

UK Domestic Energy Storage
Market Insights & Implications

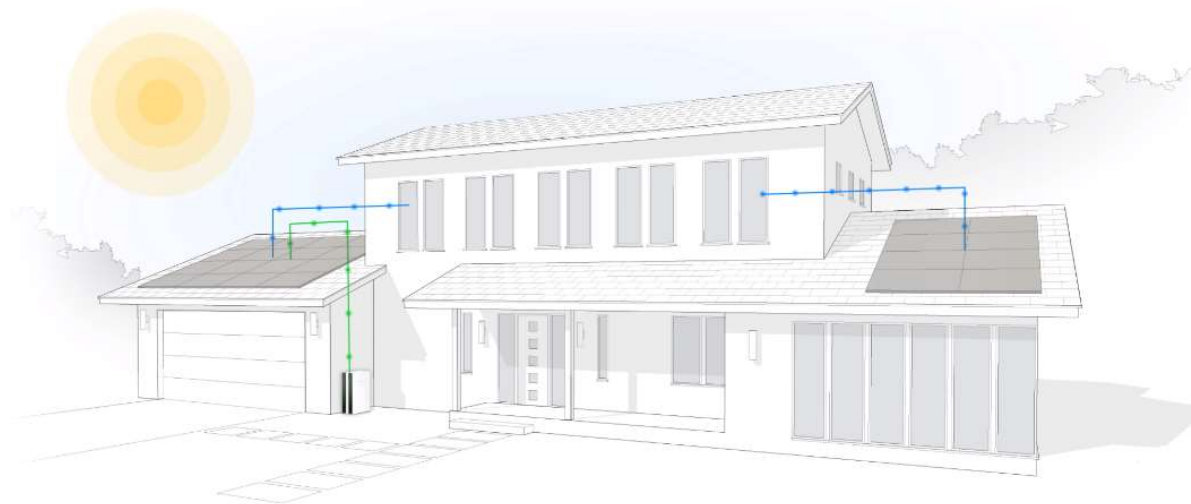
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STRATEGY

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Market Context: Domestic energy storage is an energy utilisation system involving home batteries...

What is domestic energy storage?



- A **battery system** for households
- It draws power from solar panels or other energy sources that can be stored and **used whenever it is needed**
- Software can manage which energy source the household should use and when in order to **minimise cost** to the household

Market Context: Home batteries are extremely niche in the UK with only ~10,000 sold to date...

10,000

Homes in the UK have battery storage. This equates to 0.04% of HHs

>900,000

Homes in the UK have PV. This equates to 3% of HHs

60MW

Of battery storage deployed in 2016
(across domestic and business)

