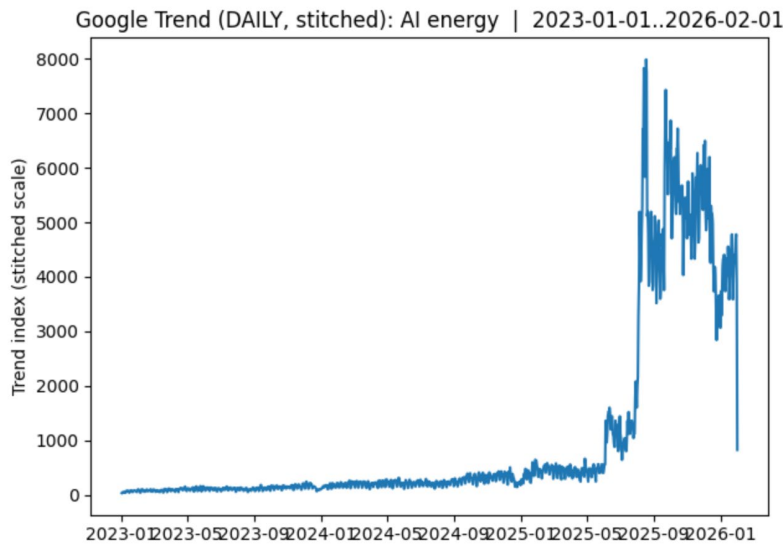


The AI Energy Bottleneck: What Is the Market Actually Buying?

Everyone knows the narrative by now: **AI is power hungry**. The training and inference buildout is driving a wave of data-center construction, and electricity demand has become part of the core AI story. But when investors obsess over "AI energy," what do they actually buy?

I tried to answer that with a simple market-based question: When attention to the "AI energy" bottleneck spikes, **which energy-related assets tend to outperform next?**

To measure "attention," I used **Google Trends**, specifically the daily search intensity for the phrase "**AI energy**", plotted below:



The idea is not that Google searches are the "true" fundamental driver of energy demand, but that they are a clean, high-frequency proxy for **when the AI-power narrative becomes salient to the public and markets**.

The Regression Design

For each ETF (i), I estimated a predictive regression of forward returns on the attention shock:

$$R_{i,t+1:t+5} = \text{const} + a \cdot R_{QQQ,t} + c \cdot R_{TLT,t} + b \cdot R_{TrendGap,t} + \varepsilon_t$$

Where I controlled for **QQQ** (tech beta) and **TLT** (rates beta) and **TrendGap** is the key variable. I defined it as the deviation of today's search volume from its recent baseline:

$$TrendGap_t = GoogleTrend_t - MA(60)_t$$

- **$Trend_t$** : The daily Google Trends index for "AI energy."
- **$MA(60)_t$** : The 60-day moving average of that trend.

Note that raw search volume for “AI energy” drifts gradually due to general adoption. By subtracting the 60-day moving average, we isolate **attention shocks**—sudden spikes in public interest relative to the recent norm. This ensures we are measuring the market's reaction to *new* information or panic, rather than just the slow steady rise of the topic.

The goal of the regression, particularly the b coefficient, is simply to observe: **when the AI-energy bottleneck enters the attention set, what does the market reward next?**

Result 1: It's a New Trade (The 2025 Breakout)

If you ran this exercise in **2023**, you would not have found much. The predictive coefficients were small and statistically weak across most energy exposures. In other words, the AI-energy narrative wasn't really an "asset-pricing object" yet.

In **2024**, there are hints of a story in some corners (materials and nuclear-related exposures show up intermittently), but it's still not a dominant pattern.

Then something changed in **2025**. Spikes in "AI energy" attention suddenly became **meaningfully predictive** of outperformance in a very specific subset of ETFs.

A quick way to see this is to look at the predictive t-stats (forward 5-day returns) for the winners:

- **TAN (Solar):**
 - 2023: ~0.64 (insignificant)
 - 2024: ~0.85 (insignificant)
 - **2025: ~2.41 (Significant)**
- **ACES (Clean Energy):**
 - 2023: ~0.61 (insignificant)
 - 2024: ~0.31 (insignificant)
 - **2025: ~2.53 (Significant)**

The timing suggests that "AI energy" moved from being **tech commentary** to an **investable narrative** only recently.

Result 2: The "Nuclear Fake-out" & The "Grid Anomaly"

The most interesting part of the results is what the market *tried* to buy, and then rejected.

- **The Nuclear Flirtation (2024 vs 2025):** In 2024, there were hints of a "Materials & Nuclear" story. Uranium (URA) showed a t-stat of **~1.66**—not quite significant, but positive. The market was testing the "baseload" thesis, likely chasing headlines about reactor restarts. But by 2025, that signal collapsed to **-0.30**. The market seemed to have tested the nuclear trade, realized the regulatory timelines were too long for the immediate AI crunch, and rotated elsewhere.
 - **Fossil Fuel:** If the story were "AI needs reliable power → we'll burn more fossil fuels," you would expect oil price exposure or fossil producers to respond. They don't. Oil proxies (e.g., USO/BNO) and E&P (e.g., XOP) show weak or zero predictive sensitivity.
 - **Grid:** If markets were immediately pricing "we need wires, transformers, and transmission capacity," then "AI energy" spikes should drive capital into **transmission infrastructure** (GRID, PAVE). You need wires and transformers regardless of the power source. Yet, these exposures remain muted. The market is ignoring the boring bottleneck (wires) to chase the generation source (electrons).
-

Result 3: The Market Buys "Speed"—Solar & Clean Tech

When "AI energy" attention spikes, the consistent next-week winners are **Solar (TAN)** and **Clean Energy (ACES)**.

So what is the market implicitly pricing? **Deployment Speed.**

The market is betting on the "fastest incremental electrons." Solar can be deployed in months. This is faster than nuclear (decades), faster than gas turbines (permitting delays), and faster than major grid upgrades (interconnection queues).

The regressions suggest that when the AI-energy narrative heats up, investors are experiencing a "Capex Panic"—they reach for the **quick-build capacity story**.

A Simple "Winner Table"

(Forward 5-day predictive t-stats)

ETF	Theme	2023	2024 (The Test)	2025 (The Breakout)
TAN	Solar	~0.64	~0.85	~ 2.41
ACES	Clean Energy	~0.61	~0.31	~ 2.53
URA	Nuclear	~0.48	~ 1.66	~-0.30
USO	Oil	~-0.09	~0.02	~0.20

Bottom Line

The market's revealed preference is striking:

1. The "AI energy" attention shock does **not** map into oil or grid infrastructure.
2. It toyed with **Nuclear** in 2024 but abandoned it in 2025.
3. It maps most reliably into **solar and clean-energy equity baskets**.