Changing Perceptions in the Energy Storage Market

- The wider market is only beginning to understand power vs energy from a use case perspective.

- Incumbent technologies (Lead, Lithium) are power-centric. Lots of power for a short period of time.
- Flow machines are energy-centric. Provide power over a sustained period in line with your use case.
Changing Perceptions in the Energy Storage Market

**Battery**
- 10-20% Utilisation
  - Single service
  - Occasional Managed Usage
  - Power Focussed

**Ideal for:**
Frequency Response Tenders – Good return in short run, but not sustainable long term

**Machine**
- 60-100% Utilisation
  - Multiple, Stacked Services
  - Daily, Heavy Usage
  - Energy-Focussed

**Ideal for:**
Multiple, stacked services – Financeable, Infrastructure Asset with good long term returns
Sales Strategy & Targets

Segment 1: UK Grid-Connected
- Behind-The-Meter Commercial, Industrial & Agricultural
- Grid-Scale projects at network level
- Stacking multiple grid services, renewable firming & energy trading
- 7-10 Year Payback

Segment 2: Off-Grid Diesel Optimisation & Microgrid
- Sub-Saharan Africa/Islands
- Developers, EPCs, C&I, Mining
- Energy Security & Project Opex Reduction
- 3-5 Year Payback

Segment 3: Australia Grid-Connected (Market Entry in Short Term)
- Behind-The-Meter Commercial, Industrial & Agricultural
- Grid-Scale projects at network level
- Stacking multiple grid services, renewable firming & energy trading
- 5-10 Year Payback
# Commercial Update

| Production & Deployment | University of Strathclyde  
|                         | Thaba Eco Lodge  
|                         | Jabil Inala  
|                         | The Olde House  
|                         | RNLI  
|                         | UK Agri-business  
|                         | Chester University  
| 15 x Tank Unit Modules |

| 2017 Orders             | 6 x Tank Unit Modules |

| Final Stage Customer Selection for 2018 delivery | €15.9m - 265 x Tank Unit Modules |

| Active Customer Pipeline | ~€314m |

- redT 15-75 being loaded for shipping
- redT 60-300 assembly
Customer Case Study: UK Agri-Business

Agriculture Business
South-West England

250kWp of Solar Panels
(Grid Connected)

60kW, 300kWh
redT energy storage

Key Project Financials

7-10 Years
Project Payback

10-17%
Internal Rate of Return
(Unlevered)

54MWh/Year
Additional PV Generation Utilised

Available Services
- Enhanced Frequency Response
- Dynamic Frequency Response
- Capacity Market
- Demand Turn-Up
- STOR
- Energy Trading
- Solar Firming / Self Consumption
- Back-Up/Reserve
- TRIAD Avoidance
- Peak Shaving
- Hedge Energy Prices (> 20 Years)
- Energy Security
- Additional Future Upside due to Policy and Regulation Changes

Customer Chosen Services
- Dynamic Frequency Response
- Capacity Market
- STOR
- Energy Trading
- Solar Firming / Self Consumption
- TRIAD Avoidance
- Price Arbitrage
- Hedge Energy Prices (> 20 Years)
- Energy Security
- Additional Future Upside due to Policy and Regulation Changes
Grid Services – System Balancing & Wholesale Markets

- To take advantage of these multiple and long peak pricing events, a long duration energy storage machine is essential where batteries won’t be able to service long intervals.

