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RedFlow Limited

Company Overview

December 14, 2010



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Company Highlights

1. Energy storage is a new and exciting growth sector in the rapidly modernising electricity industry.
2. RedFlow has world leading and proprietary battery technology.
3. Strong engineering team, and ongoing investment to maintain product leadership.
4. Currently generating sales and growing the forward order book with major Australian and international customers.
5. Our international partners recognise that RedFlow is a world leader.
6. Structured plan for growth in revenue and profitability.
7. Market cap at issue price \$68.5 million (undiluted).



RedFlow's key business relationships

Ergon Energy Corporation

Leading regional electricity distributor in Australia
RedFlow's foundation ZBM battery customer.

Jabil Circuit, Inc

A Tier One global electronics manufacturing service provider
RedFlow's selected partner for large scale ZBM and electronics manufacture, and as a systems integrator of ZBMs into wireless telecommunications original equipment manufacturers.

Powerco Limited

Second largest electricity distributor in New Zealand
RedFlow's first export customer and exclusive distributor for NZ

University of Queensland

UQ will host the RedFlow 200 – the MW class energy storage prototype
In conjunction with the UQ 1.2 MW rooftop solar PV array, the largest in Australia.

Singapore Technologies Engineering Ltd

Leading engineering and defence contractor in Asia
Will team with RedFlow on specific opportunities from 2011 within the Asian region.

Stored Energy Solutions

RedFlow's selected partner to act as exclusive distributor in UK and France from 2011.

Lend Lease Solar

RedFlow's partner of choice for solar PV projects where energy storage can be integrated in Australia.

Energy storage – a growth market

RedFlow is targeting two selected key markets:

1. Grid-connected:

- Load shifting to manage peak demand in local electricity distribution networks

2. Non-grid connected:

- Rural power supplies; and
- The telco industry - non-grid connected cellphone towers

Market Assessment on the Grid Energy Storage Market in US

- ✓ Over the next decade, challenges driven by electricity demand, renewables adoption, and infrastructure age will pave the way for a large market opportunity for energy storage within the U.S.
- ✓ Increasingly, American regulators and leading utilities view energy storage as a critical component to creating a more modern, efficient, and sustainable electricity grid.

(extract from LUX Research Report for RedFlow Prospectus)

Grid-connected opportunities

- ✓ Electricity utilities worldwide are recognising that modern, cost effective energy storage is a key element of modernising power grids and reducing costs.

 - ✓ Key drivers are:
 1. Never ending capital investment in networks to meet short-lived peak power demands, better addressed with energy storage;
 2. The roll-out of Smart Grids; and
 3. Two simultaneous megatrends:
 - The falling cost of solar PV panels; and
 - Growing greenhouse gas concerns
- = Major global uptake of residential solar PV into aging networks which were never designed to handle two way power flows.



“Smart Home” opportunities – an example...

Energy Australia is the largest electricity utility in Australia



The screenshot shows the EnergyAustralia website interface. At the top, there is a navigation bar with categories: Residential, Business, Network supply & services, Environment & community, Safety, Education, Careers, and About us. A search bar is located on the right. Below the navigation, a large banner features a family (Michael, Clare, and Ava) with the text 'smart home FAMILY BLOG' and 'Meet Michael, Clare and Ava. Australia's first Smart Home Family.' A 'Find out more' button is present. To the right of the banner is a 'Quick links' section with options: 'Connect for the first time', 'Change your details', 'Pay your bill', and 'Contact EnergyAustralia'. Below the banner, there are two columns of content. The left column is titled 'Environment & community' and lists links for 'Street lighting', 'Combating graffiti', 'Smart Home', and 'Green energy'. The right column is titled 'Understand your energy usage' and contains the text: 'Find out how much energy you are using and what actions are most effective in reducing your bill by using our energy calculators...' with a 'Find out more' button.

The linchpin in the Smart Home's electricity supply system

The Australian-designed Redflow battery storage unit stores excess energy generated from the solar panels and fuel cell during the day to be used later at night when a family's energy usage is usually at its peak. The Smart Home has a 5kW inverter and a 10kWh bank of lead-acid batteries. In the future it will have a new 10kWh zinc bromine flow battery.



