PatterPower
A PATTERTECH VENTURE

WHITEPAPER · IN BRIEF

Co-located energy parks

Bring demand to the source: A short introduction to a simple idea

The opportunity | The building blocks | Why it pays

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A short companion to the full PatterPower research whitepaper. Figures are illustrative, drawn from public 2026 sources and used as directional ranges, not forecasts. Not an offer of securities, an invitation to invest, or investment advice.

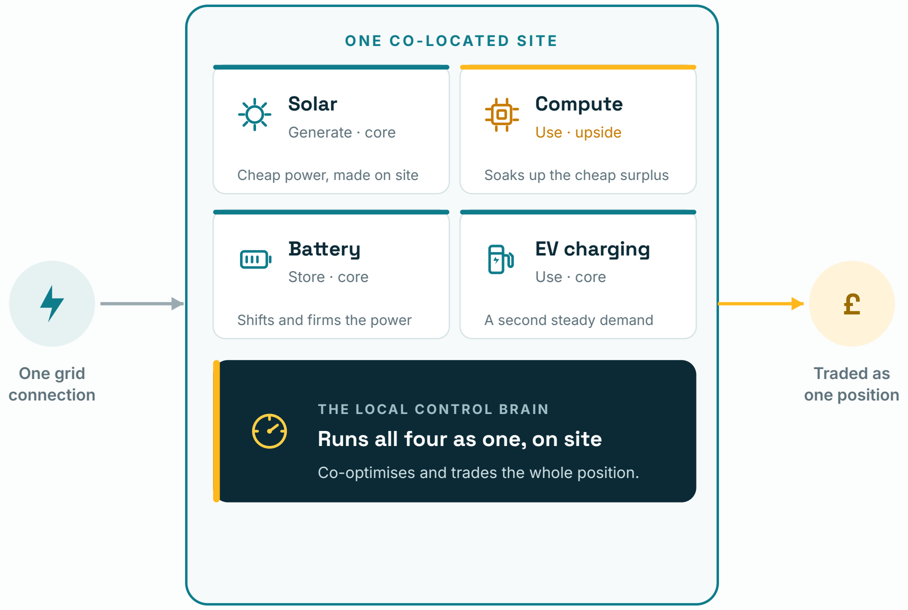
THE OPPORTUNITY

Bring demand to the source

Four things that used to live apart are coming together in one location: Generation, energy storage, flexible demand, and market participation. Put them together behind a single connection, optimised via one control system, and it turns what was previously a challenge into an opportunity.

The grid is full, computing demand is surging, and clean power is being wasted for want of somewhere local to put it. A co-located clean-energy park answers all three at once. It generates and stores power on site, uses the cheap surplus through flexible demand such as computing and electric-vehicle charging, and trades the combined position into the market.

EXHIBIT 1 **Generate, store, use and trade. All behind a single connection.**



The whole picture. Generation and storage, flexible demand and a route to market sit behind one connection; a single local control system runs and trades them as one. Illustrative.

THE IDEA IN ONE LINE

Co-locate generation, storage and flexible demand in one location, optimised via a single local control system that trades while utilising the whole system. Bring demand to the source, and turn power that is cheap, clean and otherwise wasted into a useful economic output.

WHY NOW

Three forces - One opening

Three things are happening at once and a co-located energy park sits exactly where they meet.

125 GW

The grid is full

The GB connection queue reached 125 GW by mid-2025, against a peak demand near 45 GW. New projects wait years for a connection.

