



America's Energy Operating System: Intention Matters

On Time, the Electron, and the One Chance to Design a Grid Worth Having

by CHASE WEIR | MARCH 2026

a whole-of-grid dialogue

Does human purpose (why) and intention (what) matter?

Here is some exceptional guidance:

We have been told that life is darkness, and in our weariness, we echo what was said by the weary.

*And I say that life is indeed **darkness save** where there is **urge**.*

*And all urge is **blind save** where there is **knowledge**.*

*And all knowledge **vain save** where there is **work**.*

*And all work **empty save** where there is **love**.*

*And when we work with love, we bind ourselves to ourselves, and to one another, and to [a **greater purpose**].*

For to work with purpose is to charge all we fashion with a breath of our own spirit.

– Kahlil Gibran, mostly, On Work

TERRANAUT
DIALOGUES

AUTHOR'S NOTE

A “grid worth having” definition appears in Section VI. The argument preceding it below is its proof.

Intention Matters is the author's written contribution to the GridIron dialogues – a practitioner's definition of a **tru•grid**, offered in the same spirit as the question put to every participant: **what does a truer, better, smarter grid look like from where you stand?** This is not the GridIron whitepaper nor an Earthshot Foundation definition. This essay combines a series of published arguments for both grid nerds and novices about America's electricity future. The author argues **nonzero design**, **kWh liquidity**, and **return-on-time** are the coordinates pointing us to a better North Star for grid modernization. Together, they form one thesis here: This is one definition of the grid worth building, drawn from 30 hours of moderated discussions with nearly 250 grid engineers, economists, regulators and operators alongside his two decades of experience deploying innovative, first-of-a-kind energy grid solutions that deliver on their promises.

INTENTION MATTERS

On Time, the Electron, and the One Chance to Design a Grid Worth Having

Chase Weir | March 20, 2026

A city, a market, a mind, a grid – where we gather, what we value, how we choose to think, and what powers all four. Intention matters. Too few people say it.

Not as aspiration. As design principle. The first thing you put on the page before you draw a single line.

In a world that fails to defend nonzero thinking, we forget the values repeated across millennia that bind us in social contract. [nonzero: a win-win design principle, rooted in biology, society, game theory and abundance that explains how well-structured and resourced systems enlarge total value rather than merely redistribute it]. Our collective best interests are supposed to be part of the plan. That is why we form clans. Communities. Nations. When we stop saying it, stop designing for and demanding it of the systems we build, we don't drift toward neutral. We devolve. Zero-sum fills the vacuum. The jungle reasserts. Not because people are bad. Because systems without intention are captured by the nearest available incentive.

Intention Matters combines a series of arguments about America's electricity future. The first made the case for **nonzero** thinking as the governing **design ethic** for grid modernization.¹ The second argued that the grid's central failure is not generation but liquidity – that the kWh is abundant but trapped, unavailable at the right time and place, and that **kWh liquidity** is the true **end-state** of grid modernization.² The third piece is the bridge (to be published on March 23). That **bridge is time**.

I. THE BASE CURRENCY

Before we talk about time, we need to agree on what is at stake.

The kWh is an essential base currency of the modern economy. More than barrels (or therms). While oil remains the world's primary molecule for global energy and currency trade, the petro-dollar is increasingly contested in economies being built on electrons that displace combustion. The kilowatt-hour powers every transaction and computation, every movement of goods, people, and information on earth. Every hospital and school. Every data center running the models beginning to think for us.

Here is how you know this is true: a kilowatt-hour costs pennies. The bits it produces – processed, packaged, and monetized as intelligence, logistics, communication, and commerce – is worth orders of magnitude more. This is a whole-of-systems view of the watt-bit spread: the arbitrage that drives the entire digital economy.³ We transmute cheap electrons into expensive intelligence and increasingly more productive motive and mechanical work. The margin between input cost and output value is the business model of the age. Unlocking the value of this base currency is central to economic prosperity.

What makes this moment different from every prior chapter of electrification is not the spread itself. The spread has existed since the first telephone exchange. What is new is the intelligence layer

compounding it in real time. An AI system or “factory” does not merely consume electrons and produce a product or service. It learns from each transaction to narrow margins, accelerate decisions, and compound output per watt over time. Like the calorie spread and natural selection that shaped civilization over millennia only much, much faster, by human design. The watt-bit spread is no longer a static arbitrage. It is a dynamic one — and its velocity accelerates precisely as the grid's ability to deliver electricity slows. The unstoppable force of smart electrons collides with the immovable objects of our existing grid infrastructure: its people, policies, practices, politics, poles, power plants, and wires.

