

Macro Roundup Article

Headline: [When Will Fusion Be Ready for Prime Time? Watch These Three Numbers](#)

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Tweet: According to the chief research officer at Princeton Plasma Physics Laboratory "If you gain a factor of 10 on the fusion and 10 on the efficiency," fusion achieves energy breakeven. With government support, this could be achieved in 10-20 years. @WSJ

Summary: A simple ratio known as Q provides an easy and intuitive way to understand if scientists are making progress: It's energy released divided by energy used. A Q below one means the reaction consumed more energy than it produced. A Q above one means more energy was produced than consumed. In this latest experiment, scientists put in 2.05 megajoules of energy and got 3.15 megajoules out. Q was 3.15 divided by 2.05, or about 1.5. To generate 3.15 megajoules of energy, the lab consumed about 300 megajoules of energy to fire its laser. The Q value for the entire reactor is about 0.01—roughly 1% of break-even. "If you gain a factor of 10 on the fusion and 10 on the efficiency, that gives you a factor of 100 roughly," said Jonathan Menard, chief research officer at Princeton Plasma Physics Laboratory. "That would be in the ballpark of break-even. Both of those are theoretically possible." With government support that could take one to two decades, he said.

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