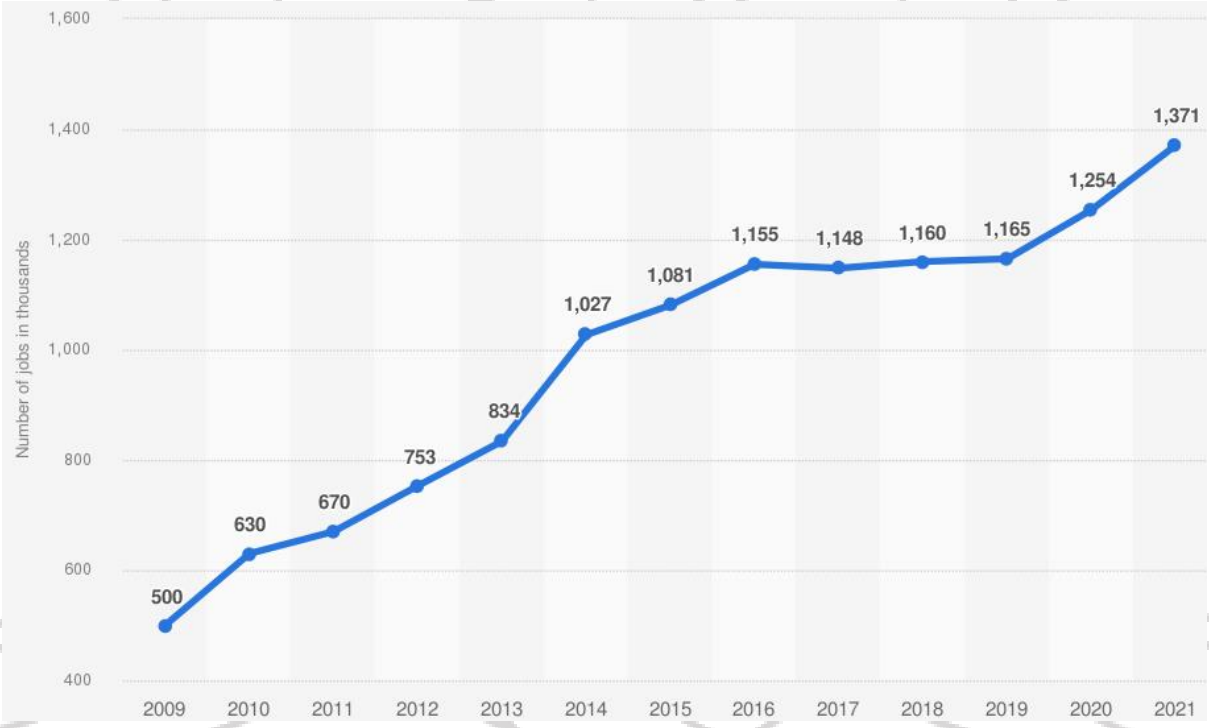
Negative impacts of wind plants are generally divided into three basic groups:

1. Disturbance by wind plants – noise and its presence that leads to the relocation or disappearance of some species including the barrier effect on migrating species

2. Mortality caused by the collision connected to its construction as the rotation of propeller and the poles by themselves in their immovable state,

3. The loss or destruction or disruption of the biotope environment because of the construction and the presence of construction with the infrastructure connected to it (Cetkovský et. al. 2010).

Number of jobs in the wind energy industry worldwide from 2009 to 2021*(in 1,000s)*



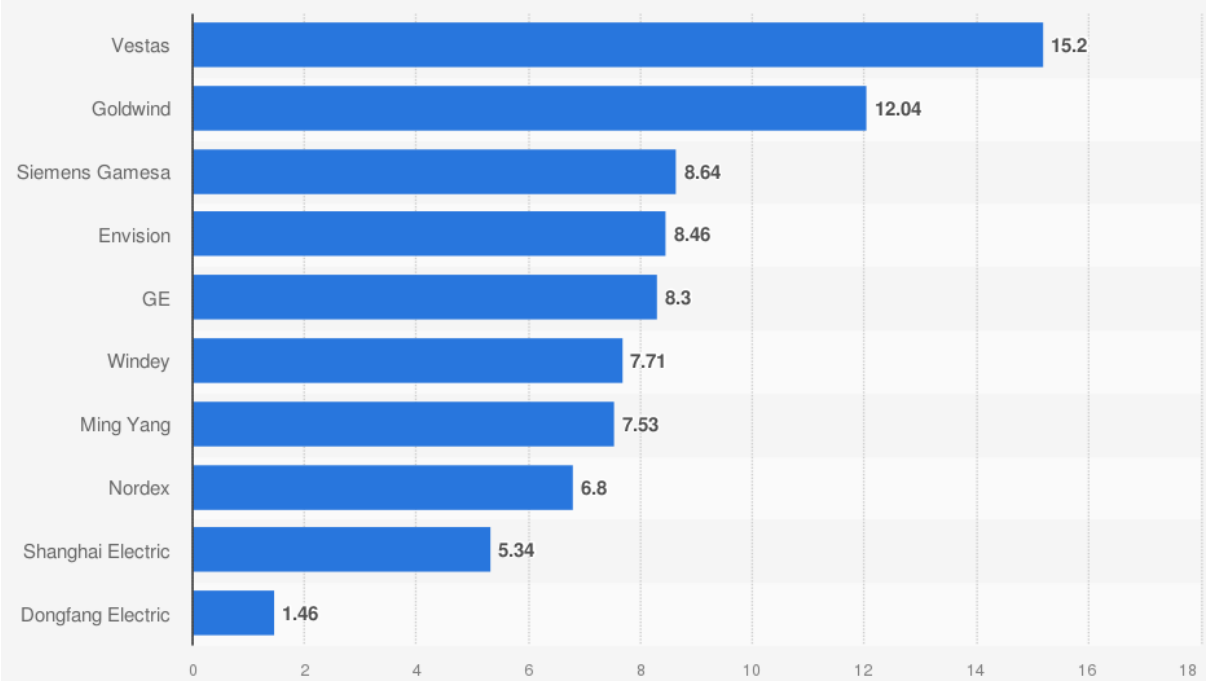
Source: IRENA. (September 20, 2022). Number of jobs in the wind energy industry worldwide from 2009 to 2021 (in 1,000s) [Graph]. In *Statista*. Retrieved March 11, 2023, from https://www.statista.com/statistics/268400/jobs-in-the-wind-energy-industry-worldwide-since-2005/

The number of wind energy-related jobs worldwide amounted to 1.37 million in 2021, an increase of about nine percent from the previous year. The industry has seen near-continuous employment growth in the period of consideration.

Wind turbine manufacturers

Production costs of wind energy are relatively low in comparison with other energy sources from the renewable sources and under some conditions, wind energy is competitive by its costs regardless of external impacts as factors of environment and health are. Wind plants in mainland represent the cheapest form of the new generation of electric energy. Wind Park creates more wind turbines in the commune location. The transmission to green energy has brought ecological benefit to many companies. The more companies will support green energy, the more we can enhance competition in production of wind turbines what will bring less burden on the environment in the world.

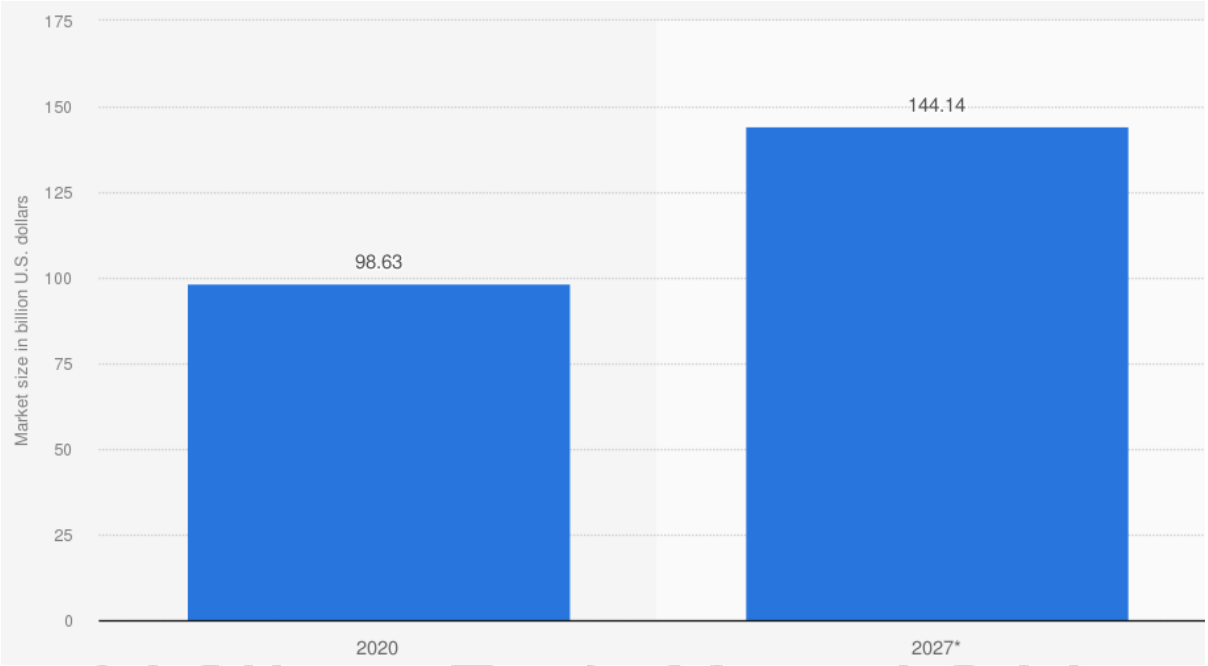
Leading wind turbine manufacturers based on commissioned capacity worldwide in 2021*(in gigawatts)*



Source: BloombergNEF. (March 23, 2022). Leading wind turbine manufacturers based on commissioned capacity worldwide in 2021 (in gigawatts) [Graph]. In Statista. Retrieved March 11, 2023, from https://www.statista.com/statistics/516028/capacity-commissioned-for-the-leading-wind-turbine-manufacturers-worldwide/

The world's leading wind turbine manufactures as of 2021, based on their commissioned capacity was Vestas. During this year, Denmark's Vestas manufactured about 15.2 gigawatts of onshore and offshore commissioned wind capacity.

Wind turbine market value worldwide in 2020, with a forecast for 2027*(in billion U.S. dollars)*



Source: Research and Markets. (August 30, 2022). Wind turbine market value worldwide in 2020, with a forecast for 2027 (in billion U.S. dollars) [Graph]. In *Statista*. Retrieved March 11, 2023, from https://www.statista.com/statistics/663483/projection-of-global-wind-turbine-market-growth/

In 2020, the global wind turbine market size stood at roughly 98.6 billion U.S. dollars. It is forecast that the wind turbine market value will grow with a compound annual growth rate (CAGR) of 5.6 percent from 2021 to 2027, reaching over 144 million U.S. dollars by the latter year (Statista 2023).

Conclusion

The world is depended on energies therefore we need sources that will last forever and will be able to secure sustainable development of every society. Nowadays, when the prices of energies are increasing and there is a pressure on decreasing impacts of energetics on the environment, the attention is focused on the use of primary renewable energy sources. Wind energy works on the principle of inexhaustible wind energy, which we use practically for free and therefore it is not subject to inflation. In the global environment, the availability of the source is wind energy and nowadays it is the most significant renewable source that it used to produce electric energy.

Literature

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