CORRE ENERGY
(CORRE ID)

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Price (€)	**2.50**
Shares in issue (m)	68
Mkt Cap (€m)	170
Net debt (€m)	7
EV (€m)	177
BVPS (€)	19.9

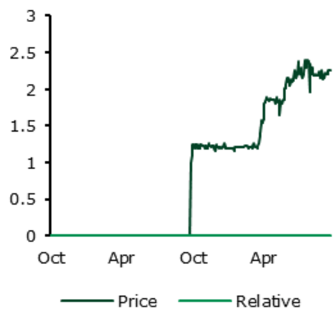
Share price performance	
1m	12.6%
3m	8.7%
12m	108.3%
12 m high/low	2.6/1.1
Ave daily vol (30D)	16,167

Shareholders	
Bloomsbury Holding	38.7%
Lorlen Investments	25.4%
Air Corre Limited	7.4%

Next news Finals Q1

Business description

Developer of energy storage systems based on compressed air and hydrogen



EARLY MOVER ADVANTAGE IN STORAGE

Corre Energy is a developer of long duration storage based on proven compressed air energy storage technology coupled with an ability to work with stored hydrogen. Corre is a European leader with this technology and offers investors an early mover opportunity at a time when growing renewable energy penetration creates demand for high capacity and long duration storage of this type.

CAES opportunity strong in Europe

Compressed air energy storage (CAES) is already one of the most deployed long duration storage technologies globally but Europe is behind China and the US in deployment despite having major salt cavern geology suitable for exploitation. It is the only technology to challenge pumped storage hydro in scale and duration and is cost competitive with other technologies at longer durations.

Corre is the leading developer

Corre is the leading developer of CAES storage in Europe and expects to bring 3,200MW of storage into operation by 2030. The company has built a strong partnership group to enable completion of these projects including cavern developers and systems providers. Corre is also supported by strong relationships with financial partners Infracapital and Fondo Italiano Per L'Efficienza Energetica.

Making tangible progress on projects

Corre's recent interim results show the company working on offtake proposals for its first CAES project in the Netherlands with investment grade partners. Its second project in Denmark has now signed a letter of intent with Gas Storage Denmark on a targeted storage cavern and a MoU has also been signed for cavern option agreements in Germany.

Central case valuation at €3.6 per share

We have valued the company at €3.6 per share which assumes that just the four projects in exclusivity are developed. The main risks to this valuation are delays in developing projects, financing uncertainty, policy uncertainty and new rival technologies. We see the partnership base and a diversity of opportunity as providing protection against these risks.

€,000 Dec	2021a	2022e	2023e	2024e	2025e	2026e
Sales	5	0	0	50,000	5,082	57,540
EBITDA	-6,628	-12,008	-12,309	12,162	-12,909	34,539
PBT	-7,600	-24,824	-13,297	11,169	-13,865	33,556
EPS	-0.1	-0.3	-0.2	0.1	-0.1	0.2
CFPS	-0.2	-0.1	-0.2	-0.1	-0.6	0.1
DPS	0.0	0.0	0.0	0.0	0.0	0.0
Net Debt (Cash)	-1,650	7,388	20,649	-72,319	-2,769	-29,026
Debt/EBITDA	0.2	-0.6	-1.7	-5.9	0.2	-0.8
P/E	-27.2	-7.4	-13.9	36.3	-21.7	12.1
EV/EBITDA	-25.4	-14.8	-15.5	8.0	-12.9	4.1
EV/sales	na	na	na	3.4	33.1	2.9
FCF yield	-9.3%	-3.5%	-6.7%	-2.0%	-22.8%	2.3%
Div yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

INVESTMENT SUMMARY

LEADING LONG DURATION STORAGE DEVELOPER

Corre Energy offers an opportunity to invest in a market leader in the expanding market for long duration energy storage in Europe. Its proven compressed air energy storage (CAES) solutions offer cost effective high capacity storage for balancing the growing penetration of intermittent renewable energy. As a developer it is ahead of most of the competition in identifying and bringing forward long duration storage projects for the European market.

A market with potentially high demand

Many studies show that the need for energy storage rises significantly with renewable energy penetration. With the energy crisis likely to accelerate domestic energy production, storage becomes an increasingly essential part of the energy mix. CAES targets longer duration storage and can accommodate higher overall capacity for which we see a total global addressable market of 21TWh.

Not capacity constrained

Sites for CAES are geographically limited by the availability of suitable geology for cavern storage. Research consistently shows that the potential available capacity vastly exceeds the potential demand even in a high renewables scenario. Less than 5% of the global CAES geological resource potential of about 6,574 TWh of electricity storage may be necessary in a 100% renewable energy scenario. In Europe, strong opportunities exist across northern Europe and this is where Corre are focusing.

Ahead of the game in project development

Corre has four projects with 1,280MWe of capacity under exclusivity and is working towards financial close on the first two of these. Beyond this it is working on origination of a further six projects with 1,920MW of capacity. A full pipeline has 8,000MW of capacity under appraisal and as such Corre is the largest developer of CAES projects in Europe with 69% of the capacity being developed under the ENTSO G Ten Year Network Development Plan.

Strong partners

Corre has put together a group of strong partners to develop out its pipeline of opportunities. These include salt miner Nobian as cavern developer, Siemens Energy as FEED partner, Gas Storage Denmark as hydrogen partner and grid operators TenneT in the Netherlands and in Germany, and Energinet in Denmark. Perhaps most importantly it has backing from funding partners Infracapital and Fondo Italiano Per L'Efficienza Energetica (FIEE).

CATALYSTS

- Project development milestones
- New project traction
- Further policy developments

BULL POINTS

- Leading CAES developer in Europe
- Demand for long duration storage set to grow
- Strong partnerships de-risk development risks

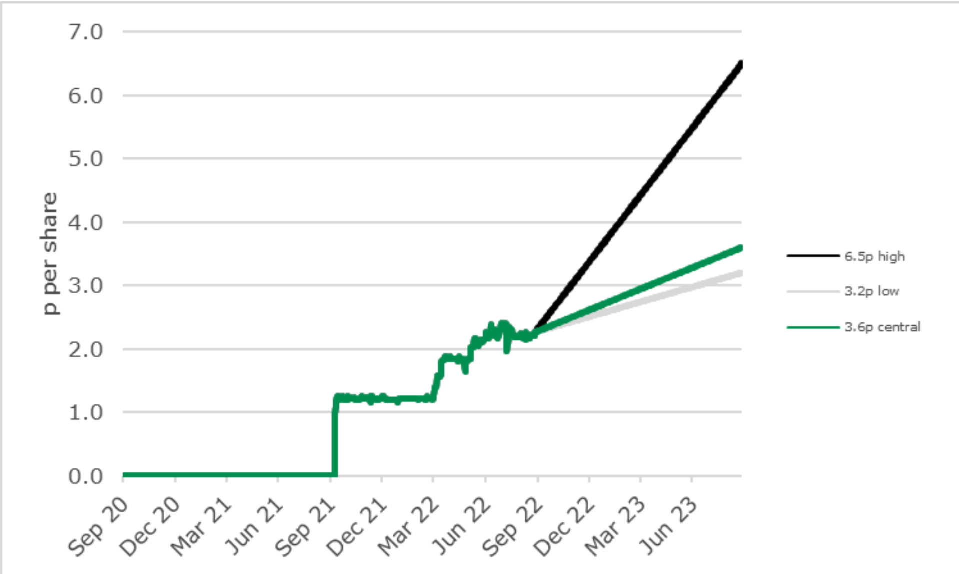
BEAR POINTS

- Funding potentially uncertain until financial close
- Market is still relatively immature and policy uncertain
- Competing technologies create noise

VALUATION

We have based our valuation on a DCF model as the early stage of most long duration storage comparators makes a comparative multiples-based valuation difficult. We have used a WACC of 11.7% to derive a central case valuation of €3.6 per share based only on the four initial projects in exclusivity. A lower case valuation assumes that these projects are delayed by two years and drops our initial valuation to €3.2. A higher case valuation adds in the current six projects in origination to give a valuation of €6.5.

Share price performance and valuation outlook



Source: Longspur Research, Bloomberg

RISKS

The key risks to our valuation are delays to the development of projects, finance uncertainty, policy uncertainty and technology disruption as potential new storage technologies emerge. The first three are both about delays rather than outright failure of the business. We see the diversity of business opportunities as protecting the company from most of these risks and the partnership network is also a major mitigating factor. Most newer technologies do not compete head-to-head, targeting different niches of the potentially very large storage market.

CORRE ENERGY - COMPANY INTRODUCTION

Corre Energy is a leader in the development and operation of Long Duration Energy Storage (LDES) projects and products, accelerating the transition to net zero and enhancing the security and flexibility of energy systems. Based in the Netherlands and listed on the Euronext Growth in Dublin, Corre Energy B.V is focused on the development, construction, and operation of grid-scale, compressed air, underground long-duration energy storage, combined with the production of green hydrogen.

The company focuses on Compressed Air Energy Storage (CAES) as a proven energy storage technology, with two CAES projects currently in development in the Netherlands and Denmark and ambitions to develop a pipeline of additional EU designated projects. These projects combine large-scale hydrogen production with large-scale energy storage solutions through the combination of underground hydrogen storage and CAES solutions. The two CAES projects in development are both currently at progressed stages with both expected to begin operations in 2025/26 and reach full profitability by 2030. The first is a joint project in the Netherlands where Corre Energy has partnered with Infracapital who form part of the M&G Group. The second project is in Denmark, where Corre currently holds full ownership of the CAES plant. Both projects have expected construction costs of approximately €350m to €400m and are expected to generate EBITDA of approximately €80m each at maturity.

Project under exclusivity and in origination

Project	Status	CAES capacity (MW)	Electrolysis capacity (MW)	Location	CoD
ZW1	Under exclusivity	320	350	Netherlands	2025
GHH 1		320	350	Denmark	2025
ZW2		320	350	Netherlands	2026
GHH 2		320	350	Denmark	2026/7
Moeckow	Continuing obligaions or in origination	320	350	Germany	2026/7
Leer		320	350	Germany	2026/7
Drenthe		320	350	Netherlands	2027/8
Etzel		320	350	Germany	2027/8
Harsefeld		320	350	Germany	2027/8
Ahaus-Epe		320	350	Germany	2028/9

Source: Corre Energy

Company History

Year	Event
2017/18	Keith McGrane (ex-Gaelectric) enters talks with Procorre for the development of CAES projects across the Netherlands and Denmark with Nobian. Corre Energy Storage is formed.
H2 2018	Corre Energy secures PCI status for CAES Zuidwending (ZW1).
H1 2019	Cavern Option Agreement signed between the Company and Nobian (Nouryon).
H2 2019	Discussions to reserve 640 MW of grid capacity in favour of Corre Energy Storage from TenneT (as defined below).
H2 2019	Co-operation agreement signed between Corre Energy Storage and PZEM to perform detailed market modelling/analysis and use results to agree terms for customer model, utilising long term contracts and upside sharing.
H2 2019	Corre Energy Storage signs the CEF Grant Agreement (providing PCI co-financing grant of up to approximately €4.4 million) subject to satisfaction of conditions.
H2 2019	CAES Cavern Development and Services Agreement entered into between Corre Energy and Nobian (Nouryon).
H1 2020	Project of Common Interest 1.17 EU grant under the CEF Grant Agreement (approximately €1.7 million) pre-financing drawdown.
H1 2020	Appointment of Royal Haskoning DHV (a consultancy and engineering company specializing in permitting application work) in respect of the ZW1 project.
H2 2020	Appointment of Siemens by Corre Energy for the conceptual design of the CAES installation and preparing a FEED of the surface elements in connection with the ZW1 project.
H2 2020	ENTSOG releases TYNDP 2020 – Corre Energy recognised as the largest developer of Energy Transition Projects ("ETR") projects in Europe.
H2 2020	Corre Energy, in consortia with Eurowind Energy A/S and Danish state-owned Energinet (among others) to formally launch plans to establish one of the world's largest green hydrogen production, storage and CAES hubs in Denmark.
H2 2020	Corre Energy secures a total of €4 million in private funding from a renewable asset developer.
H1 2021	Discussions to reserve an additional 320 MW of grid capacity from TenneT.
H1 2021	Signing of MOU between Corre Energy Storage and Siemens Energy Inc. to enter strategic collaboration to achieve financial close on the ZW1 project and future projects.
H1 2021	Heads of terms signed between the Company and Infracapital, an infrastructure fund, for financing terms to fund the ZW1 project.
H2 2021	FIEE Agreement signed between the Company and IEEF for an initial €3 million in funding plus a contingent commitment of up to €17 million, of which €8 million is to be made available shortly following Admission.
H2 2021	Placing and Admission to Trading on Euronext Growth at a price of €1 per share raising gross proceeds of €12m.
H1 2022	Placing raising gross proceeds of €10.88m at a price of €1.85 per share.

Source: Corre Energy, Longspur Research

CURRENT PROJECTS

Zuidwending (ZW1) is a large-scale renewable electricity storage facility currently under development in the Netherlands, and is the company's inaugural project. The project is listed on the ENTSO-E Ten Year Network Development Plan (TYNDP), and will deploy advanced compressed air energy storage (CAES) technology to develop and implement renewable CAES solutions for the integration of renewable energy. On completion, it is expected to have a generation capacity of 320 MW and is expected to deliver a daily storage capacity of approximately 3-4 GWh. ZW1 has already secured grid capacity and commenced permitting, and this project is expected to come on-stream in 2025/2026. Under the current partnership Corre Energy has with Infracapital, it is intended that Infracapital will fund, subject to the achievement of certain milestones, part of the development and the capital expenditure in return for an ownership interest in the project. Corre Energy will retain a significant minority equity interest in this project.

