
Erasmus+
LITTLE SCIENTIST
Escolapitos por el Mundo
REINO UNIDO
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ERASMUS+
KA2 Project

"Little Scientist"

3rd Learning / Teaching / Training Activity

in Nicosia, Cyprus

6-11 November 2016

Erasmus+

GCS

KONYA MERAM
Meram Şehit Kubilay Anaokulu

ERASMUS+

LITTLE SCIENTIST

Cycle d'Orientation des Grandes-Communes

REPUBLIQUE ET CANTON DE GENEVE

fundación escolapias montal


DURACELL
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Energy
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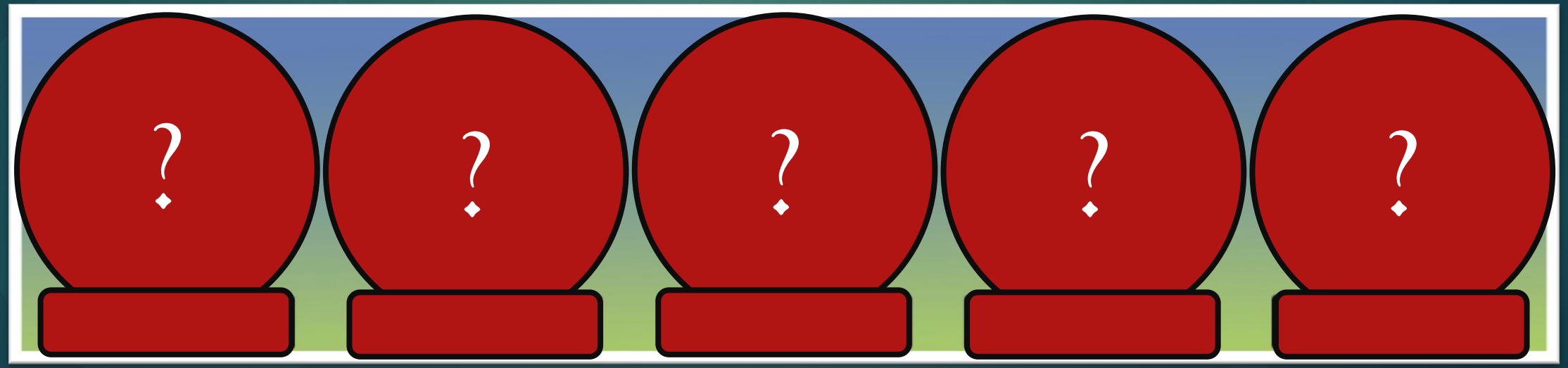
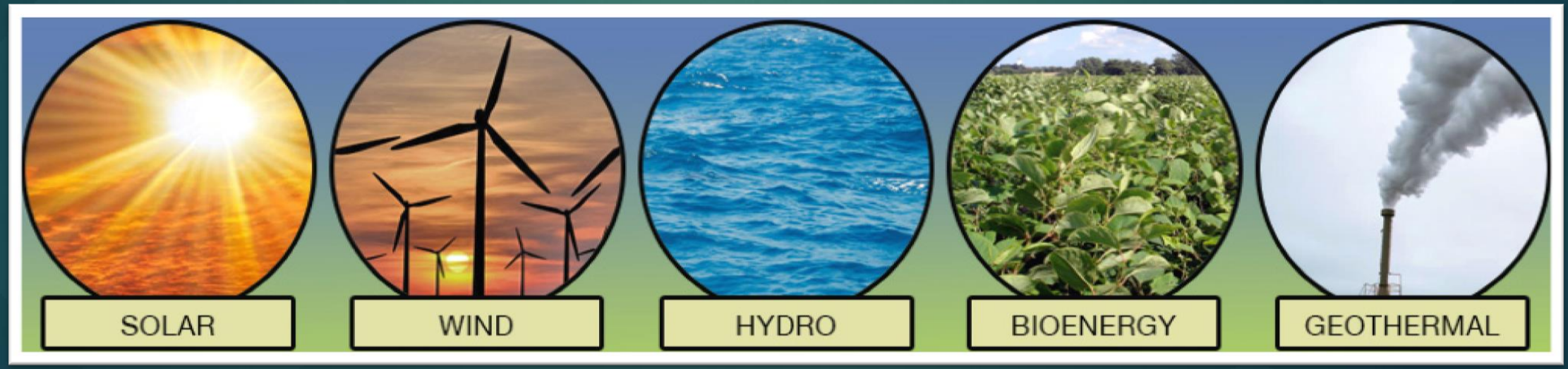
Renewable energy sources



