Battery Energy Storage

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South Somerset District Council

SSDC OPIUM power

SSDC Opium Power – A Background

- Formed in 2018
- Develops and operates Grid Scale Battery Energy Storage Systems (BESS)
- BESS accelerate the UK's transition to a zero carbon electricity supply
- 88MW operational over 3 sites in joint venture with SSDC
- 7th largest operator in UK market of 1,600MW
- Solid investor returns in a dramatic growth sector

Our Sites

Taunton 28MW
2020

Fareham 40MW
2021

Fareham 2 20MW
2022

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BATTERY ENERGY STORAGE – A Background

The Problem:

- Power generation onto the Grid is shifting from a few large easily controlled Power Stations to many thousands of small distributed renewable generators.
- Up to 50% of UK power is already supplied by unpredictable renewable energy generators – Solar and Wind.

BATTERY ENERGY STORAGE – A Background

The Solution:

- BESS enable this unpredictable renewable energy to become part of the core component of the UK's energy generation by providing two main functions:
  - Stabilising Grid Frequency at the required 50Hz by providing instant reaction charging and discharging services.
  - Storing excess power generation during low demand periods, and then providing that power to the grid during high demand periods

- Particularly important in UK as we have a minimal ability to rely on power from overseas. We are an isolated island with high energy demand.

INCOME OPPORTUNITIES

Our Optimiser (basically an “Energy Broker”) sells power and storage services from the battery sites to the National Grid and to EPEX (European Power Exchange).

Frequency Stabilisation:

- The National Grid pays Battery operators to be on standby to provide short bursts of power into the grid, and to take short bursts of power out of the grid at 0.2 second’s notice. This constantly balances power generation with power demand to maintain AC frequency at 50Hz.
- Payment for this service is calculated on a per Hour per MW basis.

Wholesale Trading:

- Optimiser buys at low demand periods, stores it and sells for profit at high demand periods.

Balance Mechanism Trading:

- In periods of excess wind generation, to prevent damage to the Grid wind turbines are ordered to turn off. But they are still paid under guaranteed contracts.
- Batteries are paid to take this excess wind power, store it, and provide it back to the grid later.

Capacity Market:

- Contractual income for providing emergency energy reserve to the Grid

What is this joint venture investment ?

- Battery Energy Storage Systems (BESS) – renewable energy sold to the national grid
- Investment Lifespan – 25 years
- 3 companies – SSDCOPL – FERL – FERL2
- 3 BESS sites – Fideoak Taunton & Fareham and Fareham 2.
- 100% Council funded (turn-key investments)

Investment and income to November 2022

Site	BESS	Loan provided £m	Investment Approved	Site Energised	First Income delivered	Income to date £m
Taunton	28MW	13.157	2018 & 2019	November 2019	November 2019	6.502
Fareham	40MW	18.69	May 2020	March 2022	March 2022	3.522
Fareham 2	20MW	10.319	February 2021	July 2022	August 2022	0.092
Total	**88MW**	**42.165**				**10.116**

LOAN REPAYMENTS

Site	BESS	Reapayments to October 2022 £m	Origional Loan £m	Estimated Balance
Taunton	28MW	4.868	13.157	9.886
Fareham	40MW	1.305	18.691	18.019
Fareham 2	20MW	Due to Commence	10.319	
Note - Fareham Repayments commenced April 2022				

What is a mega-watt hour?

Provides enough energy to:-

- Power an electric car for 3,600 miles
- Power 2 light bulbs for a year
- Power 2000 homes for an hour
- Toast 89,000 slices of bread
- Run two fridges for a year

How much fossil fuel (or other fuel) makes a mega-watt hour

- 960 pounds of coal
- 760 cubic feet of gas
- 30 minutes of wind turbine rotation
- 1/10th of an ounce of uranium

How were these investments approved/assessed by the Council?

- All approved by the Council's former Investment Asset Group (IAG)
- Part of an overall £150m Council Commercial Investment programme
- 2 of the investments (FER1 and FERL2) were approved under an exclusivity agreement
- All IAG approvals were supported by a business case/Cashflow model/Share and loan agreements

How are the investments structured ?

- SSDCOPL - a 50:50 equity split - SSDC has the casting vote
- FERL – a 65:35 profit split
- FERL2 – a 70:30 profit split

How does the Council make a return from these investments ?

- From interest earned on loan repayments (loan rate differential)
- From dividend payments declared on net profit after taxation
- NOTE – no dividends are included in Council Budget as yet

Fareham

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Battery storage summary

- SSDC has made a significant investment of £42.2m in SSDC Opium Power Ltd, lending at commercial rates of interest so that new Battery Energy Storage Sites can be built
- The council is receiving interest income on the loans and will receive a share of the profits
- Whilst the companies have not yet declared a dividend, this is because they are turn-key investments requiring construction before income can be generated
- Battery Energy Storage supports the ambition of the Environment Strategy and keeps the council at the cutting edge of renewable energy storage. The process enables renewable energy generation and usage to be maximised, further reducing carbon emissions on the electricity network

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