Nonzero design is not net-zero. Net-zero names a carbon destination, not an architecture. They don't ask the same question. Nonzero is not all-of-the-above — a political truce between competing technologies that dresses compromise as strategy. It is not a favored-technology mandate — the bet that one answer solves all questions. And it is not silo-optimization — building for one player's return while the system around it degrades. Each of these has its partisans. None is a design ethic. Nonzero is. It asks a different question: not what to reduce or favor, but what do we build that makes the system more valuable for everyone who participates in it?

The watt-bit spread runs in both directions. Watt to bit: low-cost electrons transmuted into high-value compute. Bit to watt: intelligent systems making each watt work harder, smarter, longer. The bit buying back efficiency in the watt domain. When you introduce time as the variable, both spreads become dynamic. A watt at peak congestion is not cheap. A bit processed during off-peak hours is not expensive. The temporal dimension is where the arbitrage either compounds or collapses.

The infrastructure gap is where this becomes urgent. Today, chips and processors sit idle in warehouses because the grid cannot deliver power to data centers fast enough. Amortization schedules break. Depreciation math fails.⁴ Grid flexibility — the ability to absorb, defer, redirect, and time-shift demand — is not a secondary feature of modernization. It is the mechanism by which the watt-bit spread is either captured or forfeited. A smarter grid needs smarter compute and vice-versa.

II. TIME IS LEAVING THE SYSTEM

In 1918, Congress passed the Standard Time Act and told every American what time it was. The motive was coal. Moving clocks forward one hour shifted an hour of daylight into the evening, reducing demand for artificial light and conserving fuel for the war. They did it again in World War II. Nixon did it a third time in 1973 — keeping clocks forward for two straight years after OPEC cut the oil supply. Three times in a century, under national emergency, the United States government legislated time itself as an energy policy instrument. It worked each time. The country rearranged the daily behavior of a continent by statute — not because time is abstract, but because time and energy are the same variable expressed differently. We knew this once. Then we forgot it. Now the grid is reminding us.

The grid was designed around synchronous time. Sixty hertz (in the U.S.). Spinning reserves. Dispatchable generation held in careful temporal lockstep — supply and demand balanced continuously, everywhere, at once. The grid's original time problem was measured in fractions of a second: keep frequency stable or the system collapses. That problem was solved by oversizing everything else — building poles, wires, and capacity large enough that the longer cycles of hours, seasons, and decades would never bind or bend. They bound and bent. Now both ends of the time spectrum matter: the millisecond of frequency

response and the decade of infrastructure planning, and neither can be solved without the other. For nearly a century this worked because inputs were controllable, loads were predictable, and time was something you could manage with a dispatch order and a phone call.

That world is dissolving. Not slowly. Now. We should talk about it, more plainly. And act, more urgently.

Solar generates when the sun decides. Wind blows on its own schedule. Batteries charge and discharge asynchronously. Vehicles are loads one hour and generators the next. As inverter-based resources proliferate, the temporal coherence the old grid depended on is fragmenting. The electron is becoming untethered from the clock. And the institutions built to manage that clock — utilities, regulators, capacity and capital markets — are responding at the speed of rate cases and depreciation schedules while physics moves at the speed of electrons. The grid’s time problem is a physics problem.

The gap between those two speeds is where time escapes.

It escapes in interconnection queues that stretch years, holding capital hostage while projects that would unlock grid value wait for permission structures designed for a different century.⁵ It escapes in transmission and distribution infrastructure built for peak load that sits largely idle most hours — a public good chronically underutilized, its latent capacity invisible to markets that could price and unlock it. It escapes in flat retail rates that lie to customers, telling them a kWh at noon on a July Tuesday and a kWh at midnight in October are the same commodity.

They are not. The difference between those two kWh is the entire argument.