Renewable energy sources



Wind Energy

Harnessing the air in motion

Wind Energy

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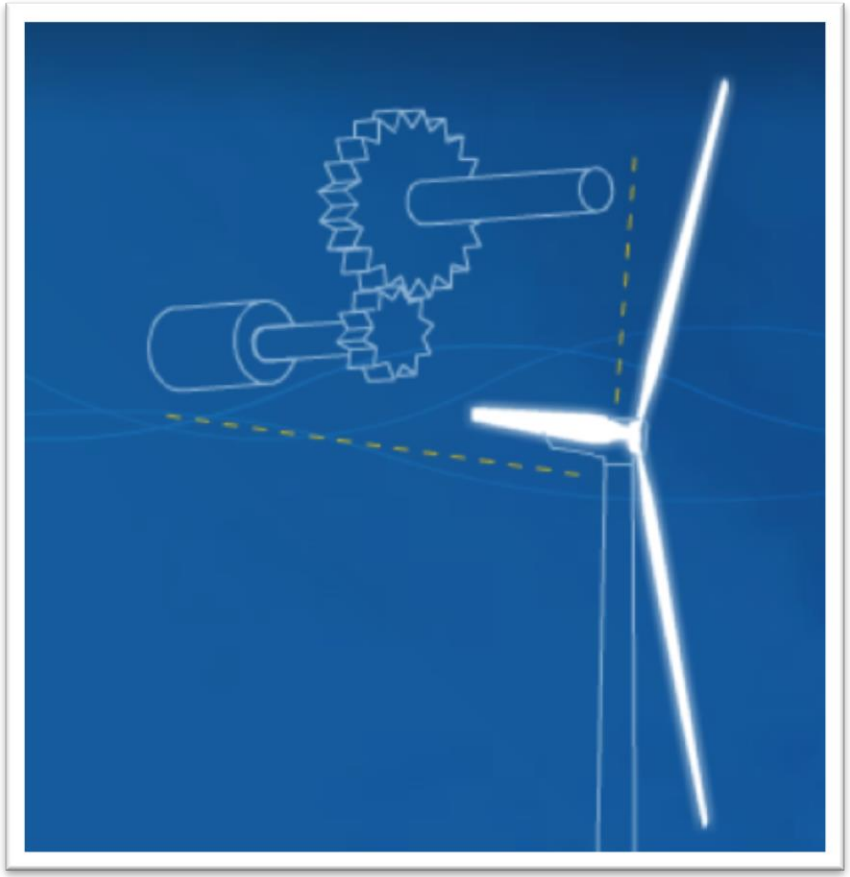
Wind turbines capture the energy of moving air and convert it to useful electricity.

Wind Energy

Harnessing the air in motion

As the wind blowes over the turbine's blades they create "lift", much like an airplane's wing, and begin to turn

Blades

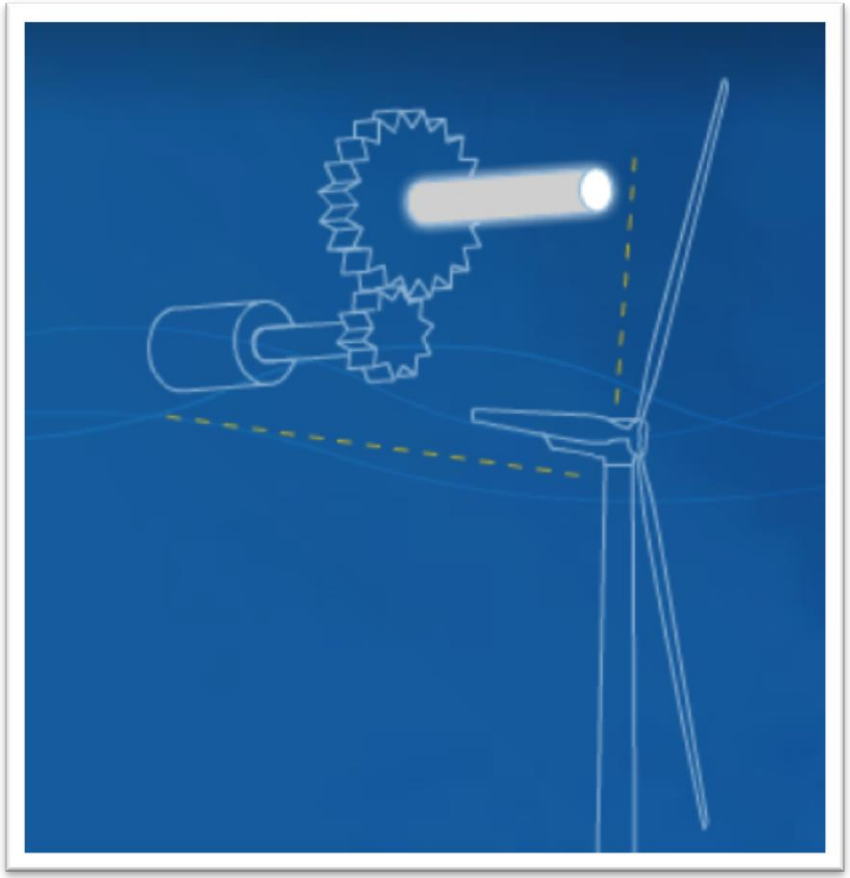


Wind Energy

Harnessing the air in motion

The spinning blades turn this shaft some 30 to 60 times every minute.

Low-speed Shaft

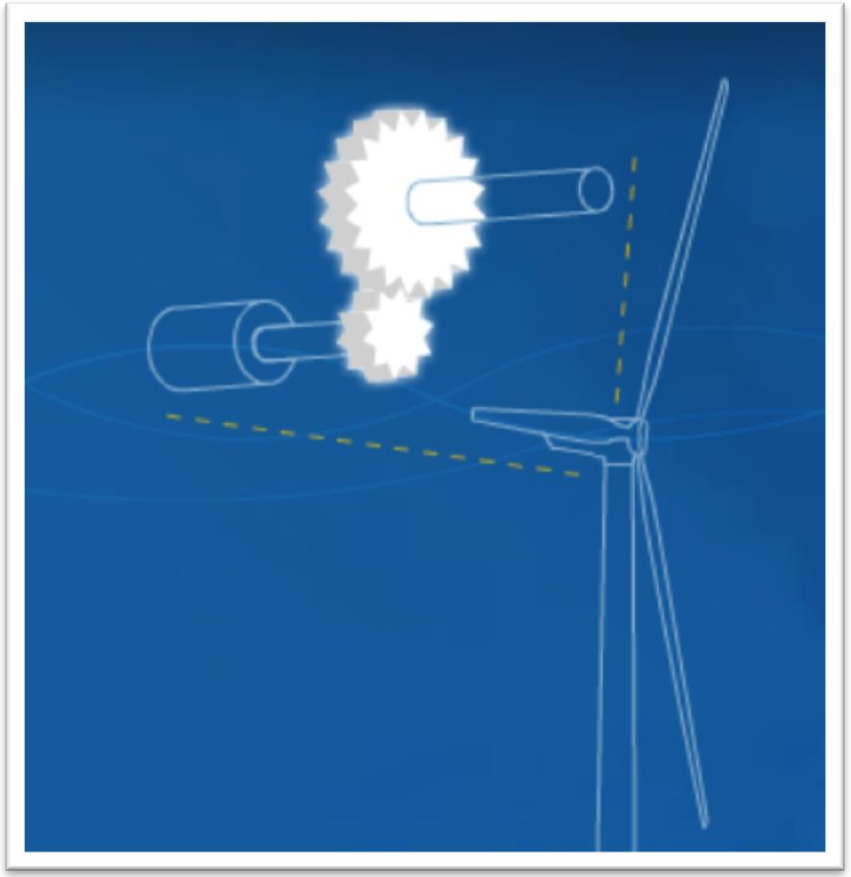


Wind Energy

Harnessing the air in motion

The gears in this box connect the low-speed shaft with a high-speed shaft that drives the generator. The gears also boost the rotation speed of the high-speed shaft to 1000 to 1800 rotations per minute.