Megawatt class electricity storage market

- Megawatt class to be addressed by the RedFlow 200
 - RedFlow's largest development project in 2010/11
- Targeted for:
 - Electricity utilities, and
 - Renewable energy smoothing
- 200 kW and 400 kWh (48 RedFlow ZBMs).
- Innovative electrical architecture, using RedFlow proprietary DC-DC converters
- Prototype to be demonstrated from early 2011
 - In conjunction with Australia's largest rooftop solar PV array (at UQ)
 - Prototype in two phases, from Jan 2011 and then May 2011
- Likely wholesale price ~ \$600,000 per unit



Off-grid telecommunication opportunities

- ✓ Telco market – mobile phone towers (non-grid connected)
- ✓ Power supply packages for mobile phone towers (small diesel genset, plus batteries, +- solar PV).
 - Required battery size matches RedFlow ZBM.
 - Alternative lead-acid battery solution is expensive, short-life and heavy
- ✓ Large global roll-out programs with market estimates:
 - 75,000 new off-grid telco sites each year in developing countries.
 - Over 500,000 off-grid sites in total by 2012 globally.

RedFlow developing two routes to the telco market:

- a) At OEM level – through a proposed Value Added Reseller agreement with Jabil Circuit, Inc.
- b) At installer level – direct sales with experienced sales team



Remote area power source (RAPS) opportunity

- ✓ RedFlow developed this product with Powerco, the second largest NZ electricity distributor.
- ✓ It comprises:
 - Packaged battery storage (lead-acid initially), control and communications;
 - High quality diesel genset; and
 - Integration with PV panels supplied by Powerco
- ✓ Replaces non-economic lines in rural locations
 - These lines typically can require maintenance that is disproportionate to the revenue they generate

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RedFlow products

- ✓ Our market is for packaged energy storage systems, not “naked” batteries.
- ✓ Our ZBM's are the basis of turnkey system solutions for our customers.
- ✓ RedFlow has:
 - a) Deep engineering skills to produce packaged systems
 - b) Hard-won experience from actually installing, and maintaining systems within utility networks

What comprises an energy storage system?

- a) ZBM batteries with chargers;
- b) Power electronics (to make AC or controlled DC);
- c) Control and communications (either 3G cellphone or satellite);
- d) Lockable, utility-grade steel enclosures; and
- e) Grid connected certification (AS 4777)



Core technology - zinc-bromine flow battery module (ZBM)

- The building block for RedFlow's products – our core technology
- Ideally suited to meet the needs of our target markets:
 - ✓ 2 – 24 hour discharge & 3 – 8 hour recharge - ideal for managing peak demand requirements.
 - ✓ Designed for 100% depth of discharge
 - ✓ Minimal performance deterioration over time – electrolyte does not wear out and is fully reusable
 - ✓ Safe and environmentally friendly product – no toxic heavy metals, recyclable, ambient operating temperature
 - ✓ Low weight, small footprint product – ideal for local residential electricity distribution networks

Key characteristics of RedFlow ZBM

- Weight of only 220 kg – high energy density.
- Primarily built from plastic and other freely available, low-cost materials.
- IP protected with patent applications & knowhow.
- Designed to be modular – 5 kW, 10 kWh units building blocks

Comparable electrical performance in daily cycling application

RedFlow ZBM

High quality industrial lead acid batteries



220 kg

1,200 kg

Different market niches suit different technologies

1. No one battery type is universally superior across applications

2. Non battery space:

- Pumped hydro
 - Highly efficient, typically very large scale and capital cost
 - Only possible in right topography and climate, needs proximity to high voltage transmission lines
- Mechanical flywheel
 - Well suited to deliver bursts of power for short duration (UPS)

3. Rechargeable battery space:

- RedFlow ZBM**
 - **Designed for daily deep cycling (ideal 'load shifter for peak demand and solar supply)**
 - **Cost and performance are attractive for utility deployment**

- Lead-acid
 - Used in cars for engine starting.
 - Heavy and not cost-effective for energy storage, shortened life when used for heavy deep cycling

- Lithium-ion
 - Light weight and high power, suit lap top computers and for electric vehicles, high cost.
 - Utility usage limited to frequency stabilisation requiring discharge times of seconds or minutes

- Vanadium
 - Large and quite heavy compared to RedFlow's power storage systems.

- Sodium sulphur
 - Commercially available in MW class only
 - Operate at high temperature (~300°C)

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Regarded as class leading technology

Extracts from Independent Technical Report (from the November 2010 RedFlow Prospectus)

..... *RedFlow has developed a very innovative and functional zinc bromine flow battery*

..... *Results to date in their sales and field experiences give solid credibility to RedFlow's approach*

..... *In my opinion, RedFlow is in an extremely strong position for the emerging energy storage market.*

Authored by Garth P. Corey, recently retired as a Principal Member of the Technical Staff, Sandia National Laboratories (USA)

Why has RedFlow succeeded?

