

REVENUE OPTIMISATION: BEYOND THE MARKETING

A GUIDE TO BATTERY STORAGE ASSET OWNERS

IN ASSOCIATION WITH 

JULY 2020

Introduction

- **Storage Revenue Optimisation is complex and multi-faceted**

- Limited track record makes it difficult to compare offerings
- Simulation methodologies are not consistent across service providers

- **Asset owners require more transparency**

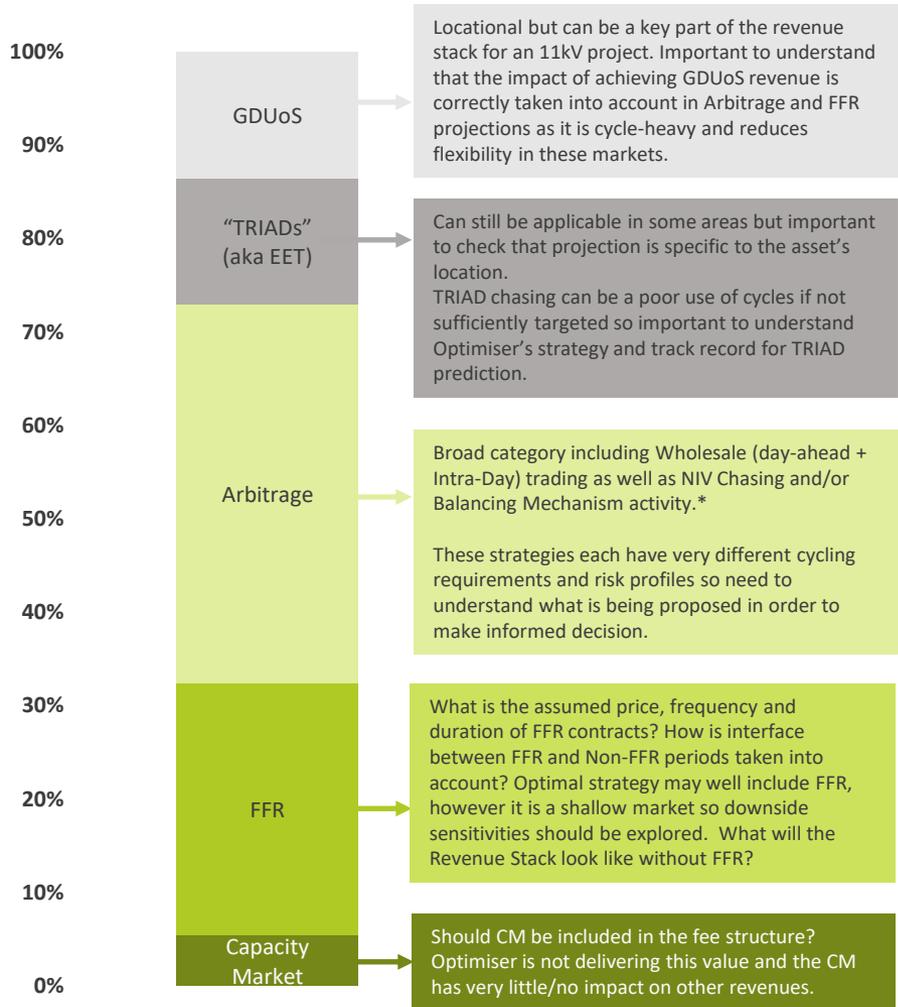
- More context and detail than a simple “£/MW/Yr” quote
- How should clients interpret short-term performance data?
- What are the key questions an asset owner should ask a Revenue Optimiser?

- Revenue Optimisation for flexible assets (specifically, battery storage) is a relatively new service
- Revenue Optimisers/Aggregators market themselves by quoting either short-term actual performance and/or simulated “back-cast” revenue projections
 - Usually expressed as a “£/MW/Yr” figure
- Revenue projections can be useful for asset owners to compare different service providers, however:
 - projections are usually not guaranteed in any meaningful way; and
 - a lack of transparency makes it hard to compare competing Revenue Optimisers on a “like-for-like” basis
- Actual performance should be a more useful comparison tool, however:
 - there is limited real track-record across a range of market conditions, and market fundamentals can move significantly over a short time;
 - the level of transparency varies by market (FFR/BM/Wholesale trading etc) so it can be hard to independently verify stated results; and
 - it is common for Revenue Optimisers to publish exceptional (i.e. unusually high) short-term performance results (e.g. one day) – this should not be interpreted as representing long-term performance
- This paper offers some context, outlining what asset owners should look for when comparing revenue projections, and how they should interpret short-term performance data

IT IS NECESSARY TO LOOK BEYOND THE HEADLINE £/MW/YR FIGURE TO UNDERSTAND THE RISKS OF A PROMOTED REVENUE STACK

- Each element of a revenue stack has specific risks and cycling requirements
- Vital to understand the strategy behind the stack. For example, an assumption of 8hrs/day FFR could be:
 - (i) overnight for 12 months; or
 - (ii) 24/7 for 4 months.