Financial markets solved an analogous problem a century ago. A dollar was not equally valuable in all hands at all times — capital markets built the instruments that made it so: futures, options, clearing houses, price discovery mechanisms that transmitted time-value through the system.⁶ A kWh is not equally valuable in all places at all times either. Nor is it always available at any price. Physical constraints — transmission congestion, capacity limits, frequency stability requirements — mean that at certain hours in certain locations, the incremental kWh simply cannot be delivered regardless of willingness to pay.

The **liquidity failure** is not only about price signals. It is about the physical architecture that determines whether the transaction can occur at all. The grid has almost none of that infrastructure at the distribution level where it matters most. **kWh illiquidity** is, at its core, time illiquidity. The market failure is temporal. The table below↓ maps the grid's structural conditions onto their financial analogs — not as metaphor but as diagnostic. Each row names something specific that is broken and points toward what fixing it requires.

TABLE 1 kWh Liquidity — Grid Conditions and Their Financial Analogs

Grid Asset/Condition	Financial Analog	What It Reveals
Battery Storage	<i>Market Maker</i>	Buys electrons when cheap, sells when scarce. Transmits time-value through the system the way a dealer transmits price signals through a market.
Demand Response	<i>Options Contract</i>	The right, not the obligation, to reduce load at an agreed price. Value lies in its availability, not just its exercise.
Virtual Power Plant (VPP)	<i>Exchange-Traded Fund</i>	Aggregated DG assets yielding diversified, stacked returns. No single asset dominates; the portfolio is the instrument.
Curtailement	<i>Negative Interest Rate</i>	Value that exists but cannot be deployed. A productive asset punished for its own abundance. The system destroys what it cannot hold.

Grid Asset/Condition	Financial Analog	What It Reveals
Interconnection Queue	<i>Capital in Escrow</i>	Productive assets locked from market by process, not physics. The queue is not a technical problem. It is a liquidity seizure.
HVDC Transmission	<i>Broker / Neutral Clearing Party</i>	Bridges asynchronous interconnections by converting AC to DC, enabling transactions between grids that cannot otherwise synchronize. Less wire transfer, more clearinghouse.
Time-of-Use Pricing	<i>Mark-to-Market Valuation</i>	Forces the system to price what it actually has, when it has it. Flat rates are fiction. Real-time prices are truth.
kWh at Peak Congestion	<i>Scarce Commodity / Premium Asset</i>	Not all electrons are equal. Time of delivery determines value. A kWh at noon in July and a kWh at midnight in October are different instruments.
Grid Services Revenue	<i>Insurance Premium / High-Frequency Trading</i>	Two models: capacity reserves are insurance, paid for availability, rarely called but critical when they are. Frequency regulation is HFT – small returns, continuous liquidity, sub-second intervals.

The analogs above are diagnostic instruments. Each identifies a specific market failure and implies a specific class of solutions. Underlying most of them is a common condition: asymmetric information. The utility knows the grid's constraints. The storage asset knows its state of charge. The flexible load knows its tolerances. The market sees none of it. You cannot price what you cannot observe. kWh illiquidity is partly a pricing problem, partly a physical constraint problem, and partly an information architecture problem. The three are inseparable.

This is what a mature liquidity infrastructure does: it makes assets available when and where value demands them. The grid, in its current form, cannot do this. Building a grid that can is not a technology problem alone. It is a market design problem. An institutional design problem. Becomes a resource, economic and security problem. But above all, an intention problem, or the lack thereof.

III. RETURN ON TIME

If time is the master variable, we need a master metric.

Not instead of internal rate of return (IRR) – but alongside it, applied where IRR is not. IRR already embeds the time value of money in theory. The failure is not metric but practice: grid planning does not apply time-value principles uniformly across the asset queue. Projects that could deliver benefit faster – lower cost, higher optionality, immediate load relief – wait beside projects that cannot, treated as equals by a queue that has no mechanism for prioritizing return on time even when the IRR arithmetic is obvious. The discount rate knows what time is worth. The interconnection queue does not. A **Return on Time Index**, or **RoTI**, provides a framework. It is not one number. It is not a formula. It is a way of asking – systematically and without apology – the question that standard project finance rarely asks directly: how much time did we unlock? If we can understand the time value of money, we can understand the money value of time measured in lost kilowatt-hours. We can tally the forfeit gains as economic costs from a grid that can't meet new power demand over time as a kWh unit neither generated nor productively consumed.

