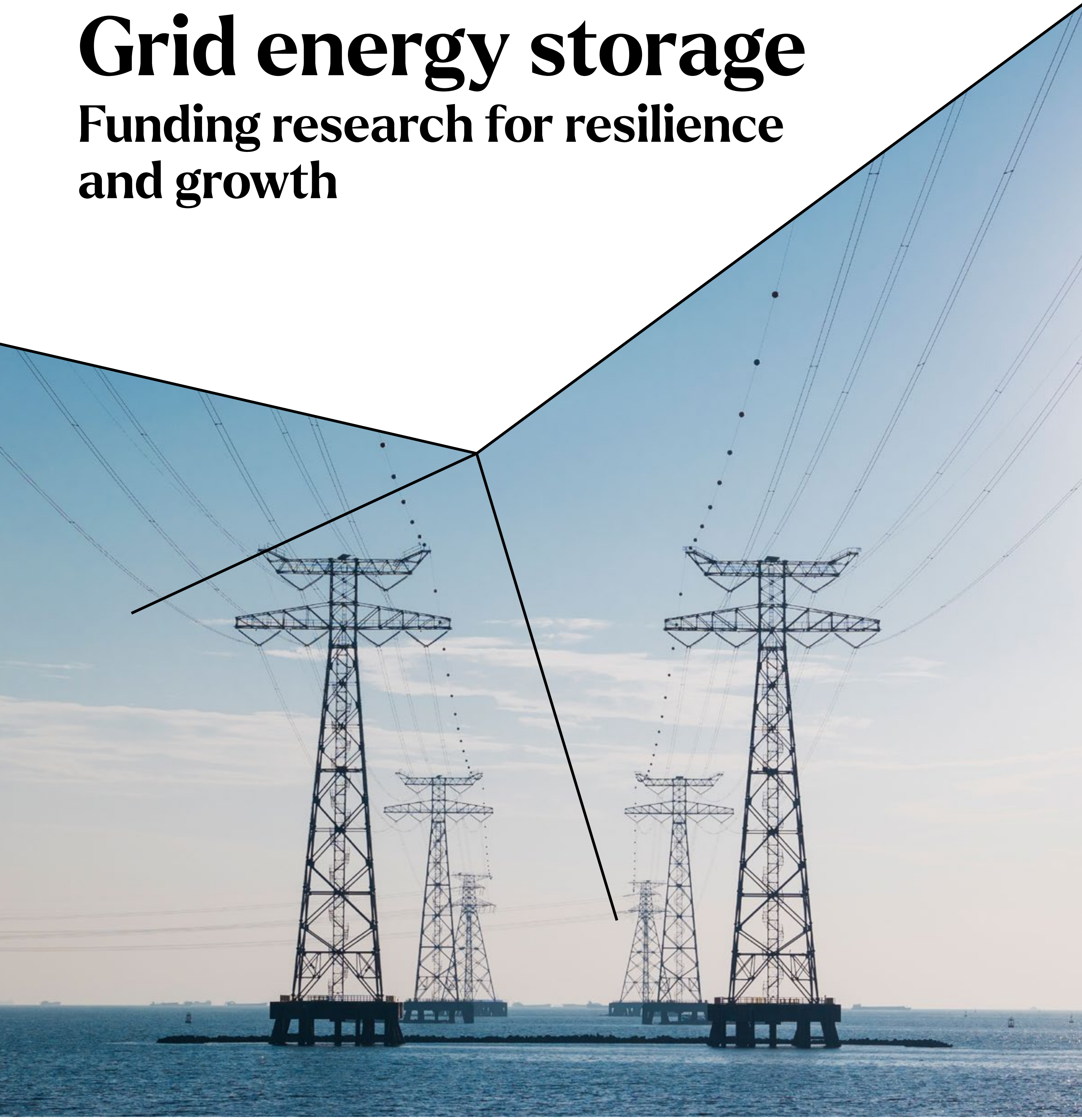
Supergen
Energy Storage

Grid energy storage
Funding research for resilience and growth



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About the report

This report is produced by the Supergen Energy Storage Network+, an EPSRC-funded platform to nurture expertise in energy storage and distribute its outputs to academia, industry and policymakers. Led by Professor Yulong Ding of the University of Birmingham, it is built around a core partnership of 19 investigators from 12 UK institutions and supported by a further 100 organisations here and globally. Our driving purpose is to identify key research barriers within the energy storage sector so that governments and funding agencies can best direct the available support. The final research report *Energy Storage: Gaps and Opportunities Analysis*, will be published in July 2025.

