Annual Report

Summary

Powerhouse Wind Ltd has made wide-ranging progress in the 2017 financial year. Market development projects have been focused on the export potential of the product system, and a very interesting pilot system is about to be installed in the Solomon Islands with Caritas as the primary customer, the Solomon Islands Association of Rural Training Centres (SIARTC) as the in-country partner and with development support from the Ministry of Foreign Affairs and Trade (MFAT). This is a very significant development for the company and represents an expansion of scope from developing, manufacturing and supplying wind turbines, to specifying, selling and installing small scale renewable energy systems incorporating our unique turbine technology.

Engineering effort has been needed for the developments involved in this extension, while maintaining the progress in reliability improvement and field issue response that was the major focus last year.

While revenue growth is happening, and further growth can be seen as a result of the pilot projects this year, the company is still pre-profitable and consuming cash.

To build sales, grow the system opportunity in the Pacific, and streamline manufacturing the company is going to need further investment. Your directors believe an investment of a further $400k is needed to follow the opportunities in front of the company, and develop the business to be sustaining and profitable.

The Directors are considering funding options, one of these is a share placement with current investors. If there are any of you that may be interested in participating in this placement please contact:

bill.currie @powerhousewind.co.nz

The Directors are also considering a name change to reflect the development of the company as a provider of renewable energy solutions and are proposing the name PHW Energy Limited.

The Annual General Meeting date and venue will be advised in a further communication.

Bill Currie
Director

24/05/2017

1.0 Introduction.

FY 2017 has been a year of successes and challenges for Powerhouse Wind.

The major project for the year was expanding the installation proposed for the Bishop Koete Rural Training Centre in the Solomon Islands from a wind turbine installation only, to a pilot renewable energy centre for a remote community. Our primary partner for this project is Caritas, the Catholic Aid Agency and we are very appreciative of their vision and support for this project.

A second move offshore has been the installation of an off grid turbine system at the Moora Moora co-operative community near Healesville, Vic, Australia. This is also an exciting opportunity, as this community is both a leading centre for the application of renewable energy systems in Australia and a significant training centre for the industry.

Around these developments, we have consolidated the improvement engineering on the product, and brought all sites up to a similar specification of development with fixes for the field issues. On top of this we implemented a significant change and redesign of the tower top relay board to increase the power and reliability of the turbine alternator. With this we unfortunately encountered a new field problem with a soldering process on the board and subsequently had to rework all the inverter connected machines.

Steady improvements with increasing field experience have been made to the 50 parameters that control and set limits for the operation of the machines. Combined with better reliability, the running hours and energy produced have dramatically increased over the last year and with it our confidence in the turbine system.

Sales during the financial year totalled $110kthis is an increase in revenue of 60%. There was also a lift in expenses reflecting a full year of retaining two contractors and an employee to operate the company. The deficit of $209k is similar to the previous year of $191k. Every effort has been made to control our cash burn while income is limited to pilot scale sales, and research and development activities remain a major focus. We are still necessarily operating in a stretched state where we are dependent on generous voluntary contributions from directors for electrical and software expertise. The time has also come for needing more sales and marketing input and expertise than can be drawn from the existing team with occasional input from contractors and interns.

The financial situation has been improved with the conversion of a Shareholders advance of $173k due to Bill Currie's shareholders advance being converted to equity in the form of 34,701 ordinary issued shares. There are now 545,188 issued ordinary shares. Net assets total $114k

A bonus from the year is the very significant input we have had from a series of European intern students who have made great contributions to the company at no direct cost. The contributions they have made range from high level research outputs, through engineering analysis and improvement work, to valuable assistance with workshop and field work. We are indebted to their support for our activities and belief in the value of the potential output of this organisation.

2.0 Export Projects.

The Solomon Island Bishop Koete and Moora Moora projects have been a major focus for the year.

The Solomons project in particular represents a stretch and a development for the company in terms of the partnerships involved, the technical development and the export process.

The partnerships are first with Caritas as the primary customer and visionary group for the project. Second, in conjunction with Caritas, the New Zealand Ministry of Foreign Affairs and Trade. With Caritas, we have gained the first instance of a new type of fund aimed at supporting innovation through smaller companies which through 4 rounds of funding to date has only seen one successful application – ours.

