Investor Open Day 2017
The Olde House, Cornwall, 25 October 2017
Scott McGregor, Chief Executive Officer
redT energy storage machines

- Develops and Manufactures Liquid Energy Storage Machines for Commercial & Industrial Applications
- UK-Based, Public Company (red:L), Office locations in UK, EU and Africa
- 17 years of development, now proven technology in the field
- > 4MWh machines across UK, EU, Australia & Africa
- Lowest Cost (<$500/kWh) Vanadium Energy Storage Machines available globally.

Jabil Circuit inc. has approx. x7 the global manufacturing floorspace of Tesla’s Gigafactory
redT Energy Storage Machine

IP54 Container

5kW Stack

75kWh Tank Set

15kW, 75kWh Module
Changing Perceptions in the Energy Storage Market

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

High Power

- 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

High Energy

Short Duration

Long Duration
It’s a Machine! Not a B*****!

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

Ideal for:
Multiple, stacked services – Financeable, Infrastructure Asset with good long term returns
The Energy Storage Market

Power

- Lithium-ion
  - 1GW
  - 10-100MW
    - Ancillary Support
      - FFR
      - EFR
      - Black-Start
  - Grid Services
    - Transmission Reinforcement
    - Arbitrage
    - T&D Investment Deferral
    - Operating Reserve
  - Grid-Scale Storage
    - Pumped Hydro/Compressed Air

- Lead Acid
  - 100-500kw
  - UPS
    - Power Quality
    - Back-Up
  - Commercial RE
    - Peak Shaving
    - Timeshifting/Firm Solar
    - Diesel Displacement
    - Energy Security
  - Domestic
    - Energy Security
    - Timeshifting/Firm Solar

Application Duration
- <1 minute
- <1 hour
- 1-4 hours
- 4-8 hours
- 8-12 hours
- >12 hours
- Days
Non-Degrading Energy Storage

• Technology does not degrade like conventional lithium or lead-acid batteries

• Machine can be cycled heavily every day without significant capacity fade

• As such, redT machines operate for >25 years – matching the life of your project

• This gives market-leading LCOS results for energy infrastructure
Grid Connected Renewables: C&I Base Case

- **UK C&I Min. 100kW Peak Demand**
- **Min. 150kWp Solar Grid-Connected**
- **60kW, 300kWh Machine**

1. **Increase Self Consumption**
   - Increase own utilisation of generation. Save money by reducing amount of energy imported from grid.

2. **Re-negotiate Utility Contracts**
   - Avoid importing energy at peak times allows customer to renegotiate energy supply agreement

3. **Contracted Grid Services (Fixed)**
   - Provide contracted services to the local grid on a fixed, contractual basis – receive utilisation and availability payments

4. **Merchant Trading (Variable)**
   - Perform arbitrage and energy trading activities using an energy storage asset for high returns

5. **Additional (not-quantified)**
   - Hedge future power prices, Energy security, Energy Independence, additional policy upside

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**Key Project Financials**

- **7-10 Years** Project Payback
- **10-17%** Internal Rate of Return (Unlevered)
- **54MWh/Year** Additional PV Generation Utilised
Demand for redT in the market

There is strong market demand now......

**Grid Connected C&I – Renewables + Storage – >10% IRR**
Certain geographies now economic; UK, Australia, Germany, USA ...Time-shifting for self consumption, contracted services and merchant revenues

**Off-Grid & Weak Grid – ~30% IRR , 3-5 year payback**
Diesel energy production cost $0.50 to $1 per kWh. Solar desired in off-grid, doesn’t work without industrial heavy cycling storage, solar + flow machine cost $0.20-0.30 per kWh (figures indicative of South African market)

**Renewables + Storage Grid Projects – Private wire PPA**
Decentralised, large scale renewables projects (Solar, Wind, Tidal etc.) supported by large scale, flexible energy storage platform asset.

**Large Scale Grid Projects – Trading and Grid balancing**
For long duration grid services at national / regional level (>3hours) as base case, then can perform all grid services at no incremental cost, including energy trading. Policy to price services (not subsidies). Works now in Germany & USA, UK viable in near-term

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**Market Size**

- **$65-103bn**
- **>$27bn**
- **$32-50bn**
  (US Market only)
Sustainable Equity Value

**Prove**
- Stack Technology proven
- System prototype
- Manufacturing Agreement
- Manufactured product
- Gen 1 design
- Market Seeding programme complete

**Scale**
- Gen 2 system delivered
- Gen 2 sales

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

3p £7m Q1 15
redT Revenue Business Model

Product Capex
- Value based pricing margin

20+ Year Annuity Stream
- Operation
  - Warranty
  - Service & Maintenance
- Value Added Services
  - Energy Trading
  - Grid Services Revenues
  - Management & Analytics

Financing
- Electrolyte Rental
- Leasing
Recent Achievements

• 14 Unit Order from Botswana based customer
• 1st Vanadium-Lithium Hybrid 1MWh System sold into Australian Market
• Expansion into new markets through strategic distribution partners 12 Units and 300 unit pipeline – engaging competitor’s pipelines
• Multiple unit orders within the UK and EU
• Team Expansion +97% y-o-y inc. Senior Hires from key competitors
• Diversified manufacturing – small and large volume production
• Launched Centrica – Cornwall 1MWh flagship project
## Commercial Update

