



# RedFlow Limited



## Phase Three Factory Expansion Under Way

*During the December 2010 quarter, RedFlow commissioned its expanded electronics manufacturing plant. This was the first component of the Phase Three facilities expansion and was completed ahead of schedule.*

Quarterly Report  
Period ending 31<sup>st</sup> December 2010

# Corporate Directory

<b>Board of Directors</b> Mr Peter Pursey, AM (Chairman) Ms Anne-Marie Birkill (Non-executive) Mr Phillip Hutchings (CEO) Mr Chris Winter (CTO)		<b>RedFlow Group Companies</b> RedFlow Limited RedFlow R&D Pty Ltd RedFlow International Pty Ltd	<b>ACN</b> 130 227 271 116 992 253 128 888 997
<b>Company Secretary</b> Ms Karen Hudson			
<b>Address - Australia</b> 1 / 27 Counihan Road Seventeen Mile Rocks Brisbane QLD 4073 Australia		<b>Contact Details</b> www.redflow.com.au info@redflow.com.au Phone: +61 7 3376 0008 Fax: +61 7 3376 3751	
<b>Representation in USA</b> John Davis Global Business Development Phone: +1 850 384 5275 <a href="mailto:john.davis@redflow.com.au">john.davis@redflow.com.au</a>		<b>Sales – Utilities and Corporate</b> Bruce Ebzery Phone: +61 7 3376 0008 <a href="mailto:bruce.ebzery@redflow.com.au">bruce.ebzery@redflow.com.au</a>	
<b>Patent Attorneys</b> Fisher Adams Kelly	<b>Bankers</b> Commonwealth Bank of Australia	<b>Listed on ASX – Code RFX</b> Ordinary shares on issue 68,604,672 Total options on issue (unlisted) 6,238,896	
<b>Solicitors</b> DLA Phillips Fox	<b>Auditors</b> PriceWaterhouseCoopers		

## Company Overview

RedFlow develops and sells battery energy storage systems that reduce the cost of supplying electricity.

### General Information

- RedFlow is one of the world's leading developers and manufacturers of kilowatt scale zinc-bromine flow batteries and associated systems.
- RedFlow is a globally focussed company headquartered in Brisbane, Australia, with representation in Florida, USA.
- Powerco is RedFlow's distributor in New Zealand.

### Zinc-Bromine Batteries

- RedFlow's proprietary zinc-bromine battery modules (ZBM's) provide 5 kW of power, and store 10 kWh of energy in a 220 kg sealed unit.
- Multiple ZBMs are linked together for higher power and capacity.

### Energy Storage Products

- RedFlow supplies its ZBM batteries in ready-to-run energy storage systems that include all necessary power electronics and enclosures.
- RedFlow ZBMs are currently available in 3 kW and 5 kW packaged AC systems. These are certified for grid connection, with 10 kWh to 20 kWh capacities.
- RedFlow also supplies packaged diesel generating sets and energy storage systems which use conventional lead-acid batteries.

- RedFlow's ZBM is also available as a 5 kW 48 volt DC system to reduce diesel generator running time in non-grid connected telecommunications sites.
- RedFlow is developing the RF 200, a megawatt class energy storage system during 2011.

### Customers

- RedFlow's products are used by major electricity utilities to supply reliable power to end users.
- The company deals with customers and selected distributors in Australia and in several locations internationally.

### Applications

- RedFlow's products:
  - Manage peak demand on electricity grids;
  - Store intermittent solar energy for use during peak periods; and
  - Reduce the operating costs of off-grid power systems.
- RedFlow systems are installed with solar PV for managing peak load on rural electricity grids.
- With sophisticated control and communications systems, RedFlow's products are Smart-Grid ready.