**System Balancing Prices: 8th November 2016**

- 3 hour peak event: £1,520/MWh

**System Balancing Prices: 9th November 2016**

- 2 hour peak event: £945/MWh
Customer Case Study: The Olde House, Cornwall

- Cornwall’s largest energy storage project
- Key redT customer demonstration site
- Currently being implemented

Customer Use Case:
- Time-shift excess energy to avoid up to 50% of peak energy charges
- Provide flexibility to the local grid and earn additional revenue from grid services
- Participate in future local energy market trading initiatives
- Stack multiple savings and revenue streams for best economic returns

Project Partners:
- centrica
- The Olde House
- redT energy storage
Sustainable Equity Value

**Prove**
- Stack Technology proven
- System prototype
- Manufacturing Agreement
- Manufactured product
- Gen 1 design

**Scale**
- Market Seeding programme complete
- Gen 2 system delivered
- Gen 2 sales

**Sustain**
- Functional performing team
- Firm Gen 3 Price
- Orderbook across defined products
- Credibility Case-studies Ambassadors
- Differentiating IP (leading tech), product, service. USP

3p £7m Q1 15
redT Organisation Growth

Targeted recruitment for:

**Engineering**: Ongoing recruitment for Gen3 & 4 projects

**R&D**: Drive further depth & breadth in our R&D capability

**Commercial**: A further team growth expected by Q4 across our target customer geographies & applications

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**CEO + support**
- Q4 16: 2
- Q2 17: 2
- Q4 17: +70%

**Engineering**
- Mechanical, Electrical, Software, Quality
- Q4 16: 6
- Q2 17: 11
- Q4 17: 16

**R&D**
- Chemical, Electronic, Software
- Q4 16: 7
- Q2 17: 10
- Q4 17: 8

**Commercial**
- Sales, Marketing, Product, Customer Support, Install, Software & Applications
- Q4 16: 8
- Q2 17: 16
- Q4 17: 4

**Operations**
- IT, HR, Facilities, Supply Chain, Logistics, Planning
- Q4 16: 3
- Q2 17: 8
- Q4 17: 4

**Finance**
- Accounting, Reporting, Payables, Investors
- Q4 16: 4
- Q2 17: 4
- Q4 17: 4

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+70% increased bandwidth across the business with key manager hires made in each function to accelerate delivery and establish operational structures.
redT – Business Outlook

• Focussed on implementation and deployment of key customer sites (Olde House, RNLI etc.)

• Final stage of redT team build-out

• Gen 2 sales key segments & product differentiation

• Building orderbook for 2018

• Gen 3 stack and electrolyte cost down
Appendix
The Energy Storage Market

- **Power**
  - 1GW
  - 10-100MW
  - 5-10MW
  - 1-5MW
  - 500-1000kW
  - 100-500kW
  - 50-100kW
  - 10-50kW
  - 1-10kW
  - <1kW

- **Application Duration**
  - <1 minute
  - <1 hour
  - 1-4 hours
  - 4-8 hours
  - 8-12 hours
  - >12 hours
  - Days

- **Lithium-ion**
  - Ancillary Support
    - FFR
    - EFR
    - Black-Start

- **Grid Services**
  - Transmission Reinforcement
  - Arbitrage
  - T&D Investment Deferal
  - Operating Reserve

- **Grid-Scale Storage**
  - Pumped Hydro/Compressed Air

- **Lead Acid**
  - UPS
    - Power Quality
    - Back-Up

- **Commercial RE**
  - Peak Shaving
  - Timeshifting/Firm Solar
  - Diesel Displacement
  - Energy Security

- **Domestic**
  - Energy Security
  - Timeshifting/Firm Solar
Hybrid Energy Storage System – Daily Output

- Use flow machines plus PV for 80% of demand
  - Does not degrade so well suited to daily, heavy cycling
- Use power-focused technology to cover short term spikes in demand
  - Power focussed tech, more suitable for occasional usage
- Resulting Hybrid system capable of serving entire market
Hybrid Energy Storage System – Annual Output

Output

15% Diesel Genset or Lithium-ion (Power-Focussed)

25% Renewables (Solar/Wind) + Flow Machine

60% Flow Machine (Energy-Focussed)

Annual Demand Profile

Time
redT 15-75 Machine being prepared for shipping to Johannesburg, South Africa

Internal view of redT 15-75 machine performing a charge/discharge cycle
redT machines being prepared for shipping at manufacturing site