×2

Demand is surging

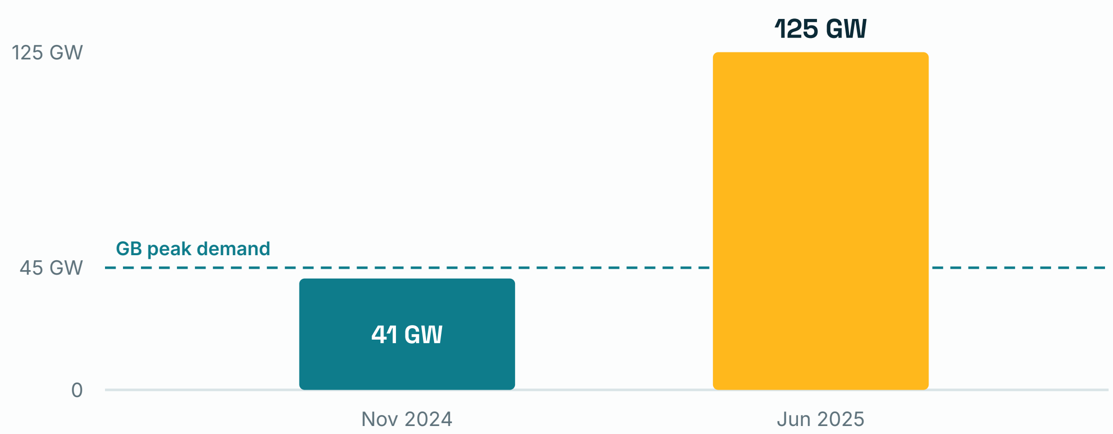
Global data-centre electricity use is projected to more than double by 2030, from about 415 TWh to around 945 TWh.

~10 TWh

Power is wasted

Great Britain curtailed roughly 10 TWh of wind in 2025, about 22% more than the year before, at a cost above one billion pounds.

EXHIBIT 2 **GB demand connection queue has outrun the system**



GB demand connection queue, against peak demand. Roughly 140 data-centre schemes are seeking connections (about 50 GW), of which only around 71 report a final investment decision. Source: Ofgem and NESO (2025).

WHAT IT MEANS

For a grid at full capacity the solution is not simply to just add more connections, but instead to manage existing ones more efficiently. For demand that can move, bring it to the source that already exists.

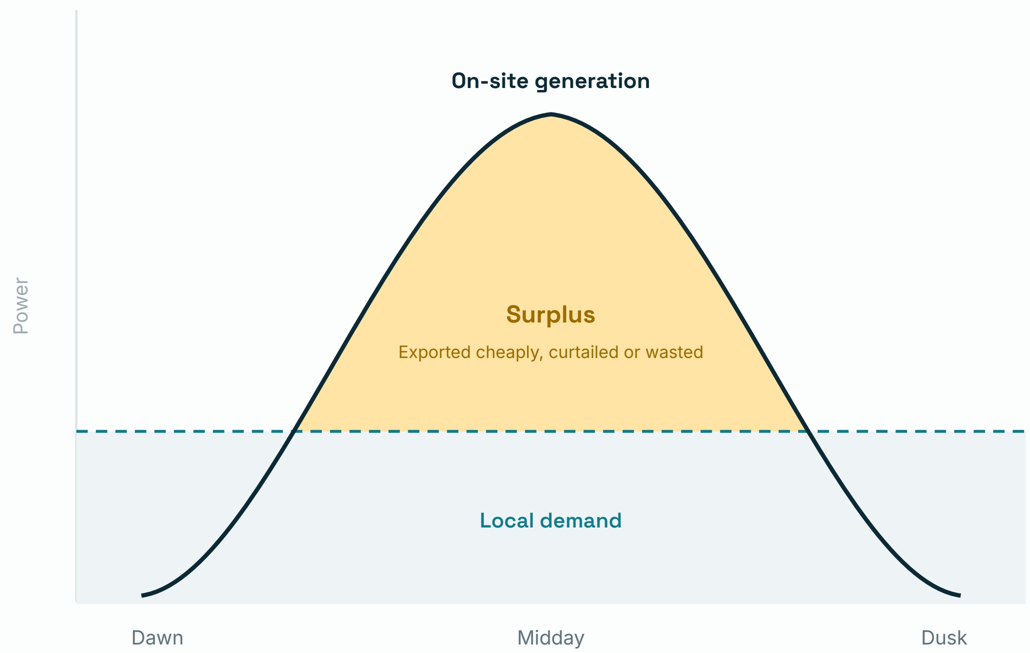
THE RAW MATERIAL

The power we already waste

A surprising amount of clean electricity is generated and then thrown away, because the network cannot carry it to anyone who can use it at that moment.