## Highlights of the Quarter

RedFlow continued with its strong progress in the December 2010 quarter. Highlights of the period were:

- Negotiation of a supply and install contract with Energy Safe Victoria for ten hybrid solar PV/diesel/zinc-bromine battery storage units. The contract value is approximately \$1 million, and is one of RedFlow's largest orders to date.
  - Initiation of the Phase Three factory expansion. This is the biggest expansion program in the history of RedFlow. It is designed to lift ZBM and systems assembly capacity by up to ten times.
  - Further advances of the RedFlow ZBM Reliability Demonstration Program with battery cycle life of over 480 cycles being demonstrated.
  - Ongoing development of the RedFlow 200 large scale energy storage prototype.
- Completion of the \$17.5 million IPO and listing on the ASX. RedFlow has the stock code RFX. RedFlow now has approximately 1,200 shareholders.
  - Further recruitment lifting total staff levels to 60 by quarter end.
  - At quarter end, RedFlow held \$16.3 million cash on hand with no debt.
  - Post the end of the December 2010 quarter, RedFlow's Seventeen Mile Rocks factory was affected by the Brisbane flood event in mid-January, causing a temporary suspension of operations. While some of our Phase Three expansion will be located at our existing site, we are incorporating appropriate flood mitigation strategies.

Overall, RedFlow is well positioned for an accelerated growth period, with a strong balance sheet, a high level of customer interest and a clear plan for expansion in 2011.

*During December 2010, RedFlow's technical staff, together with contractors, completed the first five of ten installations for ESV.*



## Supply Contract with Energy Safe Victoria (ESV)

During the quarter, RedFlow negotiated a supply contract for ten hybrid power stations for Energy Safe Victoria (ESV). ESV is the independent statutory safety regulator responsible for electrical and gas safety in that State.

Each hybrid power supply system comprises a RedFlow 5 kW packaged zinc-bromine battery-based energy storage system, together with roof-mounted solar panels and a packaged diesel generation set. Each unit is capable of communicating back to a central computer so that operations can be monitored. The approximate contract value is \$1 million.

RedFlow is installing these systems in the Daylesford and Euroa districts of Victoria. The installation is part of the Victorian Government's initiative of setting up a Powerline Bushfire Safety Taskforce to investigate alternative measures to reduce bush fire risk following the report of the Victorian Bushfires Royal Commission.

During the quarter, the systems were designed and manufacturing was partially completed. At the end of the quarter RedFlow had installed the first of five units, with the balance to be installed early in 2011.

*By the end of the quarter, construction of RedFlow's dedicated systems assembly plant, a key part of the Phase Three expansion, was underway. It will provide 1,000 square metres of factory floor space together with office facilities for our manufacturing team, and is due for completion during Q1 2011.*

The hybrid power supply units were designed to demonstrate how selected parts of the overhead electricity network can be turned off on high risk fire days in the Victorian summer. The RedFlow systems allow electricity supply to be maintained to households when that occurs and in an efficient and environmentally friendly way.

## RedFlow's Zinc-Bromine Battery Modules

RedFlow continued its long term Reliability Demonstration Program for its standard 5 kW/10 kWh zinc-bromine battery modules (ZBMs), in current Generation Two configuration.

RedFlow had a number of ZBMs undergoing long term testing, which allows alternative materials to be evaluated. At the end of the quarter, durability was approaching 500 cycles for a unit with an accelerated testing program.

RedFlow trialled alternative materials for the key conductive plastic electrodes used in the RedFlow ZBM electrode stack. These trials reduced ZBM production, as they required modified techniques.

The Phase Two ZBM factory was well bedded down by the end of the quarter and functioning well.



## Phase Three Expansion

During the quarter, RedFlow initiated its planned Phase Three expansion of both the ZBM manufacturing and systems assembly facilities.

The Phase Three expansion is the largest capital investment program in the history of RedFlow. The project will span six months and is designed to lift our ZBM and systems assembly capacity by up to a factor of ten. It has been scheduled to minimise interruption with current production plans, and will see progressive implementation of new equipment and floor space in the period to June 2011.

RedFlow acquired the leases on two additional factory premises close by the Company's existing facilities at Seventeen Mile Rocks. These total approximately 1,200 square metres and together almost double the Company's floor space.

Approximately 1,000 square metres of this will be dedicated to a new system assembly and manufacturing office complex. There is a three month fit-out phase for this facility and work commenced at the end of the quarter.

