Tribunal Session Summary

Session: conclave-20260712-180533-the-prompt-resolved-dylan-1488

Depth: T6

Advocates: 5 | Judges: 4 | Cost: $8.4148 | Time: 36m 02s

THE PROMPT: ` Resolved: Dylan Patel's July 2026 claim is correct — by mid-2028, solar plus battery will be cheaper than gas for powering new US hyperscale data centers behind the meter. The test is the COST CLAIM, apples to apples: both systems must do the same job — run a new 100+ MW data center campus's 24/7 load. Within that, each side gets its least-cost real-world configuration. - "Cheaper" = lower all-in levelized cost ($/MWh) at prices a developer could actually contract in the US — including tax credits, subsidies, and tariffs actually in effect: the post-OBBBA credit phase-out as it applies to a project breaking ground in 2027-2028, IRA 45X domestic battery manufacturing credits, and current tariffs on imported Chinese cells, modules, and batteries. Real procurement prices, not policy-free abstractions. - "Solar plus battery" = utility-scale PV plus storage, architected however a competent developer would: size the battery as you see fit, keep gas or diesel backup or a grid connection for the tail if that is the least-cost way to reach data-center-grade service — but price every component and state plainly what fraction of annual MWh is non-solar. A 90%-solar hybrid is a legitimate answer; a hidden backstop is not. - "Gas" = the least-cost gas configuration actually deployable behind the meter on the same timeline: combined-cycle turbines (with real order-book lead times and scarcity premiums priced in), aeroderivative or industrial turbines, or fleets of gas-converted reciprocating engines. Do not strawman gas as backlogged CCGT if reciprocating fleets are deployable now at volume, and do not use legacy grid fleet averages. - Service requirement: the availability a hyperscale operator would actually accept for the campus. State the availability your design achieves and defend it. If your number differs from another advocate's, expect to be cross-examined on whose assumption reflects real 2026-2028 procurement. - Region: answer for the US Southwest (NV/AZ/West TX) and Mid-Atlantic (Virginia) separately if they diverge. Deliverables, in order: (1) VERDICT — YES (Patel is right) or NO, with your central $/MWh estimate for both least-cost configurations in mid-2028, per region, and the availability each design achieves. (2) CROSSOVER — if NO: your median crossover year with an 80% confidence interval, or "not before 2040" with the specific mechanism that keeps gas ahead. If YES: the year it happened or happens. (3) CRUXES — the 2-3 assumptions your verdict most depends on, each with the numeric threshold that would flip it. Address at minimum: - battery pack and module price trajectories, and whether US tariffs on Chinese cells break the curve for US deployment; - subsidy decomposition — how much of your cost gap is policy? Does your verdict flip with zero subsidies and zero tariffs? Does OBBBA phase-out timing change the answer for a 2027-2028 groundbreaking? - reliability sensitivity — at what required availability, if any, does your verdict flip? Patel's own caveat ("enough battery to get through the night" versus "three days of rain") lives here; - solar/battery supply-chain capacity against 10-30 GW/yr of US data center demand — price scarcity premiums the same way you price gas turbine backlog premiums. (4) FLIP CONDITION — the single piece of evidence that, if produced in this debate, would change your answer. Numbers over narrative: every cost or price-curve claim needs a source and a date. Prefer 2024-2026 actuals — signed solar+storage PPA and behind-the-meter deal prices, Lazard LCOE+, NREL ATB, EIA data, announced turbine and reciprocating-engine lead times, battery pack price surveys — over extrapolated curves. `

THE RULING: NO. Dylan Patel's claim is incorrect for both the US Southwest and the Mid-Atlantic (Virginia). By mid-2028, the least-cost configuration for powering a new hyperscale data center behind the meter remains natural gas, not solar-plus-battery. In the US Southwest, gas (reciprocating engine fleets) achieves an all-in levelized cost of **$61–75/MWh**, while a solar-plus-battery hybrid configured for true 24/7 firm service costs **$90–130/MWh**. In Virginia, the gap is wider: gas costs roughly **$72–80/MWh**, whereas solar-plus-battery exceeds **$120/MWh** due to poorer solar irradiance.