A **reliable grid** doesn't just keep the lights on; it **reliably powers** all the new lights we want to turn on.

Grid assets have historically been valued on two dimensions: megawatts installed and megawatt-hours delivered. Both are static. Neither asks how long capital sat idle between financial close and first revenue. Neither asks how many hours of grid capacity went unused because no market signal made its value legible. Neither asks how many months a project waited in an interconnection queue before it produced a single electron. RoTI insists on a third dimension: the duration of waste. Time-weighting the denominator changes what gets built, what gets financed, and – eventually – what gets rewarded.

TABLE 2 Return on Time (RoTI) Framework — Five Dimensions of Time-Adjusted Grid Performance

RoTI Dimension	Key Metrics	Why It Matters
1. Development & Interconnection Velocity	<ul style="list-style-type: none"> • Time to Interconnection (TTI) • Queue Duration per MW • % Portfolio On/Ahead of COD 	Time-to-power determines who gets built at all.
2. Capital Efficiency Through Time	<ul style="list-style-type: none"> • Time to First Revenue (TTFR) • Idle Capital Duration (months) • Time-Weighted IRR 	Markets price speed long before they price perfection.
3. System Value & Optionality	<ul style="list-style-type: none"> • Peak Load Reduced or Shifted (MW) • Congestion Hours Avoided • Resilience Hours Delivered 	Optionality has value even when accounting doesn't capture it cleanly.
4. Coordination & Stackability	<ul style="list-style-type: none"> • Revenue Stack Count • Dispatch Responsiveness (seconds) • Utility / ISO Program Participation Rate 	Assets that coordinate reduce system friction. They get invited back.
5. Reliability in Time Terms	<ul style="list-style-type: none"> • Loss-of-Load Hours Avoided • Critical Load Availability (%) • Black Start / Islanding Readiness Time 	Reliability is temporal. Availability at the wrong time is still failure.

RoTI (T = time; I = Index, as framework) is a decision-making culture, not a regulatory instrument. It reorients the question from how much **did we build** to how much time **did we unlock**. Measured as time performance against objective results.

One insight embedded in the framework deserves emphasis: an intentional demand reduction by a large flexible load produces the same grid effect as generation. A data center throttling back, a fleet of vehicles shifting charge timing, a factory deferring a production run — supply and demand rebalance without a single additional electron being produced. That is not load flexibility as utilities currently understand it. That is a new class of grid asset that does not appear on any balance sheet yet.⁷ The bit, intelligently deployed, buying back efficiency in the watt domain. A better grid is a smarter grid.

Return on Time measures how quickly and effectively new energy assets turn capital and grid capacity into useful power — not just how much power they produce over thirty years.

IV. THE UTILITY AND THE SOCIAL CONTRACT

None of this happens without engaging the local utility. Fairly, collaboratively and directly.

The utility was designed as a regulated monopoly because the grid is a public good. Universal access. Reliability. Safety. The regulator sets the rate. The utility earns a return on capital. Everyone gets power. That bargain was struck in good faith and it worked — for the world it was designed for a century ago.

But the bargain carries a fatal embedded assumption: that time is manageable and predictable. The utility's entire financial architecture — rate cases taking years to resolve, depreciation schedules spanning decades, capacity planning horizons of thirty and forty years — is built on temporal certainty. Predict load. Build to meet it. Recover costs across a generation. The fatal flaw is not the financing horizon. Infrastructure financed over a generation is sound practice — when demand is static. When it is not, the actuarial tables are wrong. Pricing life insurance for a 25-year-old in 2026 using 1926 mortality tables would produce catastrophic mispricing — because you missed penicillin, surgery, and a century of medicine. Grid planning has missed something analogous: symmetric information, smart controls, and load flexibility that transform the customer from a passive recipient into an active

participant. The grid was built for a load profile that no longer exists and a regulatory compact that now structurally penalizes the behaviors a modern grid demands.