This policy paper is a summary of the high-level conclusions we reached, and particularly benefitted from the expertise of:

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A note on terminology

Until recently, discussion of grid storage has typically divided technologies into short duration energy storage (SDES), generally regarded as anything below 4 hours' discharge time, and long duration (LDES), usually seen as anything that can discharge continuously for more than about 8 hours.[1]

But these definitions fail to recognise the true importance of medium duration energy storage (MDES) and a range of largely electro-mechanical technologies such as compressed or liquid air that could supply most of it. Simple analysis of the hour-by-hour difference between supply and demand in a British net zero electricity system shows that over 90% of all energy shortfall lies in periods lasting 4-200 hours.

Technically, any storage technology can be made to discharge over any duration but it makes no economic sense to use technology in ways that raise costs unnecessarily. Modelling done for the 2023 Royal Society report *Large-scale Electricity Storage* suggests first that the least expensive UK net zero energy system is based on renewables and storage with negligible gas-fired generation, and second that more than 50% of all energy drawn from storage in that system should be drawn from MDES technologies.

In this report we categorise energy storage technologies according to the discharge time scales they suit best. SDES technologies suit discharge times of up to 4 hours; MDES suit 4-200 hours; and LDES technologies are best for more than 200 hours.

Please see *The new map of grid energy storage* (page 7) in the main report for more detail.

Executive summary

The Spending Review was a big day for clean energy. The chancellor confirmed tens of billions for carbon capture, nuclear, hydrogen and the warm homes plan. The Industrial Strategy allocated millions more to batteries. Unfortunately, in neither document was there any mention of one technology critical to achieving a net zero grid: medium duration energy storage.

All electricity systems need energy storage. It is a vital component helping us match supply and demand minute by minute and from year to year. Modern societies cannot survive without it. The recent major power outage in Spain and Portugal might have been averted if appropriate energy storage had been in place.[2]

A grid based on fossil generators has huge amounts of storage 'built in': piles of coal, tanks of gas and the kinetic energy of spinning machinery. Wind and solar have no inherent capacity to store energy. In a largely renewable grid, therefore, storage must be provided explicitly by a series of new technologies that must be researched, developed, rolled out and paid for.

Along with generation and grid infrastructure, storage is the third leg of the electricity system stool. Yet Britain has so far invested far too little in it to ensure stability, resilience and security in a net zero grid.

Worse, Britain has massively underinvested in the very types of energy storage that will be most important in an energy system powered largely by wind generation – despite warnings from the Royal Society, the House of Lords and others.

Britain has focussed most of its investment in energy storage on lithium-ion batteries, with more than £1.1 billion committed to the Faraday Battery Challenge and its successor programme.[3] This investment has been transformative for a range of sectors; most notably for transport electrification; but lithium-ion batteries are generally economically viable for short duration energy storage (SDES) of up to around 4 hours' discharge, and economic modelling suggests that in a cost-optimised system they would account for a tiny fraction – just 1% – of the total energy stored.[4]

The Spending Review committed another £500 million to hydrogen infrastructure across all uses including transport and industry, and this does include some investment in grid storage.[5] But in electricity grids, hydrogen is best suited to long duration energy storage (LDES) with discharge times of more than 200 hours. Less than 8% of all energy discharged would emerge from storage in periods of continuous discharge longer than this.

Britain has massively underinvested in the very types of energy storage that will be most important.

The bulk – more than 90% – of all energy served into the electricity grid from storage will arrive in periods of continuous discharge between 4 and 200 hours. For such duties, the most suitable storage technologies are compressed air, liquid air, pumped hydro, pumped thermal, thermochemical and flow batteries. Some of the energy delivered in these periods can be provided by hydrogen stored in salt caverns but it would be far more expensive to use only hydrogen.

Similarly, Li-ion batteries may eventually play a role in storing energy beyond 4 hours' duration, but their current costs are not competitive with MDES. There is no budget for MDES in the Spending Review, and public support for research into these technologies since 2008 has been less than £100 million.[6]

This investment was welcome but is orders of magnitude too small. For context, Britain spends around £120 billion on energy every year[7], and the government has committed £22 billion to CCS[8] and £18 billion to a single nuclear power station.[9] Yet the future stability, resilience and security of a largely wind-powered net zero grid will depend critically on MDES.