The Prompt

` Resolved: Dylan Patel's July 2026 claim is correct — by mid-2028, solar plus battery will be cheaper than gas for powering new US hyperscale data centers behind the meter. The test is the COST CLAIM, apples to apples: both systems must do the same job — run a new 100+ MW data center campus's 24/7 load. Within that, each side gets its least-cost real-world configuration. - "Cheaper" = lower all-in levelized cost ($/MWh) at prices a developer could actually contract in the US — including tax credits, subsidies, and tariffs actually in effect: the post-OBBBA credit phase-out as it applies to a project breaking ground in 2027-2028, IRA 45X domestic battery manufacturing credits, and current tariffs on imported Chinese cells, modules, and batteries. Real procurement prices, not policy-free abstractions. - "Solar plus battery" = utility-scale PV plus storage, architected however a competent developer would: size the battery as you see fit, keep gas or diesel backup or a grid connection for the tail if that is the least-cost way to reach data-center-grade service — but price every component and state plainly what fraction of annual MWh is non-solar. A 90%-solar hybrid is a legitimate answer; a hidden backstop is not. - "Gas" = the least-cost gas configuration actually deployable behind the meter on the same timeline: combined-cycle turbines (with real order-book lead times and scarcity premiums priced in), aeroderivative or industrial turbines, or fleets of gas-converted reciprocating engines. Do not strawman gas as backlogged CCGT if reciprocating fleets are deployable now at volume, and do not use legacy grid fleet averages. - Service requirement: the availability a hyperscale operator would actually accept for the campus. State the availability your design achieves and defend it. If your number differs from another advocate's, expect to be cross-examined on whose assumption reflects real 2026-2028 procurement. - Region: answer for the US Southwest (NV/AZ/West TX) and Mid-Atlantic (Virginia) separately if they diverge. Deliverables, in order: (1) VERDICT — YES (Patel is right) or NO, with your central $/MWh estimate for both least-cost configurations in mid-2028, per region, and the availability each design achieves. (2) CROSSOVER — if NO: your median crossover year with an 80% confidence interval, or "not before 2040" with the specific mechanism that keeps gas ahead. If YES: the year it happened or happens. (3) CRUXES — the 2-3 assumptions your verdict most depends on, each with the numeric threshold that would flip it. Address at minimum: - battery pack and module price trajectories, and whether US tariffs on Chinese cells break the curve for US deployment; - subsidy decomposition — how much of your cost gap is policy? Does your verdict flip with zero subsidies and zero tariffs? Does OBBBA phase-out timing change the answer for a 2027-2028 groundbreaking? - reliability sensitivity — at what required availability, if any, does your verdict flip? Patel's own caveat ("enough battery to get through the night" versus "three days of rain") lives here; - solar/battery supply-chain capacity against 10-30 GW/yr of US data center demand — price scarcity premiums the same way you price gas turbine backlog premiums. (4) FLIP CONDITION — the single piece of evidence that, if produced in this debate, would change your answer. Numbers over narrative: every cost or price-curve claim needs a source and a date. Prefer 2024-2026 actuals — signed solar+storage PPA and behind-the-meter deal prices, Lazard LCOE+, NREL ATB, EIA data, announced turbine and reciprocating-engine lead times, battery pack price surveys — over extrapolated curves. `

The Ruling

NO. Dylan Patel's claim is incorrect for both the US Southwest and the Mid-Atlantic (Virginia). By mid-2028, the least-cost configuration for powering a new hyperscale data center behind the meter remains natural gas, not solar-plus-battery.

In the US Southwest, gas (reciprocating engine fleets) achieves an all-in levelized cost of **$61–75/MWh**, while a solar-plus-battery hybrid configured for true 24/7 firm service costs **$90–130/MWh**. In Virginia, the gap is wider: gas costs roughly **$72–80/MWh**, whereas solar-plus-battery exceeds **$120/MWh** due to poorer solar irradiance.

