Heating 300 Liters of Water with Oil or Electricity: Which is Most Efficient?

Here's a breakdown of the calculations and a side-by-side comparison of the cost to heat 300 liters of water using electricity or oil.

Step 1: Energy Required

To heat 300 liters of water (mass = 300 kg) from 10°C to 60°C (ΔT = 50°C):
Energy (kWh) = mass × specific heat capacity × temperature rise ÷ 3600
Energy = 300 × 4.186 × 50 ÷ 3600 ≈ 17.45 kWh

Step 2: Cost with Electricity

Assuming night rate electricity at €0.125 per kWh:
Cost = 17.45 × 0.125 ≈ €2.18

Step 3: Cost with Oil

1 litre of kerosene provides ~10 kWh energy.
Required input = 17.45 ÷ 0.9 ≈ 19.39 kWh (90% boiler efficiency).
Oil needed = 19.39 ÷ 10 ≈ 1.94 litres.
At €0.81 per litre: Cost ≈ 1.94 × 0.81 ≈ €1.57

Cost Comparison

Electricity (Night Rate)	Oil (Kerosene, 90% efficiency)
Approx. €2.18	Approx. €1.57
17.45 kWh used	1.94 L oil used

Conclusion

Heating with oil comes out slightly cheaper in this example.