We accept that it is perfectly possible to build a zero-carbon electricity system *without* building any more MDES assets (above the roughly 30GWh of pumped hydro already in use). But it would be *massively* more expensive than necessary.

Economic modelling shows that in an energy system optimised for cost, Britain alone should install up to 6TWh of storage capacity with MDES technologies. To supply that using only lithium-ion batteries would demand an entire year of *global* lithium-ion battery production capacity.[10]

That we have not built any significant MDES capacity for forty years amounts to a major market failure – and not only in the UK. This can only be corrected through policy. The benefits to Britain of doing so include:

1. Lower constraint payments, which reached a record £2.7 billion last year[11]
2. Increased resilience, reducing the likelihood of blackouts such as those in Britain in 2018 and Spain and Portugal in 2025
3. Safely integrating a higher proportion of variable renewable energy than would otherwise be possible, so reducing our reliance on imported fossil fuels
4. New manufacturing businesses, jobs and growth
5. First mover advantage with significant export potential; all other grids face similar challenges but at smaller scales

The Spending Review did not mention MDES. It did however allocate £86 billion to research and development over the next four years and committed to pay 'significant additional funding' to clean energy industries under the Industrial Strategy.[12]

In this context, we recommend the government immediately raise its research budget for MDES to £500 million and commit £3 billion to support new commercial-scale projects in LDES.

Specific areas of funding should include:

1. Support for further research into MDES and for deployment of commercial-scale projects for LDES in the UK
2. Funding for integration of storage with generation, transmission and consumption of electricity
3. Low-discount rate 'green finance' for large scale projects
4. Commitment to develop open modelling tools, based on open data, to understand where best to focus technology R&D and to guide deployment
5. Funding for AI in modelling and control of highly complex systems
6. Support for international collaboration to develop storage technologies

Since policy has not kept pace with our understanding of the importance and urgency of energy storage, we also recommend DESNZ appoint an Energy Storage Envoy to improve communication between stakeholders. There is currently no policy lead in this area and the need is urgent because of the wide range of technologies involved, the opportunities for integration and the need to establish a portfolio balanced for the UK climate.

Acting on our recommendations now would support decarbonisation, energy security, growth, jobs and exports. Not doing so threatens spiralling constraint costs, Spain-type blackouts and our chances of achieving a net zero grid.

Introduction

One of the main pillars of resilience in any grid is energy storage. This is true irrespective of the dominant form of generation – fossil or renewable.

At its simplest, storage provides the ability to match the generation of electrical energy with demand for that energy. It can absorb energy when generation is high and demand is low and it can discharge energy in the opposite conditions. But storage also provides a range of services vital to maintaining the stability of a grid.

When grids were dominated by fossil fuel generators, energy storage and its costs were largely invisible, hidden in piles of coal next to the power station; the high-pressure gas trunk network; and the inertia of spinning thermal generators.

With the rapid phase out of coal and gas, grid storage and the services it provides must be performed explicitly by a whole spectrum of new technologies, which need to be researched, developed, rolled out and paid for.

The government's Clean Power plan assumes 28GW-35GW of grid storage by 2030, meaning we need to roughly quadruple our existing capacity (8GW) within five years, so the deadline to develop the remainder is clearly tight.[13]

Britain is indeed funding research into energy storage, which we greatly welcome. But it is still investing far too little overall and some vital areas including medium and long duration energy storage are especially underfunded.

The government needs urgently to align its research, development and deployment programmes in energy storage with the known needs of our future energy system.

We need to quadruple our existing storage capacity within five years.

The new map of grid energy storage

On the electricity grid, energy storage performs several different functions. These range from near-instantaneous frequency response and voltage control services to balancing supply and demand over hours or days and, in the future, months or even years. This requires a spectrum of technologies with differing technical and economic characteristics.

Until recently, discussion of grid storage typically divided technologies into just two main categories. Short duration energy storage (SDES) was regarded as any technology with a discharge time of less than 4 hours, and long duration energy storage (LDES) as those technologies that discharged continuously over more than 8 hours.[14] Lithium-ion grid batteries already dominate SDES, and it was widely thought hydrogen would provide most LDES. The idea of medium duration energy storage (MDES) was scarcely considered.

