2026

NETWORKOCEAN | WHITEPAPER

The First Terawatt Data Center

American Super Intelligence is bottlenecked by powered land. We build floating solar-powered data centers to optimize for **speed and scale**.

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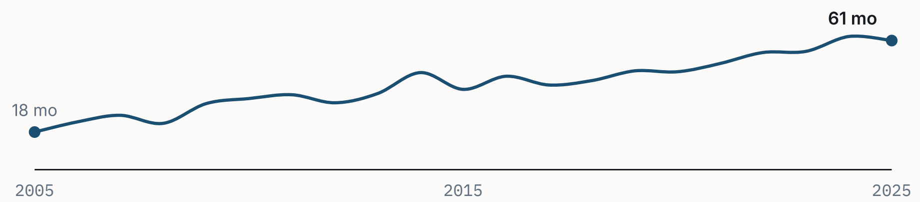
01
The bottlenecks of ASI

To pave the way for ASI, two things matter: **speed and scale.**

Median wait for new generation, interconnection request to operation[1]

Months, by year of completion



5.1 yr
Interconnection request to commercial operation for new generation reaching operation in 2025.[1]

300+
Local datacenter moratoriums and bans enacted across the United States.[2]

5.2 yr
Of gas turbine production in backlog; the first open slots are past 2030.[4,5,6]

American Super Intelligence is constrained by powered land. The grid interconnection queue is the most well known: for new generation reaching commercial operation in 2025, the interconnection request alone took a median of 61 months.[1]

To combat this, many developers are building **behind-the-meter (BTM)** power, typically natural gas turbines. Developers pay a significant premium to secure power sooner, by skipping the interconnection queue. By 2028, over half of new datacenter capacity will be BTM.[8]

This method comes with its own slew of challenges. Large gas turbines are sold out past 2030.[6] Even smaller recip engines and aeros see roughly 20 months from PO to power on.[6,10] Gas delivery delays also halt projects, with Oracle's flagship New Mexico campus facing setbacks without an approved pipeline route.[6]

Then the public can halt, or even cancel projects. More than 300 local moratoriums and bans are enacted, and the **median AI datacenter takes 816 days** from first land clearing to first operational building, after permitting and land rights are already secured.[3] Currently, about 20 GW of planned capacity are in restricted locations and 2.3 GW are already delayed. We expect these figures to significantly accelerate.

Past 12 NM, local jurisdiction ends. Past 200 NM, only the flag state regulates. No zoning laws, no interconnection queue, no transformer with grid studies, no pipeline easements, no turbine backlog, no county board, no state permit.

> By 2030, over 100 GW of American data centers must supply their own power.[9]

The four bottlenecks on a new site

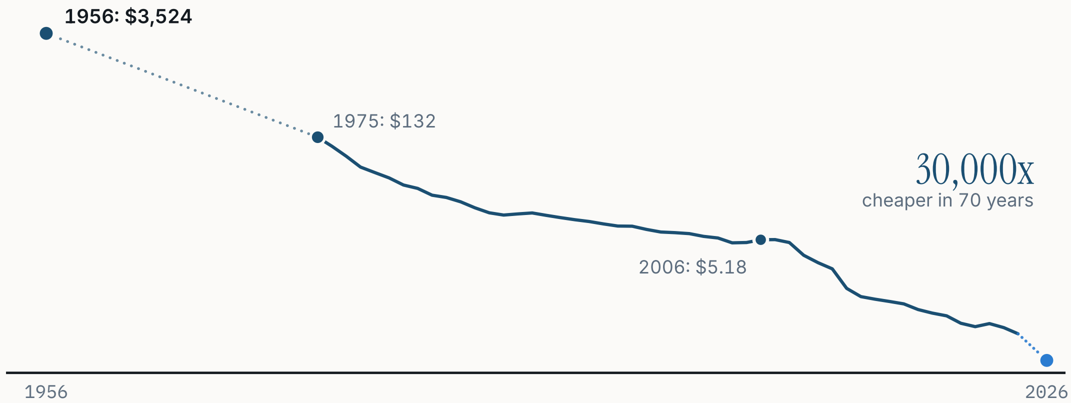
BOTTLENECK	ON LAND	AT SEA
Interconnection	61 months	Not required.
Power equipment	HV Transformers: 2+ yrs[11,12]	MV-only: 8 to 12 weeks[46]
BTM generation	Turbine backlog: 5+ years[4,5]	Solar and storage, currently at 700 GW/yr[13]
Public opposition	300+ moratoriums, 816-day median build	Maritime standards, and solar-powered

02
Solar already ships gigawatts per day.

The first terawatt of solar took 68 years. We just added a 3rd terawatt in under two years.

700 GW	5x	90%
Modules shipped in 2025: **nearly 2 GW a day**.[13]	Reduction in PV cost, 2010 to 2020; the expected reduction was 1.3x.[14]	Of new capacity in Texas's ERCOT in 2025 was solar plus batteries.[15,16]

From $3,524 per watt to $0.11, constant dollars.[18,19]



Solar is by far the fastest-ramping energy source: 700 GW of modules shipped in 2025, **nearly 2 GW a day.**[13] A learning rate is the observed cost reduction with each doubling of production: the more of something you make, the more efficient you get at making it. Solar has one of the highest learning rates ever recorded, 23% across its history and over 40% in the last two decades.[13,17]

The cost curves bulldozed every forecast. Across 2,905 published projections of solar cost from 2010 to 2020, the consensus projection was a 23% reduction in cost. **Costs fell 80% within those 10 years.**[14] **And it has nearly halved again in the 6 years since.**[17,19]

Texas' power market, ERCOT, is an energy-only market: generators only get paid for the energy they deliver, not for idling capacity. Any new energy technology must directly outcompete the local plants running on cheap Texas gas to earn its place.

Last year, solar and batteries were 90% of ERCOT's new additions to the grid. It has 6x'ed in share of ERCOT's sold energy within 5 years.[15,16] Developers have already begun powering data centers with solar and battery, with Crusoe and Redwood's solar and battery microgrid delivering 99.2% availability to a 12 MW data center (currently expanding to 20 MW).[20]

Learning rates per production doubling

Solar PV	**23% across its history; over 40% in the last two decades**[13,17]
Wind	13% onshore, 14% offshore[41]
Gas power	Roughly flat for 140 years[14]
Nuclear	Negative: costs rose with deployment[14]

Ride the learning curve of silicon, not steel. The learning rate advantage of solar power is fundamental. Solar manufacturing has fractal modularity: cells in series form a module, modules in series form strings, strings into arrays, arrays into gigawatt plants. Factories make millions of panels a day, and process changes can be A/B tested then implemented across all lines in days. Improvements at the cell immediately scale to the largest solar farms. After building a gigawatt plant, you've already built 200 million half-cells, during which you've discovered and implemented thousands of improvements.

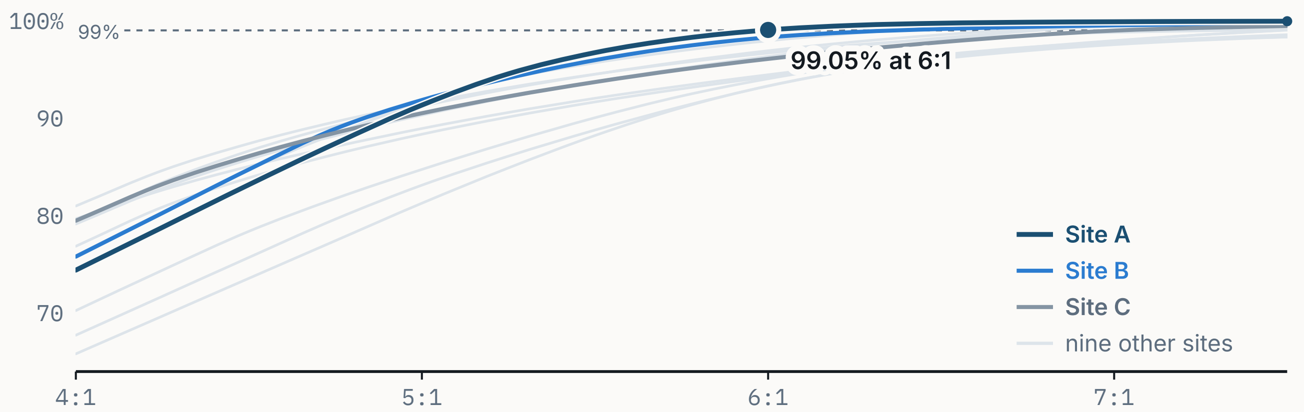
Every other path to power either faces delays or has lower learning rates. Even with China's streamlined approvals and state-backed financing, they've only added 1.7 GW of nuclear and 20 GW of gas last year. They added 315 GW of solar.[42,43]

03
The dawn of solar data centers

Solar-powered data centers can use batteries to withstand the weather and the night.

Uptime of 12 solar powered data center sites

Availability vs. solar overbuild ratio @ 24hr battery



Selected sites for a 1 GW data center

SITE	SOLAR / STORAGE GW, h per GW of IT	UPTIME %	SURPLUS % of gen	2027 $ / kWh FIRM	2027 $ / kWh ALL	2030 $ / kWh FIRM	2030 $ / kWh ALL
Site A	6 GW / 24 h	99.05	9.9	0.15	0.12	0.07	0.06
Site B	7 GW / 18 h	99.43	24.2	0.16	0.11	0.08	0.06
Site C	7 GW / 18 h	99.27	27.8	0.16	0.11	0.08	0.05

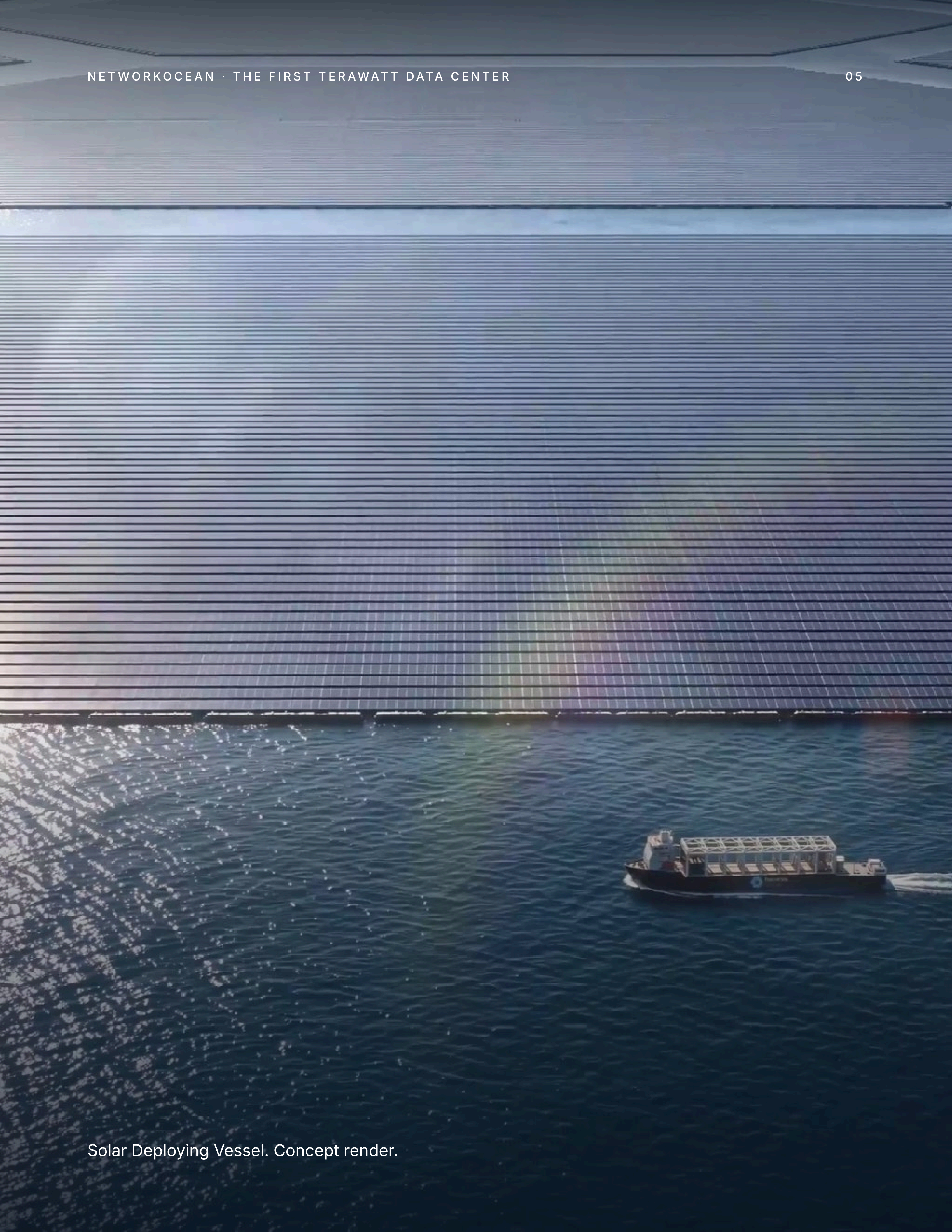
To enable off-grid solar, you need an overbuild ratio of at least 4:1. This means to power a 1 GW data center, you build at least 4 GW of nameplate solar to account for the capacity factor. You then use batteries to shift the overproduction during the day to power your load during the night and through bad weather. More batteries means more uptime and resilience to weather; more overbuild means more power even during bad days.

The best sites can reach 99% availability with only 6:1 to 7:1 overbuild and 18 to 24 hours of storage. They sit in international waters near major port infrastructure and away from common tropical storm paths. **The best sites alone are scalable to terawatts.** These are cost-competitive with many BTM solutions now, and competitive with most energy sources by 2030. 99% uptime is sufficient for both distributed training (RL rollouts) and inference, with multiple BTM projects being currently built at two nines.[6]

Floating solar 2030

SOURCE	$/KWH firm	NOTES
Our 2030 stack, at sea	0.07	Fastest learning curve
Land BTM, gas or hybrid	0.10 to 0.15	After PUE and redundancy; fuel exposure, flat learning curve[10]
US grid, industrial avg	0.09	5-yr queue[24]
Nuclear restart	0.13	TMI reference[23]

Site A requires lower overbuild, so lower capex. Sites B and C have lower battery requirements, higher overbuild, and much more surplus energy. Modules are priced at international spot.



Solar Deploying Vessel. Concept render.

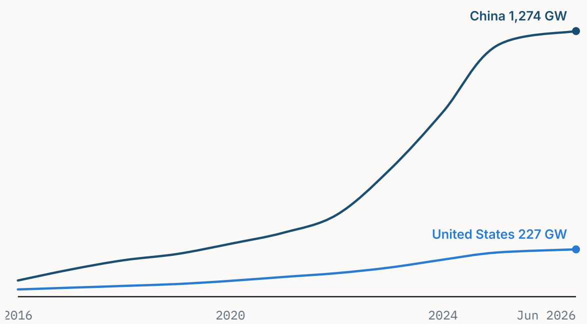
04
Taking silicon to sea

The cheapest energy in history on the largest surface on Earth.

0.00001%	5 GW	Zero
Of the ocean powers a gigawatt data center. 0.01% powers the **first terawatt data center**.	Of solar modules fits on a single large container ship.[22] The ocean moves thousands of these shipments a year.	Export cables, landfalls and onshore substations. The power is consumed where it is made.

Solar and batteries on land is growing and will be growing fast. Yet, the US has not ramped up solar installation enough. Last year, China outbuilt us on solar by more than eight times.[51,52] The gap is widening.

Installed solar capacity
Cumulative GW



> "The major challenge for US solar isn't module cost, it's permitting and construction inefficiency."
> Casey Handmer

Taking these deployments into international waters allows us to accelerate power production for American Super Intelligence. No interconnect study, no zoning, no county permit, no assembling contiguous land rights or upgrading transmission lines.

NetworkOcean inverts the priorities of any other large-scale ocean infrastructure project. Offshore projects typically take 10 years from concept to creation, design for 100-year extremes and 30-year lifespans with minimal maintenance, use 10x fatigue factors and corrosion allowances.

With floating solar, you have millions of units worth hundreds each. You have parallel strings allowing for partial failures. You design for large-scale modularity and allow for significant degradation of cheap components before replacement. You ride factory-scale solar and plastics manufacturing curves.

Historically, many offshore power technologies have been hindered by the necessity of the export power cable. Now, the data center can be the power demand on-site. This uniquely enables offshore energy projects to be built and deployed within a year.

Wind and wave power are far more variable at sea: wind goes with velocity³ and wave with height² times period, so a single calm week is a lost week and requires over 100 hours of storage. Solar's worst days still produce power through diffused light, which allows storage to be 24 hours or less.

	LEGACY OFFSHORE PLAYBOOK	FLOATING SOLAR PLAYBOOK
Timeline	10 years, concept to creation	Months, factory to array
Design basis	100-year extremes, 10x fatigue factors	Parallel strings; partial failure is routine
Unit	One structure	Millions of units worth hundreds each
Lifespan	30 years, minimal maintenance	Cheap components degrade and get replaced
Cost curve	Steel and yard labor	Factory solar and plastics learning curves

05

Sell compute not electrons

Distributed factories can fabricate power, cooling, and compute containers, which are loaded onto data center ships in ports and shipyards.

+22%	1.15	Zero
More compute for the same power at sea vs land.	Peak PUE for once-through seawater; land-based BTM is 1.4.[10]	Freshwater consumed by cooling.

Compute commands a premium for speed: 1 MW online a month earlier brings $1M to $8M of revenue sooner. For frontier AI labs, speed compounds: compute online a month earlier means a frontier model trained sooner, which means post-training and distillation into more efficient models, which in turn accelerates AI research for the next models. **In an exponential-growth race, speed is everything.**

A data center that can skip years of interconnection queues, years of turbine backlogs, and months of permitting is worth multiples of the billions in revenue it pulls forward. A data center that can be built and deployed in under a year has **infinite demand**.

Neoclouds have historically rented out GPUs at roughly $15M/MW per year. Just a few months ago, Anthropic rented 300 MW of compute from Elon at $50M/MW per year.[26] With AI labs generating more and more revenue from the same GW increases, they've shown an increased willingness to pay more for online data centers. Anthropic went from $9B a year on 1.4 GW at the end of 2025 to $65B on roughly 3 GW seven months later.[44,45]

On land, cooling requires choosing the lesser of two evils: evaporative towers that consume water and face strong public objection,[27,28] or dry coolers that push the worst-case PUE to 1.4 and must reserve precious power capacity for the harsh summer cooling loads typical in Texas. Once-through seawater cooling refuses this choice, cuts out the chiller stack, and secures a far lower peak PUE. Historically, Nautilus claims 1.15 for their floating site in Stockton, and Start Campus is building a 1.2 GW sea-cooled land data center at 1.1 PUE.[29,30] Both Project Natick and **NetworkOcean's own underwater data center** have achieved a PUE of 1.07 with seawater cooling.[31,32] 1 GW of IT rejects about 1.1 GW of heat to the sea. GW plants can do this on lakes with no measurable effect, and with diffusers in open ocean it is negligible.[31]