In addition, RedFlow ordered additional production equipment, which was scheduled for delivery from late 2010 and into the first quarter 2011. Two new 200 tonne presses were delivered at the end of the quarter and these will supplement the company's existing 50 tonne press for ZBM electrode and stack manufacturing.



*RedFlow's Generation Two zinc-bromine flow battery.*

In addition, RedFlow expanded its recruitment program to build up the staffing levels required at full Phase Three operations. Overall the Phase Three expansion is on track for completion in mid-2011. It is an important step to bed down manufacturing techniques ahead of the planned shift to contract manufacturing.

While some of the new facilities will be installed at our existing site at 27 Counihan Road, Seventeen Mile Rocks, appropriate flood mitigation strategies will be implemented.

## Powerco, New Zealand

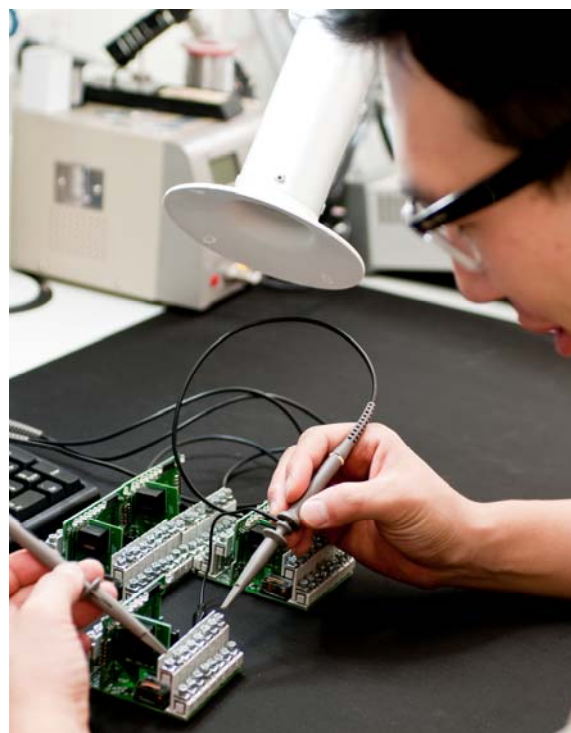
During the quarter, RedFlow shipped an additional system to Powerco, the second largest distribution utility in New Zealand and exclusive product distributor for RedFlow in that country.

Of interest to shareholders, Powerco established its subsidiary company, BasePower, during the quarter to develop the distribution network for RedFlow products.

BasePower's website can be viewed at [www.powerco.co.nz/Divisions/BasePower/](http://www.powerco.co.nz/Divisions/BasePower/)

## Telecommunications Sector

RedFlow shipped its first packaged ZBM for testing in a telecommunications environment during December 2010.



## RedFlow 200 Development

Development of the RedFlow 200, RedFlow's inaugural megawatt class energy storage product continued during the quarter.

The first prototype will have 12 RedFlow ZBMs, and will be designated RedFlow 60.

RedFlow has agreed with The University of Queensland that this prototype will be showcased in conjunction with the most powerful solar photovoltaic (PV) generation in Australia, now undergoing installation.

At the end of the quarter, the mechanical assembly and electrical wiring for the first prototype was virtually completed, with initial commissioning trial scheduled for January.

At full scale, the RF200 will incorporate 40 RedFlow ZBMs, with design rating of 200 kW.

Once the RedFlow 60 has been commissioned, the development of the larger scale prototype will commence.

## Contract Manufacturing

RedFlow furthered its discussions on contract manufacturing during the quarter, ahead of planned factory visits early in 2011.

## IPO and Listing on ASX

RedFlow completed its preparations for an initial public offering with the lodgement of its Prospectus on 1<sup>st</sup> November 2010.

The IPO was fully underwritten by RBS Morgans Corporate Limited. It was for an offer of 17.5 million shares at \$1.00 raising \$17.5 million. The IPO was over-subscribed and the shares listed on 14<sup>th</sup> December 2010 with the ASX code RFX.

