



FACT #1: It takes just four solar roofs to offset as much energy as was in the 25,000 gallons of oil spilled onto California’s beaches in October 2021.

Step 1:

- 1 solar roof = 8.76 kilowatts (kW) of energy capacity¹
- 8.76 kW x 8760 hours in a year x 17.5% capacity factor² x 20-year life of system³ = 268,582 kWh over lifetime or 268.58 megawatt-hours (MWh) over lifetime of solar roof
- Since 1 MWh = 3,600 megajoules⁴, 268.58 MWh/lifetime x 3600 megajoules/MWh = 966,893.76 megajoules of energy generated over lifetime of rooftop system

Step 2:

- Oil spilled: 588 barrels⁵ or 25,000 gallons⁶
- 1 barrel of oil equivalent = 6,118,000,000 joules⁷ or 6,118 megajoules
- 588 barrels x 6,118 megajoules = 3,597,384 megajoules spilled in Orange County

Conclusion:

⇒ 3,597,384/966,893.76 = 3.72 solar roofs equal energy of oil spill (rounded up to 4)

Fact #2: California’s 1.3 million solar roofs generate twice as much energy every hour as was contained in the 25,000 gallons of oil spilled on Orange County beaches in 2021. Since most rooftop solar systems export, or “spill out”, about half the energy they generate⁸, California’s rooftop solar systems “spill” the equivalent amount of energy every hour as was contained in the 25,000 gallons of oil spilled onto southern California beaches in October 2021.

Step 1:

- 11,228 megawatts (MW) rooftop solar in California⁹
- 11,228 MW x 17.5% capacity factor = 1,964.9 MW generated on average every hour

¹ Data source [CA DG Stats](#). California consumers installed 143,916 distributed solar, or “rooftop solar” for short, in 2020 with a combined capacity of 1260.99 megawatts (MW).

² The rated capacity of a generation source, such as a solar photovoltaic panel found on roofs in California, is the amount of electricity the generation source would generate under optimal conditions (e.g. the solar panel is pointed directly at the sun and the sun is shining). Capacity factor takes into consideration “real world” factors such as the sun’s movement across the sky. 17.5% is an averaged capacity factor for solar panels located on roofs across northern and southern California.

³ Solar photovoltaic panels come with a manufacturer warranty of at least 20 years.

⁴ Simple conversion (Source : [Google](#))

⁵ Source: [Coast Guard/KTLA](#)

⁶ <https://www.eia.gov/tools/faqs/faq.php?id=327&t=10>

⁷ Source: [Google](#)

⁸ The other half is consumed onsite

⁹ This is the total installed capacity of distributed, or “rooftop”, solar in California today. Source: [DGStats](#)

- Since 1 MWh = 3,600 megajoules, $1,964.9 \text{ MWh} \times 3600 \text{ megajoules/MWh} = 7,073,640$ megajoules of solar energy generated on average every hour

Step 2:

- Oil spilled: 25,000 gallons of oil or 588 barrels
- 1 barrel of oil equivalent = 6,118,000,000 joules
- 588 barrels spilled \times 6,118 megajoules = 3,597,384 megajoules spilled

Conclusion:

$\Rightarrow 7,073,640 \text{ megajoules of solar} / 3,597,384 \text{ megajoules oil} = 1.966$ or roughly 2x