The verdict hinges on one core reality: while solar panels and global battery packs are cheap, **firming** that power to "data-center-grade" availability (99.9%+) in the US creates non-linear cost explosions. The resolution's requirement to price real-world tariffs (Section 301) and post-OBBBA subsidies decouples US battery costs from global declines, and the physics of a 24/7 load forces developers to pay for redundant backup capacity—either as massive battery overbuild or a full-capacity gas tail—that undermines solar's headline cost advantage.

Core Analysis

The Winning Thesis: The "Availability Crux" Trumps Headline Solar Economics

The fundamental error in Patel’s claim is confusing the cost of *intermittent* solar energy with the cost of *firm, 24/7* power. While energy-only solar PPAs have fallen to the $20–50/MWh range, powering a hyperscale data center requires bridging the gap when the sun isn't shining—specifically, multi-day winter troughs. Moving from an intermittent supply (90% firmness) to a hyperscale standard (99.9%+) requires exponentially more capital.

This is the **Availability Crux**: to achieve 99.9% availability behind the meter without a grid lifeline, a developer must either build an economically ruinous battery overbuild or accept the "stranded capital" of a full-capacity gas backup fleet that sits idle most of the year. In either case, the resulting levelized cost exceeds that of a dedicated gas plant.

Comparative Economics: Southwest vs. Virginia

The analysis converged on specific cost ranges after correcting initial outliers.

Southwest (NV/AZ/West TX):

- **Gas Configuration ($61–75/MWh):** The debate settled on a realistic gas baseline using modular reciprocating engines (e.g., Wärtsilä, Jenbacher). These engines face scarcity premiums (current procurement shows costs of **$1,700–2,000/kW** due to data-center demand, not the outdated $1,200/kW baseline). Using firm delivered Permian gas at **$3.50/MMBtu** (higher than spot Waha prices to account for transport and firm contracts), the Levelized Cost of Energy (LCOE) lands in the **$61–75/MWh** range. This configuration achieves 99.9% availability with N+ redundancy.

- **Solar+Battery Configuration ($90–130/MWh):** The most decisive evidence came from an S&P Global Market Intelligence March 2026 analysis of a West Texas data center. It found that gas costs **$61/MWh** while solar-plus-battery costs **$130/MWh** (pre-ITC)—a $69/MWh premium. Even applying remaining Investment Tax Credit (ITC) subsidies brings solar into the **$90–110/MWh** range. The S&P study revealed the engineering reality missed by optimistic models: achieving firm power requires a **4.3× solar overbuild** and a **10-hour battery** sized at 1.44× peak load just to survive the lowest *average* solar day—let alone a multi-day storm. Pro-solar advocates' hybrid models (~$70–80/MWh) were systematically found to under-size battery duration or over-utilize the gas backup, failing the reliability test.

Mid-Atlantic (Virginia):

- **The Resource Penalty:** Virginia has a solar capacity factor of only **16.5%**, compared to ~26% in the Southwest. This physical constraint forces a solar hybrid to overbuild capacity by **5.6×** to deliver the same annual energy.
- **Cost Outcome:** This overbuild, combined with higher delivered gas costs (Transco Zone 5 pricing at ~$4.00/MMBtu), keeps solar-plus-battery costs above **$120/MWh**. Gas remains the clear winner at **~$72–80/MWh**. The consensus was that parity in Virginia will not occur before **2035**.

The Policy Wall: Tariffs and OBBBA

Patel’s implicit assumption of smooth cost declines fails under the resolution’s requirement to price *actual* US procurement conditions.

- **The Tariff Gap:** BloombergNEF’s 2025 survey showed Chinese battery packs at **$73/kWh** versus **$219/kWh** for US turnkey systems—a 3× gap. This is not physics; it is policy. **Section 301 tariffs** on Chinese LFP cells are set to reach **82.4%** in January 2026.
- **Subsidy Phase-Out:** The resolution mandates pricing a project breaking ground in 2027–2028 under the **OBBBA (One Big Beautiful Bill Act)** rules. This phases out the lucrative 30% ITC (unless strict domestic content/FEOC rules are met) and tightens **IRA 45X** manufacturing credits. Without these subsidies, the massive upfront capital costs of batteries cannot be easily amortized.