Most utilities earn their authorized returns by deploying capital — by building. Not by optimizing what already exists. Not by unlocking latent capacity. Not by moving faster. The model rewards the rate base and penalizes efficiency. A utility that defers a transmission upgrade by deploying distributed resources has, under most state regulatory frameworks, harmed its own financial position. That is not a utility failure. It is an institutional design failure. And it is ours to fix.⁸

To be fair to the utility: its first job is to keep the lights. Through every storm, every pandemic, every demand ‘shock’ the load forecasters missed. That is not a small thing. It is the whole thing — until it isn’t. The obligation to keep existing lights on is real, honorable, and load-bearing. The argument here is not that utilities failed that obligation. It is that the obligation was written for a grid that powered the last century’s economy. The new lights — the data centers, the EV fleets, the on-shored factories, the autonomous systems — are arriving faster than a regulatory compact written 90 years ago was designed to absorb. Keeping the old lights on and turning the new ones on, these are not the same job. The institution that conflates them will eventually fail at both.

There is a corollary risk running in the other direction. Full grid defection — complete islanding — harms no one but possibly the defector. The real problem is partial defection: data centers that build behind-the-meter generation to secure speed to power but retain grid connection for reliability backstop and cost averaging. They access the grid’s resilience and economies of scale without bearing proportional cost. The fixed costs of shared infrastructure — built and paid for by average ratepayers over decades — concentrate on the grid-dependent. This raises a temporal cost allocation question the industry has not faced before: **should the cost of new load reflect when that load arrived on the system?** New interconnection is dramatically more expensive than legacy connection. Who bears that delta — the new load that caused it, or the average ratepayer who preceded it? The answer shapes whether large load growth is a rising tide or a cost transfer.^{8a}

The utility that doesn't modernize hasn't just fallen behind technology. It has lost the thread back to why the monopoly bargain was struck in the first place.

Investor-owned utilities operate under regulatory frameworks that require them to earn a return on capital deployed — that is the design, not the deviation. The \$200 billion in net income between 2021 and 2025 — roughly 13-15 cents of every dollar paid by ratepayers — was earned inside a system that regulators approved, rate cases authorized, and legislatures enabled. If the return is too high, the fix is regulatory reform, not utility shame. The utilities did not design the incentive structure that rewards building over optimizing. They responded to it — rationally, legally, and with the predictability that long-duration infrastructure investment requires. And yet, one in six American households fell behind on their bills during the same period. The grid kept the lights on for the customers who could pay. The social contract does not end there. A monopoly granted in the public interest carries an obligation that survives the rate case.^{8b} The question is not whether utilities deserve a return. They do. The question is whether the return is being earned in proportion to the value being delivered — to all customers, not just the most creditworthy with the largest balance sheets.

The social contract at the heart of utility regulation is this: we grant the monopoly, you serve everyone, you hold the public trust, you steward the infrastructure on which all other prosperity depends. That is a nonzero contract. It is a trust instrument. Honor it and the utility is not the enemy of grid modernization — it is its operating system. Redesign its incentive structure around utilization, flexibility,

and time-value optimization rather than capital deployment alone, and you transform the monopoly from obstacle into institutional backbone of kWh liquidity.

The environmental argument finds its proper home here — not as politics but as systems logic. A grid optimized for efficiency wastes less. A grid optimized for resilience protects the communities it serves. Clean air and clean water are not externalities to be managed. They are operating requirements for a civilization that intends to keep running. A system that degrades its own substrate is by definition a failing system. A smarter grid is a cleaner grid — not because we wish it, but because incoherent design fails and coherent design endures.

Human wellbeing is not an add-on to grid modernization. It's the key performance criteria: accessible, available and affordable electricity.

V. THE GEOPOLITICAL STAKES

There is a larger prize visible from here — and a larger threat.

The architecture of global economic dominance has always followed energy. Great Britain industrialized on coal and built an empire on the steam it produced. The United States secured its post-war primacy not through military force alone but through a specific financial architecture: oil priced in dollars. The petrodollar meant that every nation needing energy had first to acquire dollars. The Federal Reserve became the world's central bank by proxy. OPEC set production. The dollar collected the toll.

That architecture is now being contested — not by nations bidding to denominate oil in a different currency, but by a nation building the infrastructure that may make oil's denomination irrelevant. The kWh is becoming the world's base currency. And the nation that builds the grid through which the world's kWh flows holds a new kind of reserve power.

China is not running a race. China is building a reserve currency.

While the United States debates the exchange rate — arguing over tax credits, tariffs, and which technology deserves preference — China is minting the underlying instrument. Between 2020 and 2024, China added 686 gigawatts of solar and 331 gigawatts of wind. The United States added 147 gigawatts of solar and 50 gigawatts of wind. China's battery storage fleet stands at 168 gigawatt-hours against the United States' 27 gigawatt-hours. In a single month — December 2024 — China added more battery storage than the United States deployed in all of 2024.⁹

TABLE 3 China vs. United States Grid Buildout, 2020–2024

Metric	China	United States	Ratio
Solar Capacity Added (2020–2024)	686 GW	147 GW	4.7×
Wind Capacity Added (2020–2024)	331 GW	50 GW	6.6×
Battery Storage (cumulative GWh)	168 GWh	27 GWh	6.2×
UHVDC Transmission Built	50,000+ km	~800 km	62×
Single-month BESS addition (12/2024)	65 GWh	~2 GWh	~32×

Sources: IEA, Global Energy Monitor, GWEC, CNESA, BloombergNEF, EIA.

China has also built >50,000 kilometers of ultra-high voltage direct current transmission – UHVDC corridors that are not infrastructure projects in the ordinary sense. They are economic arteries: rivers of electricity value circulating through an economy and, crucially, extending beyond it. Pakistan has displaced liquefied natural gas imports with Chinese-made solar gigawatts. Rooftop decisions by millions of consumers that cancelled 21 LNG shiploads, bending national demand by 40% in just two years. That is not an environmental story. It is a currency story – the kWh as instrument of economic denomination, offered at scale, with intention toward domination, to nations that will remember who showed up.

This is how reserve currencies are built. Not through declarations but through dependency. Not through force, through infrastructure. The solar factories are the mint. A fair objection: oil was globally transactable. A barrel shipped anywhere. A kilowatt-hour does not cross oceans. The reserve currency analogy is imperfect in that specific way. But China’s play is not to export electricity. It is to export the manufactured capacity to produce it – solar panels, battery systems, electric vehicles, the rare earth inputs that underpin all three.

Every economy that buys Chinese clean energy infrastructure embeds Chinese kWh economics into its cost structure. Produce something China doesn’t approve of? The panels stop shipping. The BESS contracts evaporate. The rare earth supply tightens. OPEC managed dependency through the molecule. China is managing it through the machine that produces the molecule’s replacement. That is not a weaker position. It is a more durable one – because the dependency is built into the manufacturing base, not just the fuel supply. UHVDC corridors are the wire transfer system. The grid architecture China exports is the denomination. The United States’ response should not be to out-manufacture China on solar panels – that contest is already decided on those terms. The nonzero move is to build what a command economy cannot replicate: a grid architecture that makes kWh genuinely liquid through open markets, interoperable standards, and a trust architecture that attracts global capital. The dollar became the reserve currency not through force but through the depth and trustworthiness of the markets it underpinned. The path is known. National will is the variable.

The demand side only amplifies the urgency. AI consumed more new power last year than most nations’ entire generating capacity. Data center power demand is projected to more than triple by 2030.¹⁰ Humanoid robots (if that’s a thing) threaten to add another order of magnitude. Goldman Sachs projects 1.4 million units deployed by 2035. Morgan Stanley’s long view reaches one billion units by 2050 – a fleet if running simultaneously would consume roughly 840 terawatt-hours per year.¹¹ The onshoring of advanced manufacturing adds further demand that did not exist 5 years ago and was not in any utility’s load forecast.

TABLE 4 The Widening Gap (Capital, Generation, and Value, 2020–30)

	China	U.S.	Ratio
Capex 2020–2024	~\$1.8T	~\$500B	3.6x
Capex 2026–2030 (projected)	~\$2.0–2.5T	~\$600–800B	~3x
Lifetime generation (25 yr from ‘24 base)	~55,600 TWh	~12,075 TWh	4.6x
Lifetime value (illiquid – flat rate)	~\$2.3T	~\$507B	4.5x
Lifetime value (liquid grid)	~\$4.6–6.9T	~\$1.0–1.5T	~4–5x
GDP gap by 2030 (forfeited, indicative)	–	~\$1.5–2.5T	↑ Growing

¹ Lifetime generation estimated from 2024 installed base at blended capacity factors over 25 years. Directional only. Do your own math.