Since 2020, however, economic modelling has shown that these categories and definitions are no longer adequate.

There are four main components of cost associated with energy storage:

- Cost per unit of rated power ($/kW)
- Costs associated with losses in the storage itself ('round-trip efficiency')
- Cost per unit of rated energy ($/kWh)
- Cost per unit of power slew-rate (or speed of change, $/kW/s)

It is the cost of each technology against each of these measures that determines which duration of storage it can best provide.

Controlling frequency and voltage on the grid requires near-instantaneous changes in power output, so technologies best suited to providing this service – very short duration energy storage, or VSDES - are those with the lowest cost of power slew-rate, such as flywheels and supercapacitors.

SDES requires high power to be delivered in short bursts of up to four hours, so the technologies best suited to providing it must have the lowest possible cost-per-unit-of-rated-power ($/kW). Since these systems will charge and discharge ('cycle') frequently, a high round-trip efficiency is also important. That's why lithium-ion batteries are already well established to supply SDES on the grid.

LDES stores large amounts of energy over long periods, so the technologies that provide it must have low cost-per-unit-of-storage-capacity ($/kWh). Since these systems will cycle infrequently, round trip efficiency is much less important. Fuels such as hydrogen or possibly ammonia, which are relatively cheap to store, are likely to dominate here.

Systems providing MDES need to balance three main cost components: rated power; rated energy; and efficiency. This favours a range of electro-mechanical technologies such as compressed air (CAES), liquid air (LAES), pumped-hydro (PHES), pumped thermal (PTES) as well as flow batteries.

Some of these technologies, such as LAES and flow batteries, are commercially active already but can still improve significantly with development. Others like CAES and PHES were already deployed at large scale fifty years ago but have not yet built enough capacity to bring costs down through the effects of serial production.

Britain is singularly fortunate to have very substantial resources of bedded salt geology suitable for storing pressurised air or hydrogen underground. We have some potential to develop PHES further but this resource is limited relative to the volumes of storage we need.

Other MDES technologies such as PTES and reversible CO_2 liquefaction have not yet reached the point of commercial operation.

With further research, some of these technologies could provide MDES plants that combine low cost, long natural lifetimes, good round-trip efficiency, complete flexibility as to location – which is important for balancing renewables locally – and high sustainability metrics.

A report by the Royal Society published in 2023 showed that long-term variability in wind output over years and even decades means that we will need ultra-long duration energy storage.[15] This would be called-on only rarely but would need huge storage capacity, equivalent to around 50 days' national electricity consumption, and would be dispatched mainly in periods of 200 hours or longer.

These startling results have since been confirmed by reports from Centrica, the Climate Change Committee, the Electricity System Operator, the National Infrastructure Commission, and Science and Technology Committee of the House of Lords.[16] They are consistent with modelling that has been done by DESNZ.

As a result, the map of energy storage categories, and the boundaries between them, now looks very different. In this report we associate VSDES with discharge durations of seconds or minutes; SDES with discharge durations up to 4 hours; MDES with 4-200 hours; and LDES with durations greater than 200 hours. 'Discharge duration' refers to the time taken for the storage asset to discharge from fully charged to completely spent at full power.

The boundaries between these duration ranges are not fixed in stone, however, and are likely to evolve. Technical advances and cost reductions may change the competitive balance between technologies and therefore where the boundaries lie.

Grid service	Duration	Storage technologies
Frequency response and voltage control	Minutes Very Short Duration (VSDES)	Flywheels and supercapacitors
Intra-day balancing, peak shaving	0-4 hours Short Duration (SDES)	Batteries Flow batteries
Multi-day balancing 'Dunkelflaute'	4-200 hours Medium Duration (MDES)	Flow batteries Pumped hydro (PHES) Compressed air (CAES) Liquid air (LAES) Pumped thermal (PTES) Hydrogen salt caverns
Seasonal and annual balancing of variable renewable output	200+ hours Long Duration (LDES)	Hydrogen salt caverns Ammonia Biomass

Table 1: Energy storage technologies by duration

Public investment fails to match the scale of the challenge

With the natural storage capacity of the grid declining as renewable generation squeezes out fossil fuels, you might expect Britain would be investing massively in grid energy storage technologies. But we are not.