<table>
<thead>
<tr>
<th></th>
<th>September 2017</th>
<th>April 2017</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production &amp; Deployment</strong></td>
<td>16 Units</td>
<td>9 Units</td>
<td>+78%</td>
</tr>
<tr>
<td><strong>Orders</strong></td>
<td>16 Units (+ 12 Distributor Committed)</td>
<td>5 Units</td>
<td>+220% (+ 12 units committed)</td>
</tr>
<tr>
<td><strong>Final Stage Customer Selection for 2018 delivery</strong></td>
<td>~€16.5m (205 Units)</td>
<td>~€6.5m (101 Units)</td>
<td>+154%</td>
</tr>
<tr>
<td><strong>Active Customer Pipeline</strong></td>
<td>~€323m</td>
<td>~€246m</td>
<td>+32%</td>
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The Olde House – 1MWh Project
Case Study: The Olde House, Cornwall

1822% Increase in Utilisation of On-Site Generation

34% Reduction in Total Imported Electricity

10% Internal Rate of Return (IRR) (Unlevered)

Site Details

- 600 Acre Farm & Holiday Retreat, Cornwall, UK
  - Peak Demand: 130kW, Average Demand: 30kW

- 350kWp Solar Panels (Grid-Connected)

- 90kW, 1,080kWh redT energy storage system

![Graph showing energy generation and savings over years]

- Revenue/Savings (£)
  - Year 1: £5,000-10,000
  - Year 3: £20,000-30,000
  - Year 5: £20,000-30,000
  - Year 10: £30,000-50,000

- colours represent:
  - Red: Export to Grid
  - Orange: Import from Grid
  - Yellow: Discharging Storage
  - Pink: Charging Storage from PV

- Site Demand not met by PV

![Diagram showing energy generation and storage over time]

- Off-Peak Pricing Period
- Peak Pricing Period
Expansion into New Markets

- Active redT market
- Access via Partner
- Launching soon
- Response market
redT – Business Outlook

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

- Final stage of **redT team build-out**

- Key segments & **product differentiation**

- **Building orderbook for 2018**

- **Gen 3 development, cost and specifications**
Appendix
Liquid Energy Storage

- Conventional batteries have fixed power and energy locked together in the cell – redT energy storage machines are modular and decouple power from energy – sized to your exact needs.

- Our energy storage machines use liquid electrolyte contained in tanks outside the stack and pumped through it – like a car engine and fuel tank – albeit, with fuel that does not degrade or run out.

- Long duration storage, with 100% depth of discharge functionality that doesn’t deteriorate over time.

VIDEO: How redT’s Technology Works
## Flow vs Conventional

### redT Energy Storage Machine

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Industrial-Scale, Medium &amp; Long Duration</td>
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<tr>
<td>Stationary Energy Storage Applications</td>
<td></td>
</tr>
<tr>
<td>Up to 25 year life – Low Levelised Cost of Storage (LCOS)</td>
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<tr>
<td>100% Depth of Discharge without Degradation</td>
<td></td>
</tr>
<tr>
<td>Safe – No Risk of Thermal Runaway</td>
<td></td>
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<tr>
<td>Charge is retained indefinitely with negligible self-discharge over time</td>
<td></td>
</tr>
<tr>
<td>Electrolyte is 100% reusable and can be reused over and over again</td>
<td></td>
</tr>
<tr>
<td>Power and Energy requirements can be sized independently for best fit</td>
<td></td>
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<tr>
<td>Optimal Performance with daily usage, coupled with renewables</td>
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### Conventional Batteries (e.g. Lithium, Saltwater, Lead)

<table>
<thead>
<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Short Duration, Residential &amp; Small Scale Applications</td>
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<tr>
<td>Deteriorates with every cycle, need to replace after ≈5,000 cycles @ 50% discharge</td>
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<tr>
<td>Discharge beyond 30-50% causes damage, requiring systems to be oversized</td>
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<tr>
<td>Risk of Thermal runaway, requiring safety systems to be installed</td>
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<tr>
<td>Fully Charged systems will self-discharge over time</td>
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<tr>
<td>Lithium-Ion systems are not widely recycled &amp; must be disposed of safely</td>
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<tr>
<td>Power and Energy Components cannot be separated</td>
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<tr>
<td>Most effective for occasional use and back-up functions</td>
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High System Utilisation

- Different technologies are better suited for providing certain services
  - **Lead Acid** – Short term
  - **Lithium ion** – Short/Medium term
  - **Flow Machine** – Long Term + Additional Short and medium term services
Hybrid Energy Storage

Flow machines address the weaknesses of conventional battery technology

- **Flow machines - energy**
  - 80% of demand/supply - Does not degrade - suited to daily, heavy cycling 20-30 years

- **Lithium - power**
  - Short term spikes, occasional careful usage will protect

- **Solar generation - daytime**

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Daily Demand Profile

- Load met by PV + Flow Machine
- Load met by Flow Machine only
- Load met by Diesel Genset/Lithium

Image credit: RedT Energy Storage
H1 2017 Financial Highlights

Financial results for the group in H1 2017 were in line with overall management expectations

- **€13.2m** in available cash (FY 2016: €2.8m)
- Loans and borrowings **€Nil** (FY 2016: €Nil)
- Revenue for the period **€4.5m** (H1 2016: €4.5m) (incorporating Camco activity)
- EBITDA loss for the period **€3.2m** (H1 2016: loss €2.2m)

- **redT business** – reflective of the strategic investment and continued growth of the business

- **Camco business** – comprising the legacy business operations of Africa, US and Carbon – continues producing positive contributions to the Group
redT 15-240 units being tested at PNDC facility, Scotland

redT 5-40 units at customer project in Johannesburg, South Africa
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 15-75 on site in South Africa

Siting and commissioning of redT machine