- ✓ Core challenge is around cost effectively managing the electrolyte flow into and through the cell, with both plumbing and cell design.
- ✓ Started with a small manageable turn-key unit as the building block and then insuring that all functionality was managed at this level.
- ✓ Importantly, RedFlow's ZBM is capable of mass production.
- ✓ Designed to meet a particular market need (daily cycling).



Sales growth strategy

1. Direct industrial selling

- Utility & large corporates
- Global sales & telcos
- Stand alone power systems

2. With channel partners

- Powerco (customer & distributor)
- Jabil Circuit, Inc (planned value added reseller)
- Singapore Technologies
- Stored Energy Solutions

New Zealand utility and large corporates

Telco Original Equipment Manufacturers

Non-exclusive teaming agreement into Asia

France and UK distributor

Electricity distribution utilities

- ✓ Large addressable market, slow to adopt new technology.
- ✓ Product demand for trial and demonstrations are more than satisfactory for RedFlow .

Telco industry (off-grid cellphone towers)

- ✓ Signs are that the global telco sector will be quicker adopters of flow batteries.
- ✓ RedFlow developing distribution channels.

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Momentum building

✓ Ergon Energy installations of thirty trial units nearly completed.

✓ In past 12 months, we have added:

- Powerco (NZ);
- Energy Australia (Sydney);
- Discussions with several utilities; and
- Ongoing RAPS installations (Australia)

✓ Jabil Circuit, Inc

- 60 ZBMs for delivery in H1 2011, foundation order for telco OEMs
- First unit shipped

✓ Teaming Agreement with Singapore Technologies

- One of Asia's largest defence and engineering groups

✓ Energy Safe Victoria

- The state's electricity safety regulator
- Ten packaged ZBM/solar PV/diesel genset systems
- Demonstration for bushfire mitigation
- \$1 million value, currently installing.



Structured expansion plan for manufacturing

Planning in place to achieve high volume ZBM battery production:

- ✓ Collaboration with Jabil - one of world's largest contract manufacturers;
- ✓ Targeting lower unit costs for ZBMs – facilitate widespread market penetration;
- ✓ High quality & high volume to support our sales team; and
- ✓ Assembly to occur locally to meet different local standards

Phase 3

- Capacity up to 6,000 ZBMs per year

Phase 4

- Fully contract manufacturing
- Capacity only limited by sales growth

	2010		2011				2012				2013				2014			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Zinc-bromine battery modules	<-- RedFlow Phase 2 ----->		<<----- New RedFlow Phase 3 (Brisbane) ----->				<-- Phase 4 - Large Scale, Jabil ----->											
	<--Generation 2 ZBM -->		<--Generation 3 ZBM design -->															
Electronics	<----- RF ----->		<----- Transition to contract manufacturing ----->>>>															
Systems Power+BOS X+BOS Telco, etc	<----- RF - at Counihan Rd - >>		<<----- RF - at site of new Phase 3 factory ----->>>>															
	<<----- Additional offshore systems assembly plants ----->>>>																	

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Key milestones next twelve months

First half 2011

- Expansion of commercial sales
- Appointment of Value Added Resellers;
- Progressive expansion into Phase Three manufacturing facilities;
- Showcasing the RF 200 prototype at UQ;
- Telco trial and demonstration sites;
- Larger scale contract manufacturing plans cemented; and
- Prototyping of G3 ZBM – lower cost and higher performance.

Second half of 2011

- Further expansion of commercial sales into utility and telco applications;
- Opening of expanded Phase Three facilities (10 x existing capacity);
- Commercial orders for RF 200 class of products; and
- Commercial production of G3 ZBMs



The RedFlow team

Board

Chairman	Peter Pursey	Non-exec director Austin Engineering
Non-Exec	Anne-Marie Birkill	General partner of OneVentures, ex i.Lab
CEO	Phil Hutchings	Ex Wilson HTM, BHP
CTO	Chris Winter	Ex Schlumberger

Management

Chief Engineer	Dr. Alex Winter	Ex Schlumberger
COO	Richard Aird	Ex Lend Lease
CFO	Karen Hudson	Ex Mincom
Utility Sales	Bruce Ebzery	Ex Energex
Global Telco Sales	John Davis	Ex Deeya, VRB, located US



A RedFlow ZBM (zinc bromine battery module)

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