Which is it? FFR revenues would be different in either case, and both options would restrict availability of other revenues in different ways
- The cycling requirement is not consistent across strategies – **beware of high headline revenues with very high cycling** as this can significantly reduce project life, damaging the IRR
- Risk profile also varies by revenue stream:
 - Shallow markets (e.g. FFR) carry greater deliverability risk – important to quantify a “plan B” if asset fails to win contract(s)
 - Wholesale markets are deep, so less deliverability risk but lower spreads – in order to boost these revenues Optimisers often show “re-trading” or “churning” gains, but this requires consistent out-performance of the market so increases performance risk
 - Balancing Mechanism & NIV Chasing have more depth than FFR yet do not rely on consistent trader out-performance. However, still requires sophisticated optimisation software and management



SIMULATION METHODOLOGY CAN SIGNIFICANTLY IMPACT RESULTS

Optimisation Objective: Balance required between revenue and project life

- Important to clarify whether the optimisation prioritises gross revenue over revenue net of degradation cost
- If degradation cost not taken into account, there is a risk that the optimisation may chase spreads that give low (or negative) *net* profit = high gross revenues but low IRRs

Use of Foresight

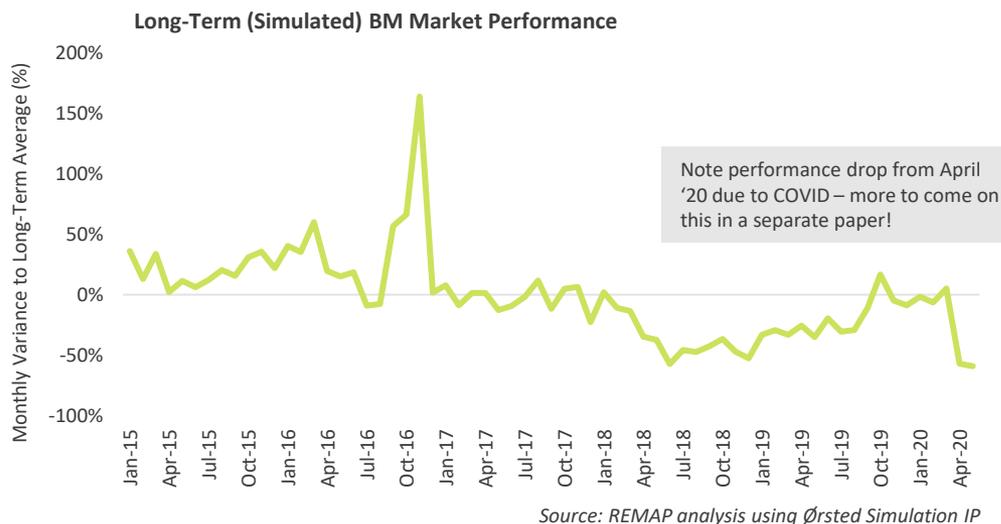
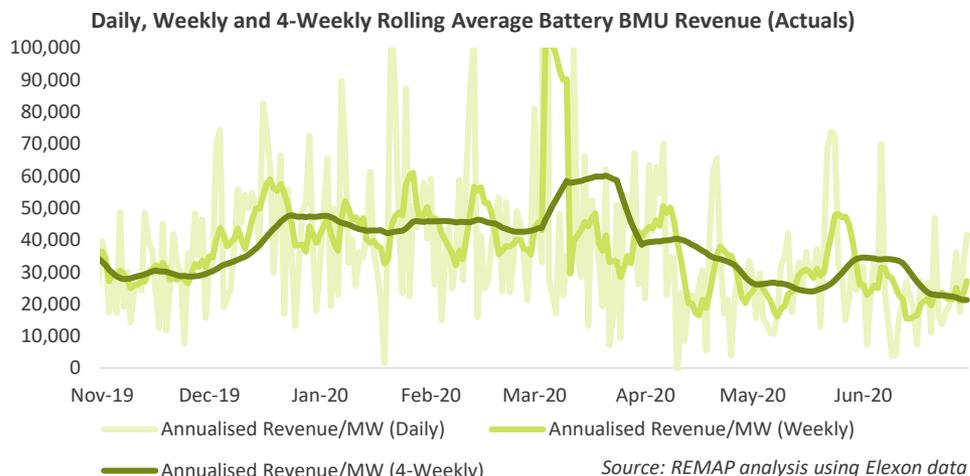
- Decisions around which market to target and how to allocate price and volume is crucial – decisions should be based on information available *at the time* and not include foresight