When wind or solar farms make more power than the local network can accept, the system operator often pays them to switch off. In 2025 Great Britain curtailed roughly 10 TWh of wind, 22% more than the previous year at a cost above one billion pounds. That is power that was available, was paid for, and then inadvertently wasted. A site that can dynamically adjust its demand and optimise for this, turns what was previously wasted into an economic output.

EXHIBIT 3 **Graph showing Surplus Generation VS Local Demand**



Illustrative. On a sunny day, on-site generation runs well above baseline local demand. The gap is surplus that today is exported cheaply, curtailed or wasted. A flexible on-site load can put it to work, maximising value.

> **THE WASTE THAT ALREADY EXISTS**
>
> Many sites already have a firm connection, some generation and storage, but only need the full capacity on a handful of days throughout a given year. Adding flexible on-site demand with a route to market, enables that otherwise spare capacity to be put to work.

THE BUILDING BLOCKS

Four layers - One location

A co-located energy park stacks up to four layers. Each is a viable revenue stream on its own, but combined are worth more with one control system co-optimising across all assets.

EXHIBIT 4 The four layers of a co-located park

LAYER FOUR
The local control brain
Co-optimises and trades the whole site, minute by minute. Local-first.
THE EDGE

LAYER ONE — Core
Generation & storage
Solar makes cheap power on site; a battery shifts and firms it, beating power bought at retail. The firm base everything else stands on.

LAYER TWO — Upside
Flexible demand
Interruptible computing soaks up the cheap surplus; EV charging adds a steadier use. Compute is the upside, never the foundation.

LAYER THREE — Core + upside
Markets & flexibility
The battery and a controllable load trade power and sell flexibility to the grid, earning across the idle hours. Volatile, so handled with care.

Each layer is a real business on its own. Each layer can operate independantly, with the control brain optimising across all layers to maximise value for the site. Illustrative architecture.

WHY IT IS WORTH MORE TOGETHER

Four assets run by four systems are a collection of product layers. The same four run by one brain is a holistic system. This the opportunity.