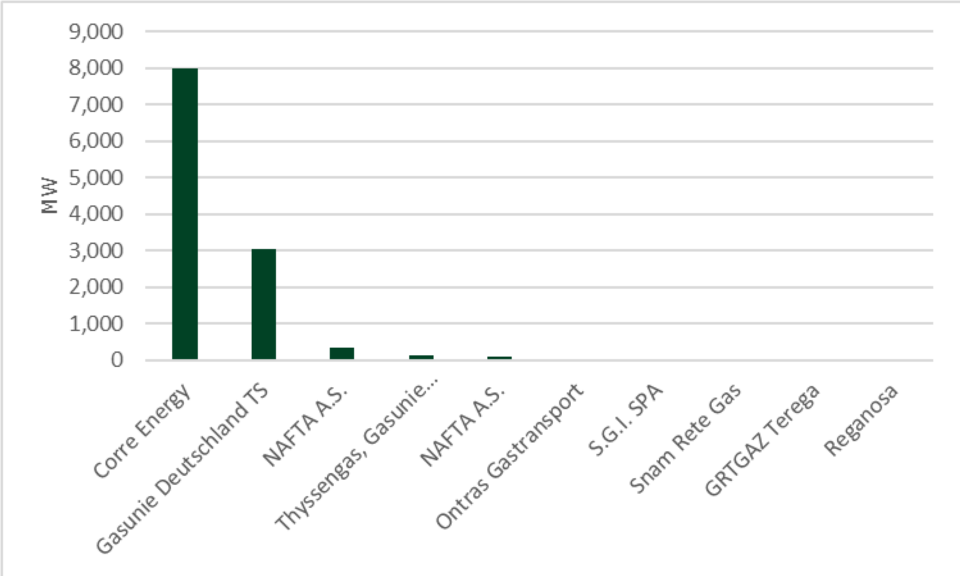
The company's 100 per cent owned second project, the CAES element of the Green Hydrogen Hub Denmark, GHH1, is currently being developed in Denmark as a renewable energy storage facility expected to have a generation capacity of 320 MW with fully integrated green hydrogen capability. The Danish Climate Agreement for Energy and Industry 2020 is targeting 70% renewables and a 70% reduction in greenhouse gas emissions by 2030. Approximately 10 GW of offshore wind is to be in operation by the end of the decade and presents a significant integration problem for electricity grid operators, highlighting the need for scalable storage solutions. Hydrogen based systems are included to facilitate deep decarbonisation of both the electricity system and industrial sectors.

In December 2020, Corre Energy in association with Eurowind Energy A/S and Danish state-owned transmission system operator Energinet (through its subsidiary Gas Storage Denmark) formally launched plans to establish GHH1 as one of the world's largest green hydrogen production, storage and CAES hubs in Denmark. The project's ambition is to combine CAES and green hydrogen production via electrolysis with two large scale energy storage solutions. These include underground hydrogen storage and CAES. It is intended that Corre Energy will be the lead developer of CAES and co-developer of the electrolysis facility. The Danish project will combine large-scale green hydrogen production with two large-scale energy storage solutions, underground hydrogen storage and CAES. The company has indicated that it will be pursuing 2025 capacity targets of 350 MW for electrolysis, 200 GWh of hydrogen and 320 MW of CAES.

Both ZW1 and GHH1 have second phase projects currently under exclusivity which will double the capacity at each site. A further six projects are also under continuing obligations or in origination in Germany and the Netherlands.

Beyond these projects, Corre has a larger pipeline in evaluation giving it a potential total capacity of interested projects of 8,000 MW. This makes it the largest developer of CAES projects in Europe.

ENTSO G Ten Year Networ Development Plan Project Promoter



Source: Corre Energy

THE MARKET

The European and global energy markets are seeing substantial growth of renewables due to the emergence of high energy prices as well as negative pricing as a result of wholesale price volatility, the growing demand of EV's, the electrification of heating and the introduction of increased government polices to fast track decarbonisation efforts across the board. The EU's objective to become carbon neutral by 2050 is driven by the European Commission's Long-Term Strategy submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in March 2020. Additionally, the Green Deal is expected to mobilise at least 1 trillion Euros over the next decade. Green Hydrogen makes up an important part of this strategy with an estimated 650x increase in the European electrolyser market by 2030 and an over 8,000x increase in the European electrolyser market by 2050. The need for grid scale storage to offset intermittency in renewable production increases rapidly as renewable generation rises. We see grid scale energy storage as crucial in order for these targets to be met given the huge amount of renewable production that will be implemented, estimated to be 70 per cent of all EU generation by 2030 from 20 per cent in 2020 as well as the 55 per cent reduction in greenhouse gas emissions if this is to be achievable.

Up to 108GW of energy storage would be necessary for the EU to hit its targets, and these trends are substantially increasing the need for large scale, long duration energy storage within the grid. Bloomberg NEF estimates that energy storage, excluding pumped storage hydropower, will increase 122x by 2040 and require $662 billion of investment.

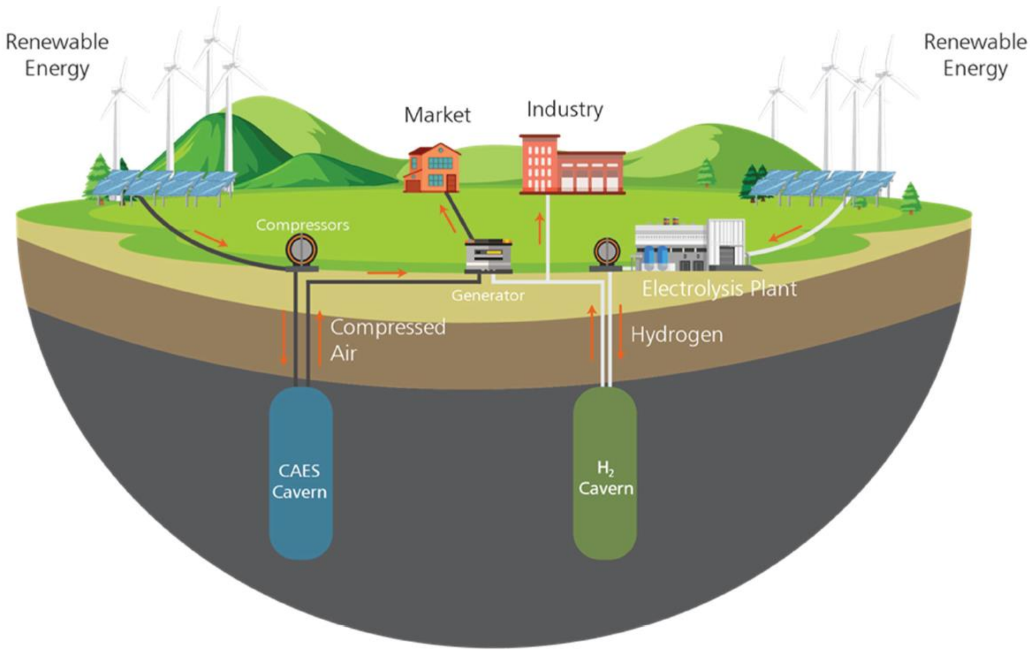
THE TECHNOLOGY

Underground energy storage in the form of compressed air provides a low-cost storage solution for a minimum of 10-12 hours, and subject to cavern sizes, a duration of 80-100 hours can be achieved for 300 MW+ of energy storage. A combination of relatively unlimited storage cycles and significantly lower capital costs provides for much lower annualised costs for CAES versus lithium-ion battery at these longer durations. The process uses electrical energy to compress air and store it under high pressure in underground geological storage facilities. This compressed air can be released on demand to produce electrical energy through a turbine to power a generator and in turn produce electricity.

Compressing air or hydrogen in salt caverns is an economically viable, scalable storage technology that will be able to reach true grid scale in excess of 100MW and offer both short and long-term duration storage. CAES has been operating reliably and safely since 1978 in Germany and 1991 in the U.S. The technology uses specifically designed underground storage caverns created in geological salt deposits by a process known as solution mining or leaching.

During operation of the CAES facility, in the storage phase, electricity is used to compress air into the storage cavern. In the generation phase, the compressed air is released and pre-heated using a fuel to drive turbines, producing electricity when required. Two CAES caverns of 0.5 million cubic metres can generate 320MW of power over a 3-4 day duration. Corre Energy will also combine projects with green hydrogen stored in co-located caverns to fuel the generation of electricity.

Typical CAES project with co-located hydrogen electrolysis



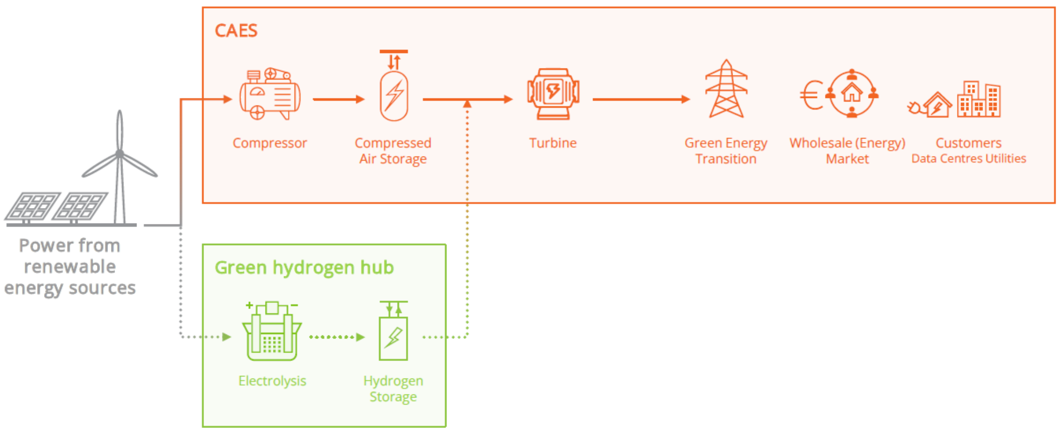
Source: Corre Energy

The construction of a CAES project can be divided into the above ground installation and the below ground salt caverns. The salt caverns are large solid cavities in the salt layers made by dissolving salt. For the above ground installation, 220MW of compression capacity is divided over four compressors at 55 MW each. Compressors compress outside air into compressed air and use (excess) electricity for this purpose.

The compressed air needs to be cooled before it enters the cavern using hybrid cooling towers, resulting in the application of both air and water cooling. This results in an air temperature of 50 degrees Celsius, an ideal temperature to guarantee the safety and stability of the cavern.

Full operation of the CAES facility involves the use of electricity to force air into the storage cavern during the storage phase before the compressed air is released and heated to drive turbines and in turn produce electricity when needed during the generation phase. When the electricity is supplied back to the electricity network, two Turbine Expanders with a total capacity of 320 MW are used. This air expansion process will once again cause the air to cool and further heating will be required before electricity can be used. The Corre Energy solution is one of the first to be able to use hydrogen for this process on a large scale and heat the compressed air which drives a modified turbine to produce electricity.

Combined CAES and Green hydrogen hub

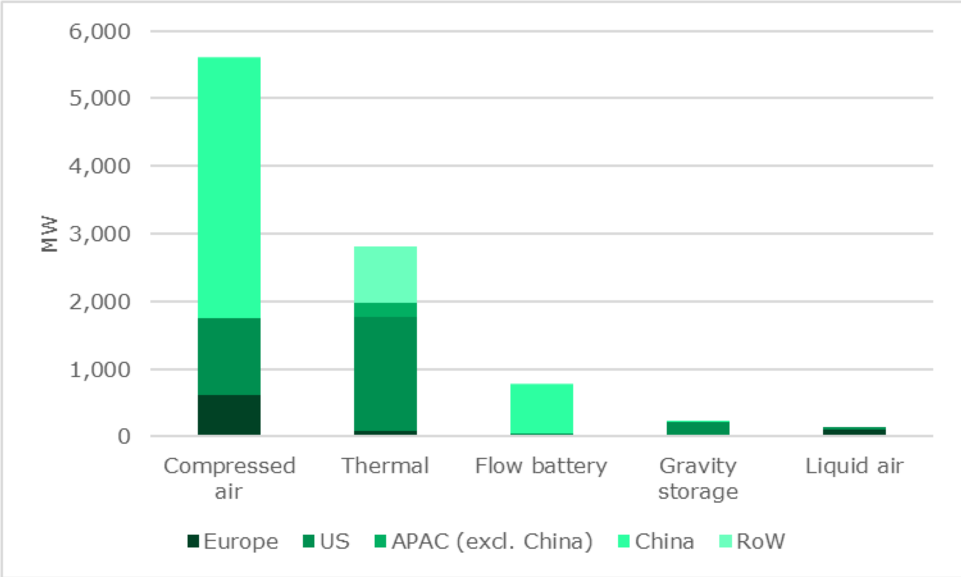


Source: Corre Energy

THE OPPORTUNITY FOR CAES

CAES is already a proven technology and, after pumped hydro storage (PHS), is the largest deployed long duration storage technology today.

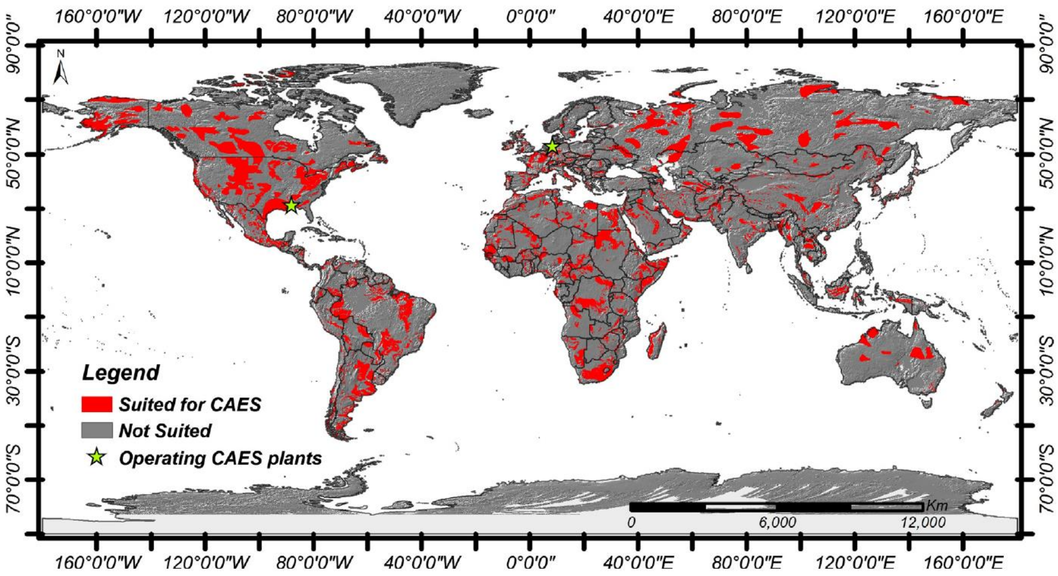
Long duration energy storage capacity (ex PHS and Li-on)



Source: BNEF

The full potential for CAES clearly depends on the availability of suitable salt caverns. These are widely available across the world but concentration means they are not necessarily a solution for every electricity market.