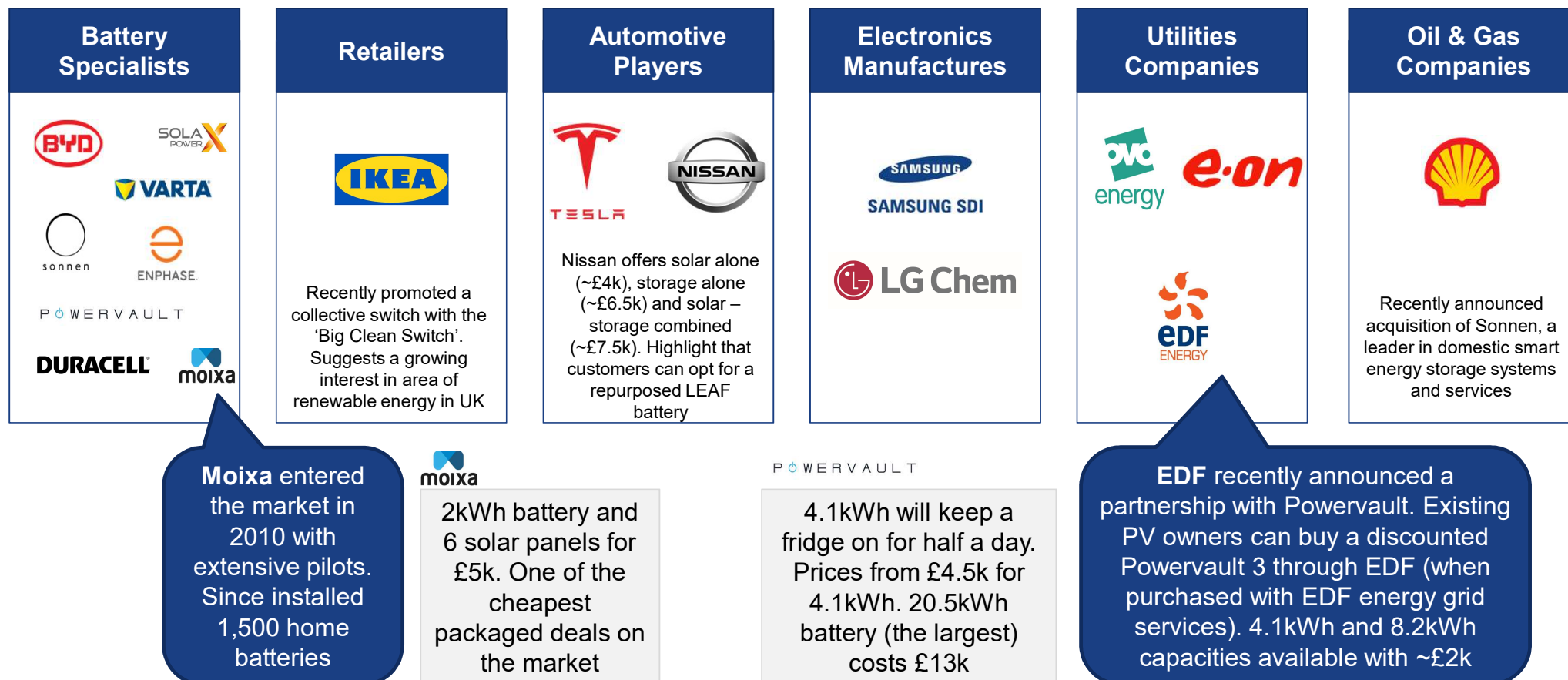
The FiT scheme is now closed and new PV owners will not be paid for their generation

Home batteries are still very niche in the UK. They are expensive and for many, the benefits are not clearly articulated to be worth the investment. Those that do have a battery typically already have PV



125,000 homes in Germany have a home battery. This equates to 0.3% of all HHs. They are looking to reach 200,000 in the next 2 yrs. 1m HHs have solar panels

Market Landscape: The landscape of companies involved in the home energy storage market is becoming increasingly busy and fragmented with some Big 6 energy retailers recently entering the space...

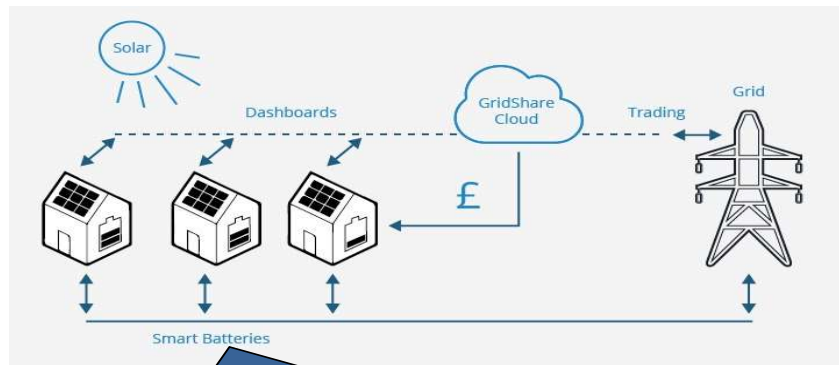


Average home uses 4,000 kWh / yr

Propositions: Some of the more interesting home battery propositions on the market are built around smart, AI powered capability that makes decisions on behalf of the customer...



GridShare platform aggregates distributed batteries creating a virtual power plant. Customers' paid-for energy is traded with Grid. Fixed (£50/yr) or profit share (50% of revenue brought in by customer's battery)



Customer profile developed based on consumption, generation, weather patterns using machine learning

"Our smart battery systems are overcoming the key issues with home batteries to date - the systems know when it makes sense to purchase energy and when to export it. They will soon know whether it's better to power your home or charge your car"

Co-Founder, Moixa



Duracell hardware, Social Energy software. The AI software predicts energy usage patterns. Customers use stored energy before drawing from the Grid



"The Duracell battery will succeed where others have failed because it's a smart battery and owners want all of the decision making to be taken out of their hands. When you combine the automation with the Duracell brand, 12%-16% ROI and simple plug and play nature that can be up and running in minutes we are onto a winner!"