Total recent and currently committed public investment relevant to grid energy storage amounts to around £1.7 bn (see Table 2). This compares with £22 billion committed for CCS[17] and £18 billion to a single nuclear power station.[18]

Not only is Britain investing far too little overall, but its investment fails to recognise the known needs of our emerging electricity system and the urgency of our deadline.

Of the total invested, electrochemical batteries have claimed by far the largest slice: £1.1 billion through the Faraday Battery Challenge and its successor programme.[19] These batteries have transformative impact for transport electrification, but at grid-scale such batteries will almost certainly operate only in SDES. And modelling shows that in a wind-dominated net zero grid, SDES will dispatch <~1% of all the energy stored.[20]

At the other extreme, the same modelling shows that MDES will dispatch more than 90% of stored energy. Yet the total funding for research into MDES over the last eight years has fallen short of £100 million.[21]

The Royal Society report proposed that LDES could best be provided by hydrogen stored in salt caverns – for which Britain has favourable geology. But even this would cost £100 billion to build, along with over £100 billion each for renewable generation and grid infrastructure – and subsequent estimates are higher still. In contrast, the Spending Review committed £500 million to hydrogen infrastructure across all uses including transport and industry, but does include some investment in storage.

Against this backdrop, current investment into MDES and LDES is clearly orders of magnitude too small. For further context, the government's latest funding round for hydrogen production (not storage) commits £90 million to support capital investment and more than £2 billion in 'revenue support'.[22]

Duration	Technologies	Proportion of grid storage discharged at this duration in cost-optimised grid	Recent relevant research funding
SDES	Lithium-ion batteries	~1%	>£1.1bn[23]
MDES	LAES, CAES, PTES	90%+	<£100m[24]
LDES	Hydrogen, ammonia	~9%	£509m[25]

Table 2: Public funding of research relevant to grid energy storage versus duration and proportion of grid storage discharged

Assessing public funding for grid storage

Assessing the value of public funding for various durations of grid storage is complicated by definitional differences, and by the fact that both batteries and hydrogen have uses outside the electricity grid whereas MDES technologies do not.

For example, the main motivation for the £610 million Faraday Battery Challenge so far was to ensure that Britain remained at the forefront of EV battery development. But this produced advances in battery chemistry and reductions in cost that also benefitted SDES. By analogy, the Tesla Powerwall home battery is a direct result of research into EV batteries and the emergence of a mass market for EVs.

Likewise, the Spending Review committed £500 million to hydrogen infrastructure across all applications including transport and industry. Grid storage will receive some fraction of the headline figure but may also benefit from the rest of the spending through learning-through-doing effects. Having said that, even £500 million looks low for the needs of hydrogen salt cavern development.

By contrast, MDES technologies have so far been developed solely for grid storage and therefore have no external markets or research funding sources to leverage. We calculate that since 2017 MDES has received less than £100 million in research funding[26], even though, in a cost-optimised electricity grid, 90% of the total stored energy would be dispatched in periods falling within the MDES range.

MDES has received less than £100 million even though 90% of stored energy would be despatched in this range.

Building Britain's MDES with lithium-ion batteries would consume an entire year of *global* lithium-ion production.

There are two positive developments relevant to MDES funding. The first is the Faraday Institution's UltraStore funding call which will support two research projects into 'ultra-low cost long duration energy storage', which Faraday correctly identifies as a transformational challenge.[27]

The funding call seeks proposals for storage durations 100 hours or more – right in the middle of the MDES range – and not just from conventional battery technologies, but also thermal, mechanical or chemical energy storage.[28] We welcome this project and the only problem we see is that the maximum budget is probably around £15 million.[29]

The second is Ofgem's Long Duration Energy Storage Cap and Floor scheme launched in April 2025.[30] This aims to support grid storage projects with discharge durations of more than 8 hours - which Ofgem calls LDES but which we classify as MDES - through a revenue guarantee similar to a wind farm CfD (Contracts for Difference).

If the project's revenue falls below a preset floor, it will be topped up by a charge on consumers' bills, and if it exceeds a preset cap, the money will be returned to bill payers. The scheme is meant to make it easier for developers to attract finance.