Key Cruxes and Flip Conditions

The verdict holds under the following assumptions:

1. **Battery Price Threshold:** US turnkey battery costs exceed **$110/kWh** through 2028 due to tariffs. If they fall below this threshold, solar becomes competitive in the Southwest.
2. **Availability Standard:** Hyperscalers demand **99.9%** availability (Tier III/IV). If they relax this to **95–98%** (allowing occasional curtailment), the solar LCOE drops to the **$70–80/MWh** range, achieving parity in the Southwest.
3. **Policy Ceiling:** Full ITC/45X credits are unavailable for Chinese-imported cells. If these subsidies remain fully in place without FEOC restrictions, solar gains a **$20–30/MWh** advantage.

Crossover Timeline

Based on the converged data:

- **Southwest:** Median crossover is **2032–2034**. Solar is approaching competitiveness, but the "last mile" of reliability costs remains too high for mid-2028.

- **Virginia:** Median crossover is **"Not before 2035."** The solar resource deficit is too structural to overcome with near-term battery cost declines.

How We Got Here

Scorecard

Judge	Claude Opus 4.8	Gemini 3.1 Pro	Grok 4	DeepSeek V4 Pro	Magistral Medium	Winner
MiniMax M2.7	ACCEPT	ADOPT	ADOPT	REJECT	REJECT	**Claude Opus 4.8**
GPT-OSS 120B	ACCEPT	REJECT	ADOPT	REJECT	REJECT	**Claude Opus 4.8**
Zhipu GLM-4.7	ACCEPT	REJECT	ADOPT	REJECT	REJECT	**Claude Opus 4.8**
DeepCogito v2.1 671B	ACCEPT	REJECT	REJECT	ACCEPT	REJECT	**Claude Opus 4.8 / F**

Convergence Assessment

The convergence was **epistemic** (evidence-driven). All advocates shifted positions based on verifiable data rather than social pressure.

- *Evidence of Epistemic Shift:* **DeepSeek V4 Pro** shifted from a YES/Split verdict to a NO position (or admitted the margin was razor-thin) only after being forced to concede that their gas price inputs were wrong and their hybrid math failed to account for capacity factors correctly. **Claude Opus 4.8** and **Gemini 3.1 Pro** revised gas capital estimates upward from ~$1,200/kW to ~$1,700/kW after being presented with 2026 procurement data, even though this change narrowed their winning margin. The debate moved toward truth, not toward the majority opinion.

Closing Statements

- **Claude Opus 4.8 (Winner):** Reiterated that the "Availability Crux" is the decisive factor. Emphasized that the S&P Global study is the definitive proof: even in the best solar region (West Texas), the cost to firm solar to hyperscale standards is double the cost of gas. Acknowledged that solar *is* approaching competitiveness, but argued that the "last few nines" of reliability are where economic viability breaks down for Patel's mid-2028 timeline.
- **Gemini 3.1 Pro:** Focused on the "Capital Redundancy" thesis. Argued that Patel is wrong not because solar is expensive, but because the hybrid architecture (Solar + Battery + Gas Backup) forces the

developer to buy "three power plants for the price of two." Dissented from the majority's reliance on the high-end S&P solar cost ($130/MWh), arguing that his granular hybrid math ($78.52/MWh) is more accurate, but ultimately agreed this still loses to gas ($65.55/MWh).

- **Grok 4:** Defended the "Policy Wall" argument. Stressed that the OBBBA phase-out and domestic content rules are the definitive barriers preventing US battery costs from falling enough to beat gas. Conceded that the Southwest is borderline but maintained that Virginia is a decisive NO.
- **DeepSeek V4 Pro:** Maintained a split verdict (YES Southwest, NO Virginia). Conceded that initial gas price estimates were too low but argued that the corrected gas cost ($65–75/MWh) is still vulnerable to a solar hybrid ($70–75/MWh) due to projected battery declines. Admitted that without a signed contract, the case for a crossover in 2028 is probabilistic, not definitive.
- **Magistral Medium:** Stood by the Southwest YES but acknowledged errors in the policy analysis. Conceded that the ITC would be lower than initially modeled but maintained that cost declines would still prevail. (Note: This position was largely rejected by judges for ignoring binding constraints).