Global suitable locations for CAES



Source: Aghahosseini, A., and Breyer, C., *Assessment of geological resource potential for compressed air energy storate in global electricy supply*, Energy Conversion and Management 169 (2018) 161–173

Research at Lappeenranta University of Technology in Finland has examined the global potential for CAES studying globally available data and criteria for lithological formations, geologic maps, salt deposits and aquifer reservoirs. The potentially acceptable locations were mainly determined by the overlapping of two or more proper geological formations. They found a total global resource potential of 6,574 TWh based on just 1% of available land. Perhaps their most interesting conclusion is that "less than 5% of the global geological resource potential of about 6,574 TWh of electricity storage may be necessary in a 100% renewable energy scenario for the very unrealistic case that all electric storage would have to be provided by CAES."

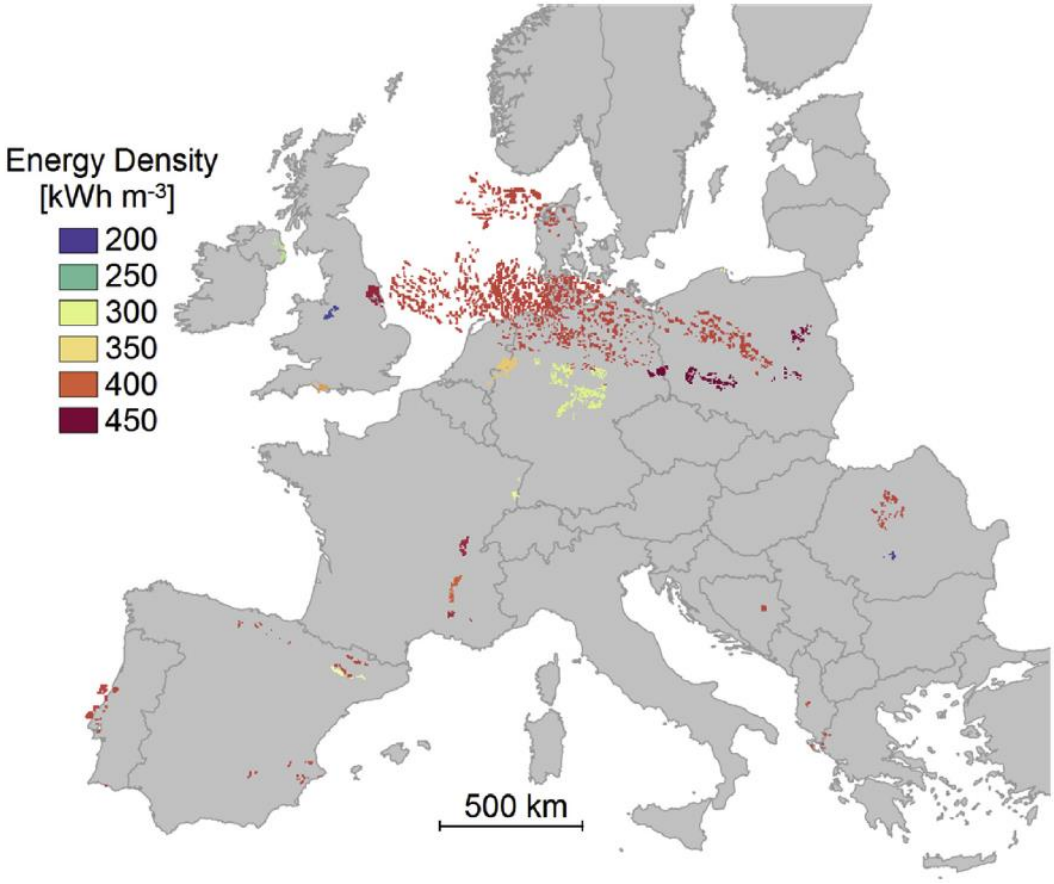
CAES geological resource potential

Region	Territory	Surface area suitable for CAES		CAES potential
	(mil. Km2)	(km2)	% of total area	(TWhe)
Europe	6.5	7,951	0.12	238
Eurasia	21.4	26,073	0.12	780
MENA	11.3	17,335	0.15	518
Sub-Saharan Africa	25.3	50,033	0.20	1,496
SAARC	5.2	5,072	0.10	152
Northeast Asia	11.8	10,433	0.09	312
Southeast Asia	12.6	12,892	0.10	385
North America	21.3	54,930	0.26	1,642
South America	18.3	35,143	0.19	1,051
Total	133.7	219,862	0.16	6,574

Source: Aghahosseini, A., and Breyer, C., *Assessment of geological resource potential for compressed air energy storate in global electricy supply*, Energy Conversion and Management 169 (2018) 161–173

A reason for the authors describing a 100% CAES storage case as "very unrealistic" is in part due to the fact that the CAES resource is not uniformly distributed. While CAES storage can play a part in an interconnected system, transmission and distribution cost limitations mean that it will not necessarily be the most economic solution in all places. However where potential CAES resources are plentiful it is an ideal long duration storage solution. In this regard when we look at Europe we see a strong distribution across northern Europe.

Distribution of potential salt cavern sites across Europe



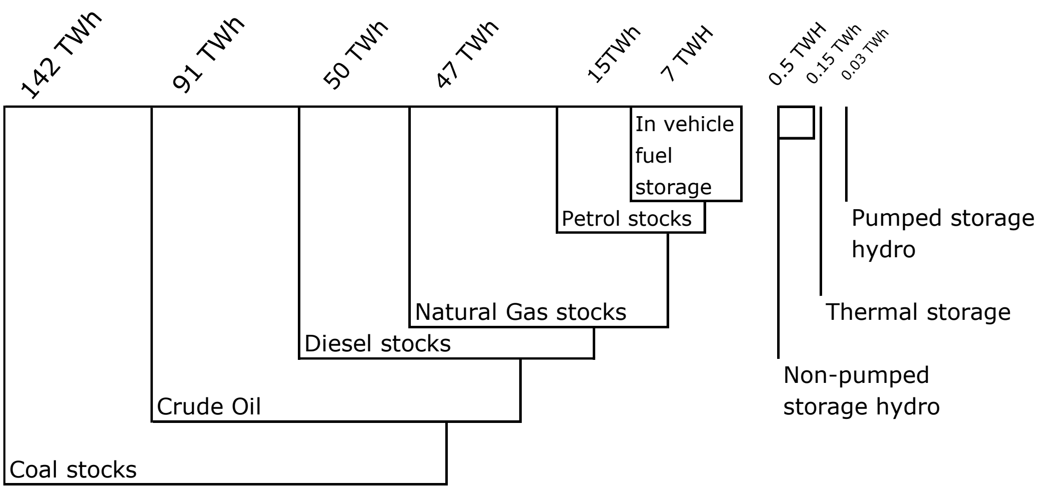
Source: Caglayan, D.G., Weber, N., Heinrichs, H.U., Linßen, J., Robinius, M., Kukla, P.A., Stolten, D., *Technical potential of salt caverns for hydrogen storage in Europe*, International Journal of Hydrogen Energy 45 (2020) 6793-6805

The opportunity for substantially more development beyond the company's plans is clear in our view and we think Corre is not constrained in current growth plans and could go well beyond these.

WHY STORAGE?

In the past, chemical energy storage was always a major part of the energy mix. For example in the UK storage represented around 76% of total energy capacity in 1999. Energy was stored chemically in oil tanks, coal stocks, gasometers and line stack. However, the coal is being phased out and it is likely that a significant amount of oil and gas will follow if we are to hit net zero emissions. If we look at the total energy market, a move to net zero will entail the loss of 352 TWh of mainly chemical energy storage in the UK market alone.

Energy Storage in the UK, 2015



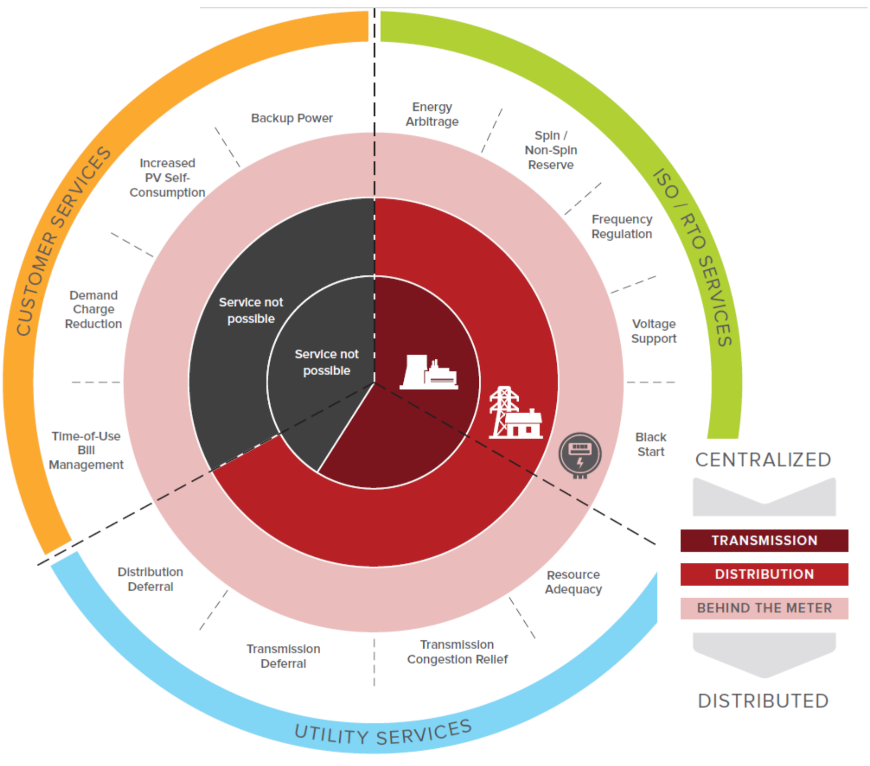
Source: Simon Gill, University of Strathclyde, 2015

Extrapolating globally suggests up to 20,000 TWh of storage will be lost as we move from a fossil fuel-based energy system to one driven principally by renewable electricity. This is equal to approximately 80% of total energy demand.

STORAGE IS COMPLEX

The Rocky Mountain Institute identifies 13 use cases for stationary electricity storage applications.

Power Storage Use Cases

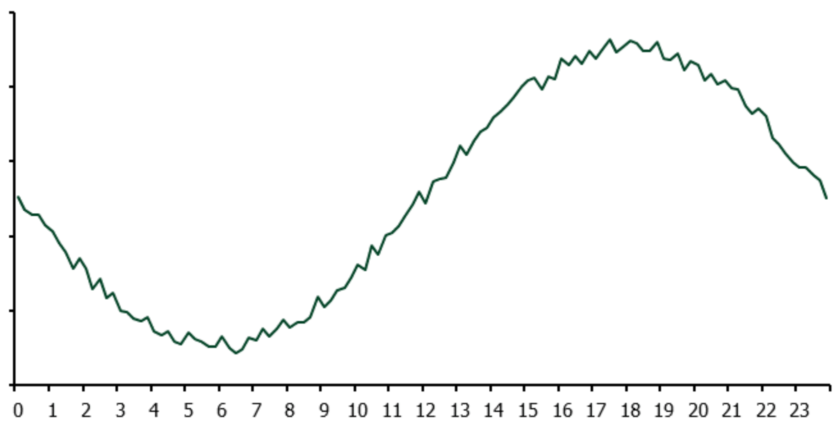


Source: Rocky Mountain Institute

The main areas of value in the market today are arbitrage (technically trading electricity rather than arbitrage as it is not risk free) and frequency response.

We can assess these needs by considering main groups of demand based on storage duration across a typical day. A simplified picture of power demand across a 24-hour period is shown below, illustrating the need to convert a typical grid's daily power supply profile to a baseload demand need. The profile supplied varies across the day with small variations from second to second and larger variations across the day.

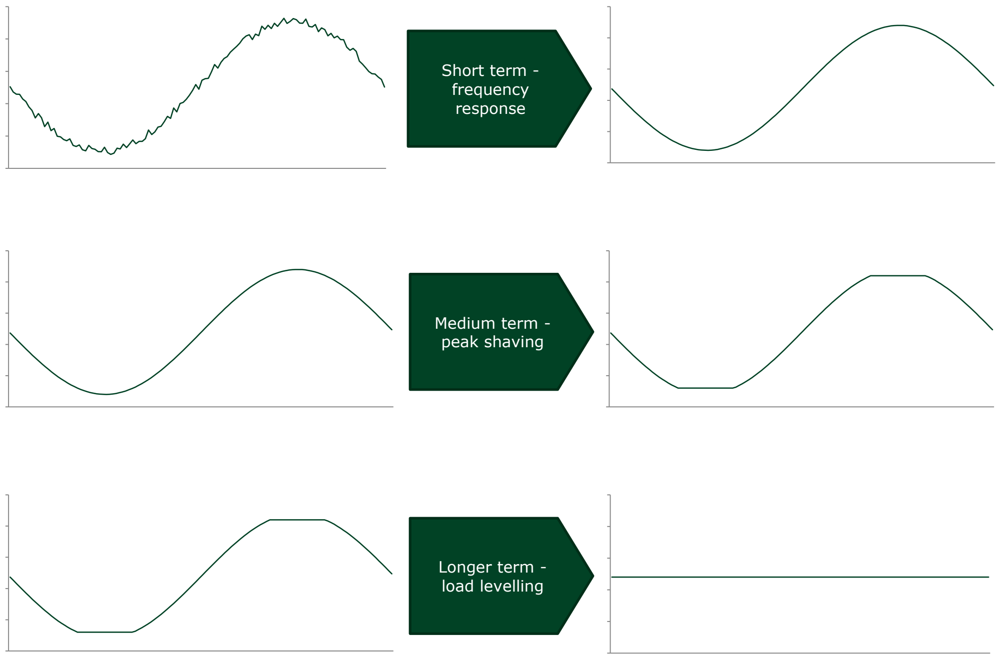
Idealised daily electricity demand



Source: Longspur Research

Storage can flatten this demand profile entirely but to do so there are three principal applications for daily or diurnal storage.

