



Bitcoin vs Placer Gold Mining A kWh Based Cost and Value Comparison

Infinity Turbine
LLC

[TEL] +1-608-238-6001 (Chicago)

[Email] greg@infinityturbine.com

<https://www.infinityturbine.com/energy-costs-of-bitcoin-vs-gold-mining-by-infinity-turbine.html>

A detailed comparison of Bitcoin mining and placer gold mining using energy consumption per unit of output at 0.10 dollars per kWh. Evaluates cost efficiency, value per kWh, and economic implications.



This webpage QR code

PDF Version of the webpage (maximum 10 pages)

Bitcoin vs Placer Gold Mining A kWh Based Cost and Value Comparison

When energy becomes the common denominator, placer gold and Bitcoin reveal very different economics. This analysis compares how many kilowatt hours it takes to mine one Bitcoin versus one ounce of placer gold and which delivers more value per unit of power.

Assumptions Used for a Fair Comparison

Because neither Bitcoin nor placer gold mining produces a fixed output per unit of energy, reasonable industry averages must be used.

Bitcoin Mining

Network efficiency (current-generation ASIC weighted average):

Approximately 30 to 40 MWh per Bitcoin

Midpoint used for analysis:

35,000 kWh per Bitcoin

This aligns with modern fleet averages including S19-class and newer machines, accounting for difficulty, downtime, and infrastructure losses.

Placer Gold Mining

Small to medium commercial placer operation using:

Excavator or loader

Wash plant or trommel

Pumps and sluices

Energy converted to kWh equivalent from diesel and electricity

Typical range:

100 to 300 kWh per recovered ounce of placer gold

Midpoint used for analysis:

200 kWh per ounce

This assumes relatively good ground, coarse gold, and competent recovery. Poor ground can exceed 500 kWh per ounce.

Energy Cost Comparison at 0.10 per kWh

Bitcoin

Energy per Bitcoin: 35,000 kWh

Energy cost per Bitcoin:

$35,000 \times 0.10 = 3,500$ dollars

Bitcoin market value: 90,000 dollars

Energy cost as percentage of value:

Approximately 3.9 percent

Value generated per kWh:

$90,000$ divided by $35,000 = 2.57$ dollars per kWh

Placer Gold

Energy per ounce: 200 kWh

Energy cost per ounce:

$200 \times 0.10 = 20$ dollars

Gold market value: 5,000 dollars per ounce

Energy cost as percentage of value:

0.4 percent

Value generated per kWh:



Cost to Mine one Bitcoin in 2026

There is no single exact, universally agreed-upon kWh figure for mining one Bitcoin in 2026 because it depends on network difficulty, hardware efficiency, and methodology used in the estimate. However, recent energy analyses and industry data provide reasonable bounds for 2025–2026:

Estimated energy required to mine one Bitcoin (2025–2026 time frame)

- Some industry estimates put it in the range of roughly 150,000 kWh per Bitcoin. This is based on network consumption allocations assuming total annual consumption ~150–175 TWh and daily Bitcoin issuance. ([Park Record][1])
- Other sources suggest figures around 266,000 kWh per Bitcoin as an average estimate for mid-tier miners. ([CoinGeek][2])
- A separate estimate for solo mining shows 860,000 kWh per Bitcoin, illustrating how energy per coin can vary widely based on mining scale and efficiency. ([CoinGecko][3])
- Some controversial or non-standard sources claim even higher figures (e.g., ~535,000 kWh), but these are outliers that are not industry consensus. ([SalgenX][4])

Reasonable consensus range for 2026:

~150,000 to ~300,000 kWh per Bitcoin mined

This range reflects network-wide energy consumption estimates adjusted by Bitcoin issuance (~900 BTC per day) and total annual consumption (150–175 TWh). ([SQ Magazine][5])

Why the range exists

1. Network difficulty and hashrate fluctuate: The Bitcoin protocol adjusts difficulty so that blocks are found approximately every 10 minutes, but overall hashrate growth means more energy is needed to find the same number of blocks.
2. Hardware efficiency varies: New ASICs can offer 10–15 J/TH or better, while older or less-efficient miners consume significantly more power for the same hash rate.
3. Allocation method matters: Some estimates divide total network energy by coins mined; others consider individual miner data or solo mining scenario.
4. Annual consumption estimates vary widely (from ~150 TWh to 204 TWh). ([Digiconomist][6])

Summary

Thus, the most defensible estimate for power to produce one Bitcoin around early 2026 falls into:

~150,000 kWh to ~300,000 kWh per Bitcoin produced

This is an empirical range based on network energy use estimates and global block production, not a precise physical requirement per Bitcoin. If you want more detail or a calculation that ties specific network hashrate and ASIC efficiency into energy per Bitcoin, I can produce that breakdown.