The RedFlow Prospectus included three independent reports:

- A technical review of RedFlow's zinc-bromine batteries by US battery expert, Garth P Cory;
- An assessment of the market opportunity for grid-connected energy storage in the US by prominent independent research firm, Lux Research; and
- A comparable market report for grid-connected energy storage in Australia and New Zealand by noted utility consultant group, Marchmont Hill.

## Selected Extracts from Independent Reports in RedFlow 2010 Prospectus

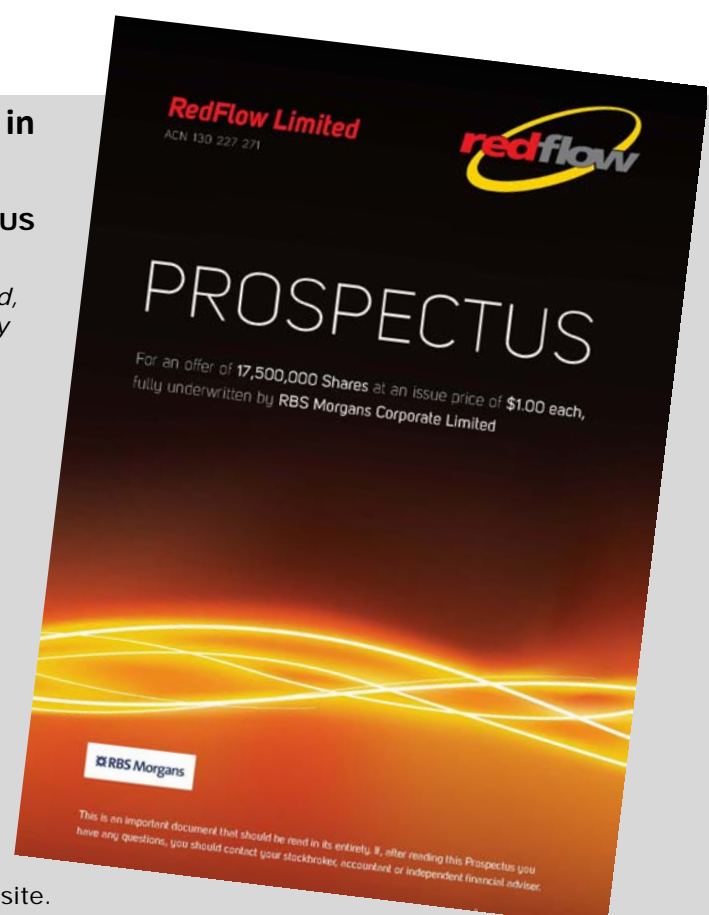
### Market Assessment on the Grid Energy Storage Market in US (authored by Lux Research)

- 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.*

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

- 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.*

The full Prospectus is available for download from RedFlow's website.



## Corporate News

As a consequence of the IPO, we welcomed approximately 1,100 new shareholders to our share register, and that brought our total number of shareholders at the end of the quarter to approximately 1,200.

## Planning

RedFlow undertook a modest corporate restructure. This was to enhance the separation between our Product Development and our Manufacturing activities. During 2011, there will be expansion in both areas. Additional management roles have been filled with internal promotions and external recruitment.

To meet the increased activity levels, RedFlow recruited additional staff during the quarter.

At the end of December 2010, our total staff levels were 60, with an additional five contractors.

## Financial

Following the IPO raising of \$17.5 million, and after meeting the costs of the issue and operational costs during the quarter, RedFlow closed the quarter with a cash balance of \$16.3 million.

RedFlow has no corporate debt.

## Effect of Brisbane River Flood

After the end of the quarter, RedFlow's current factory at Seventeen Mile Rocks was affected by the Brisbane River flood in mid January. Production operations were suspended on 13<sup>th</sup> January and, after a clean-up operation, began ramping up again in the week of 24<sup>th</sup> January.

### Phil Hutchings, CEO, RedFlow Limited

If you have any questions, I would be pleased to assist.

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*A RedFlow packaged energy storage system at work in South East Queensland.*



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