Liquidity & Market Share

- The day ahead Wholesale Market is highly liquid and transparent, however the intra-day market is far less liquid. Optimisers should be transparent about the split between these two markets and their approach to modelling market share in relation to intra-day volumes
- Frequency Response is a shallow market – transparency required around assumed number of contracts won, their duration and price
- For the Balancing Mechanism, simulations should have an assumption showing how often “in-merit” bids/offers are called by National Grid, and for how long – National Grid is currently* the only customer in this market, so their behaviour is a key variable
- NIV Chasing strategies should take into account the risk of the asset’s behaviour to “flip” a period from being short to long (or vice versa). This risk correlates to the size of the asset. The number of Settlement Periods with a NIV of less than 100 MWh in either direction is increasing, the number of NIV chasers also increases. Therefore the larger the asset, the bigger the risk

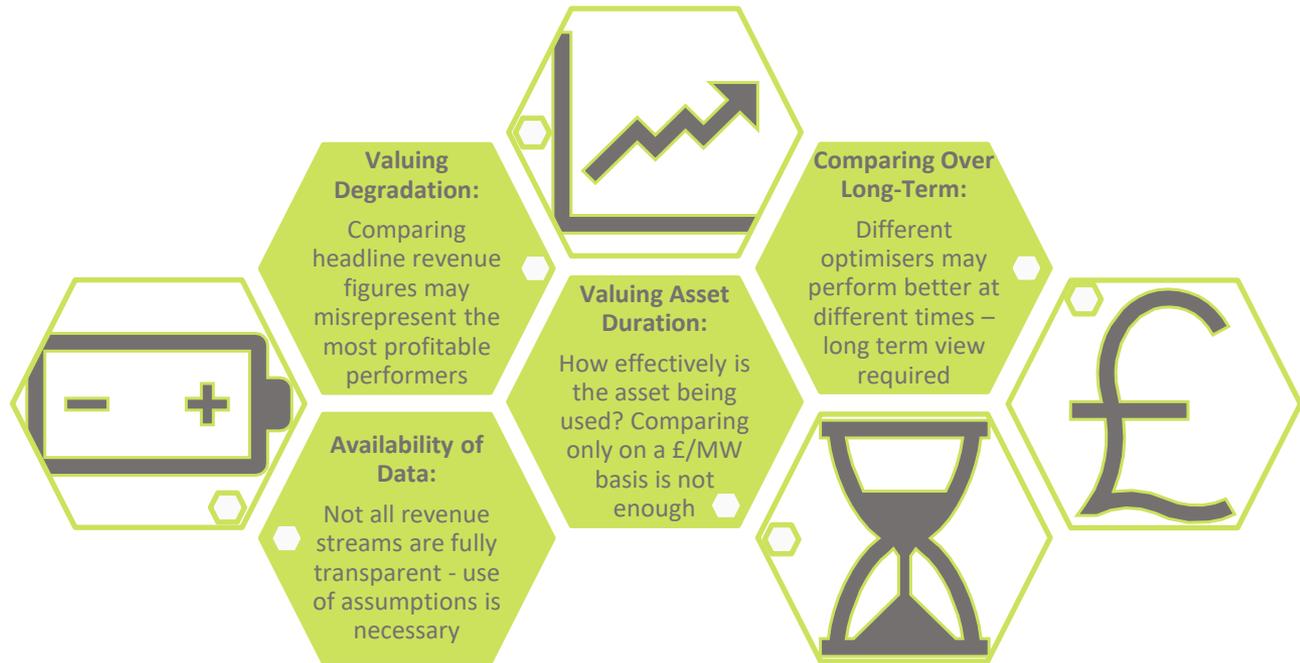
SHORT TERM PERFORMANCE IS NOT A RELIABLE INDICATOR OF LONG-TERM RESULTS

- It is common to see public bold statements from revenue optimisers about positive battery performance on a given day
- Daily performance can be extremely volatile
- Looking at a rolling average over 4-weeks significantly reduces this effect and provides a more robust indication of current performance
- When comparing back-cast simulations from competing Optimisers, it is vital to ensure each is using the same historical data-set
- Low short-term performance (over a period of months or even a year) does not necessarily invalidate a higher long term simulated revenue projection
- Simulations use long-term data-sets in order to provide an expectation of long-term average earnings
- The chart to the right shows the monthly variance to the long term average for simulated BM revenues – demonstrating the potential movement in market conditions over a five year period