Again, we welcome this scheme but fear it lacks sufficient ambition to match the scale of the challenge, does nothing to support *emerging* MDES technologies and could lead to an electricity system with higher costs than necessary.

The scheme's initial round aims to support up to 7.7GW by 2033 and requires applicants to demonstrate TRL of 8 or 9. At present, the only technology guaranteed to match these criteria is pumped hydro, which is technically well suited to MDES but highly capital intensive. The sector has a project pipeline of almost 13GW[31] but beyond that geographical constraints may make expansion harder. The Royal Society study found that a least-cost system would need around 40GW of MDES and 60GW of LDES.

The Ofgem scheme may unlock a significant amount of pumped hydro – which we welcome. It will do nothing to advance the progress of a swathe of technologies that could dramatically improve the cost and performance of MDES, nor our ability to locate it throughout the country rather than only in the mountains.

That could then leave few options but to extend lithium-ion batteries into longer duration (MDES) roles which would massively increase costs. That might in any case be industrially impossible: the study underpinning the Royal Society report has indicated that Britain could need up to 6TWh of MDES. Building that with lithium-ion batteries would consume an entire year of current *global* production.[32]

These positive developments notwithstanding, it is hard to avoid the conclusion that funding for research into MDES technologies falls far below what is needed for Britain to minimise its own grid costs and maximise its export potential.

Market failure and barriers to MDES and LDES

Batteries already operate commercially as SDES on the British grid. At the end of 2024 there was 5GW of operational capacity, 5GW more under construction and a total pipeline of 127GW.[33] By contrast, Britain's net zero-compatible MDES comprises only 2.8GW / 30GWh of pumped hydro, all of which was built before 1983.[34] We have no net zero-compatible LDES.

MDES and LDES are underdeveloped in Britain because of a series of barriers we have not yet cleared, and which taken together amount to a major market failure.

Unlike batteries, longer duration storage technologies have lacked markets to help fund their research and development. Batteries have benefitted not only from public investment but also the emergence of mass markets in consumer electronics and EVs, which helped fund R&D and reduce costs. LDES based on hydrogen can benefit similarly from support being given to the establishment of a hydrogen economy. MDES, by contrast, must rely solely on the nascent market in grid flexibility.

Worse, this 'market' does not yet exist as a single entity. Actors throughout the grid benefit from the presence of storage but there is no simple way to quantify the benefits and reward the storage operator proportionately. As things stand, would-be storage developers must 'stack' revenues from providing various grid services to get close to justifying an MDES investment. This complexity is significant barrier.

There are also barriers due to the scale and longevity of the necessary investments.

Unlike batteries, most MDES projects inherently require large-scale plant to reach the best cost and performance possible, and this sets the risk and investment hurdle high.

MDES and LDES plants also have very long natural service lives. This means that financial evaluation of the projects are highly sensitive to the applied discount rates. By contrast, financial models for projects having much shorter natural service lives are relatively insensitive to the discount rates applied.

Unlike batteries, LDES technologies have lacked markets to help fund their research and development.

The benefits of correcting market failure now

MDES storage technologies face something of a Catch-22 problem. It can be argued that MDES does not add significant value until we reach high penetrations of renewable generation. But that day is not far off and by the time it comes, it will be too late to start thinking about developing the technologies to match our needs.

Britain would reap immediate benefits from raising its investment in both MDES and LDES technologies right away. One obvious benefit is lower constraint payments, which reached a record £2.7 billion in the last financial year.[35] Another would be increased resilience, reducing the likelihood of blackouts such as those in Britain in 2018 and Spain in 2025 – or worse. Yet another would be increased energy security through reducing our reliance on imported fossil fuels.

Backing longer duration energy storage also fits with the government's growth-through-infrastructure economic strategy. It would support new and innovative manufacturing businesses with good jobs and first-mover export potential – since many other countries face the same challenges.

In any event, the government targets a 'Clean Power' grid by 2030. Full-scale backing of MDES and LDES is already long overdue.

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Hybridization, modelling and AI

Beyond increasing the overall funding and clearing the barriers for longer duration energy storage, there are several specific areas of research that also need support.

Storage is usually thought of as sitting in the 'middle' of the electricity system: electricity is generated, converted into some other form of energy to be stored, then converted back into electricity when needed.