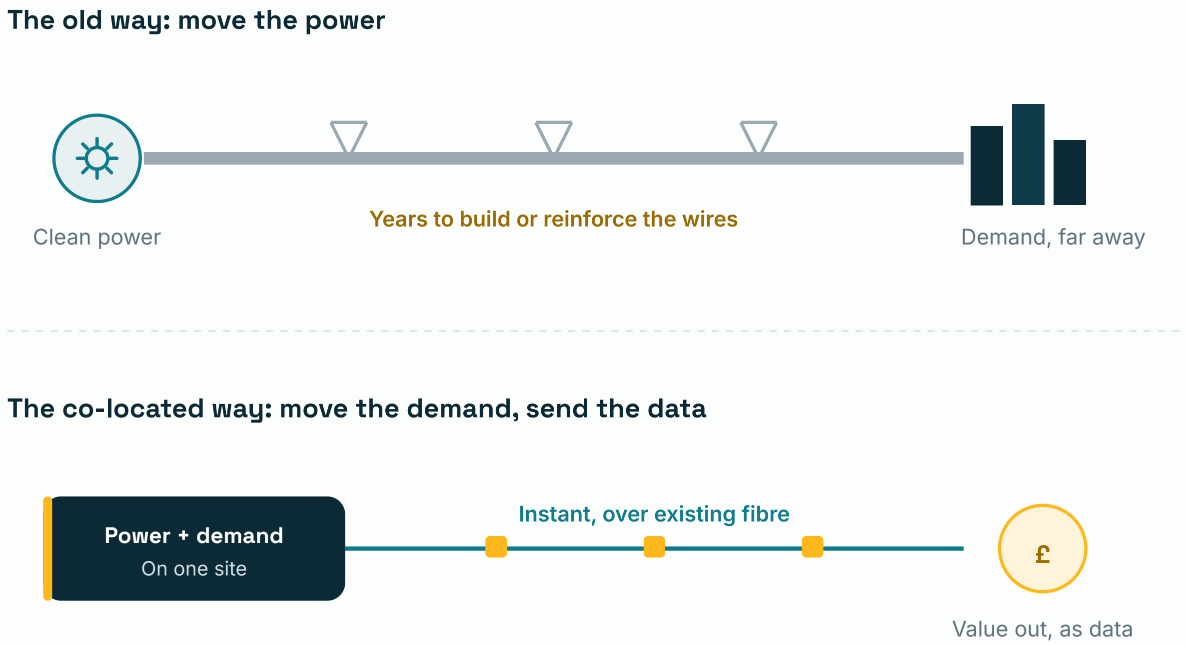
THE DEEPER LOGIC

Bring the demand to the energy

Energy is expensive and difficult to move. Data is cheap and easy to move. Once this concept is taken seriously, what were challenges yesterday become opportunities today.

We have spent a century carrying power across long distances to wherever demand happens to be. But moving electricity needs physical wires and complex infrastructure. Moving data is close to free and instant over the existing fibre network that already crosses the country. As compute demand surges the optimal pathway appears obvious, move power demands from compute to the energy source, rather than the other way around.

EXHIBIT 5 **Move the demand, send the data**



Illustrative. Instead of paying a wind farm to switch off and a distant data centre to draw expensive grid power, the same power runs the same work where it is made, and only the result travels.

THE THESIS IN ONE LINE

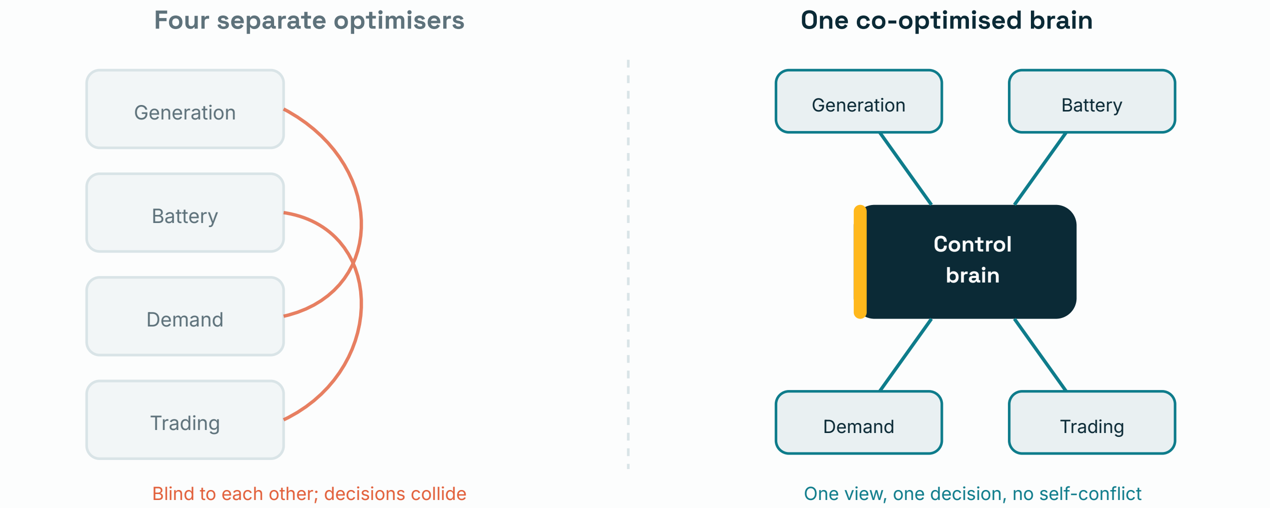
Energy is hard to move and data is not, so for demand that can travel, bring the demand to the energy, use the cheap and wasted power on site, and send out the value as data.

