

METHODOLOGY + TRANSPARENCY — FULL DOCUMENT (English Version)

1. Objective

Ensure full auditability, guarantee the reproducibility of the model, and allow independent review.

2. Mathematical Formulas

For each region r :

E = Power consumption (TH/s \times W/TH).

Cooling factor C depends on temperature:

$C = 1 + \alpha \times (T_{\text{ext}} - T_{\text{ref}})$.

Electricity cost = Price_kWh \times (E \times 24 / 1000).

Hardware depreciation = ASIC_price / depreciation_duration.

Total cost_r = Cooling + Electricity + Depreciation.

Aggregation:

$GHI = \Sigma (\text{Cost}_r \times \text{Hashrate}_r)$.

3. Assumptions

- Regional temperature = 10-year NOAA average.
 - Cooling factor adjusted according to climate.
 - Hardware depreciation: 18 to 36 months.
 - Energy mix based on official sources.
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4. Digital Sources

Complete tables including:

- electricity price datasets,
 - NOAA weather series,
 - regional hashrate,
 - ASIC manufacturer data,
 - BTC price via Kaiko/CoinMetrics.
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5. Update Process

- daily ingestion,
 - consistency checks,
 - manual validation by the maintainer,
 - automatic publication in the API.
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6. Auditability

- public Python engine,
 - recalculation instructions,
 - recalculation examples to replicate the historical series,
 - analysis scripts.
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7. Institutional Transparency

- public version registry,
- publication of adjustments,
- full documentation of assumptions.

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