Energy 101: Wind Turbines, Transcript

MR. : We’ve all seen those creaky old windmills on farms, and although they may seem about

as low-tech as you can get, those old windmills are the predecessors for new modern wind turbines

that generate electricity. The same wind that used to pump water for cattle is now turning

giant wind turbines to power cities and homes. OK, have a look at this wind farm in the California desert, a hot desert next to tall mountains– an ideal place for a lot of wind. Here’s another one on the windy prairies of Wyoming.

Now, today’s wind turbines are much more complicated machines than the old prairie

windmills, but the principle is the same. Both capture the wind’s energy.

OK, here’s how it works. First, a wind turbine blade works sort of like an airplane wing.

Blowing air passes around both sides of the blade. The shape of the blade causes the air

pressure to be uneven – higher on one side of the blade and lower on the other – and

that’s what makes it spin. The uneven pressure causes the blades to spin around the center

of the turbine. On the top, there’s a weather vane that’s connected to a computer to keep

the turbine turned into the wind so it captures the most energy. Now, the blades are attached to a shaft which only turns about 18 revolutions a minute, and that’s not nearly fast enough to generate electricity by itself. So the rotor shaft spins a series of gears that increase the rotation up to about 1,800 revolutions per minute, and at that speed, a generator can produce a lot of electricity.

So why are wind turbines so tall? Well, the higher up you go, the windier it is; more

wind naturally means more electricity. And in many cases, larger turbines can also capture

wind energy more efficiently. The blades can sweep a circle in the sky as long as a football

field. Now what’s really cool is that even a small wind farm like this one in Wyoming can generate

enough electricity to power more than 9,000 homes, and larger farms can provide much more

clean energy for our homes and businesses.