

The “Power” of the Ocean

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Our oceans are full of energy. **Energy** is the ability to do work, and we humans get our energy from the food we eat. But energy can be found in many different forms such as thermal and mechanical energy. **Thermal energy** is energy from heat, like the heat you get from a fire. The heat from the fire can warm you, cook your food, or burn something into ashes. **Mechanical energy** is the energy of force, meaning strength or power, on something. Think about how much force you would need to pick up an elephant compared to the force you would need to pick up a feather. The ocean gives us energy in those two different ways: Thermal and Mechanical.



One example of mechanical energy in the ocean is the wind blowing across the ocean's surface. The force of the wind blowing creates a lot of energy in the ocean. This energy is seen in the form of waves. Think about going to the beach and seeing waves crash on the beach. There is a lot of energy in the crashing of waves. Sometimes when we go to the beach the waves are small and don't have a lot of force. This is usually when we don't have a lot of wind, so there isn't much energy in the waves.

Another example of mechanical energy in the ocean is in the form of **tides**. A tide is the rising and falling levels of ocean water caused by the gravitational pull of the moon on Earth. During low tide the water level is low and much more of the beach is shown, while during high tide the water level is high and more of the beach is covered with water. A lot of energy is contained in the water as it moves from high levels to low levels and back again.

The other type of energy the ocean produces is called thermal energy. This energy is a little more difficult to understand. Remember thermal means heat, what happens when we add heat to water? That's right, it warms up. Well the ocean warms up too, not from a fire on Earth, but from the energy of the sun. What happens when you leave a glass of water in the sun? It warms up. The ocean takes the sun's energy and warms up too, and once it's warm it stays warm for a long time. This warm water can warm other things like the air and land (some scientists also use this water to warm things up.) Thermal ocean energy is a difficult energy to use, much harder than the wave and tidal energy, but scientists are still trying to figure out an efficient way to use this energy.

To summarize, the ocean produces thermal energy by using the stored heat that is from the sun, and the ocean produces mechanical energy by using the motion of the tides and waves. Why do some scientists think it's important to discover ways to use the energy of the ocean? It is because the energy from the ocean is **renewable**, meaning it can be replaced and used over and over, as opposed to **non-renewable** energy like oil, coal, and other fossil fuels. Once we use up those non-renewable sources, they are gone forever, but there is always energy in the ocean – it never runs out!