How storage can flatten demand



Source: Longspur Research

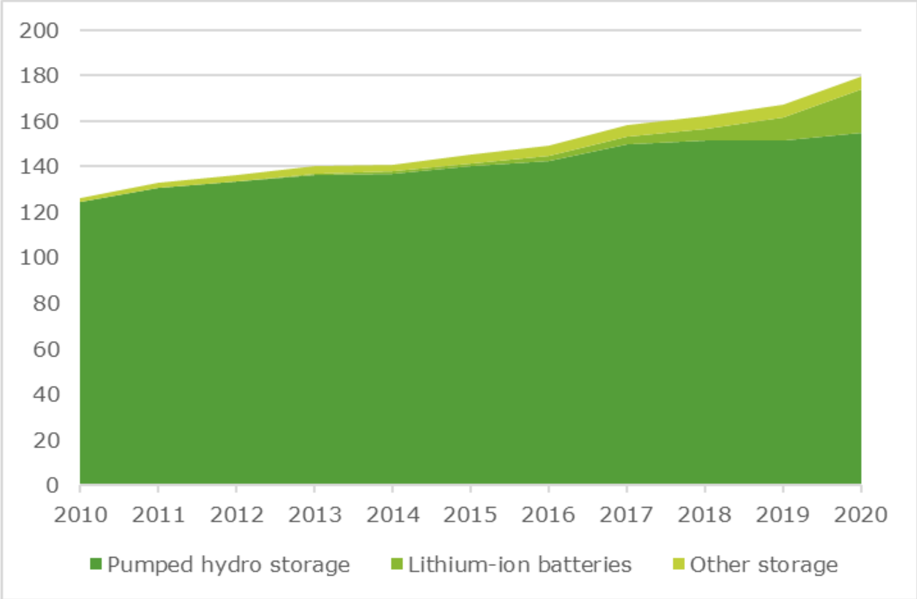
Here the short-term market needs storage solutions of up to 30 minutes, with more responsive solutions providing superior performance. Peak shaving requires storage of from one to six hours and load levelling needs six hours of storage or more. Beyond this there is an additional need for inter-day and seasonal storage which requires higher volumes to be stored for longer periods.

Following from the above we see five main markets for storage.

- Very short duration < 5 minutes
- Short duration 5 minutes to 4 hours
- Long duration 4 hours to 200 hours
- Very long duration >200 hours

To date most electricity storage has been very long duration pumped hydro. However, over the past five years lithium-ion has become a noticeable contributor in the short duration market.

Grid connected storage capacity

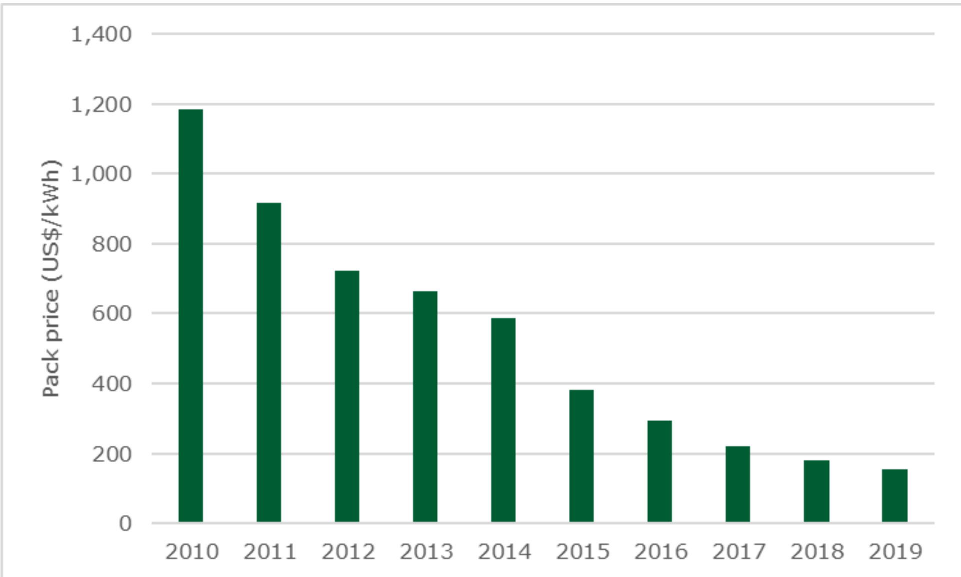


Source: BNEF

THE LITHIUM-ION REVOLUTION

As a result of an extremely well-developed manufacturing base and global supply chain owing to their widespread use in consumer electronics, lithium-ion batteries currently dominate the short end of the stationary battery market in terms of deployments.

Lithium-Ion Energy Storage Costs



Source: Bloomberg New Energy Finance

Lithium-ion is now cheaper than pumped storage provided the storage duration is not too great. Essentially, lithium-ion has emerged as an economic solution at shorter durations of up to two hours and, if anything, is displacing open cycle gas turbines and gas or diesel reciprocating engines.

Why lithium-ion is not a universal solution

Batteries are now being seen as the ideal solution to solving the intermittency issues of renewable energy. While current lithium-ion batteries certainly have potential in these areas, there are certain issues which mean that they are not necessarily a cure all:

- Operating life
- Thermal runaway
- Cost development and raw material scarcity

Life

The life of a battery is usually expressed in the number of full charging cycles that a battery can deliver before there is a noticeable loss of power delivered. Because a lithium-ion battery is damaged if it is fully discharged, its cycle life is often based on the assumption of limiting depth of discharge to 80%. Even with this limitation, lithium-ion batteries can only deliver around 5,000 cycles, with storage capacity decreasing with every cycle to as low as 50% of initial rating at end of life. Exposure to temperature extremes, rapid charging (over 1C), repeated cycles within a short time period or operating within high or low states of charge for extended periods also reduce the cycle life of a lithium-ion battery.

Thermal runaway

Lithium-ion batteries have also had some well-publicised issues with thermal runaway which can in certain circumstances lead to fire. There have been a number of well-publicised incidents involving lithium-ion batteries catching fire including the Samsung Galaxy Note 7, the Boeing 787 Dreamliner and the Tesla Model S. In the stationary storage space fires at Moss Landing in California, Carnegie Road in the UK and more than 30 fires in South Korea suggest that this is a major issue.

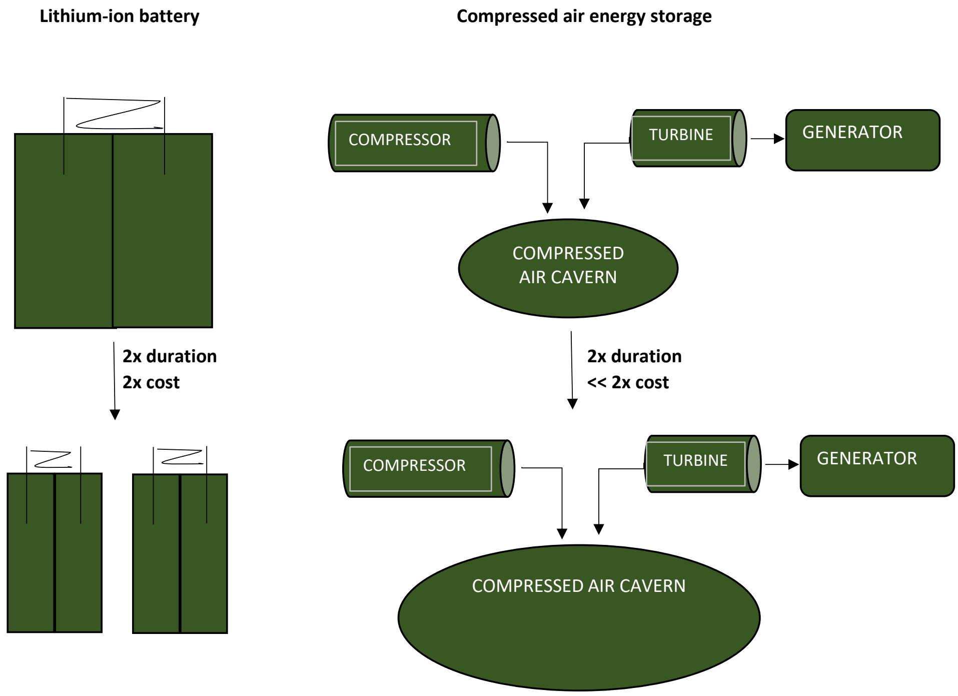
Lithium-ion flammability

Source: AJ Gill

Scalability

Lithium-ion batteries are composed of many cells which are grouped into packs and modules. However, if you want to double the duration you need to double the number of cells. There is some scaling advantage in a complete system as the balance of plant has some benefits of scale, but broadly speaking, lithium-ion battery cost is correlated with duration. Longer duration technologies; CAES, flow batteries, thermal and pumped storage, split the storage capacity from the electricity generating "engine". This engine does not change size with duration and so as duration increases the average cost falls.

Scaling of batteries compared



Source: Information Technology and Innovation Foundation

Cost development

There is a broad assumption that lithium-ion costs will continue to fall based on a learning curve assumption similar to Moore's Law. This is not actually a law but merely an observation and there is no defined causality which is a feature typical of learning curves. Abernathy and Wayne's classic paper on learning curves (The Limits of the Learning Curve, Harvard Business Review, September 1974) which studied the learning curve of the model T Ford emphasised that the cost reductions achieved had to be worked for and had to come from a deliberate focus on cost above all else, often at the expense of flexibility. Cost increases reported by lithium-ion manufacturers in 2021 and 2022 further imply that cost reductions in lithium technologies may be limited by the cost of input materials.

Looking at the facts we see a number of issues that might result in slower than expected cost progression for lithium-ion batteries.

- Material constraints – supply chain restrictions in key materials
- Low margins – limited scope for competition to drive reductions
- Electrochemistry – gains cannot be considered linear

Electrochemistry does not usually lend itself to simple solutions. For example, Lithium-ion technology has been struggling with a problem known as voltage fade for a number of years now. This has limited gains in energy density and hence duration. Perhaps the biggest barrier to cost savings is that batteries are effectively three-dimensional solutions compared with semiconductors or PV cells which effectively work in layers. This means a thinner solution will not reduce costs without reducing performance and makes a Moore's law type outcome less likely.

OTHER SOLUTIONS

The dominant form of energy storage remains pumped storage. It is expensive and time-consuming to build but the cost of energy storage can be low given the ability to store long durations and remain in service for many decades. Compressed air storage technologies have the potential to store large volumes of energy provided a suitable location can be found, but also have high installation costs. Gravity is reliant on finding appropriate sites. Finally, hydrogen storage is a contender but suffers from low round-trip efficiency; in addition, rising gas prices mean the increased value of hydrogen either as a fuel for direct use or for conversion into products such as methanol or ammonia make pure storage with hydrogen less competitive.

Long duration storage technologies

Technology type	Lithium ion	CAES	Pumped storage	Flow batteries	Thermal storage	Gravity
Response time	Milliseconds	3-10 min	Seconds	Milliseconds	Seconds	Milliseconds
Inertia	No	Yes	Yes	No	Yes	Yes
Cycle life	7,000	12,000	30,000	>20,000	30,000	30,000
Energy density (kWh/m3)	150-500	4-12	0.5-2	10	80-500	0.2-3.1
Roundtrip efficiency	90%-95%	55%-75%	60%-85%	65%-85%	60%-65%	75%-80%

Source: Longspur Research

LEVELISED COST OF STORAGE

The levelised cost of storage (LCoS) effectively calculates the level of average pricing for energy delivered from a battery which must be achieved to deliver a positive return to investors in the technology. If the LCoS can be brought below the expected average revenue then the technology will get deployed.

LCoS amortises the capital costs of storage over the lifetime output of the technology and takes these together with the unit operating costs to give a cost per unit of output. The figure is given by the following formula.

$$LCoE = \frac{capital\ cost\ x\ capital\ recovery\ factor + fixed\ O\&M}{annual\ expected\ generation\ hours} + variable\ O\&M + charging\ cost$$

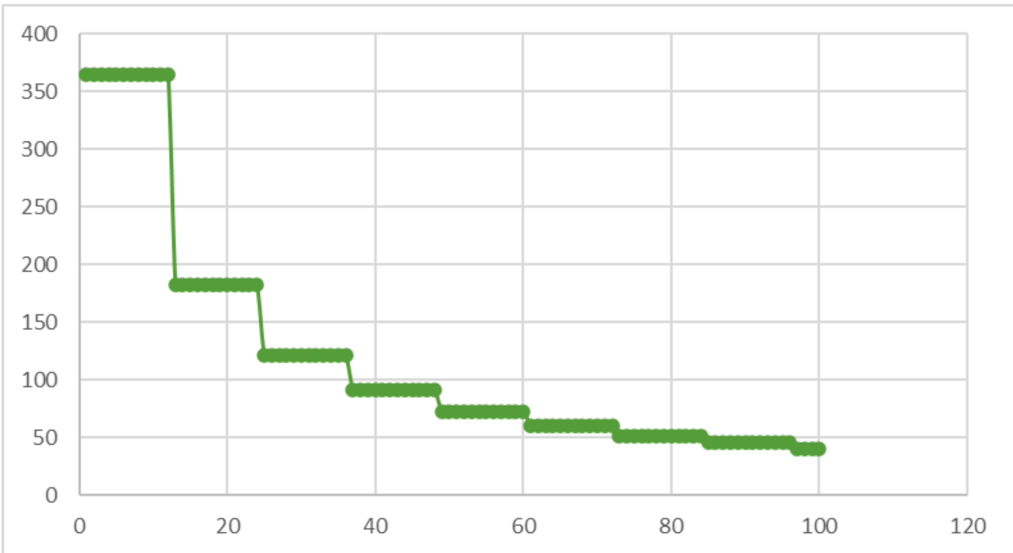
It is important to note that there is a distinction between capital costs which are related to the power output of the technology and those which are related to the energy output. A battery cell can only add more energy by adding another cell, doubling the energy but also doubling the cost related to the battery cells. Of course there are other costs including the balance of plant which do not double, but overall the levelised cost is comparatively static across durations before the impact of multi day storage is taken into account.