² Illiquid value at indicative flat wholesale (~\$42/MWh); US retail closer to \$0.13/kWh, China’s administrative rate ~\$0.08/kWh. Liquid value applies a 2–3x multiplier reflecting time-of-use pricing, ancillary services, and demand flexibility. China’s system is designed for liquidity. The US system is not. That asymmetry means the illiquid column overstates US realized value and the liquid column understates China’s. The true gap is wider than this table shows.

³ US consumers overpay per kWh and underprice its value simultaneously. A liquid US grid would lower average cost through off-peak reductions while widening the peak premium. The current system does neither.

⁴ GDP gap is the cumulative annual difference in realized kWh value between a liquid and illiquid system. Indicative, not modeled. It does not shrink. It compounds.

Sources: IEA World Energy Investment 2025; BloombergNEF Energy Transition Investment Trends 2026; Clean Investment Monitor (Rhodium/MIT); NREL capacity factors; EIA wholesale price data. The ratio column is arithmetic. The argument it supports is propositional logic. The math and logic are inviolable.

We have never, in the history of electrification, arrived at a moment where we had too many kilowatt-hours. We built the grid to meet the last century's demand. Artificial inference, autonomous labor, and the return of domestic industry are the next century's demand – arriving now, in parallel, without waiting for the grid to be ready. The question has never been whether we will find purpose for more electrons. We always do. The question is whether we build the grid before the purpose arrives, or after.

A note on irony, offered without malice: a major technology company recently announced achieving one hundred percent renewable energy. In a warehouse nearby, ten thousand chips sat idle waiting for a grid too slow to feed them. The press release went out on time. The electrons didn't. Meanwhile, the race to build artificial intelligence has produced some of the least intelligent energy decisions in recent memory – including at least one prominent AI supercomputer powered by simple-cycle natural gas combustion turbines, already designated the largest source of nitrogen oxide emissions in its eleven-county metropolitan region, a region already failing federal air quality standards.¹² One data center can reverse the decarbonization gains of an entire metropolitan area overnight. We are capable of holding these contradictions simultaneously and cheerfully. Deploy first, permit later is about “my speed to power, not yours.” A single planned data center in New Mexico would emit more CO₂ annually than the entire state reduced over the last twenty years. And a single campus in Nevada rewrote a utility's emissions trajectory by a decade, while Microsoft's total footprint has grown as much as 40% and after its pledge to go carbon negative. The grid doesn't balance contradictions. It just runs the math.

We have the technology and capital. We have the resources, demand and willingness. We are not outgunned on these dimensions. What we consistently, persistently, and at compounding cost lack is the institutional intention: to design grid systems the way they deserve to be designed – **in and on time**.

VI. WHAT IS YOUR DEFINITION OF THE GRID?

Earthshot Foundation launched the Terranaut GridIron Dialogues in March of 2025. Twelve months later, over 200 stakeholders and practitioners across the grid's ecosystem have joined in virtual and in-person, moderated dialogues. Sessions have been convened with dialogue partners and co-hosts in Washington, DC, Golden, CO and Austin, TX. Grid engineers and energy economists, state and federal regulators, policy and market analysts, systems thinkers and operators, developers and public servants. People who, when they speak, our instincts tell us to stop, get quiet and listen. We asked everyone the same question: **what is your definition of the grid we are trying to build?**

Having asked it of others, this is my summarized answer below combining the arguments above.

A tru•grid is a grid that earns the trust placed in it.

One designed with nonzero intent – not to redistribute value among partisans, but to enlarge the total value available to all participants. One that treats time as the master variable, not an afterthought. One in which the kilowatt-hour is genuinely liquid: available at the right time, in the right place, at a price that tells the truth. One whose institutions – utilities, regulators, markets, and the public that ultimately owns the infrastructure – are aligned around the same long-term interest: a grid that compounds value for the stakeholders it serves, the industries it powers, the security it protects, economies it grows and standards-of-living it lifts.



A working definition has guided the GridIron from the start: **a tru•grid is a national public good and competitive advantage — the modernization of which benefits all.** That is the floor. The walls and ceiling are still being built by the people in the room and on the field.

This is one contribution among definitions of that better, truer, more perfect, future grid. The argument for nonzero as design ethic, for time as the master variable, for kWh liquidity as the true end state: taken together, they are what I believe a tru•grid is and why intention matters. The definition is not a conclusion. It is the beginning.

VII. THE CHAIN

Back to Kahlil Gibran. Writing not about grids but about the deepest nature of work, he gave us the chain of conditions reproduced at the opening of this piece. It is worth running forward through the intentional argument we have built.

[Darkness] — a grid without design intention.

Built for the rate base. Administered without memory of why the monopoly was granted. Optimized for capital deployment rather than capital efficiency. Zero-sum by default, not by design — but zero-sum in outcome all the same. This is what we inherit if we do nothing.

[Urge] — the nonzero impulse.

The human decision to design for abundance, for everyone, for the long game. The recognition that in a world without defended nonzero principles, zero-sum fills the vacuum and the jungle reasserts. Urge is the starting point — the moral memory that says we have done this before and we can do it again. Every institution that distributes abundance rather than hoarding it was built by someone who first felt this urge and then did something with it.

[Knowledge] — Return on Time.

The watt-bit spread as proof of what is at stake. The RoTI framework as the discipline that makes time legible and manageable. The understanding that kWh illiquidity is time illiquidity, that the grid's failure is temporal before it is technological, and that solving for time is solving for everything. Knowing exactly what you are optimizing for, and why, is the difference between a system that compounds and one that drifts.

[Work] — the actual modernization.

Interconnection reform. Utility incentive redesign. Time-based market structures at the distribution level. HVDC corridors that don't yet exist but must. The deployment of demand flexibility as a grid asset class. The patient, unglamorous, technically demanding labor of remaking a century-old system while it continues to operate. This is not strategic planning. It is construction. Built. Not wished.

[Love] — the social contract honored.

The grid held in stewardship. The public good administered as a public good. The understanding that we are writing a book — in steel and wire and software and policy and capital allocation — that our children and theirs will read. The nonzero or zero-sum character of what we build in this decade will be legible to people not yet born. The decisions calcify into institutions. The institutions shape the next generation of decisions. Build with genuine competence and institutional intention — design the grid the way Gibran describes work done with love — and charge all you fashion with a breath of that spirit.

VIII. THE ONE CHANCE

Infrastructure lasts. That is both the opportunity and the weight of this moment.

The decisions made now — about how to build, reform, and operate America's electric grid over the next decade — will have lasting impacts not so easily reversed. For years and decades, and possibly generations to come. We are not tinkering at the margins. We are setting the temporal architecture of an economy. The nonzero or zero-sum character of what we build will compound for generations.

We already have the abundance: intelligence, technology, capital, capacity, resources, demand, and willingness to design a better tomorrow. We don't get it if we don't say it, state it, model it, design and develop it, deliver and operate it like custodians.

The kWh is the base currency. Time is the master variable. Trust is the institutional infrastructure. The utility, reformed and renewed around these principles, **is the operating system**. The natural world is not an externality — it is the operating environment. And nonzero thinking — *the design principle, rooted in game theory, that well-structured systems enlarge total value rather than merely redistribute it* — is not a philosophy for optimists. It is the design logic of every system that has ever survived the test of time.

Say and model it. Design and develop it. Deliver and operate it. Like custodians.

Intention matters.

It's time.

About the Author

Chase Weir is co-founder and CEO of truCurrent and Distributed Sun (DSUN). truCurrent deploys behind-the-meter energy systems — solar, storage, microgrids, and EV charging — for utilities, data centers, and large commercial and industrial loads nationwide. DSUN develops, owns, and operates utility-scale solar and storage: with 1GW/2GWh in active development, assets in 17 states, \$1B+ in delivered savings, 14% average yields across a dozen funds over 16 years. He founded the Earthshot Foundation in 2008 to protect and preserve our natural capital and accelerate an abundant energy transition for all. The foundation's core work is pursued under the Terranaut Programs: our motives and dialogues about energy and natural capital resources and, above all, our human capital — the Terranauts themselves and supporting their missions.

About The Terranaut GridIron Dialogues

The Terranaut GridIron Dialogues are a cross-sector series convened by the Earthshot Foundation. Nearly 250 engineers, economists, regulators, operators, and policy leaders have participated across 30 hours of moderated discussion. A synthesis session convenes April 15, 2026. The **GRIDIRON WHITE PAPER** and participant definitions of a tru•grid will be unveiled at the series finale on June 8, 2026, in Washington, DC. The dialogue continues at earthshot.foundation and trugrid.org.

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