THE EDGE

Why co-location wins

Run the layers separately and they can work against each other. Run them as one and the same system earns more, from the same connection and site operating reqirements.

EXHIBIT 6 **One brain beats four optimisers**



Illustrative. Separate optimisers each act sensibly yet pull against one another; one co-optimising brain resolves the trade-offs in a single decision.

WHAT THE BRAIN DECIDES, MINUTE BY MINUTE

Store or sell

Charge the battery, hold it, or sell the power into the market, whichever is worth more that minute.

Run or pause

Run the flexible computing load when power is cheap and plentiful, and ease it back when it is not.

Buy or supply

Draw from the grid, or supply the on-site tenant from generation made on the same site.

THE CORE CLAIM

Four assets run by four systems are a collection. The same four run by one brain that co-optimises and trades the whole position are a single, more valuable asset. The combination, not any one layer, is the opportunity.

WHY IT PAYS

One connection: Multiple income streams

A representative site earns from a dependable core optimisation schedule which then stacks additional revenue streams on top, focusing on optimising the site holistically and ensuring continuation of supply as a priority.

Core · earns from day one	Upside · stacks on top

SELF-SUPPLY — CORE

Cheapest unit on site

On-site solar is among the cheapest new generation. Power made and used on site displaces grid electricity at retail prices, so the most valuable unit is the one never carried across the network.

LOCAL SUPPLY — CORE

A willing local buyer

Surplus that would otherwise export cheaply instead supplies a flexible on-site tenant. More of the energy stays where it is worth most, rather than being sold back to the grid for relatively little.

TRADING & FLEX — UPSIDE

£47,000 to £88,000 per MW/yr

GB battery revenue ran across this range in 2025, with two-hour batteries near £108 per kW for 2026. Real but volatile, so it is treated as upside, never banked as the base case.

COMPUTE & EV — UPSIDE

$1 to $2–$7/GPU-hr

Interruptible compute runs on cheap or wasted on-site power, lowering the input cost against a grid-drawing rival. Rapid charging adds a steadier second use, at about a 25p/kWh premium.

Stacked together, these streams turn one expensive connection into several sources of income, and keep a site earning through the quiet hours when a single-purpose asset would sit idle. The same kit, run as one position, simply works harder.

Illustrative public 2026 benchmarks, used as directional ranges, not a forecast. A real site treats trading and compute as upside on sound energy fundamentals. Full figures and sources are in the appendix (Modo Energy; Cornwall Insight; Zapmap; public trade pricing).

CORE BEFORE UPSIDE

The dependable core earns from day one. Trading and compute stack higher value on top, but a site is built on the core and treats them as upside, never the foundation.

THE TAILWIND

The wind is blowing the right way

Policy and market rules are shifting to reward exactly what a co-located energy park intends to achieve. Generation and storage that sidesteps the connection queue to get power on site. Flexible demand that helps balance the system and enable more control over energy flows, combined with a pathway to trade that flexibility. AI compute is the icing on the cake which not only adds an additional revenue stream, but an additional mechanism to control on site load.

CONNECTION REFORM

A tougher, faster queue

Ofgem's reform, advancing through 2026, brings tougher readiness tests and a use-it-or-lose-it approach. Flexible, ready sites are favoured over fixed new loads.

AI GROWTH ZONES

Five zones - Faster approval

The government has designated five AI Growth Zones, with electricity-cost support and faster planning, signalling where flexible demand and on-site clean power are most welcome.

P415, NOV 2024

Trade without a licence

A market change created the Virtual Lead Party role, so an independent operator can trade a site's flexibility into the wholesale market without running a licensed supply business.

For a site, the practical effect is simple. The queue now rewards being flexible and ready rather than just large. The Growth Zones point to where a clean, flexible load is most welcome and quickest to approve. And the trading value of a battery and a controllable load can be captured directly, rather than handed to a third party. The wider numbers below show why this is not a passing moment.

415 TWh→945 TWh

Global data-centre electricity use, 2024 to 2030 on IEA projections

~6×

Growth in GB battery storage needed this decade for Clean Power 2030

>£1bn

Cost of GB wind curtailed in 2025, clean power wasted for want of local demand

READING THE DIRECTION, NOT BETTING ON IT

Reform timetables slip and details change. The point is not that any single rule guarantees the model, but that several independent shifts all push the same way: toward behind-the-meter generation, flexible demand, and independent routes to market.

IN THE WORLD

Where it works

The same idea scales up and down, from a small site pairing solar and a battery with one flexible tenant, to a large energy park built to supply local industrial demands. These are the shapes it takes in the market today.

The compute-led campus

Generation and storage built to feed a large, flexible computing load. The energy exists to power the work, and surplus is traded.

The energy-led park

A generation and storage site that adds flexible demand to use power that would otherwise be exported cheaply or curtailed.

The behind-the-meter host

An existing large power user, a factory or data centre, that adds on-site generation and flexibility to cut cost and earn from markets.

The temporary or mobile site

A containerised version assembled for a fixed period or a specific event, then moved. The same logic, packaged to be portable.

One flexible tenant	A working site	A clean campus
Solar, a battery and a single load behind the meter	A connection that earns across the idle days, not just the peaks	Generation and storage built to feed a block of computing

What every shape shares is the same test for a site: a strong grid connection that is hard to replace, generation that is genuinely cheap, and a demand that can flex. Where those three line up, the model earns its keep. Where one is missing, it is usually better to leave a layer out than to force it onto a site that does not suit it.

A WORKED EXAMPLE: THE IDLE CONNECTION

Across the country sit grid connections used heavily for only part of the year, and idle the rest. An events site is the vivid case. Place flexible generation, storage and demand at that connection and the expensive, hard-won grid access earns its keep year round. It is the whole idea in miniature, without waiting years for new grid capacity.

THE HONEST CASE

What carries the risk

No serious paper should sell only the upside. The co-located park is a strong idea, but it is a hard thing to build and run well. Naming the risks plainly is part of making the case.

1. **Merchant and price risk.** Trading revenues rise and fall with volatile markets. The defence is to lean on contracted and core revenue for the base case and treat traded income as upside, never to bank the good years.

2. **Market access.** Trading a site's flexibility needs a route to market, usually a partner offering trading as a service. That access has to be secured and priced, and a site should not assume it comes for free.

3. **Reliance on the compute layer.** Computing can be the most valuable activity, but it depends on customers, on hardware that ages fast, and on demand that is dependably interruptible. Build a site that stands up without it, and let it lift the return.

4. **Centralised against decentralised compute.** If local and edge compute grows faster than expected, it could soften demand and prices in the wider compute market. A site should price its compute upside conservatively, not on today's rates.

5. **Operational complexity.** Running four layers as one in real time is harder than running any alone. It is justified only where the combined value clearly exceeds the added difficulty.

6. **Regulatory change.** The rules that make this attractive are still moving. The direction is helpful, but a project has to hold up if rules land differently from how they look today.

7. **Upfront capital and financing.** Generation and storage are capital-heavy, and the return depends on those assets being well used over a long life. The case rests on patient capital and high utilisation.

8. **Siting, land and planning.** Solar needs space and consent, and dense computing produces heat that must be managed. These are well-understood problems, but they take time and care.

> THE HONEST LIMIT: SOFTWARE ALONE IS NOT A MOAT
>
> A materially better co-optimising brain is a real edge, but software can be matched in time. The lasting advantages are harder-won: a strong site with a valuable connection, assets that are well chosen and well used, contracts that secure a base of revenue, and the discipline to run a complex site safely.