Chief Executive, Social Energy

Propositions: OVO have trialled their home storage battery. As an energy retailer, their access to customers is a potential key to any future success...



Released Spring 2018, currently being trialled with customers in the Midlands. Battery stores energy from the Grid when demand is low and sells it back when demand is high

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Introducing Home Energy Storage

Our revolutionary home battery trial, exclusive to OVO customers based in the Midlands

By joining this free 2 year trial¹, you'll help support the high demand for electricity in your local area and lead the charge for green energy.

"I think the OVO offering could be successful. For one thing you don't have to have solar panels, which a lot of homeowners will struggle to afford once they bought the battery.

More interestingly OVO have access to customers in the way that other players in the market don't. They have the ability to say to a customer 'stay with us for five years, you'll get your energy from us and this home battery for £x a month.'

The monthly payment commercial model, along with the fact that it is just one company you are dealing with could really work"

Chief Executive, Social Energy

Channel / Partnerships: E.ON have recently secured a trial with Berkeley Homes to provide battery storage capability to a new luxury housing development in London...



E.ON working with Berkeley Homes trialling various initiatives at the Kidbrooke Village site in London, inc batteries for the entire development

The Future Energy Home allows residents to generate and store electricity in a battery, to make use of in-built renewable sources to charge electric vehicles, and to relieve pressure on the Grid at times of high demand

LG Chem batteries have been installed at the development. LG appears to be E.ON's manufacturer of choice

"As technology progresses we also want to see energy management becoming second nature to consumers. We are really invested in playing our role in a greener future. We have a big commitment to home building in the UK and this is just the start of our investment in sustainability"

Divisional MD, Berkeley Homes



Home Storage Buyers: Current buyers tend to be those that have solar panels and therefore see batteries as a natural extension or are looking for an area in which to invest savings...

Current Buyers:

Have Solar Panels

"For me a home battery was a natural extension of having solar panels. My family and I are out all day and so we are not making the most of the energy we produce. The battery will allow us to store what we don't use during the day and use it at night"

Interest in the Area

"The installation of the panels and battery has been an extension of a hobby of mine. As a retired engineer I am extremely passionate about the area. My wife and I now run a consultancy that focusses on solar energy in the UK"

Have Savings to Invest

"My primary motivation for investing in a home battery was that I wanted to invest some of our savings in an area that would provide a good return and add to the value of our home. The battery seemed like a good investment"

"Duracell are immediately going to target those homeowners that already have solar panels but not yet a battery. I am convinced 90% of these will pick-up a battery quickly. You also have those who have recently retired and want to a good investment"

Chief Executive, Social Energy

Potential Buyers:

Portfolio Landlords

"If I were a portfolio landlord I would be looking into home batteries. In addition to adding value to the properties, they would bring household bills down which would really appeal to tenants. The batteries will pay for themselves after a couple of years"
Chief Executive, Social Energy

Which? Survey concluded that 90% of people who have had solar panels installed paid for them in full with savings. With 10% taking out loans

Needs & Drivers: For those with solar panels, a key need is for a proposition that communicates a clear financial benefit and offers simplicity...

Example prospective customer...



Owens a detached 4 bedroom home in South London. AVP at a global bank



Installed PV on roof 2 yrs ago. Paid for in one-off payment



Recently purchased a BMW i3



Has not installed a home battery. Has looked into adding a home battery. Knows of Tesla, Moixa & Powervault



POWERS V AULT

Key needs & drivers...

Financial
Benefits
Clearly
Communicated

"I have not seen anything that clearly and simply communicates the kind of ROI I want. I would also want to see that a home battery would increase the value of my house by x%"

Simple
Automated
Proposition

"I have two young kids and a time consuming job. I want a battery that does all of the work – it stores and sells back energy at the most appropriate times for my bills to be as low as possible. I don't have time to be dealing with managing my energy"

Unsure About
Battery
Technology

"Everything I have read on battery technology suggests it'll need replacing within a decade if I am lucky. I would want something that lasts longer. I would probably be more inclined to trust a company that has been involved in the industry for some time"

Less
Concerned by
Cost

"I am quite lucky – I would not need finance or to have to pay for the battery on a monthly basis. The £5k cost would not be an issue for me"

Barriers to Adoption: Regulation is regarded as one of the key barriers to more widespread adoption. However, initiatives are being adopted to clarify and simplify the current regulatory complexity...

