wind turbine

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Agenda

Introduction:

- Industry of Wind Turbines.
- Concept of wind turbines.
- Types of wind turbines.

Locations of wind turbines

Wind turbine manufacturers

Plant operators

Recommendations

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1888

The first US wind turbine is built

Jan 2022

More than 70,800 wind turbines in the U.S

118 GW

Total wind turbine capacity in the U.S.

The United States has the **second largest** installed wind power capacity in the world after China

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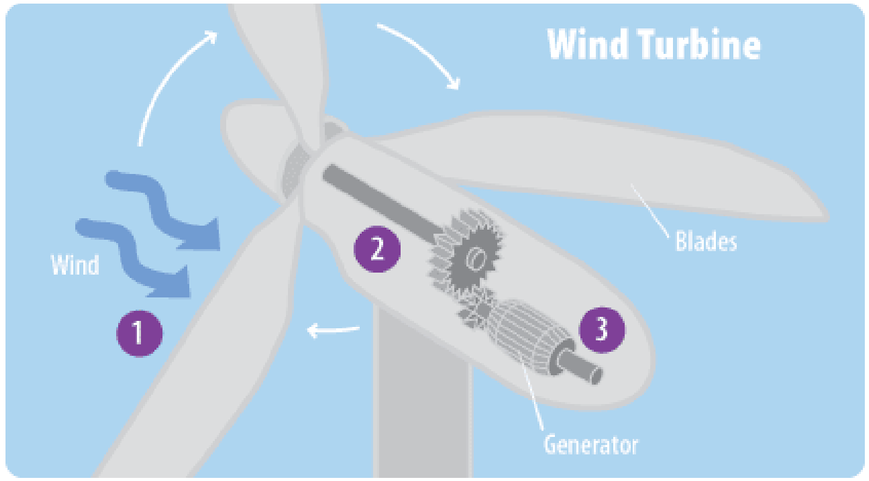
Operating Principle



A series of blades catch the wind (Kinetic Energy)

The rotor translate the kinetic energy into a rotational energy.

The rotor turns the generator that creates electricity.

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Types of wind turbines

Onshore

Turbines that are located on land and use wind to generate electricity.

Offshore

Turbines that are set up in water bodies such as oceans and seas. Offshore wind turbines tend to be larger, more powerful, and more expensive than onshore ones.

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Onshore vs Offshore Wind Turbines

	Onshore	Offshore
Pros	• Cost-effective • Quicker Installation • Boosts Local Economy	• Generates more energy • More Efficient • less physical impact on the environment .
Cons	• The capacity could vary due to the change in wind speed. • Generates Less Power	• More expensive • Maintenance Challenges

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Where are the highest capacity turbines located?

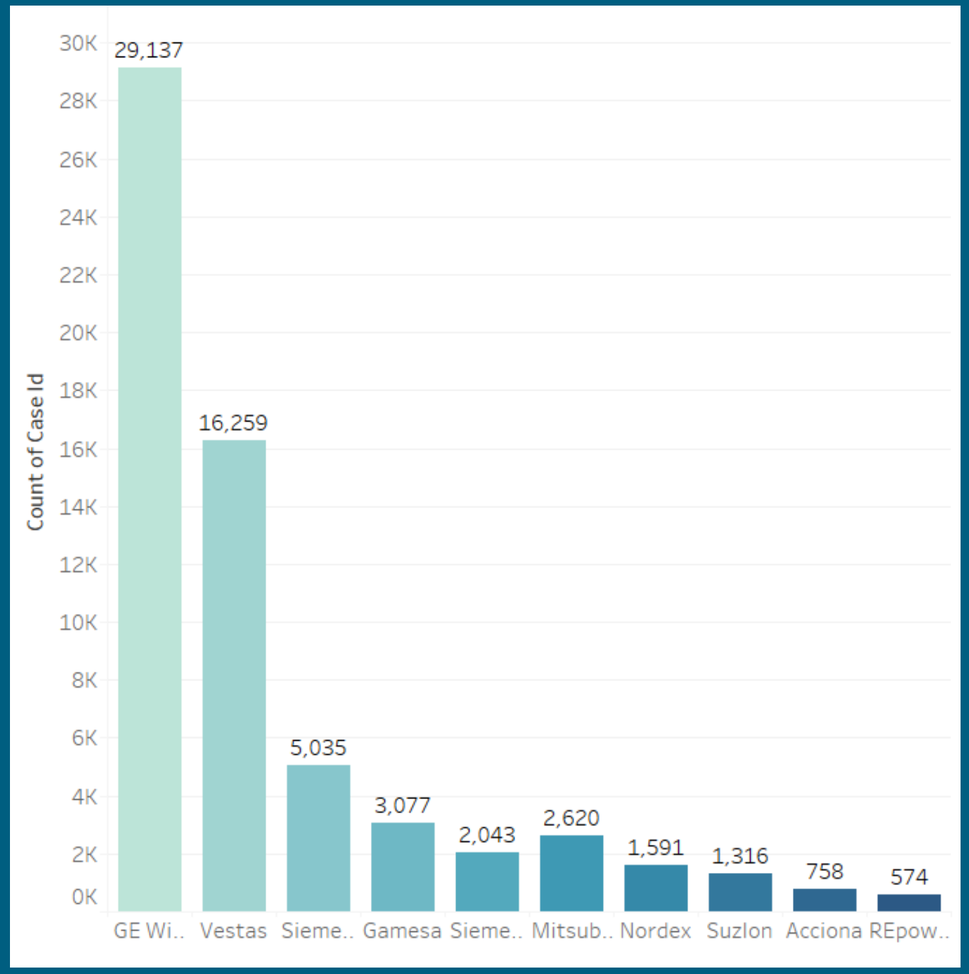
Why do only states in the middle have high capacity turbines?

VizSlides FREE for Tableau Public

CLOSE

LOADING DASHBOARD AND APPLICATION

Equipment Manufacturer (OEM)



01 **General Electric (GE) Wind**

More than 29,000 turbines with full turbine features confidence. The company produced (41%).

02 **Vestas**

Produced the next highest number. 23% or 16,259 turbines .

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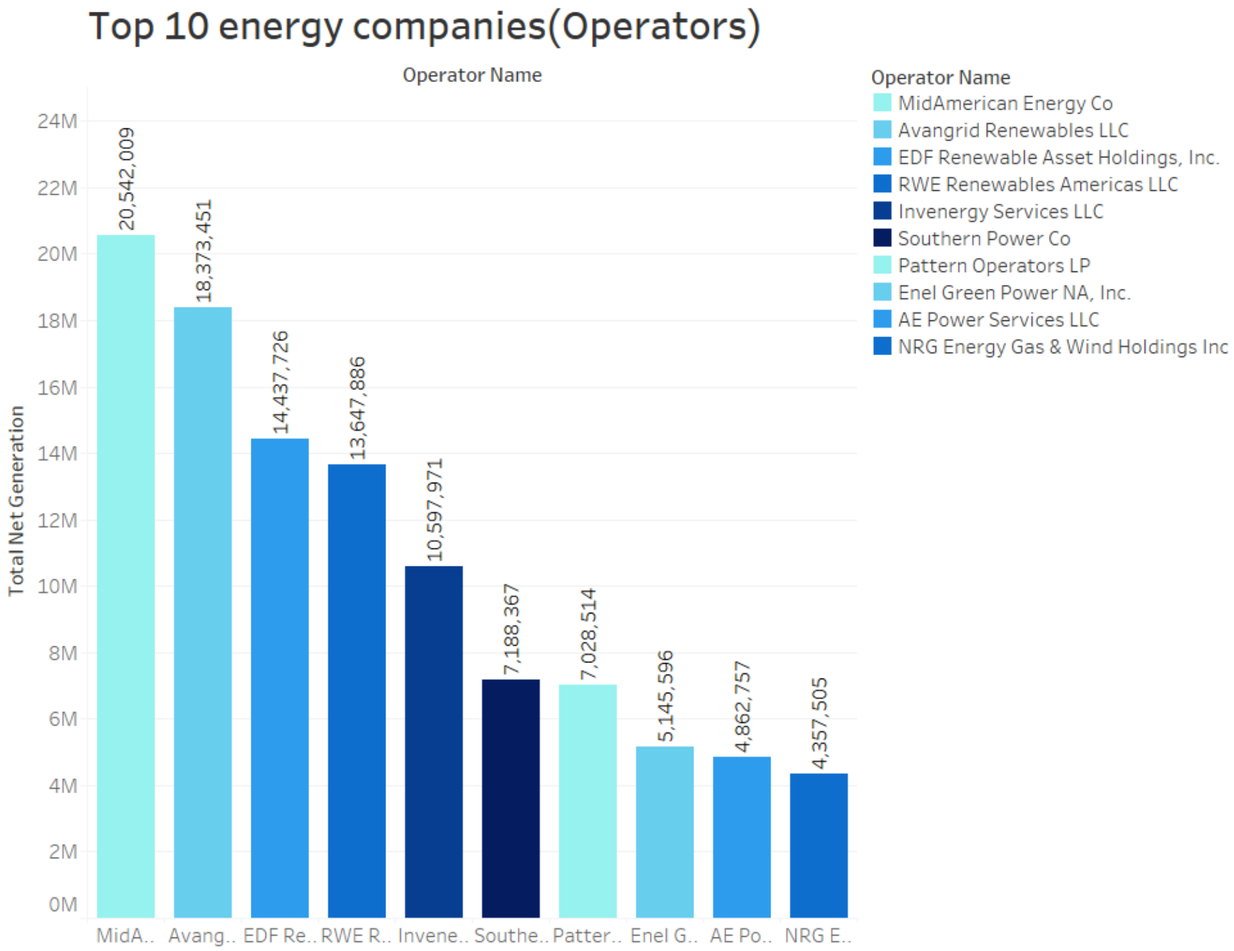
The best plant operator in terms of electricity generation



MidAmerican Energy Co

The company generated around 21 million (MWH) of electricity in 2020.

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Recommendations

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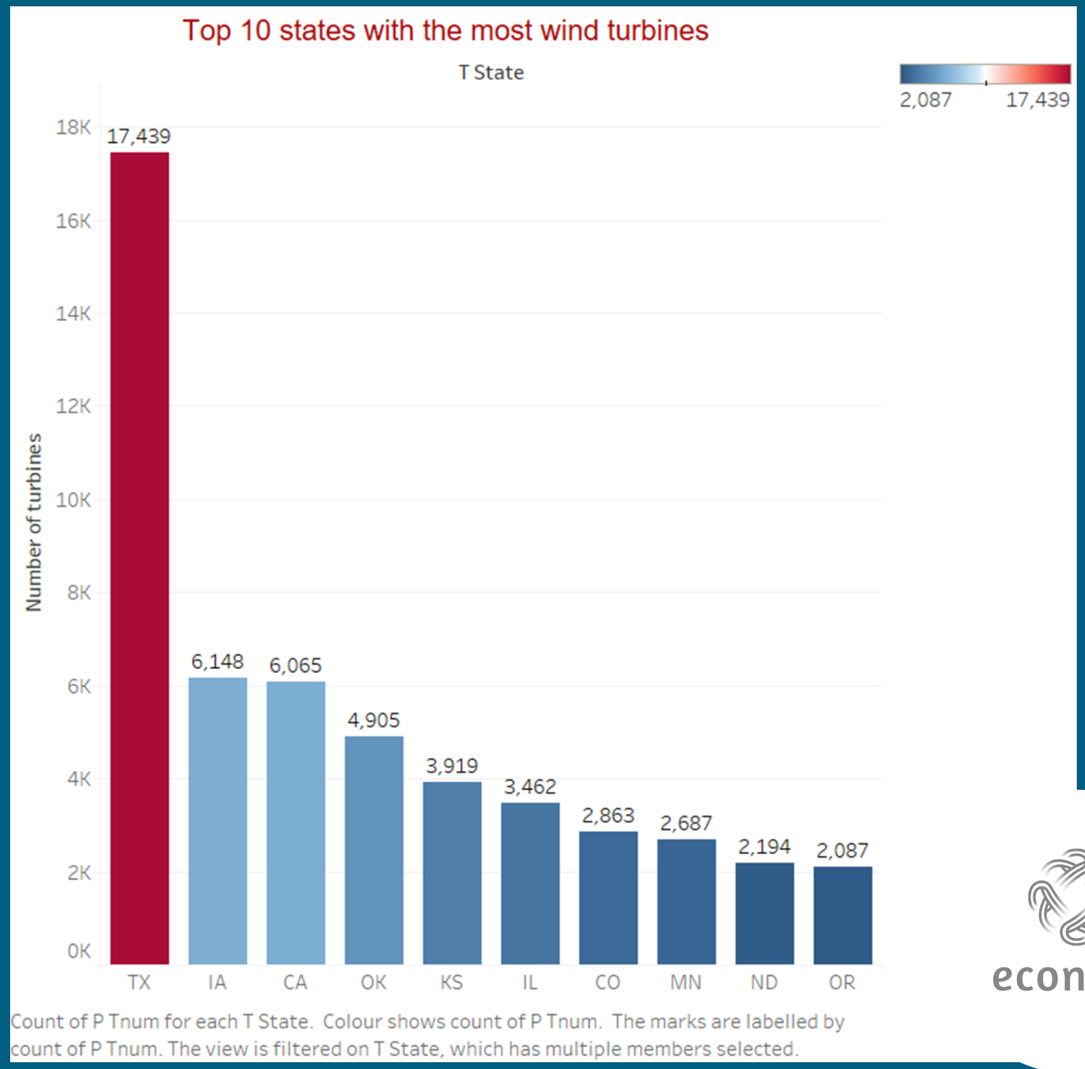
Location

Texas is the ideal place for wind turbines

Texas has an additional 10,000 wind turbines compared to other states. Because of the following factors:

- **The wind belt:** Texas is situated in a natural wind belt that generates a high volume of wind. because of the westerly wind that blows over the Rocky Mountains to the high plains and its located in the area of tornado ally .
- **Countryside areas:** Texas doesn't have to worry as much about zoning regulations or spacing issues.
- **Infrastructure:** Texas has nearly 500 miles of transmission lines throughout the state to help transport electricity generated by its wind farms.
- **Taxes:** The state has a favourable tax system for energy producers so it's more affordable for businesses to build energy farms.



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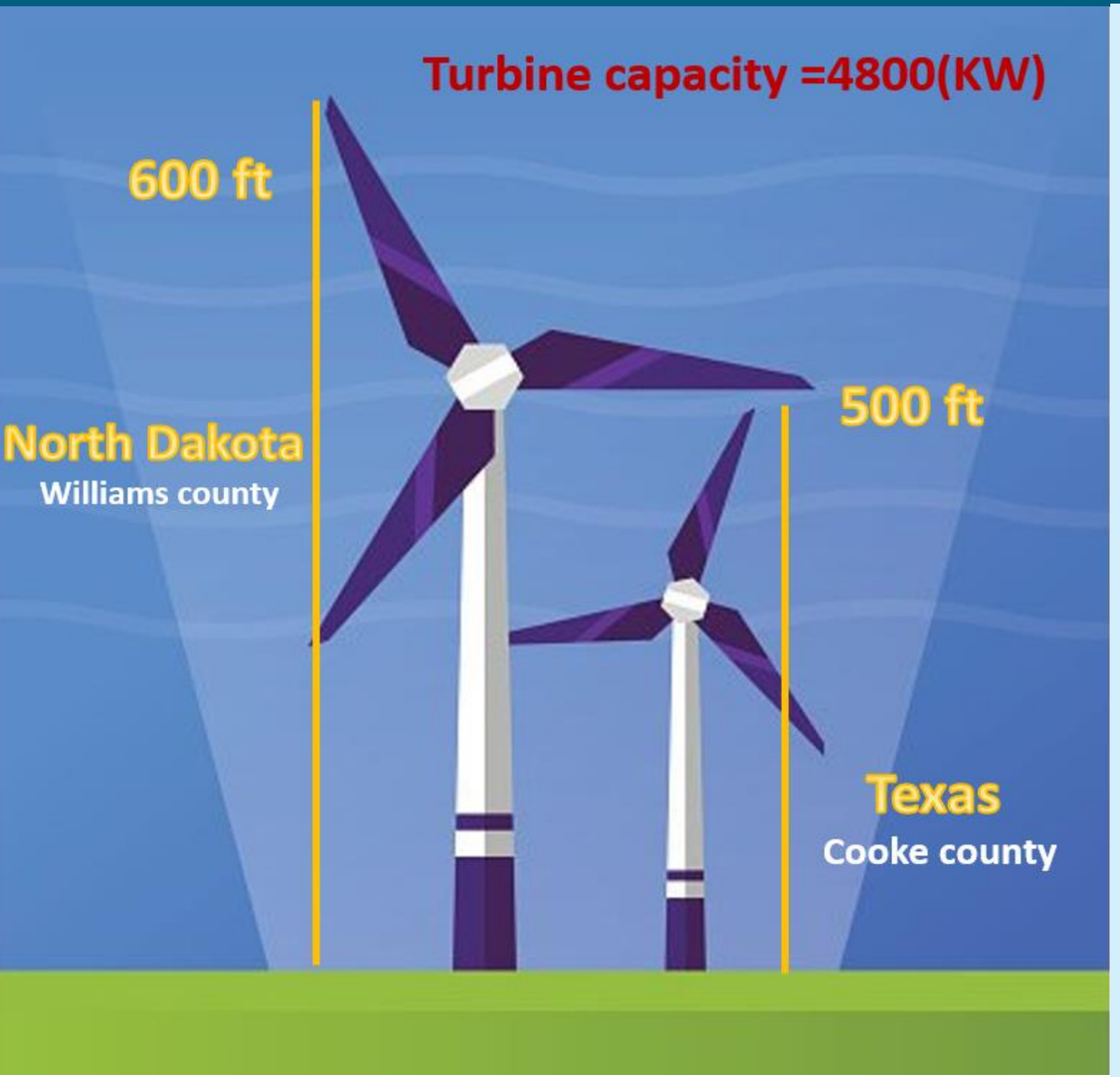
Texas is the ideal place for wind turbines



- **Low in cost :**
  A smaller turbine in Texas has the same capacity as bigger turbines in other states.

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Type

Onshore Turbines

Location

Texas (Cooke county)

Manufacturer

General Electric (GE)

Wind

Ideal size

The bigger the better!

Height = 152.1 m

Rotor swept area =16,513 m^2

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