Gear Box



Wind Energy

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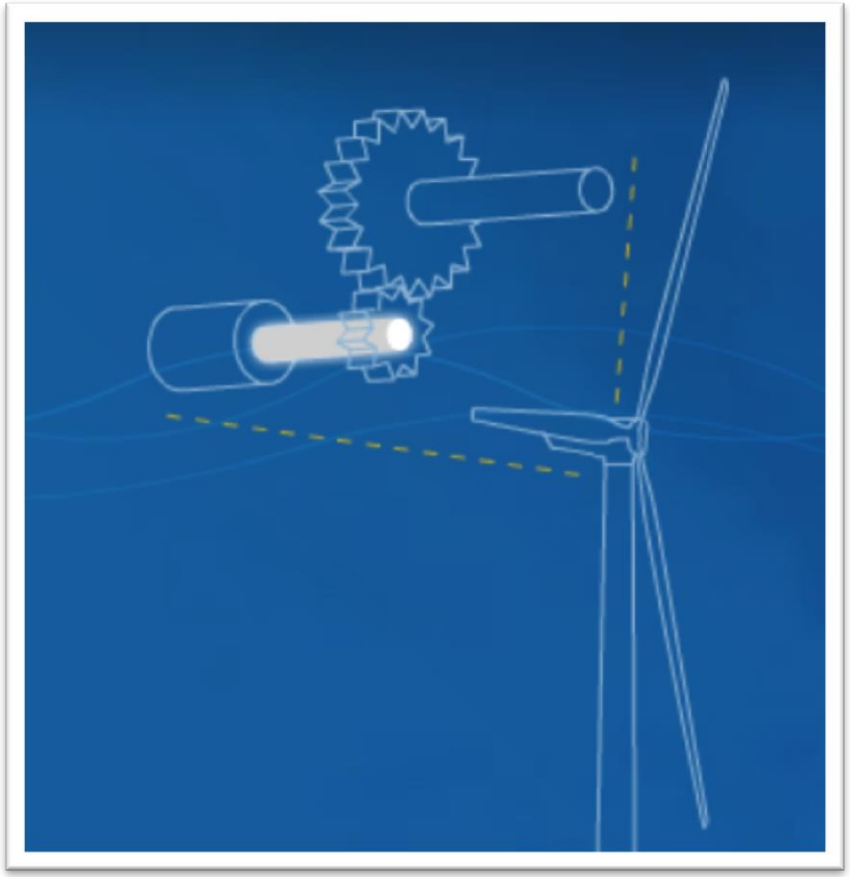
The rapidly spinning shaft drives the generator to produce electric power.