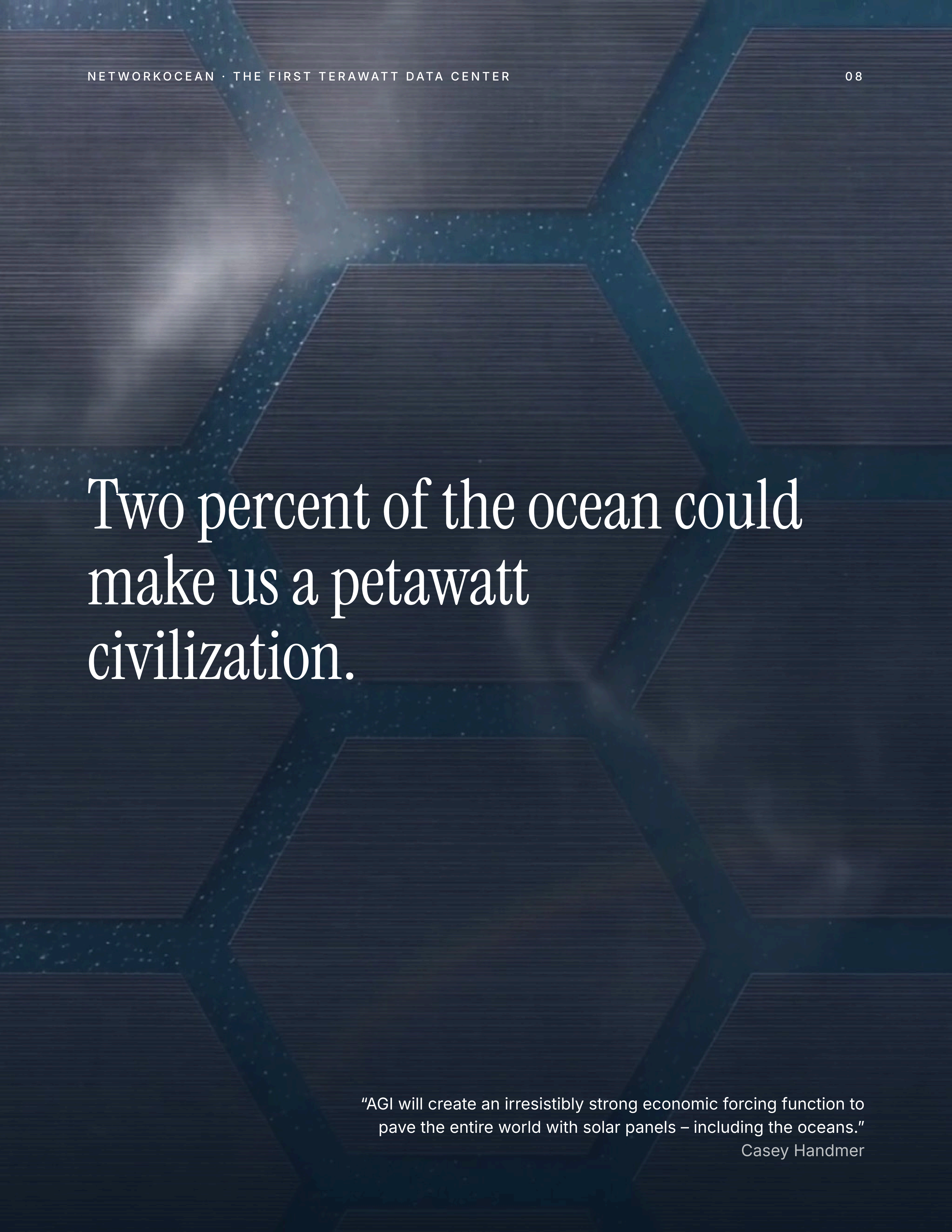
> Accelerate time-to-power at competitive cost.

The electrical chain is also simplified. With megawatt-scale compute nodes, the plant can run DC to DC: solar, battery, and GPU can share a DC architecture, cutting many stages of conversions.[33,34] Even on a standard MVAC solar collection system, hundreds of MW per compute ship is achievable without requiring HV transmission.

Connectivity will be served by LEO first, fiber later. Serving tokens needs 30 to 70 Mbps per MW: GPT-OSS streams about 3 kbps per conversation and GPT-6 Astra about 1.5 to 1.8, so one Starlink-class terminal, with a 20 to 40 Mbps uplink, serves about 10,000 users.[35] One subsea fiber cable would be capable of serving hundreds of millions of users, and is two orders of magnitude cheaper per mile than subsea power cables.[36,37]

Land vs sea, per megawatt of IT

LINE	ON LAND	AT SEA
Power	$5M of gas turbines, plus fuel[6]	$5.9M of solar and battery (2030), fuel-free
Site and shell	$20M all-in with power[6,21]	~$20M all-in, with ship being ~1%
IT inside	$40M: GPUs + other[21]	Same as land
Revenue	$15M bare-metal, $30M managed, $100M tokens[7,21]	Same as land
Payback, all-in	About 4 years rented, 2 managed[21]	Same as land
Time to power	Years: queues, backlogs, gear, permits[1]	Months: factory and yard throughput



Two percent of the ocean could make us a petawatt civilization.

"AGI will create an irresistibly strong economic forcing function to pave the entire world with solar panels – including the oceans."
Casey Handmer

06
Synergies with future technology

American frontier companies are addressing the night, the weather, and the surplus.

+14%
Output per array, while boosting uptime to 99.99% with synthetic fuel generation.

10x
Less downtime **at the same cost**: cloud seeding takes uptime from 99.4 to 99.9%.

+27%
Same array provides 27% more firm power.

Our baseline is 99% with just solar and storage. These startups build drop-in products that immediately increase available power and uptime.

At 7:1 overbuild, a quarter of everything the array makes is surplus at zero marginal cost.

Electrofuel synthesis from air has been achieved by startups such as Terraform Industries and Rivan.[25,48] A synthesizer on the array turns surplus into about 100 kt/yr of methanol per firm GW, and a marine genset can use it during the darkest weeks. This enables 14% more firm load, at 99.99% uptime. Other companies, such as Lightcell Energy or Bloom, can increase this round-trip efficiency.[53,54] This enables more firmed power for the same surplus energy.

Cloud-seeding has been led by Rainmaker, who generated 145M gallons, including 19M gallons in three hours.[38] Meteoric, a 2026 YC company, is also flying drones specifically to thin clouds over solar farms.[50] If cloud-seeding thins the darkest 10% of days by half, we can achieve 99.9% uptime while also increasing firm output by 11%.

Space-based solar startups can also increase uptime and availability at low cost. If Reflect Orbital's mirrors deliver 200 W/m² for three hours at dawn and three at dusk, uptime rises to 99.9% and the same array carries 27% more firm power.[39,40]

Long-duration storage startups can widen the map to include higher-latitude sites with greater seasonal variation. Standard Thermal can hold summer surplus as heat for months, then convert back to electricity at large scale.[47] Form Energy has started shipping 100-hour iron-air batteries, which could stave off seasonal storms.[49]

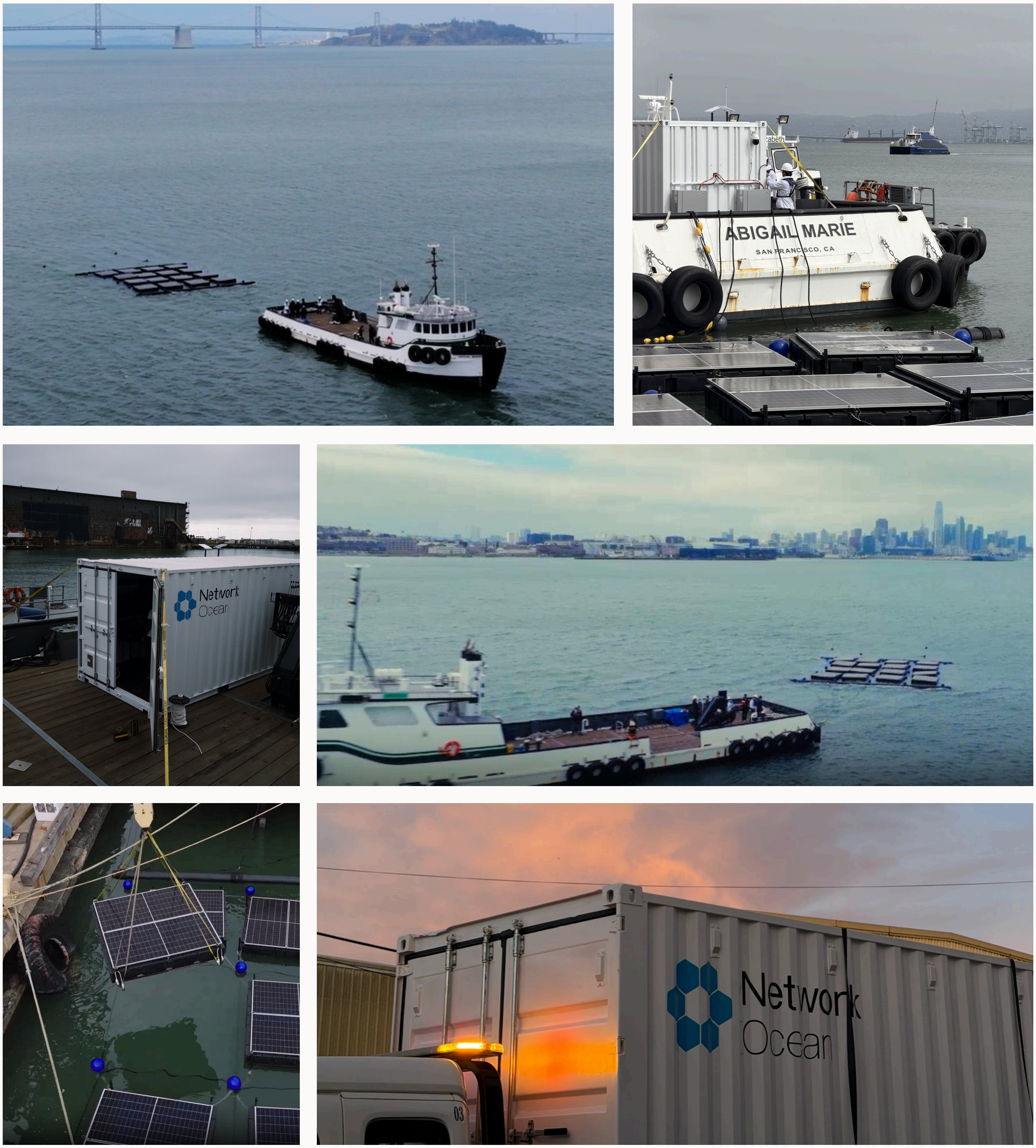
> Frontier tech can increase uptime and significantly increase power output of already deployed arrays.

Site B

SCENARIO	OVERBUILD	STORAGE h	UPTIME %	FIRM OUTPUT x, same array	ESTIMATED LCOE $ / kWh, 2030
Baseline: silicon and storage	7:1	18	99.43	1.00	0.078
+ Synthetic methanol from our surplus	6:1	18	**99.99‡**	**1.14**	0.078
+ Cloud seeding	7:1	18	**99.94**	1.11	0.078
+ LEO reflector, 200 W/m² for 6 hours	7:1	18	99.93	**1.27**	0.078
+ All three together	5.5:1	18	99.99‡	1.50	**0.074**

Methanol rows make methanol from the array's own surplus at 50% electricity to fuel and burn it through a 40% genset at $700 per kW, with a two-week tank the loop seeds before the load ramps. No fuel is bought. ‡ models to 100% over the 87,672-hour run, printed as four nines for genset outages. Scenario magnitudes are ours, not vendor commitments.

The first array is in the water.



San Francisco Bay, September 2026. From top left: the sixteen-float array off the Bay Bridge; the Abigail Marie, a 110 ft support vessel; the 20 ft data center container on her deck; the 4 by 4 array under tow; a float on the crane at the dock; the data center container at sunset. The array is 20 kW, on a temporary tow under US Coast Guard approval.

Diligence

NetworkOcean dispatch model: ten years of hourly weather, 756 design points, checked against Solargis and NASA POWER.

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Model assumptions

ERA5 weather via Open-Meteo, ten years hourly per site, 2015 through 2024. Capital at 8% real over 25 years; O&M 1.5% of capex; PF 1.0 at the IT bus. Solar $1.50 per installed W (2027) and $0.68 (2030 stack: module 0.12, structure 0.28, electrical 0.28); battery $90 and $60 per kWh, pack basis; balance of system $0.5M and $0.35M per MW of IT; methanol made on site from surplus at 50% electricity to fuel, burned through a 40% genset, genset $700 per kW at full load, 336-hour tank, 48-hour commissioning fill; Rainmaker lifts the darkest 10% of days 1.5x; Reflect 200 W/m² for 3 h either side of night, dimmed by that day's cloud; 7.4 m² of ocean per kW of nameplate at 60% coverage. Delivered costs rounded to the cent.

Thanks to Austin Vernon (Standard Thermal), Peter Hirschboeck (impactECI), Danielle Fong (Lightcell Energy), and Ally Stone and Sam Harrison (Reflect Orbital) for reading drafts of this.