BENCHMARKING AGAINST COMPETITORS CAN BE A USEFUL

- Benchmarking against competitors can be more effective than benchmarking against revenue projections
- Comparing over the long-term is still important as different optimisers will perform better/worse under different conditions
- Different assets may be prioritising different elements of performance (e.g. lower cycling to preserve asset life vs higher cycling to maximise cash flow)
- Benchmarking needs to take into account:
 - Battery duration (e.g. longer duration can get higher arbitrage revenues but not rewarded in FFR)
 - Cycle usage – how profitable is each cycle?
 - Missing data – not all revenues are transparent so need to make assumptions for a fair comparison



Consider analysing different strategies on a £/cycle basis

SUMMARY: KEY QUESTIONS FOR REVENUE OPTIMISERS

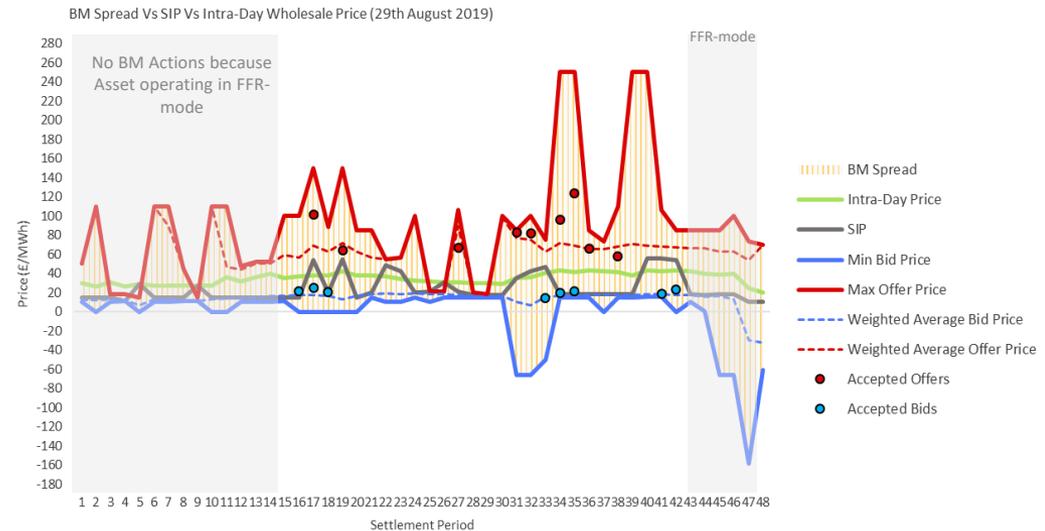
- 1) What is your forecast Revenue stack, what are the risks associated with each strategy. What is “plan B”?**
- 2) Do you take into account the degradation cost of cycling?**
- 3) What are your liquidity/market share assumptions?**
- 4) Does your simulation use perfect foresight?**
- 5) Data Set – which years are included in back-cast simulations?**
- 6) Will you disclose operational performance data, in what format and against what benchmark?**

REMAP's SERVICE OFFERING (in partnership with Ørsted)

Ørsted offers:

- experience and capability across all battery revenue strategies, with a focus on the Balancing Mechanism & FFR
- proven track record with 20 MW battery in Liverpool since May 2019
- a collaborative “managed account” approach, specifically tailored to each asset’s specifications and owner’s risk profile
- full transparency and accountability for simulation assumptions as well as performance data – answers to the key questions

- REMAP is mandated to promote optimisation services of Ørsted in GB
- REMAP uses Ørsted’s IP under licence and acts with a duty of care to the asset owner by providing (at no additional cost to the owner):
 - informed advice in relation to Ørsted’s service offering;
 - bespoke simulation results, giving asset owners transparency and the ability to flex assumptions behind revenue projections; and
 - benchmarking: REMAP’s performance monitoring compares:
 - Ørsted service performance versus the market and/or other individual assets (ensuring comparisons are on a like-for-like basis)
 - simulated vs actual performance under a variety of revenue strategies



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Please feel free to contact us to request further information or analysis in relation to development and/or optimisation of battery storage projects



20 MW battery storage project at Carnegie Rd, Liverpool. Owned and managed by Ørsted

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