High-speed Shaft

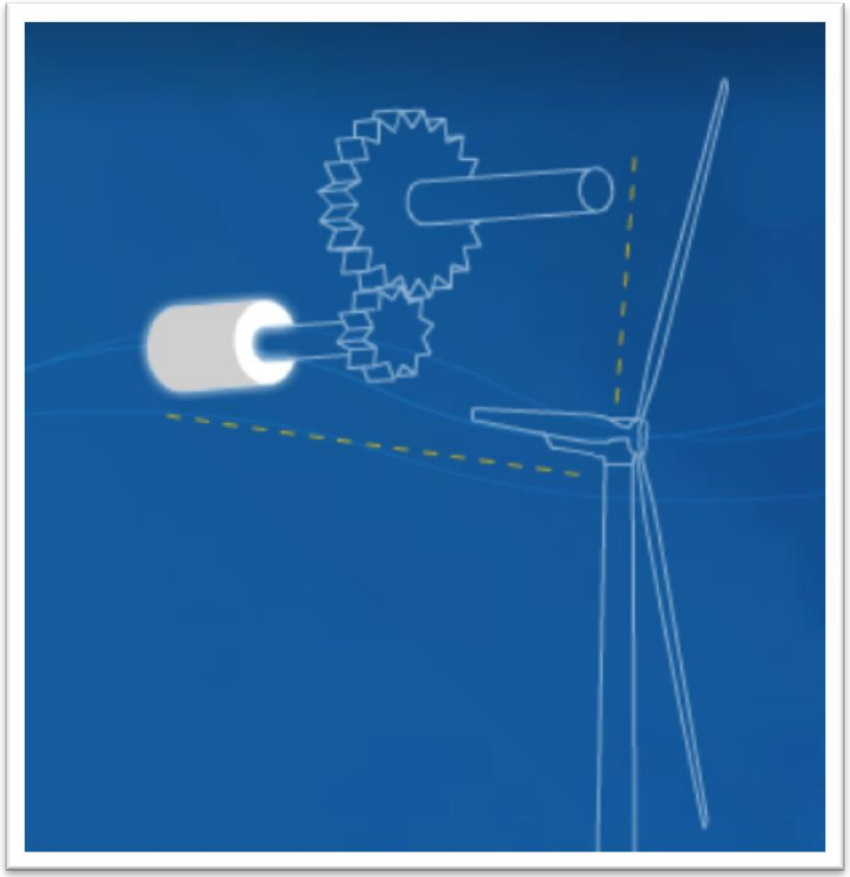


Wind Energy

Harnessing the air in motion

The generator's electrical output is connected to the larger electrical grid

Generator



Wind Energy

Harnessing the air in motion

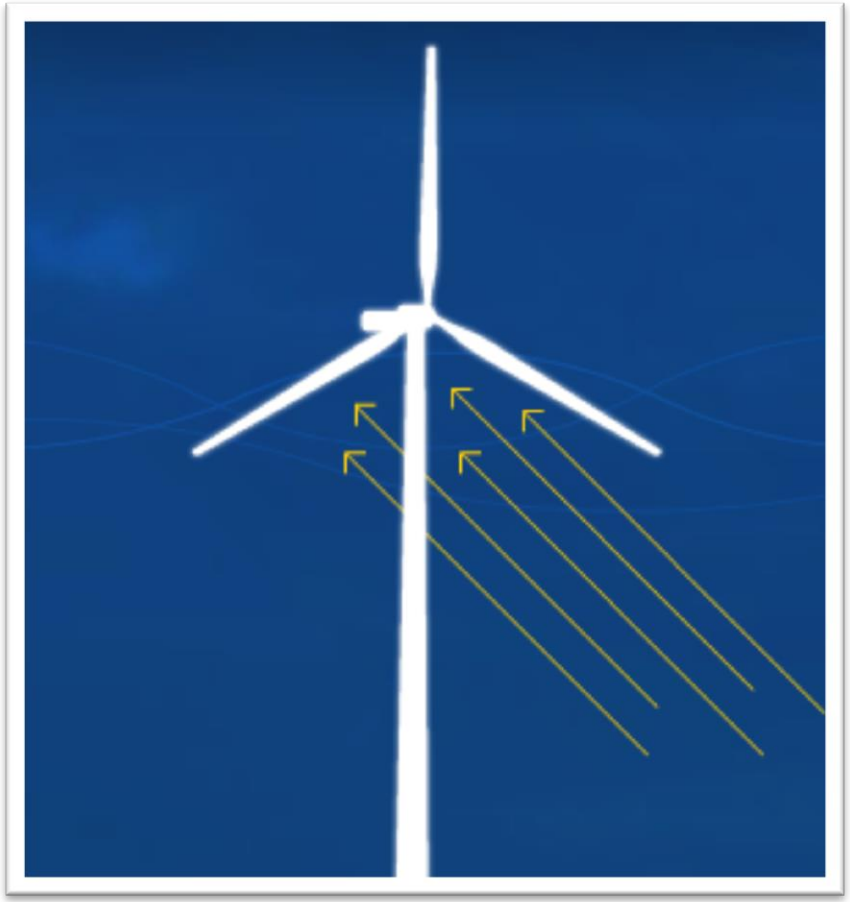
What *variables* do you think affect how much electricity a wind turbine can produce?

Wind Energy

Harnessing the air in motion

Wind speeds are not constant and stronger winds produce more energy – but only up to a point.

Wind velocity

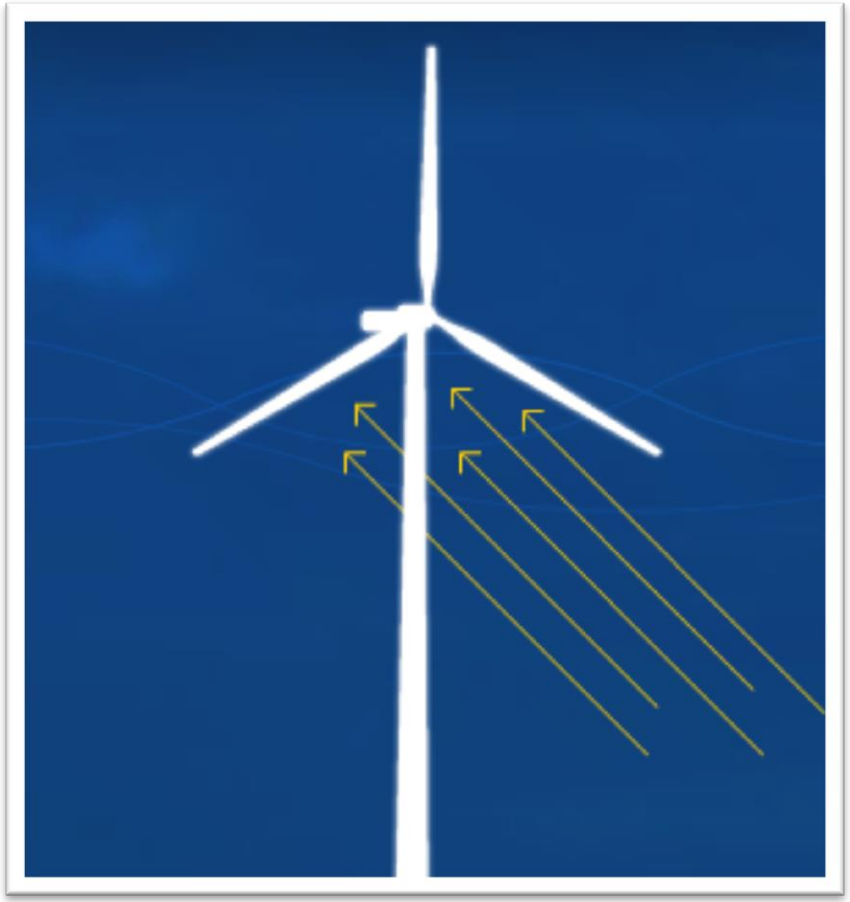


Wind Energy

Harnessing the air in motion

Turbines usually don't operate at all if wind speeds are below about 13 km/h and they shut down at about 88 km/h because they can be damaged at higher winds.

Wind velocity



Wind Energy

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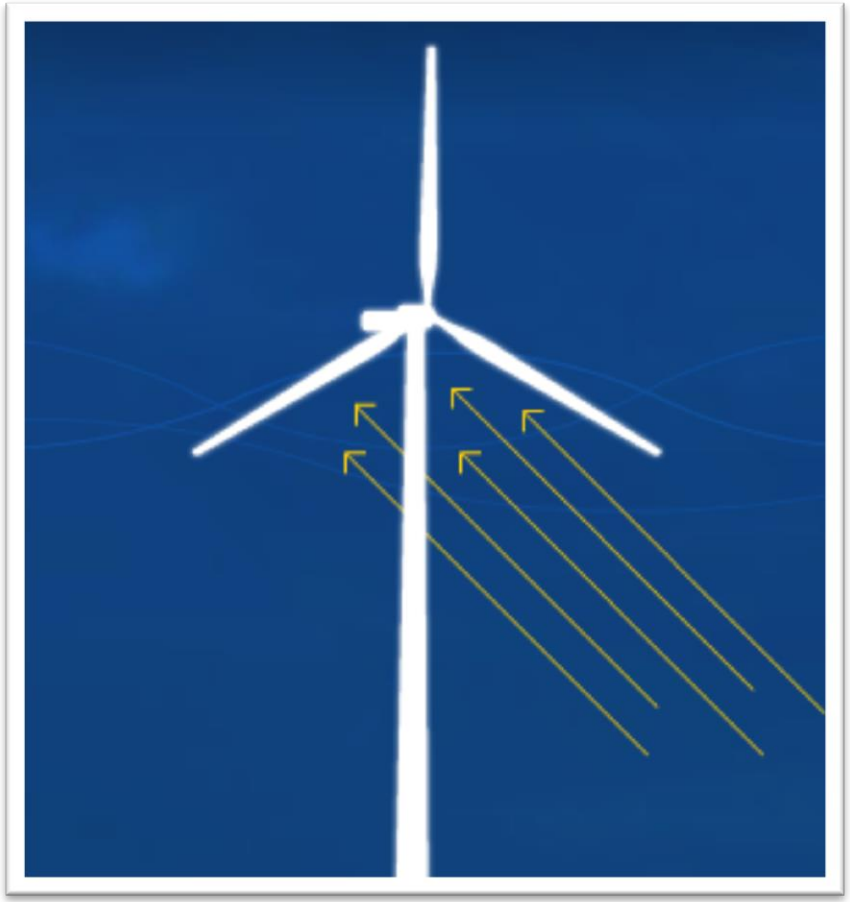
Between about 40 km/h and 85 km/h they operate at their maximum efficiency

Wind velocity



Wind Energy

Harnessing the air in motion

The vertical disk created by the rotating blades determines affects how much electricity the turbine can produce. Doubling the blade length can result in four times more power!

Blade radius

Wind Energy

Harnessing the air in motion

Tall turbines are more efficient as they can reach greater winds found at altitude.

Tower Height

Wind Energy

Harnessing the air in motion

Heavier/more dense air which is found near sea levels exerts more lift on a rotor which drives it more effectively

Air Density

The Evolution of Wind Power