Key Moments

- **The Gas Price Correction (Rounds 3–5):** Early debate featured wildly divergent gas prices. **DeepSeek V4 Pro** initially projected Southwest gas at a dirt-cheap **$35–42/MWh** using spot Waha hub prices, while **Advocate-A** used a pessimistic **$95–110/MWh** based on proprietary models. **Gemini 3.1 Pro** and others dismantled the low-end figures, pointing out that mission-critical data centers require *firm* pipeline gas (costing ~$3.50/MMBtu), not interruptible spot fuel. The field ultimately converged on a realistic range of **$61–75/MWh**, stripping away a major false advantage for solar.
- **The S&P Global "Smoking Gun" (Round 7):** As the debate narrowed, **Claude Opus 4.8** produced the most decisive piece of evidence: a March 2026 S&P Global BTM study comparing gas ($61/MWh) to solar-plus-battery ($130/MWh) in West Texas. This apples-to-apples engineering study confirmed that the "Availability Crux" adds roughly **$70/MWh** in costs to solar solutions to reach firm service, instantly validating the NO verdict against optimistic extrapolations.
- **The Capital Redundancy Trap (Round 6): Gemini 3.1 Pro** forced a realization that undermined the hybrid advocates. By calculating the Capital Recovery Factor (CRF) for a gas backup, C showed that a solar hybrid must pay for a **100 MW gas engine fleet** (costing ~$170M) just to sit idle for 90% of the year. This "stranded capital" penalty—where you pay for the backup asset 365 days a year but only use it for a few—mathematically proves that a hybrid cannot beat a pure gas plant unless the solar component is essentially free.
- **The Policy Reality Check (Rounds 2–4): Magistral Medium**'s early projection of solar dominance relied on a flat 30% ITC and 10% annual cost declines. **Grok 4** and **Claude Opus 4.8** systematically dismantled this by citing the specific text of the OBBBA phase-out and the 82.4% Section 301 tariff step-ups, proving that US battery costs would diverge from global trends through 2028.

Reality Checks

Claim	Challenge	Result
DeepSeek V4 Pro: Southwest gas LCOE is $35–42/MWh based on Waha spot prices.	**Advocate-A & C:** Waha is an interruptible spot hub; BTM hyperscale loads require firm pipeline contracts at ~$3.50/MMBtu.	**Full Concession.** DeepSeek V4 Pro revised gas up to $65–75/MWh, eliminating a false advantage.
Magistral Medium: Solar+battery will reach $0.045/kWh ($45/MWh) via 10% annual declines.	**Grok 4 & A:** LevelTen data shows solar PPAs are *rising* (9% YoY), not falling, and you must price OBBBA phase-outs and tariffs.	**Full Revision.** B revised estimate up to $0.06/kWh ($60/MWh) but the model remained flawed for ignoring reliability tails.
Gemini 3.1 Pro: A 16-hour battery is required for winter nights, making solar astronomically expensive.	**Claude Opus 4.8 & F:** The resolution allows a gas tail; a hybrid only needs 6–8 hours + backup. A 16-hour design is a strawman.	**Concession.** C revised to an 8-hour hybrid + gas tail design. **However**, this concession *strengthened* the NO position because it revealed the "stranded capital" cost of the backup.
DeepSeek V4 Pro: Solar hybrid achieves $70–75/MWh in the Southwest.	**Advocate-C:** Your own math implies **$79–87/MWh** when standard Capital Recovery Factors (CRF) and 92% availability are applied to your inputs.	**Partial Concession.** F admitted the narrow margin was inside the error bars, but continued to assert overlap with gas costs.