Steps have been taken to overcome regulatory barriers:

Barrier

Current definition of energy storage is unsatisfactory. Conflicting guidance on co-location of renewables & storage. In addition to this, customers are being charged twice (for storing and then resupplying grid)



How the barrier is falling

December 2018 – Ofgem updated technical guidance clarifying payment and smart meter requirements on co-locating renewables & battery storage. Still more clarification required

Progress is still needed to overcome the price and battery technology barriers...

"For the majority of prospective buyers, home batteries still are not economically viable. They perceive them as being an expensive luxury"
Energy Consultant



Price of a lithium-ion battery has fallen by 85% since 2010, average cost in 2018 was <\$200/kWh. The price is expected to drop further to ~\$60/kWh by 2030*

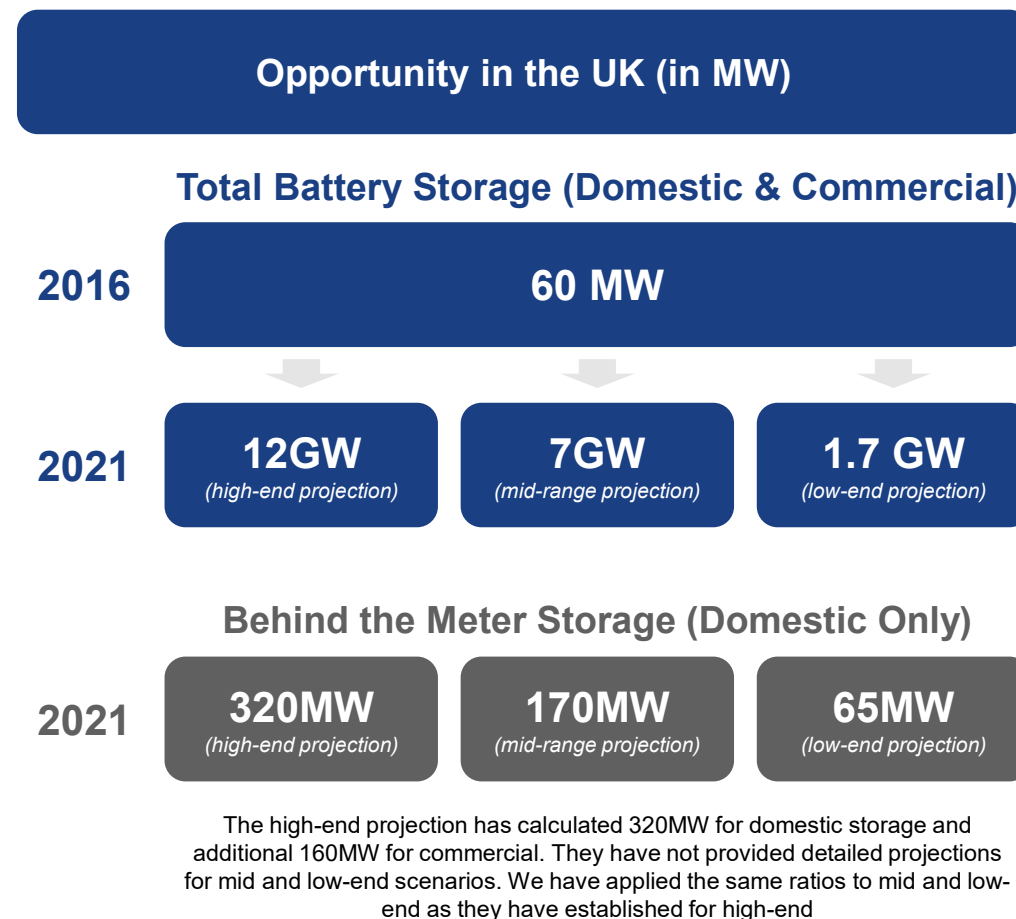
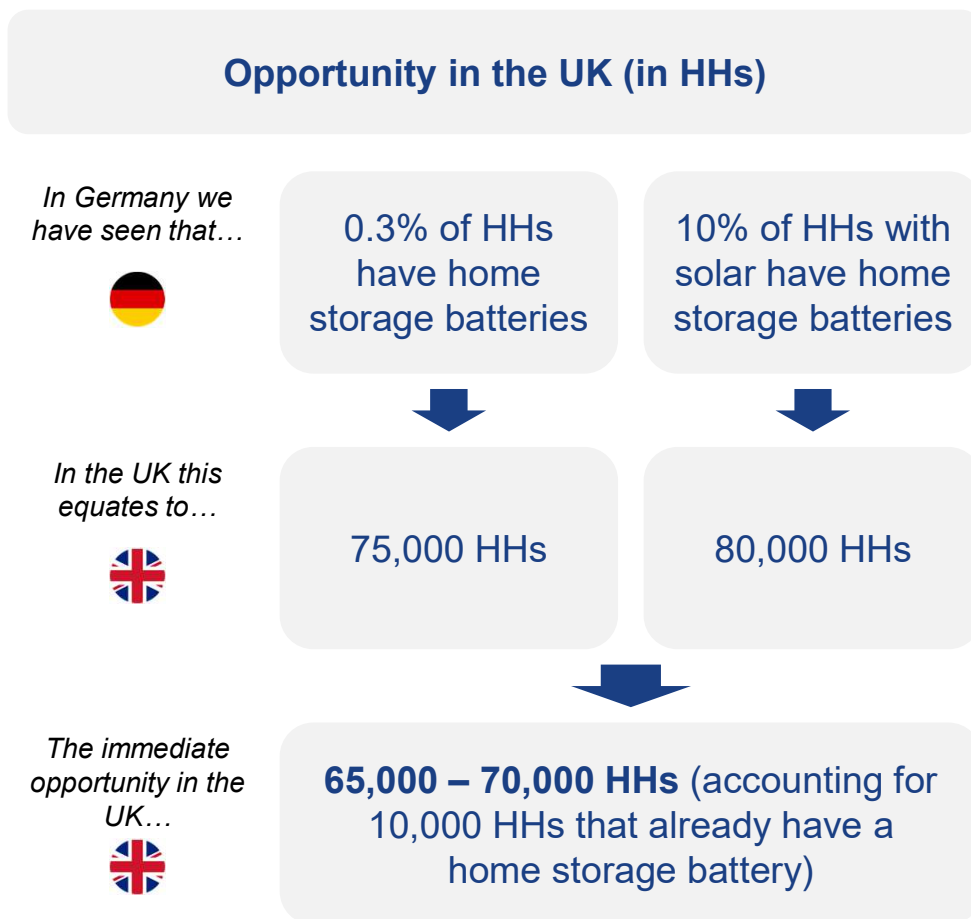
A battery's lifespan is 5-15 yrs. It is likely that it will have to be replaced at least once within the lifespan of a PV system (these last 25-30 yrs)



Faraday Institution has earmarked £40m for battery technology research. Gov commitment to EVs is also playing a role as lithium-ion batteries can be used in both EVs and at home

*Bloomberg New Energy Finance Survey conducted in 2017

Potential Opportunity: Modelling potential uptake in the UK on the basis of uptake in Germany, there could be as many as 70,000 HHs who could be keen buyers...



In the above projects don't account for any differences between the UK and Germany (eg government regulation, costs of installations, tariffs, competitive environment, propositions, weather conditions)

Summary: White Space can help you understand how you can enter and thrive in this market...

Market summary:

Investment in domestic energy storage is growing, and the opportunity is international

Both energy companies and non-energy companies have propositions in this market

Homeowners with solar panels are engaged with ways to improve their efficiency

The UK alone has ~70,000 households that could be very interested in a proposition now



Questions to consider:

What capabilities do you have to win customers in this market?

How much revenue and profit could be available for you?

Which customers should you target? What propositions would resonate best with them?

What are the key channels? Who are the key partners?



White Space has completed a number of engagements on the topic of home energy management, supporting clients with market entry and proposition development

Our energy clients include:

