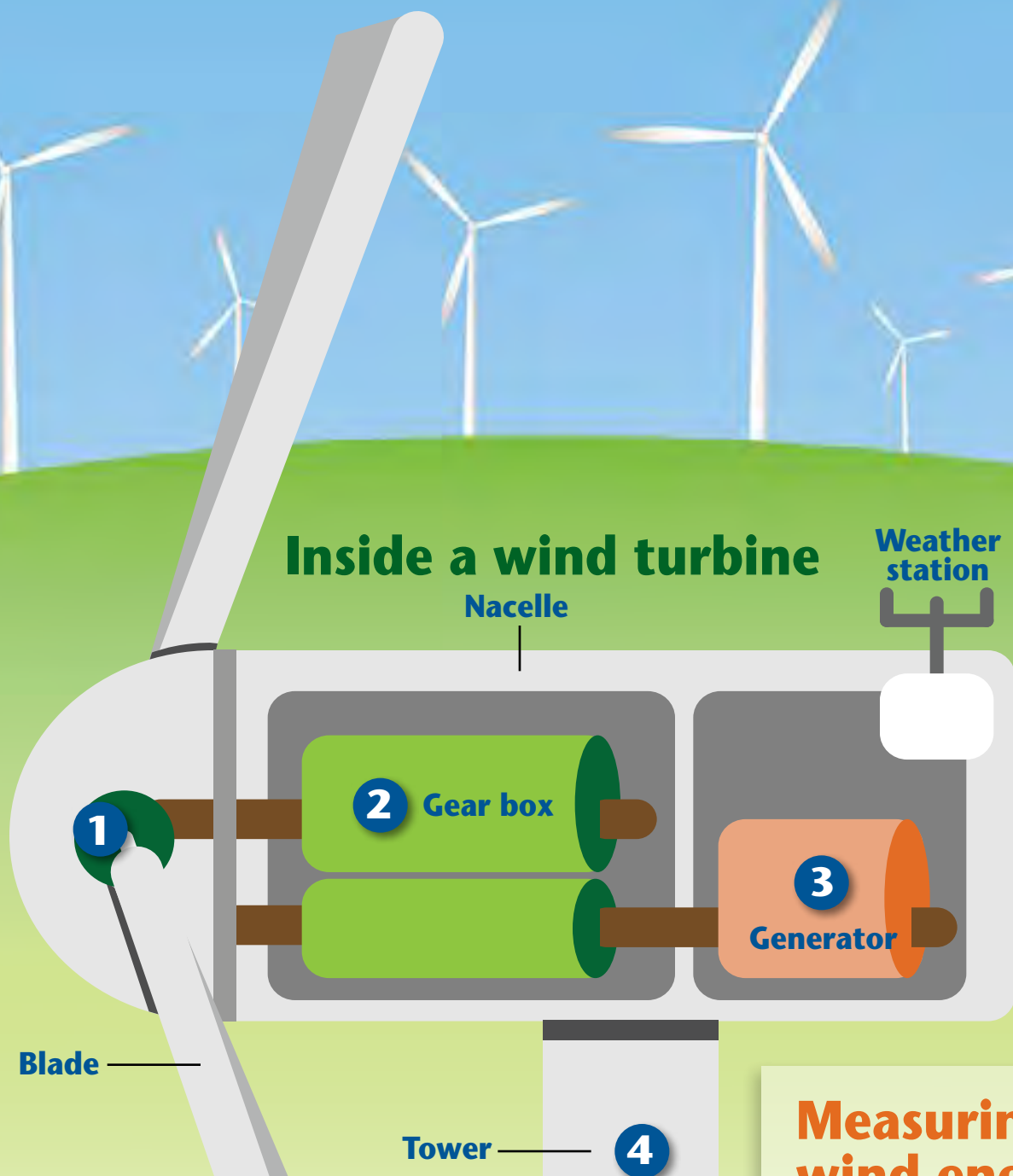


# EVERY WAY THE WIND BLOWS

Year, after year, more wind energy is added to electric utilities' generation portfolios. But how does electricity from a giant fan get to your home?



## Generating wind energy

- 1** A computer turns the **nacelle** and the **rotor** (three blades and a hub) to face into the wind. The blades rotate when wind moves over them, which turns the rotor and a low-speed shaft.
- 2** The **gear box** connects the low-speed shaft to the high-speed shaft to increase the rotational speed.
- 3** The **generator** uses this faster motion to turn magnets surrounded by copper wire loops. This creates electromagnetic induction, which generates electricity.
- 4** The electricity travels down the inside of the **tower** through cables to a transformer at the base of the tower.
- 5** From the transformer, electricity flows underground to an on-site **substation**.
- 6** Overhead power lines take the electricity to an off-site substation and into high-voltage transmission lines.
- 7** The electricity goes from the high-voltage transmission lines into lower-voltage **distribution lines**.
- 8** The distribution lines bring the electricity to customers' **homes and businesses**.

## Measuring wind energy

The amount of electricity generated by utility-scale wind turbines depends on wind speed and blade length.

↑ Tower height =  
↑ wind speeds

### 25% faster

wind speed at 164 feet compared to 33 feet, with **double the electricity** output

**Doubling blade length** increases power output by **four times**

