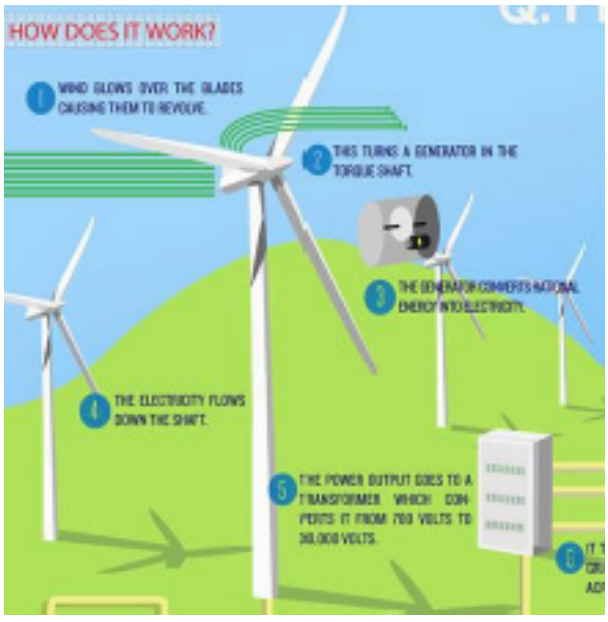
Wind Energy

Wind power is a powerful source of zero-carbon energy and is playing an increasingly important role in the United States' transition to renewable forms of energy. Yet, it also has its challenges, which must be met with continued innovation.

Overview

- Power is generated by large turbines, which convert the mechanical energy of the wind moving the blades into electricity via an electromagnetic generator.



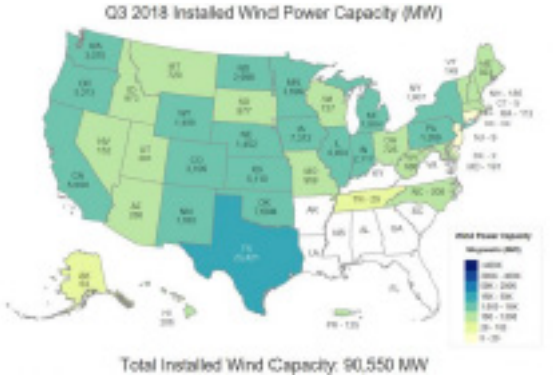
- **Onshore wind turbines**, grouped into large clusters, are more cost-effective.
- **Offshore wind turbines** usually produce more power from strong ocean winds, and are
- easier to transport using boats.

The Economics

- **Wind prices have plummeted** from $70/MWh in 2009 to below $20/MWh now, making especially onshore wind one of our **cheapest energy sources.**
- In the U.S., there are over **110,000 wind-related jobs**, expected to grow to 500,000 by 2030.

Current Standing in the U.S.

- In 2019, wind energy represented about 7% of total U.S. energy production, and **42% of all renewable energy production.** That is a 50-fold increase since 2000.
- By 2023, wind capacity is projected to grow to 9% of US energy production. The U.S. is close to gaining a **20% share of the world wind market.**
- If Texas were a country, it would be the **5th largest wind producer** in the world.
- Wind developers have received $30 billion in federal subsidies since 1980.



Challenges

- Wind is an intermittent energy source. This means that production is unpredictable, and might lead to blackouts if it can't meet peak demand. Innovation in **advanced battery storage** is crucial to tackle this.
- Turbines require lots of space, as well as large amounts of resources, such as steel and concrete, to produce, which places a high upfront resource-cost.
- Turbines pose risks to wildlife, endangered bird species in particular.

What's Next for Wind?

- By 2050, wind energy will produce **33% of the world's energy**, providing an important source of clean energy. The success story of Texas shows how greater energy choice and **competition can accelerate wind production** at decreased cost. Yet, we must also recognize the distortive impact of subsidies and **strive to create a market that internalizes all costs**. Ultimately, however, until battery and transmission technology improve, wind will struggle to be a base load energy source.