PATTERTECH

Built in Belfast

PatterTech is a Belfast technology company building local-first software for energy and AI: software that runs close to the assets it controls, rather than on a distant cloud.

WHAT WE DO

Local-first software for control, optimisation and market participation.

WHERE WE ARE

Belfast, Northern Ireland. PatterTech Ltd, company number NI739839.

WHY THIS PAPER

To share our vision and to connect with interested parties.

THE ONE IDEA, IN FIVE WORDS

Bring demand to the source.

Energy is hard to move. Data is not.

Put flexible demand beside clean power & operate the system as one, optimising across all assets within the system.

WHERE TO GO NEXT

The research whitepaper
The full, detailed version of this argument

Commercial materials
A specific proposition, on request to suitable parties

A conversation
Reach out to PatterTech Ltd, Belfast

LET'S TALK

If the idea is useful to you, or you are working on the same problem from another angle, we would like to hear from you. Reach out to PatterTech Ltd, Belfast. A fuller research whitepaper and a more detailed commercial proposition are available to suitable parties on request.

APPENDIX A · THE FIGURES BEHIND THE HEADLINES

Illustrative unit economics

The headline numbers in this paper rest on public 2026 benchmarks and is used as directional and indicative values and not as concrete forecasts. The table sets out the unit figure behind each layer and what it implies, so the mechanics are concrete and checkable.

LAYER	PUBLIC 2026 BENCHMARK	WHAT IT IMPLIES
Generation & storage	Solar build costs have fallen sharply over the past decade. On-site solar is now among the cheapest new generation. Direction per IEA and industry cost data.	Power made and used on site displaces grid power at retail prices. The cheapest unit is the one never carried across the network.
Flexibility & trading	GB battery revenue ran at roughly £47,000 to £88,000 per MW across 2025. It hit a record low near £41,000 in February 2026 and recovered to about £70,000 by March. Cornwall Insight put two-hour batteries near £108 per kW for 2026. Modo Energy; Cornwall Insight (2026).	A megawatt of battery earned tens of thousands of pounds a year from flexibility. Real but volatile, so we treat it as upside.
EV charging	Rapid and ultra-rapid charging sat around 79p per unit in mid-2026. Slower charging was roughly 54p. Zapmap (2026).	Fast charging earns about a 25p-per-unit premium over slow. It is a second steady use for on-site power.
Flexible compute	Specialist providers rent high-end processors at about $1 to $2 per processor-hour at the value end. The newest hardware reaches around $7. Public 2026 trade pricing.	Running interruptible compute on cheap or wasted on-site power lowers the input cost against a rival drawing grid power.

How to read these figures

Each row pairs a public 2026 benchmark with what it implies at the unit level. They are deliberately the conservative end of the published ranges, and they are shown to make the mechanics concrete, not as a business case for any one site. The figures are never summed into a single site total here; that belongs to a project's own validated model. Trading and compute are treated as upside on top of sound energy fundamentals, never as the base case. A real project builds and validates its own model against its own connection, generation mix and market exposure.

APPENDIX B · BACKING EVERY CLAIM

References and sources

Every figure in this paper is public and cited in the text as a directional range. The full sources are listed below; the detailed research whitepaper carries the complete reference set and methodology.

Ofgem (2025) *Connections queue data*; and Ofgem (2026) *Demand Connections Reform: consultation*. London: Office of Gas and Electricity Markets.

National Energy System Operator (2025) *Future Energy Scenarios 2025*. Wokingham: NESO.

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Modo Energy (2026) *ME BESS GB Index* [online dataset]. London: Modo Energy.

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Montel / edie (2025) *GB wind curtailment 2025* [online news report].

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Elexon (2024) *Balancing and Settlement Code Modification P415*. London: Elexon.