[1]: <https://www.parkrecord.com/2025/12/17/green-tips-bitcoin-mining-requires-a-lot-of-energy/> Green Tips: Bitcoin mining requires a lot of energy

[2]: <https://coingeek.com/cheapest-place-to-mine-crypto-iran-leads-sustainability-needed/> Cheapest place to mine 'crypto': Iran leads, sustainability ...

[3]: <https://www.coingecko.com/learn/can-you-mine-bitcoin-solo> How Hard Is It to Mine Bitcoin? Solo Mining Odds & Reality

[4]: <https://salgenx.com/cost-to-mine-one-bitcoin-by-salgenx.html> How Much Energy Does It Take to Mine One Bitcoin ... • Salgenx

[5]: <https://sqmagazine.co.uk/bitcoin-energy-consumption-statistics/> Bitcoin Energy Consumption Statistics 2026: Insights

[6]: <https://digiconomist.net/bitcoin-energy-consumption/> Bitcoin Energy Consumption Index

Cost to Mine one Bitcoin in 2026

There is no single exact, universally agreed-upon kWh figure for mining one Bitcoin in 2026 because it depends on network difficulty, hardware efficiency, and methodology used in the estimate. However, recent energy analyses and industry data provide reasonable bounds for 2025–2026:

Estimated energy required to mine one Bitcoin (2025–2026 time frame)

- Some industry estimates put it in the range of roughly 150,000 kWh per Bitcoin. This is based on network consumption allocations assuming total annual consumption ~150–175 TWh and daily Bitcoin issuance. ([Park Record][1])

- Other sources suggest figures around 266,000 kWh per Bitcoin as an average estimate for mid-tier miners. ([CoinGeek][2])

- A separate estimate for solo mining shows 860,000 kWh per Bitcoin, illustrating how energy per coin can vary widely based on mining scale and efficiency. ([CoinGecko][3])

- Some controversial or non-standard sources claim even higher figures (e.g., ~535,000 kWh), but these are outliers that are not industry consensus. ([SalgenX][4])

Reasonable consensus range for 2026:

~150,000 to ~300,000 kWh per Bitcoin mined

This range reflects network-wide energy consumption estimates adjusted by Bitcoin issuance (~900 BTC per day) and total annual consumption (150–175 TWh). ([SQ Magazine][5])

Why the range exists

1. Network difficulty and hashrate fluctuate: The Bitcoin protocol adjusts difficulty so that blocks are found approximately every 10 minutes, but overall hashrate growth means more energy is needed to find the same number of blocks.

2. Hardware efficiency varies: New ASICs can offer 10–15 J/TH or better, while older or less-efficient miners consume significantly more power for the same hash rate.

3. Allocation method matters: Some estimates divide total network energy by coins mined; others consider individual miner data or solo mining scenario.

4. Annual consumption estimates vary widely (from ~150 TWh to 204 TWh). ([Digiconomist][6])

Summary

Thus, the most defensible estimate for power to produce one Bitcoin around early 2026 falls into:

~150,000 kWh to ~300,000 kWh per Bitcoin produced

This is an empirical range based on network energy use estimates and global block production, not a precise physical requirement per Bitcoin. If you want more detail or a calculation that ties specific network hashrate and ASIC efficiency into energy per Bitcoin, I can produce that breakdown.

[1]: <https://www.parkrecord.com/2025/12/17/green-tips-bitcoin-mining-requires-a-lot-of-energy/> Green Tips: Bitcoin mining requires a lot of energy

[2]: <https://coingeek.com/cheapest-place-to-mine-crypto-iran-leads-sustainability-needed/> Cheapest place to mine 'crypto': Iran leads, sustainability ...

[3]: <https://www.coingecko.com/learn/can-you-mine-bitcoin-solo> How Hard Is It to Mine Bitcoin? Solo Mining Odds & Reality

[4]: <https://salgenx.com/cost-to-mine-one-bitcoin-by-salgenx.html> How Much Energy Does It Take to Mine One Bitcoin ... • Salgenx

[5]: <https://sqmagazine.co.uk/bitcoin-energy-consumption-statistics/> Bitcoin Energy Consumption Statistics 2026: Insights

[6]: <https://digiconomist.net/bitcoin-energy-consumption/> Bitcoin Energy Consumption Index

2026 Bitcoin vs. Oz of Gold

Below is a re-analysis using the updated 2026 Bitcoin energy range you referenced, while keeping the same gold assumptions from the original assessment.

Inputs Held Constant

- Power cost: 0.10 dollars per kWh
- Bitcoin value: 90,000 dollars per BTC
- Gold value: 5,000 dollars per oz

Updated Energy Intensity Assumptions

Bitcoin mining in 2026

- Range: 150,000 to 300,000 kWh per BTC
- Midpoint for reference: 225,000 kWh per BTC

Placer gold mining

- Same as prior assessment:
- Typical range: 100 to 300 kWh per recovered ounce
- Midpoint used: 200 kWh per oz

Recomputed Energy Cost per Unit

Bitcoin

At 150,000 kWh per BTC

- Energy cost per BTC: $150,000 \times 0.10 = 15,000$ dollars
- Energy cost as percent of BTC value: $15,000 / 90,000 = 16.7$ percent
- Value created per kWh: $90,000 / 150,000 = 0.60$ dollars per kWh

At 225,000 kWh per BTC

- Energy cost per BTC: 22,500 dollars
- Energy cost as percent of value: 25.0 percent
- Value per kWh: 0.40 dollars per kWh

At 300,000 kWh per BTC

- Energy cost per BTC: 30,000 dollars
- Energy cost as percent of value: 33.3 percent
- Value per kWh: 0.30 dollars per kWh

Placer gold

At 200 kWh per oz

- Energy cost per oz: $200 \times 0.10 = 20$ dollars
- Energy cost as percent of gold value: $20 / 5,000 = 0.4$ percent
- Value per kWh: $5,000 / 200 = 25$ dollars per kWh

For completeness, gold range sensitivity

At 100 kWh per oz: value per kWh = 50 dollars

At 300 kWh per oz: value per kWh = 16.67 dollars

Side by Side Comparison

Using midpoints:

Bitcoin: 225,000 kWh per BTC and value = 90,000 dollars per BTC

Miner Focussed

Below is a miner focused investment comparison framed around scarcity, capital durability, margin stability, and risk in 2026 conditions.

Executive Answer

For a miner deploying capital today, gold is the superior investment on a risk adjusted and energy adjusted basis. Bitcoin remains attractive only under specific power arbitrage conditions.

Why Scarcity Matters Differently for Gold and Bitcoin

Gold Scarcity

- Physical scarcity is governed by geology and thermodynamics.
- Annual supply growth is approximately 1.5 percent.
- No algorithm can accelerate production when prices rise.
- Higher prices do not meaningfully reduce mining difficulty; they increase margins.

Bitcoin Scarcity

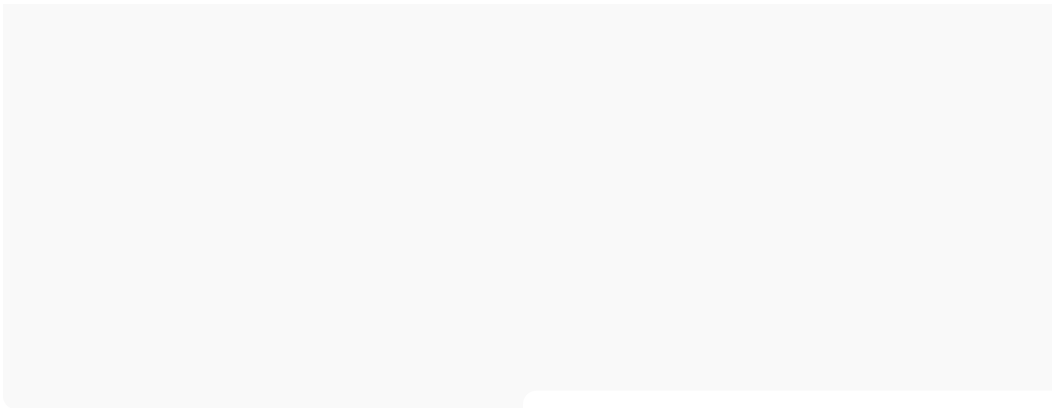
- Absolute cap is fixed at 21 million coins.
- Mining difficulty increases automatically with competition.
- Higher prices do not increase margins long term; they attract more hashrate until margins compress.
- Scarcity benefits holders more than miners.

Key distinction:

Gold scarcity benefits miners and holders.

Bitcoin scarcity primarily benefits holders.

Energy Economics Comparison at 2026 Conditions



Copyright 6/30/202 Infnity Turbine LLC