There are potentially large benefits to be gained, however, from integrating storage with generation, transmission or consumption of electricity. By reducing the number of times that one form of energy is converted to another, with inevitable conversion losses, such integration could raise efficiency and lower costs throughout the electricity system.

Some offshore wind farm developers are beginning to integrate storage into their projects: 3MW is in operation and another 600MW has been consented.[36] But so far this storage is only 'integrated' in the sense that it is co-located near the wind farm to help 'firm' its output. This is worthwhile, but the arrangement still typically involves two separate and conventional technologies: a cable to transport the electricity ashore and a battery to convert and store it.

The two functions could however be combined to provide both transmission and storage in a single vector. The wind farm's power could, for example, be used to produce compressed air or hydrogen, which would be transported ashore by pipeline and stored until needed to generate electricity – with fewer energy conversion steps along the way.

Early research suggests this kind of approach could reduce overall costs significantly.[37]

In this way, a wind farm becomes not so much an asset that generates electricity when the wind blows, but one that harvests energy when available and generates electricity on demand. Such an approach could reduce the capacity of grid upgrades needed to transport energy from Scotland to demand centres in the south and might obviate the need for highly controversial reforms to the wholesale electricity market.

At the consumer end of the electricity grid, it is now becoming clear that distributed thermal storage could, in effect, be provided by heat pumps operating with an optimiser.[38] These devices combine a local weather forecast and time-of-use tariff to reduce energy consumption and cost. In effect they use the home as a thermal battery – while keeping the internal temperature constant – and so avoid the need to invest thousands of pounds in an actual thermal battery. This also benefits the grid by greatly reducing heat pump energy consumption during peak hours.

In the middle of the electricity system, where we tend to assume that all energy storage sits, it is clear there are big opportunities for hybrid energy storage systems. These would combine various technologies and use their complementary strengths to provide a more consistent energy supply and reduce the strain on power infrastructure.

Examples could include hybrids of liquid air and compressed air storage; hybrids of compressed air or pumped thermal storage with synchronous flywheels; compressed air with long duration thermal storage.

To understand where the best value can be added by further research and to inform deployment, we need to develop a set of open modelling tools, based on open data, representing expected energy futures, along with a coordinated group of researchers capable of working with those resources. At present, without this context, it is simply impossible to evaluate many good storage propositions.

Such modelling could be strengthened by applying machine learning or AI. This could help especially with simultaneously optimising several different objectives – such as arbitrage with security of supply.

AI should also be a powerful tool to help control highly complex systems such as electricity grids. AI could for example help optimise complex systems for cost, forecast weather and demand to schedule the operation of energy storage, and control distributed demand-side management.

For a full account of all the remaining research gaps and opportunities, please see our technical report for the EPSRC, *Energy Storage: Gaps and Opportunities Analysis.*[39]

Funding research for resilience and growth

In brief, longer duration energy storage, and MDES in particular, has been deeply undervalued and under-resourced for far too long. The level of public investment in its research and development fails to reflect its vital role in maintaining the stability, resilience and security of a net zero grid.

The Spending Review did not mention MDES or LDES. It did however allocate £86 billion to research and development over the next four years and promised to pay 'significant additional funding' to clean energy industries under the Industrial Strategy.[40]

In this context, we recommend the government immediately raise its research budget for MDES to £500 million and commit £3 billion to support commercial-scale LDES projects.

More specifically, Britain needs to invest urgently in:

1. Support for research into advancing MDES technologies and deploying numerous commercial scale projects for LDES
2. Funding for integration of storage with generation, transmission and consumption of electricity
3. Low-discount rate 'green finance' for large scale projects for both MDES and LDES technologies
4. Funding and commitment to develop open modelling tools, based on open data, to understand where best to focus technology R&D and to and to guide deployment
5. Funding for AI in modelling and control of highly complex systems
6. Support for international collaboration to develop storage technologies

Since policy has not kept pace with our understanding of the importance and urgency of energy storage, we also recommend that DESNZ should appoint an Energy Storage Envoy to improve communication between stakeholders. There is currently no policy lead in this area and the need is urgent because of the wide range of technologies involved, the opportunities for integration and the need to establish a portfolio balanced for the UK climate.

Acting on our recommendations now would support decarbonisation, energy security, growth, jobs and exports. Not doing so threatens spiralling constraint costs, Spain-type blackouts and our chances of achieving a net zero grid.

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