Next Steps

Next Step	Why It Matters	Confidence
Will engine scarcity premiums ($1,700/kW) persist or ease by 2028?	If modular engine manufacturing scales rapidly, gas costs could drop, widening the solar gap. If scarcity worsens, gas costs rise, potentially helping solar in the Southwest.	Medium (60%)
Can Chinese assembly chains bypass Section 301 tariffs by 2028?	If manufacturers successfully assemble cells in third-party countries to evade the 82.4% tariff, US battery prices could collapse, validating Patel's claim retrospectively.	Medium (70% - against evasion)
Will hyperscalers accept 95-98% availability standards?	If operators relax requirements (e.g., for training clusters), the solar LCOE drops to $70–80/MWh, achieving parity in the Southwest immediately.	Low (40%)

Dissenting Opinions

No dissenting opinions were filed in this session.

Glossary

Term	Definition
BTM (Behind the Meter)	An energy system located on the customer's side of the utility meter, operating independently of the grid to serve a specific load (e.g., a data center).
CTGF (Combined Cycle Gas Turbine)	A type of gas power plant that uses both a gas and a steam turbine to achieve high efficiency, typically suffering from 3–5 year backlog periods.
CRF (Capital Recovery Factor)	The ratio used to calculate the annual payment required to repay a capital investment over a specified time period at a given interest rate.
FEOC (Foreign Entity of Concern)	A designation in the Inflation Reduction Act (IRA) that disqualifies components (primarily from China) from receiving full tax credits like the 45X manufacturing credit.
LCOE (Levelized Cost of Energy)	The average total cost to build and operate a power plant over its lifetime divided by the total energy it produces, used to compare different generation methods in $/MWh.
OBBBA (One Big Beautiful Bill Act)	A hypothetical legislative scenario in the prompt that phases out or tightens clean energy tax credits (ITC/45X) and imposes domestic content rules starting in 2027.
Reciprocating Engine	A type of gas engine (e.g., Wärtsilä, Caterpillar) that uses pistons to convert gas energy into mechanical energy. Modular and faster to deploy (12-18 months) than large turbines.
Section 301 Tariffs	US trade tariffs on imported goods, specifically lithium-ion battery cells from China, which are set to reach 82.4% by January 2026 under the prompt's scenario.
Tier III / IV Availability	Industry standards for data center uptime involving redundancy and fault tolerance, typically demanding 99.9%+ reliability (less than ~8 hours downtime per year).

How The Conclave Works

The Conclave is a structured multi-model deliberation system. Instead of asking one AI model a question and trusting its answer, the Conclave convenes a panel of independent models, forces them to argue, and subjects their conclusions to judicial review. The process is adversarial by design — consensus must be earned through evidence, not assumed through agreement.

Advocates are independent AI models (e.g., Claude, GPT-5, Gemini, DeepSeek) that each receive the same question and produce a sealed submission without seeing each other's work. Each submission must include a falsifiable hypothesis, tagged evidence with reasoning type (deductive/inductive/abductive), provenance labels for any frameworks cited, and an honest self-assessment.

Challenges follow submissions. Each advocate reads all other submissions and directly attacks weak points — not polite reviews, but pointed cross-examination. They must identify the single factual crux that would settle each disagreement.

Debate Rounds (1–7 depending on depth) force advocates to defend, concede, or revise their positions under pressure. The system tracks position stability across rounds to detect sycophantic drift — when models change their stance to agree with others without citing new evidence.

Judges (called Justices on The Bench) are separate models that never participated as advocates. They evaluate the full record: submissions, challenges, and debate transcripts. They fact-check claims, audit framework provenance, assess whether convergence was epistemic (evidence-driven) or affective (social pressure), and render a verdict: ACCEPT one position, SYNTHESIZE the best elements, or REMAND for further debate.

Depth levels control rigor: T1/Spot Check (submissions only), T2/Standard Review (1 debate round, 1 judge), T3/Deep Review (3 rounds, 3 judges), T4/Full Panel (5 rounds, full panel), T5/Stress Test (5 rounds + Fresh Eyes review), T6/Red Team (7 rounds + mid-debate judicial checkpoint).

The system is deterministic code — it cannot be sycophantic. It dispatches prompts, collects responses, and enforces the adversarial structure. The models argue; the code referees.