Duration

Duration is the amount of time for which energy can be storage in a single charge. If we multiply the power capacity of the storage technology by duration, we get the total energy stored in a single charge. When considering duration in the LCoS calculation, we need to consider that for every period of discharge there must be a period of charging. This assumes that charging and discharging periods are equal which is essentially a 1C charging or discharging rate. This is a reasonable assumption for most storage technologies.

As duration increases, the maximum number of cycles in any year becomes limited. A duration of six months can only have a single cycle in any year. A duration of 12 hours, with a single charge and discharge every day will have a maximum of 365 cycles in a year. We have assumed that for durations over 12 hours, annual cycles are reduced by the rounded up fraction of 12.

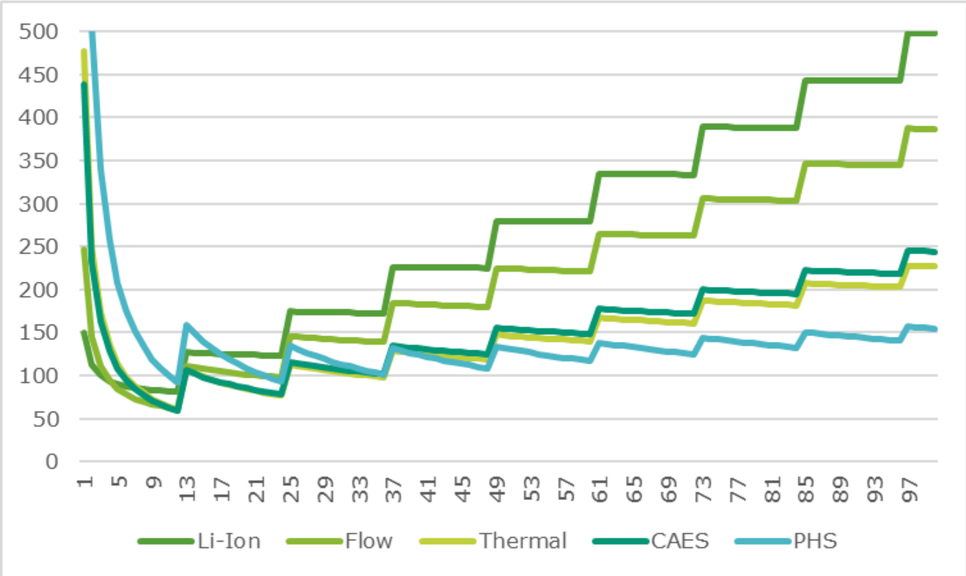
Duration and maximum cycles per annum



Source: Longspur Research

Using these assumptions we can plot LCoS against duration.

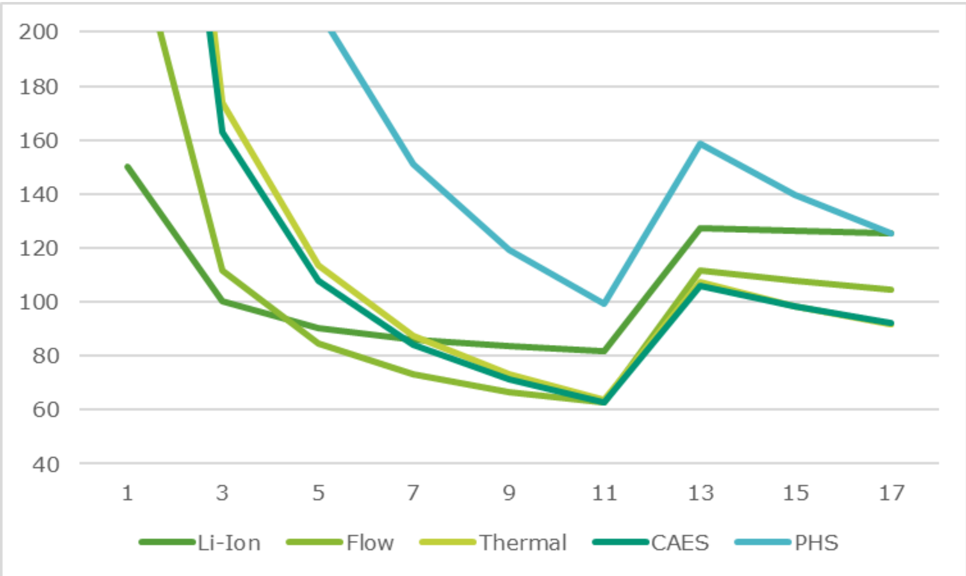
Levelised cost of storage against duration



Source: Longspur Research

This shows that lithium-ion is dominant at durations of up to four hours. This is reasonably consistent with the type of deployments we are seeing in the market today. Beyond four hours flow batteries and thermal solutions are more economic out until about 12 hours when CAES weighs in. Eventually at multi day durations pumped hydro covers its capital costs to become more cost efficient.

Levelised cost of storage against duration detail

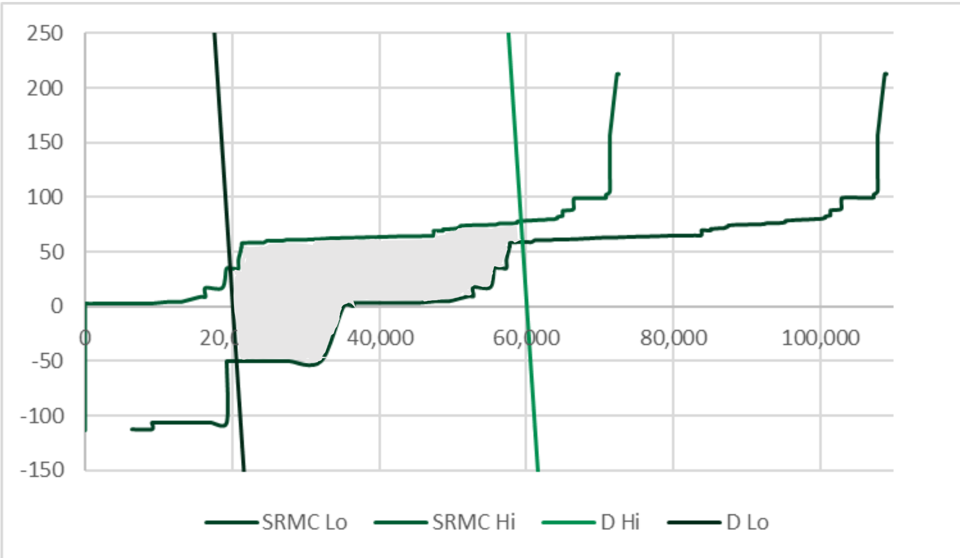


Source: Longspur Research

LONG DURATION STORAGE ECONOMICS

The UK (GB) electricity market was deregulated early and is making strong early progress in decarbonisation with c. 40% of electricity now generated from intermittent renewables. As such it provides a good example of how electricity markets are likely to behave as renewable penetration grows. We use it as an example to show supply and demand using a traditional supply and demand graph. Because of the instantaneous nature of the market with demand changing every 20 ms (in a 50Hz system), we really need to show two demand curves, one with the peak demand in the year and one with the minimum demand. Also, because intermittent renewable supply varies, we think it helpful to show the limit points in two supply curves, one with all renewable capacity available and one with no renewable capacity available. Prices across the year should all fall in the shaded area between the curves.

GB electricity market supply and demand



Source: Longspur Research, BNEF, National Grid FES

The average price for the year will be roughly in the middle of this area. It can be estimated using assumptions of average demand and supply. Full forecasts are available using Monte Carlo simulation techniques to capture the variation in demand and weather-related supply to pinpoint the exact point in the middle of this area. However, this is data and calculation heavy with one consultant reporting a ten-hour run time to prepare a forecast.

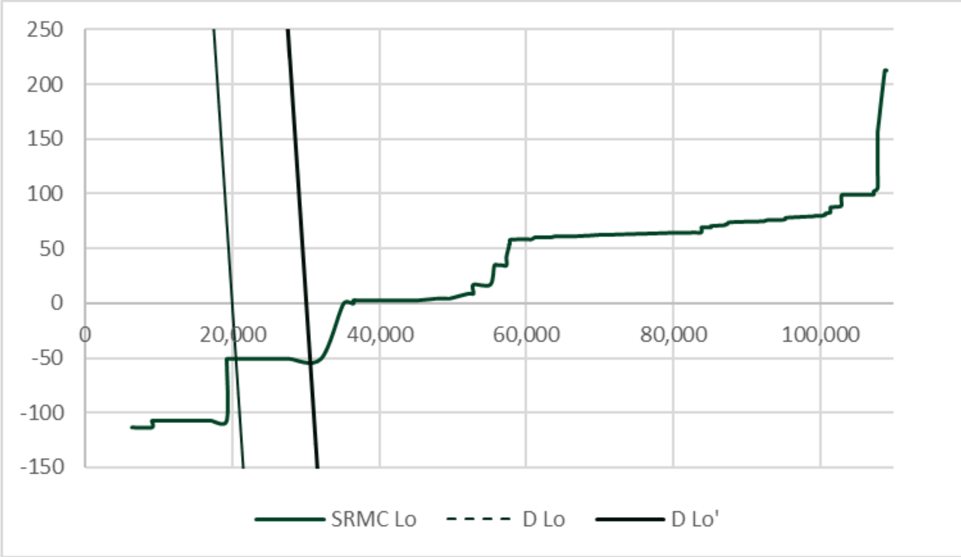
The low supply curve includes renewables with negative short run marginal costs. This is a result of subsidy programmes. The generators only get the subsidy when they run so should be prepared to bid negatively down to the level of subsidy. This may be rare but does happen and is on the increase as more renewables are added to the system.

Adding storage

Storage is both a source of demand and supply. When storage charges it is demand and when it discharges it is supply. Charging will ideally take place when supply is at a maximum and demand at a minimum. With negative pricing, batteries could be paid to charge, although in practice we think the actual low charging point will be zero.

Discharging will try to take place when demand is at a maximum and supply at a minimum. While storage will also sell services to the ancillary markets and the capacity market, it can make money from trading the difference between the high demand/low supply periods and the low demand/high supply periods. If we add storage capacity two things happen. The capacity moves the low period demand curve to the right to represent the additional demand caused by charging.

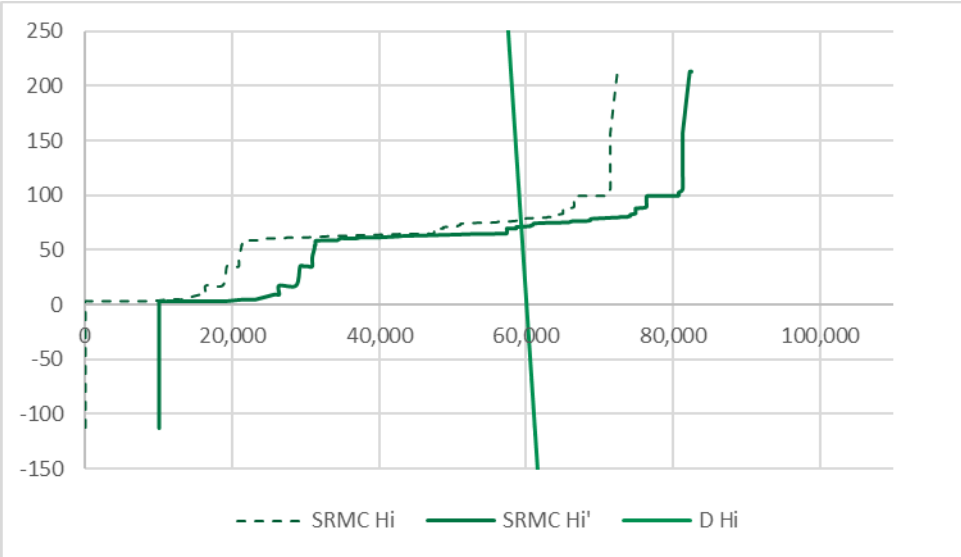
Impact of 10GW of storage charging



Source: Longsur Research

Then the high period supply curve is moved to the right (new supply is added), representing discharging.

Impact of 10GW of storage discharging



Source: Longspur Reseach

Looking at these graphs we can see that we can add over 30GW of new storage before the charging cost rises materially above zero and before the discharge price falls below £50/MWh. We would caution that this is the extreme range available but it does give a useful illustration of the fact that trading spreads can remain attractive even with a lot of new storage capacity in the market.

30GW represents c.50% of the peak demand in the market. This is a significant opportunity and if this opportunity presents itself in other similar markets, we are underestimating the opportunity for stationary energy storage systems.

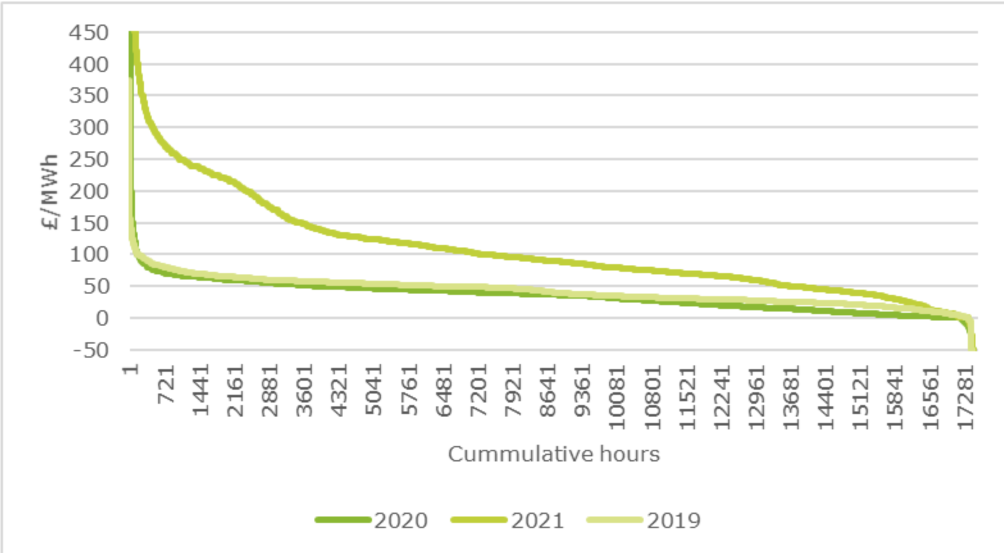
LONG DURATION STORAGE PRICING

This analysis is based on an examination of the two extreme cases in the market, that of maximum renewable availability and that of minimum renewable availability. We need to look at market behaviour between these two points. Again, the UK market remains one of the best sources of data in a deregulated power market and we have data for the short-term balancing mechanism which is close to being a spot market, run on a half hourly basis.

Recent pricing

Prices for every half hour in each of the years 2019, 2020 and 2021 are plotted in descending order of price to give a price duration curve for each year.

Balancing mechanism price duration curves



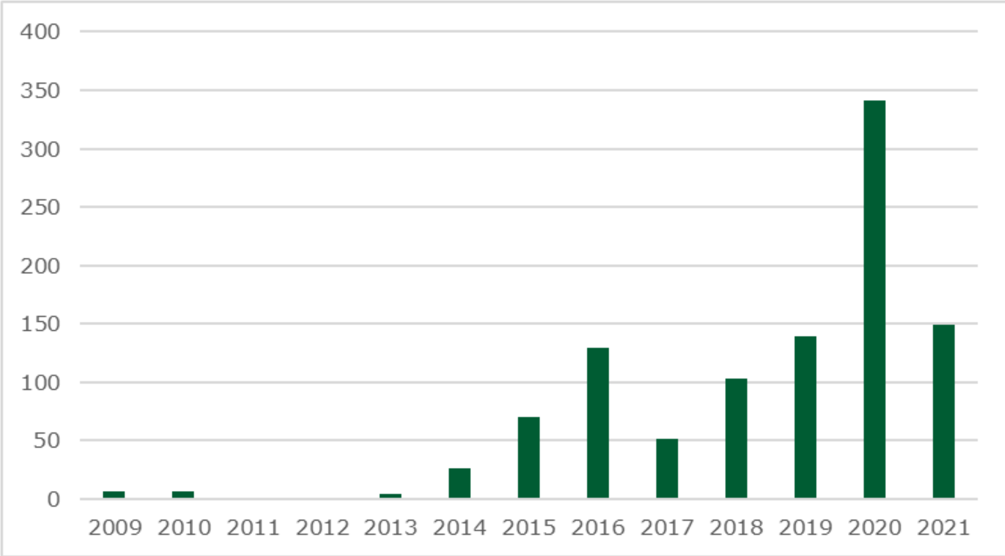
hard to tell difference between 2019 and 2021

Source: Elexon, Longspur Research

Storage seeking arbitrage revenue will buy power at the right-hand end and sell it at the left-hand end of the curve. The flatter the curve, the less money can be made from arbitrage and the steeper the curve, the more money can be made.

2021 is an interesting year with low wind output and high gas and carbon prices. The price duration curve has increased along its length with a notable filling out towards the peak (left-hand end). Less obvious is the fact that 2020 saw a decline in baseload pricing, modest but indicative of future pricing as more renewables are added to the system. Negative pricing events more than doubled in 2020.

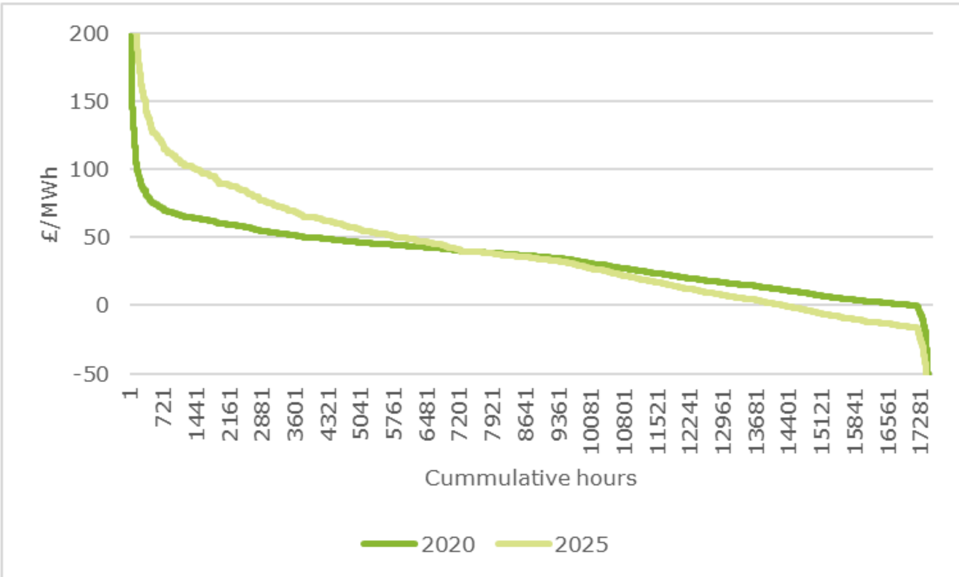
Negative pricing events



Source: Elexon, Longspur Research

Looking forward we expect a pivoting of the curve around the middle as carbon prices rise and eventually with the entry of hydrogen gas turbines. This will increase the value of arbitrage for storage assets.

Expected price duration curve evolution



Source: Elexon, Longspur Research

In addition to this growing revenue opportunity in energy arbitrage, ancillary service revenue from providing a number of support services to help balance grids will be available to CAES. Also ownership and management of a storage assets gives the company a trading advantage through control of a real option in the market.

STORAGE POLICY

For the 193 nation states who have aligned themselves with the Paris Agreement, pursuing to a 1.5^{o}C outcome is a policy commitment. The key guide to getting to this outcome are the pathways summarised in the IPCC's recent Working Group 3 (WG3) report.

This report highlights the problems of low carbon generation being either intermittent, in the case of renewables, or insufficiently flexible, in the case of nuclear, and these impact power systems in a number of ways, creating problems such as loss of inertia and voltage stability issues. All these issues have solutions with storage a key component and likely to see growing demand over the coming years. The WG3 report gives full recognition to this.

"Flexibility technologies - including energy storage, demand-side response, flexible/dispatchable generation, grid forming converters, and transmission interconnection - as well as advanced control systems, can facilitate cost-effective and secure low-carbon energy systems (high confidence)."

"To achieve very low carbon systems, significant volumes of storage will be required."

In addition to lithium-ion batteries, the benefits of longer duration technologies including flow batteries are considered, with the report emphasising that a portfolio of complementary technologies is likely to be optimum.

"No single, sufficiently mature energy storage technology can provide all the required grid services - a portfolio of complementary technologies working together can provide the optimum solution (high confidence)."

With this in mind we expect to see supportive government policies emerging in countries which are Paris signatories.

The EU Response

The European Commission acknowledges that energy storage has a key role to play in the transition towards a carbon-neutral economy, and it addresses several of the central principles in the Clean Energy for all Europeans package.

The Commission also provides substantial co-financing for projects via direct grant funding and financial instruments, principally via the Connecting Europe Facility ("CEF") and the EU Innovation Fund.

Regulation (EU) 347/2013 of the European Parliament and of the Council provides for the designation of Projects of Common Interest (PCIs). PCI designation also allows projects to benefit from CEF financial instruments administered by the European Investment Bank. PCIs can also benefit from accelerated permit granting through coordination of procedures by a single national authority in each EU Member State.

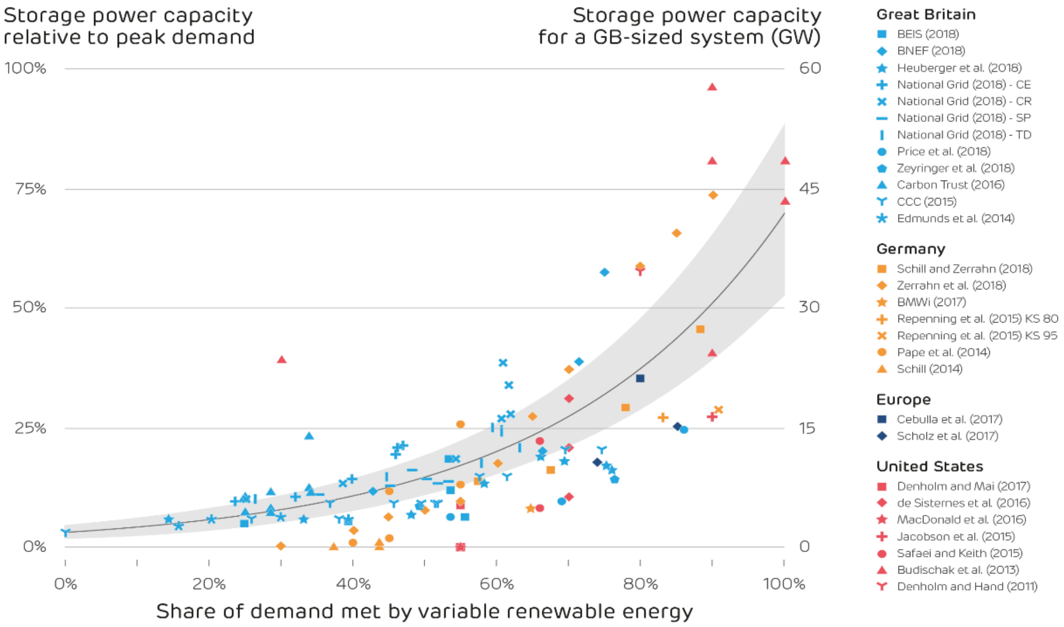
At an institutional level the European Network of Transmission System Operators for Gas and Electricity ("ENTSOG" and "ENTSO-E"), use Ten-Year Network Development Plans ("TYNDP") as a tool to map and plan the future of the energy and gas networks. It is a prerequisite for obtaining PCI status, which can in turn unlock EU grant funding opportunities.

To date, CORRE has secured up to €4.4m of CEF co-financing for the development of ZW1 under the CEF Grant Agreement and will apply for further CEF funding going forward. The Company also believes that its projects have potential to apply for substantial grant funding from the EU Innovation Fund.

DEMAND FOR STORAGE

As we add more intermittent renewable energy, the demand for storage and long duration storage in particular increases. The following meta study of research by Imperial College London shows this fairly clearly.

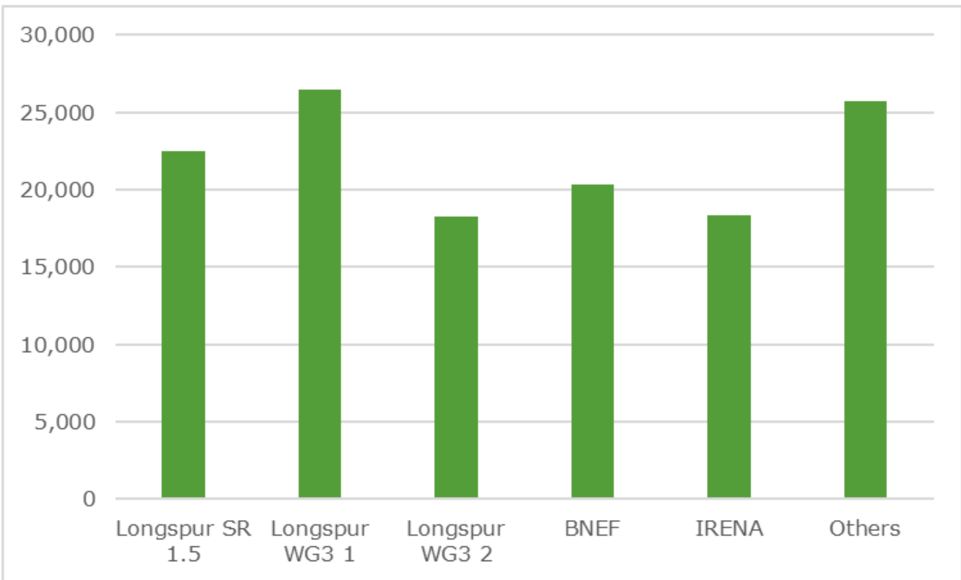
Storage capacity relative to renewable penetration



Source: Imperial College based on Zerrahn et al., 2018.

The UN Intergovernmental Panel on Climate Change (IPCC) Working Group III (WG3) report is an analysis of emission pathways to mitigate climate change. WG3 presents two typical energy mixes, one reaching net zero in 2040 (WG3 1), which is compliant with the aims of the Paris Agreement and one (WG3 2) which reaches net zero in 2060 and is not.

Renewable energy forecasts for 2050



Source: Longspur Research, IPCC, BNEF, IRENA, As can be seen above, the WG3 scenario outcomes for renewables capacity fits well within the range of outcomes from a number of other assessments, including our own analysis of the IPCC 1.5°C special report (SR1.5). The first of the WG3 examples shows renewable penetration of 98% from which suggests storage capacity of 70% of peak capacity. The second shows renewable penetration of 67% which would suggest storage at 25% of peak.

IPCC WG3 illustrative energy mixes

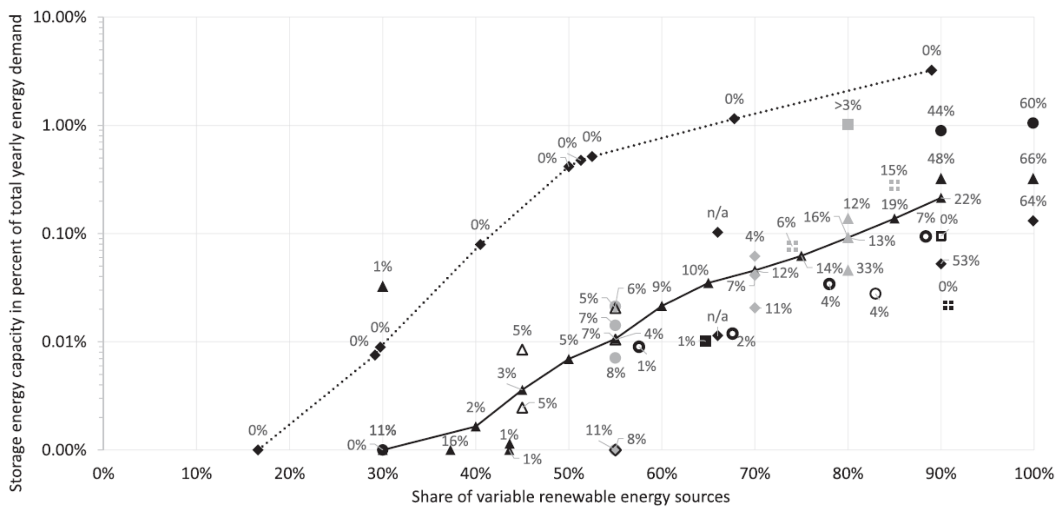
TWh	**Mix 1**	**Mix 2**
Coal	1.7	111
Natural gas	40.3	115
Oil	64	140
Nuclear	4.7	23
Biomass	92	93
Hydro	24	28
Solar	181	70
Wind	79	74
Geothermal/other	8	1
Total	495	655
Renewables	384	266
Renewable penetration	98%	67%

Source: IPCC, Longspur Research

How much storage in the total?

The Imperial work shows storage expressed as storage power capacity as a percent of peak demand. However to really work out storage demand we need to know how much storage energy capacity is needed rather than power. The Imperial study draws heavily on another meta study; Zerrahn, A, Schill, W, Kemfert, C, *On the economics of electrical storage for variable renewable energy sources*, European Economic Review 108 (2018) 259–279. This shows the storage energy capacity as a percentage of total annual energy demand.

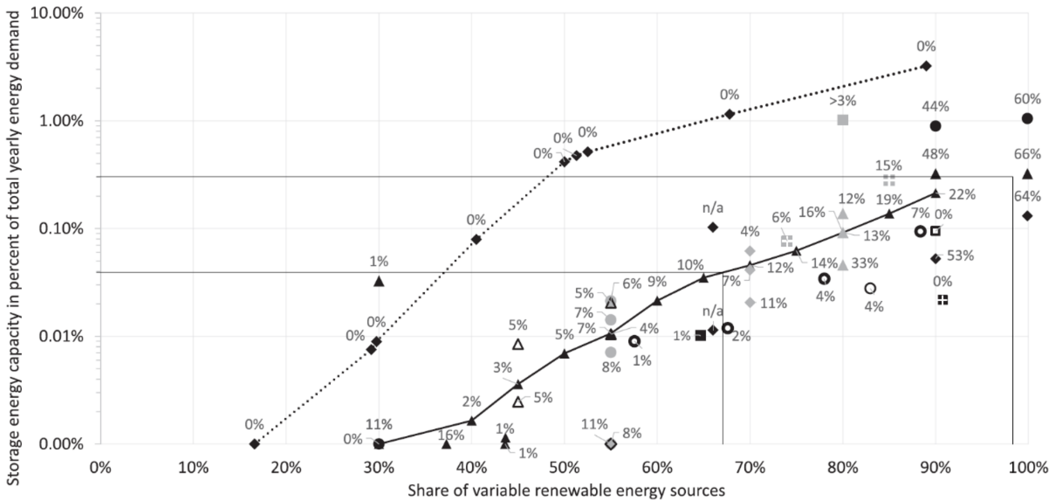
Storage energy requirements in recent research literature



Source: Zerrahn et al., 2018. Percentage figures represent curtailment.

We can use this with the WG3 scenarios to estimate a demand for storage.

Storage energy requirements; renewable penetration of 67% and 98%



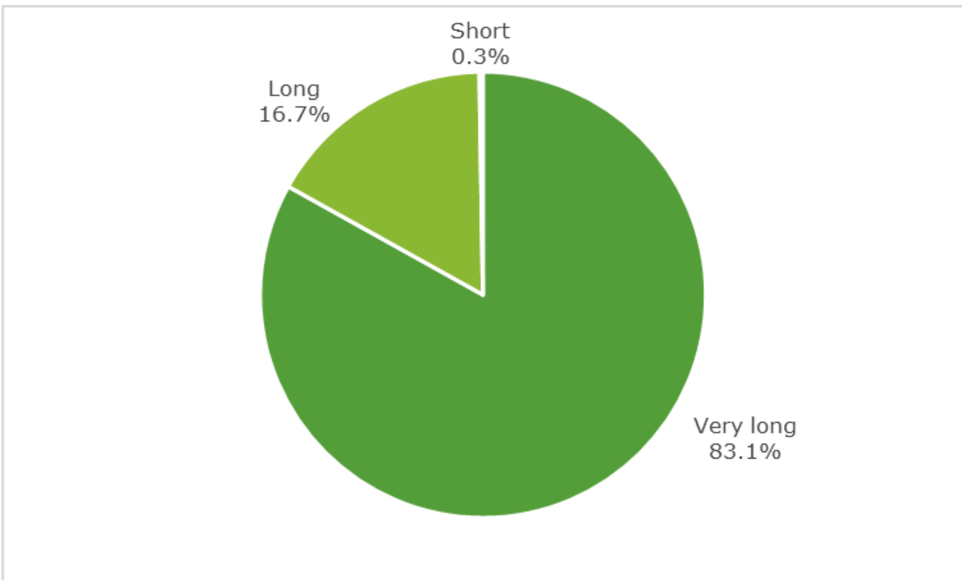
Source: Zerrahn et al., 2018. Percentage figures represent curtailment.

This suggests that the Paris compliant scenario would mean storage of 0.3% of yearly electricity demand and the non-compliant scenario would mean 0.4% of yearly demand.

HOW MUCH LDES IN THE TOTAL?

Recent research on the UK market has distinguished between short, long and very long duration storage with long defined as durations of 4 to 200 hours and representing 16.7% of the total storage volume. Very long is over 200 hours and represents 83.1% of the total. CAES has a market opportunity in each of these segments.

Renewable energy forecasts for 2050



Source: Cárdenas, B, Swinfen-Styles, L, Rouse, J, Garvey, S.D; Short-, Medium and Long-Duration Energy Storage in a 100% Renewable Electricity Grid: A UK Case Study. Energies 2021, 14

Combining the above work allows us to build a picture of storage demand by 2050 under the two WG3 scenarios. We think for valuation purposes the more conservative non-Paris compliant scenario is the better figure to use.

Total storage demand estimates

	Mix 1 TS-59	Mix 2 TS-60
Renewable penetration	98%	67%
Storage capacity	0.30%	0.04%
Total system output (TWh)	108,444	111,111
Storage required (TWh)	325	44
Short duration (%)	0.3%	0.3%
Long duration (%)	16.7%	16.7%
Very long duration (%)	83.1%	83.1%
Short duration (GWh)	976	133
Long duration (GWh)	54,331	7,422
Very long duration (GWh)	270,352	36,933

Source: Longspur Research

In the long duration space we see CAES competing with flow batteries and thermal storage. In the very long duration space we see it competing with pumped hydro. We have assumed an equal split between technologies so that CAES gets 1/3rd of the long duration market and ½ of the very long duration market. This suggests a total market of 21 TWh.

Total storage demand estimates for CAES

GWh	Market size	CAES share	CAES market
Long duration	7,422	33%	2,474
Very long duration	36,933	50%	18,467
Total			20,941

Source: Longspur Research

FROM TAM TO SAM

Estimating demand in 2050 is not directly helpful in assessing the near-term market. The Bass Diffusion model is a well-established model for estimating how a new product diffuses into an existing market. In this case the market is long duration energy storage, and we want to estimate how flow batteries will diffuse into it. The model uses a coefficient of innovation to represent the propensity of innovators to buy an unknown product and a coefficient of imitation to represent the rest of the market to follow the innovators. We have chosen coefficients that fit with certain other market estimates. We combine these with our Low case total addressable market estimate of 20,941 GWh to derive demand out to 2029.

Bass Diffusion model output (M=20,941 GWh, p=0.006, q=0.3)

GWh	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
Sales	209	268	342	434	545	677	829	997
Cumulative sales	497	765	1,108	1,541	2,086	2,763	3,591	4,588
Penetration (%)	2.4%	3.7%	5.3%	7.4%	10.0%	13.2%	17.2%	21.9%

Source: Longspur Research

This suggests a total annual market of 4,553 GWh by 2029. Corre expects to have 3,200 MW of storage capacity operational by that date. If we assume a 12 hour duration this would equate to 38 GWh of energy storage. Against the market expectation this is a market share of c.4% which feels very achievable given Corre's strong position in the market.

Serviceable obtainable market

GWh	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
Sales	209	268	342	434	545	677	829	997
Cumulative sales	497	765	1,108	1,541	2,086	2,763	3,591	4,588
Penetration (%)	2.4%	3.7%	5.3%	7.4%	10.0%	13.2%	17.2%	21.9%
Projects closed (MW)					640	1,440	2,400	3,040
Projects closed (GWh)	0	0	0	8	17	29	36	38
Market share	0.0%	0.0%	0.0%	1.8%	3.2%	4.3%	4.4%	3.9%

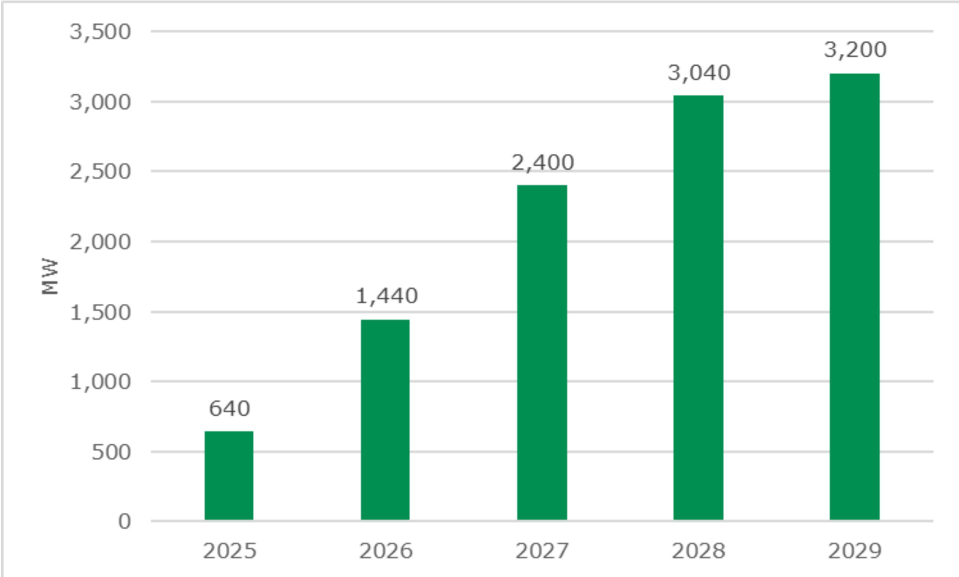
Source: Longspur Research

FINANCIALS

EARNINGS OUTLOOK

CORRE should bring its first project online in 2025. Further projects will then deliver a rapid increase in operating capacity with the 3GW level being reached by 2028.

Corre Energy Portfolio Development Pipeline



Source: Corre Energy

Until 2025 the company earnings will be negative with operating losses and operating cash outflow both at around €12m per annum. 2024 should see a €50m one-off developer fee paid on the financial close of ZW1. Project revenue will then begin in 2025 with project income moving the company into profit in 2026. From then onwards we expect profit to grow strongly to 2030 based on the current project development portfolio. Of course we would expect the company to add additional projects so that growth continues strongly beyond that point and our analysis suggests no shortage of opportunities.

BALANCE SHEET

Corre had cash of €15.6m at 30 June 2021 which should comfortably cover expenditure through to 2024 when further financing will be required. The company has strongly supportive financing partners notably Infracapital, part of M&G Group, who has already committed €200m for ZW1 project and Fondo Italiano Per L'Efficienza Energetica (FIEE), an EIB backed infrastructure fund, who invested at IPO. FIEE through the Italian Energy Efficiency Fund II (IEEF II) injected €3m into the company via a convertible loan in June 2021 with a second instalment of €8m in October. The fund will lend a further €4m or €9m at the commercial close of ZW1 provided that occurs before 1 June 2024.

Project funding remains under negotiation but the company expects to benefit from some level of free carry to cover its development investment in the projects. It may also retain a further stake. For modelling and valuation purposes we have assumed that the projects can attract gearing of 50% and grant funding of 20%. We then assumed that Corre retains 50% ownership with 25% as free carry. We have assumed that the company funds the remaining equity directly with new share issues, undertaken at points of significant progress. We have assumed a raise of €100m at 10% discount to today's share price broadly in line with the average discount on London raises in the year to date.

VALUATION

Other than pumped storage, long duration storage solutions remain a relatively new area and most of companies in the sector will be loss making for some time as the market evolves. This makes PE and EV/EBITDA multiples unusable leaving EV/Sales as the main metric on which to make comparisons. These vary widely. As a result, we think a valuation approach should concentrate on a well-constructed DCF valuation.

We have modelled the company based on the first four projects in exclusivity only. We see this as conservative but a realistic view of what the market is prepared to value ahead of exclusivity on other projects. We have modelled each project individually and consolidated into a group cashflow model.

We have used a weighted average cost of capital of 11.7%. This is based on the high end of the most recent UK's Competition and Markets Authority assessment on cost of capital. We see this as one of the best contemporary estimates based on thorough work that if required must be able to stand the scrutiny of a judicial review. This gives a risk-free rate of -1.0% which with a 2.5% inflation assumption gives 1.5%. The market premium is 8.5% based on historical ex-post market returns going back to 1900. We have used a beta of 1.2 based on the median beta from the comparator group. With no debt this gives us a WACC of 11.7%.

Weighted average cost of capital

Risk free rate	1.5%
Market premium	8.5%
Loan margin	3.0%
Marginal tax rate	25.0%
After tax cost of debt	3.4%
Debt/total capital	0.0%
Beta	1.2
Cost of equity	11.7%
Weighted cost of capital	11.7%

Source: Longspur Research, CMA

We have forecast cashflows to 2040 based on our discussion under earnings outlook above. We then calculate a terminal value in 2040 based on Gordon's growth model and assuming that long-term cashflows are flat in nominal terms. The terminal EV/EBITDA on this basis is 8.3x which we do not see as onerous.

DCF Valuation – central case

€'000	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e
Operating cash in	-10,075	-12,303	1,288	470	6,855	-11,616	-11,549	-7,065	-3,066
Cash from assoc's	0	0	-221	-2,517	19,027	61,152	88,821	105,267	105,924
Tax paid	3,653	0	0	-2,882	0	-8,657	-13,875	-22,046	-26,488
Interest tax shield	0	0	0	0	0	0	0	0	0
Capex & investments	0	0	-7,357	-66,212	15	13	0	0	0
Free cashflow	-6,422	-12,303	-6,290	-71,140	25,897	40,891	63,397	76,156	76,371
Terminal growth	2.5%								
Terminal valuation	850,867								
Terminal EV/EBITDA	8.3								
Implied EV	340,386								
Implied market cap.	432,998								
Implied share price	**3.6**								

Source: Longspur Research

This gives a base case valuation of €3.6 per share.

SCENARIOS

We see the biggest risk to our valuation as being delay of one form or another. We have modelled a one-year delay across all projects. This results in a valuation of €3.2. The obvious upside to our valuation is the addition of more projects. Our immediate scenario here is to include all the projects which the company has under origination. This gives a valuation of €6.5.

DCF Scenarios (€/share)

	€/share
2 year delay	3.2
All exclusivity projects	3.6
All origination projects	6.5

Source: Longspur Research

COMPARATIVE MULTIPLES

Comparative multiples are fairly meaningless as the industry is in early stages with companies still developing business models and jostling for market share. We believe Corre is extremely well placed against the competition both in terms of its offering and also the advantages of building capacity early. Corre is trading roughly at the median in terms of forward EV/sales and below the median in EV/EBITDA.

Comparative multiples

	EV/sales 2022	EV/sales 2023	EV/EBITDA 2022	EV/EBITDA 2023
Corre Energy	4.7	1.5	na	18.5
Invinity Energy	1.5	0.9	na	na
Ess Tech Inc	129.0	4.4	na	na
Eos Energy	4.0	1.0	na	na
Redflow Ltd	na	na	na	na
Genex Power	24.1	20.1	37.3	30.9
Fluence Energy	1.8	1.3	na	na
Quantumscape	na	493.6	na	na
Zinc8	na	na	na	na
Azelio Ab	na	na	na	na
Brenmiller	na	na	na	na
Kyoto Group As	na	na	na	na
Saltx	na	na	na	na
Mean	27.5	74.7	37.3	24.7
Median	4.3	1.5	37.3	24.7
Max	129.0	493.6	37.3	30.9
Min	1.5	0.9	37.3	18.5

Source: Bloomberg

MANAGEMENT

BOARD

Frank Allen Independent Non-Executive Director, Chair

Frank Allen is an experienced infrastructure sector board member. He is an independent financial consultant, advising on infrastructure investment and operations, mostly in developing and transition economies and is an independent advisor to the World Bank on various infrastructure projects. He is also the former Head of Infrastructure Finance at KBC Bank. Mr. Allen is currently a board member and chair of Iarnród Éireann (Irish Rail) and is chair of the Depaul Housing Association.

Keith McGrane Executive Director, Chief Executive Officer

Keith McGrane is a pioneer and thought-leader in energy storage with over 20 years of experience in geophysics, renewables, project development, technology commercialisation and financing. A scientist by background, Mr. McGrane has held many senior management roles throughout his career particularly in natural resource financing (at KBC Bank and Barclays Bank PLC) and renewables development (at Airtricity and Gaelectric). Mr. McGrane is a director on the board of directors of the Company's substantial shareholder and parent company of the Group, Corre Energy Group Holdings C.V.

Darren Patrick Green Executive Director, President

Darren Patrick Green is an entrepreneurial business owner with a career spanning over three decades, initially in the property development space, followed by professional consulting services focused on the energy and financial sectors. Mr. Green is the founder of Procorre, a consulting company which has operated across 100 countries throughout Africa, Asia, Europe, North America and South America. It is Mr. Green's vision, leadership and hands on business management that has enabled his businesses to succeed and deliver a meaningful professional legacy, providing a solid foundation for the future organic and strategic growth.

Rune Eng Independent Non-Executive Director

Rune Eng has significant experience from his many years in the energy sector. He is currently the Executive Vice President International of the TGS Group where he has been employed for almost two years. He was previously CEO and President of Spectrum Geo Limited (subsequently sold to the TGS Group) where he worked for almost nine years. Mr. Eng has also held various roles at PGS ASA over a period in excess of 13 years as well as roles in Fugro, Digital Equipment Corporation A/S and GeoTeam Group.

Luca Moro Non-Executive Director

Luca Moro is a Senior Investment Manager for the Italian Energy Efficiency Fund, a Private Equity focused on Energy Transition. Mr. Moro started his career in JPMorgan, Investment Banking division in London, before joining the buy-side at several hedge funds, dealing with distressed, turnarounds and special situations. Specifically, he was previously Senior Investment Analyst at Bardin Hill, Co-Founder and Head of Research at Eyck Capital and Portfolio Manager at both Numen Capital and Ironshield Capital. Mr. Moro has been a member of many restructuring committees in the role of creditors representative, implementing corporate turnarounds for mid-cap companies in various European Countries and he invested across the capital structure in European and US companies for over 15 years.

SENIOR MANAGEMENT

Chief Financial Officer (interim) Matthew Savage

A financial executive with over 15 years' experience and has worked with Corre Energy since it was founded. Hasb worked with a range of SME and FTSE-listed organizations providing financial and commercial leadership.

Chief Strategy Officer Patrick McClughan

Former Head of Customer & Stakeholder Relations at EirGrid plc. Former Head of Corporate Affairs at Gaelectric completing over €500m in Renewable. Has competed many energy transactions, with c.€2bn of infrastructure development experience.

Chief Development Officer Astrid Hartwijk

Experienced in the development, project management and operation of energy projects around the globe. Has worked with Shell in the upstream business as development manager for the UK Southern North Sea region.

Chief Projects Officer Allan Ralston

Has 30 years' business & complex project leadership experience across aerospace & defence, oil & gas, and renewable energy. Worked with a range of renewable companies including SSE Renewables and Oceaneering.

Chief Commercial & Products Officer Hans-Age Nielsen

A leading expert on large-scale underground hydrogen storage and one of the main architects behind the world-leading Green Hydrogen Hub Denmark project.

President Corre Energy US Development Company LLC Chet Lyons

A pioneer in the energy storage industry, Chet developed the first storage-based 20MW frequency regulation plant in the US. He has 20 years of storage industry experience includes utility-scale storage applications, technologies, markets, regulations, project origination & development.

Head of Corporate Finance John O'Connor

Formerly Head of Renewable Energy Corporate Finance at PwC Ireland and former Vice President at KBC Project Finance. Has over 20 years' finance experience within the Renewable Energy sector.

Head of Legal Alistair Metcalfe

Has 12 years' experience in renewable energy development and transactions. Was formerly General Counsel and Group Company Secretary at Element Power and former Head of Legal UK & Ireland at Statkraft.

Head of Investor Relations Stephanie Casey

An experienced investor relations executive with over 15 years experience working with a range of global financial institutions. Former Vice President and Client Advisory lead for J.P. Morgan's ADR business.

RISK

The key risks to our valuation are delays, policy uncertainty and technology disruption as potential new storage technologies emerge. The first two are both about delays rather than outright failure of business. We see the diversity of business opportunities as protecting the company from both these risks. Most newer technologies do not compete head to head, targeting different niches of the potentially very large storage market.

PROJECT DELAYS

We think project delay rather than outright failure is the major risk to our valuation of the company. The technology is now proven with operating hours on the clock. Project development timelines could however lead to slower roll out than planned, limiting the company's ability to grow as expected.

POLICY UNCERTAINTY

While there is clear demand for long duration storage, markets are not necessarily valuing it as efficiently as possible largely due to policy impacts on market design. While policy may act to improve things as it looks likely to do in the UK, in Europe there is also a risk that new policy could weaken individual project economics either directly or as a result of the unintended consequences of bad policy design.

COMPETITIVE DISRUPTION

Our analysis suggests that CAES solutions can dominate the longer duration storage market alongside pumped hydro storage. However, other technologies will compete in this space and may develop solutions that can compete head-to-head. In this regard we see many of the potential developments of lithium-ion chemistry as being aimed at greater density and charging times driven by the needs of transport markets. We do not see these outcomes as a major threat in the stationary market.

FINANCIAL MODEL

Profit and Loss Account

€,000, Dec	2021a	2022e	2023e	2024e	2025e	2026e
Turnover						
Project income	0	0	0	0	0	0
Central costs and fees	5	0	0	50,000	5,082	57,540
Other	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	5	0	0	50,000	5,082	57,540
Operating profit						
Project income	0	0	0	0	0	0
Central costs and fees	-6,643	-12,038	-12,339	12,353	-10,423	15,482
Other	0	0	0	0	0	0
Other	0	0	0	0	0	0
Operating profit	-6,643	-12,038	-12,339	12,353	-10,423	15,482
P&L Account	**2021a**	**2022e**	**2023e**	**2024e**	**2025e**	**2026e**
Turnover	5	0	0	50,000	5,082	57,540
Operating Profit	-6,643	-12,038	-12,339	12,353	-10,423	15,482
Investment income	0	0	0	-221	-2,517	19,027
Net Interest	-957	-12,786	-958	-963	-926	-954
Pre Tax Profit (UKSIP)	-7,600	-24,824	-13,297	11,169	-13,865	33,556
Goodwill amortisation	0	0	0	0	0	0
Exceptional Items	0	0	0	0	0	0
Pre Tax Profit (IFRS)	-7,600	-24,824	-13,297	11,169	-13,865	33,556
Tax	3,653	0	0	-2,882	0	-8,657
Post tax exceptionals	0	0	0	0	0	0
Minorities	0	0	0	0	0	0
Net Profit	-3,947	-24,824	-13,297	8,287	-13,865	24,898
Dividend	0	0	0	0	0	0
Retained	-3,947	-24,824	-13,297	8,287	-13,865	24,898
EBITDA	-6,628	-12,008	-12,309	12,162	-12,909	34,539
EPS (p) (UKSIP)	-0.09	-0.34	-0.18	0.07	-0.12	0.21
EPS (p) (IFRS)	-0.09	-0.34	-0.18	0.07	-0.12	0.21
FCFPS (p)	-0.23	-0.09	-0.17	-0.05	-0.57	0.06
Dividend (p)	0.00	0.00	0.00	0.00	0.00	0.00

Source: Company data, Longspur Research estimates

KEY POINTS

- During development phase company is spending c. £12m per annum
- ZW1 comes online in 2025 with €50m project development revenue in FY 24
- Project income show in income from investments still negative in first year
- GHH1 comes online in 2026 increasing development revenue
- Project income goes positive in 2026 and PBT moves fully into the black

Balance Sheet

€,000, Dec	2021a	2022e	2023e	2024e	2025e	2026e
Fixed Asset Cost	5,266	5,266	5,266	5,266	5,266	5,266
Fixed Asset Depreciation	-5	-35	-65	-95	-125	-155
Net Fixed Assets	5,261	5,231	5,201	5,171	5,141	5,111
Goodwill	0	0	0	0	0	0
Other intangibles	717	717	717	717	717	717
Investments	0	0	0	7,136	70,832	69,503
Stock	0	0	0	0	0	0
Trade Debtors	2,582	2,647	2,713	19,219	1,671	18,917
Other Debtors	3,641	41	41	41	41	41
Trade Creditors	-823	-2,873	-2,945	-11,238	-1,671	-18,917
Other Creditors <1yr	-2,657	-2,657	-2,657	-2,657	-2,657	-2,657
Creditors >1yr	-1,845	-1,845	-1,845	-1,845	-1,845	-1,845
Provisions	0	0	0	0	0	0
Pension	0	0	0	0	0	0
Capital Employed	6,876	1,260	1,225	16,544	72,229	70,870
Cash etc	13,375	16,719	3,458	96,426	26,876	53,133
Borrowing <1yr	0	0	0	0	0	0
Borrowing >1yr	11,725	24,107	24,107	24,107	24,107	24,107
Net Borrowing	-1,650	7,388	20,649	-72,319	-2,769	-29,026
Share Capital	279	4,779	4,779	49,027	49,027	49,027
Share Premium	11,501	17,171	17,171	72,923	72,923	72,923
Retained Earnings	-3,250	-28,074	-41,370	-33,083	-46,948	-22,050
Other	-4	-4	-4	-4	-4	-4
Minority interest	0	0	0	0	0	0
Capital Employed	6,876	1,260	1,225	16,544	72,229	70,870
Net Assets	8,526	-6,128	-19,424	88,863	74,998	99,896
Total Equity	8,526	-6,128	-19,424	88,863	74,998	99,896

Source: Company data, Longspur Research estimates

KEY POINTS

- Projects assumed to be equity accounted so fixed assets remains constant
- Investments build from FY 24 as initial projects starts to deploy
- Working capital expands with sales growth
- Cash benefits from assumed equity raise in FY 24

Cashflow

€,000, Dec	2021a	2022e	2023e	2024e	2025e	2026e
Operating profit	-6,643	-12,038	-12,339	12,353	-10,423	15,482
Depreciation	15	30	30	30	30	30
Provisions	0	0	0	0	0	0
Other	0	0	0	0	0	0
Working capital	-1,000	1,933	6	-11,095	10,863	-8,657
Operating cash flow	-7,628	-10,075	-12,303	1,288	470	6,855
Tax paid	-107	3,653	0	0	-2,882	0
Capex (less disposals)	-2,107	0	0	0	0	0
Investments	-189	0	0	-7,357	-66,212	15
Net interest	-24	-12,786	-958	-963	-926	-954
Net dividends	0	0	0	0	0	20,340
Residual cash flow	-10,055	-19,208	-13,261	-7,032	-69,549	26,257
Equity issued	10,837	10,170	0	100,000	0	0
Change in net borrowing	-1,650	9,038	13,261	-92,968	69,549	-26,257
Adjustments	868	0	0	0	0	0
Total financing	10,055	19,208	13,261	7,032	69,549	-26,257

Source: Company data, Longspur Research estimates

KEY POINTS

- Net operating outflows across period
- Project investment outflows in FY 24, 25 and 26
- First project dividend in FY 26 not enough to cover investment outflow that year
- Equity issue assumed in FY 24 to cover investment costs

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