The project has been to extend the turbine only solution to become a model for a renewably based 'power station' for isolated communities. The solution we have put together and is now in transit to the Solomons integrates a Thinair turbine, 4 kW of PV panels, a 15 kWh (usable) Lithium ion phosphate battery, and an energy management system with an integration to the existing diesel generator as a backup. The turbine controller and later the energy manager will be accessible from New Zealand via a software extension that has been developed as part of this project.

Enatel Energy Ltd based in Christchurch is a key supplier of the energy management and conversion system and provide equipment that we believe will offer special benefits to a remote installation like this. The charging and inverting devices are all modular, so failures can be tolerated by the system, and devices swapped as needed to restore capacity. The technology is from the telecom industry and has been developed with those standards for reliability, uptime and flexibility as drivers.

The Bishop Koete project will be installed in late June, and after an evaluation period, we expect it will lead to a wider pilot and eventually regular orders for remote power systems. This is a very promising direction for the company, as beyond the interests of the current partners, there are other potential customers and agencies in other regions with similar needs.

The Moora Moora system was less technically challenging, but useful experience in preparing a product for export, confirming that our packaging is satisfactory to an export trip and is as perfect a demonstration installation as we could hope for as our first one in Australia.

3.0 Engineering

The major effort in improving reliability and resolving field issues in FY2015 has been successful, though there are still some improvements needed. We are listening to what the products in the field are telling us, and addressing anything that comes up.

The latest failure, the relay board soldering, was due to manufacturing rather than design, and raises the issue of needing to invest in improving our ability to do better accelerated stress testing on production parts and systems. Thermal imaging of the stress test we already do on the alternator system would be a good step.

There is also a good opportunity with the remote supervision software that has been developed for the Solomons project to extend our ability to see what is happening on hard working sites. Some of the behaviours we need to improve occur only very rarely, and there has been too much luck involved in the past in being in the right place at the right time to see them. Continuous supervision and monitoring will improve our ability to find and fix these remaining issues.

Training and manual development has been significant over the year. As we move beyond installations and maintenance directly managed by the company, we need to have reliable understandable manuals that can be rigorously maintained and updated. We are going to use the Open Polytechnic's iqualify system for the Solomons project to experiment with online delivery and maintenance of these documents.

4.0 Situation and Prospects for Powerhouse Wind

An immediate prospect for developing sales for Powerhouse Wind exists pending a positive review of the performance of the Bishop Koete RTC performance in the Solomons.

The company will be in a good position to leverage experience from the pilot, working with the partnerships involved, and incorporating learning into a developing and improving solution which we expect will be suitable for other similar applications in other regions of the Pacific and beyond.

We are still getting enquiries and interest from around New Zealand despite the fact there has been little active promotion of the product and the website is now significantly out of date. We believe we could with a small investment in sales development sell 10 to 20 units per year into the New Zealand market in current conditions.

Developments in the future, both technical and commercial are likely to make self-generation of electricity far more interesting and attractive than it currently is. As a company, we are actively following such developments and as we can, taking part in research to shape this future.

Smart grids, PV developments, improvements in batteries and electric cars will all accelerate this process, and having a complementary wind turbine product at a point of performance, cost and reliability maturity to be a part of these developments is part of the market opportunity ahead of us.

A question that we ask ourselves is whether there is a place for distributed small scale wind as PV technology develops at an impressive pace. There is no definitive answer to this. The potential output of a PV system is directly linked to both the day-night and seasonal cycles with weather overlaid. Wind is less directly linked these cycles and on good sites we see machines running for days on end without stopping. This makes turbines good complements for PV systems with batteries where people or sites are wanting to be self-sufficient, either by choice or by service necessity.

From personal experience, PV is a great technology - solid state and static, but a turbine is dynamic, kinetic, a great reflection of the weather existing and exciting to live with!

Second round of funding

In terms of being able to continue and develop, Powerhouse Wind needs to raise more capital. Our realisation is that we needed the full $900k targeted in the PledgeMe campaign, and if we had achieved that, we would be in the position of having a path to system sales, good prospects of local turbine sales, a beachhead in Australia and a technically tested and refined product with close to $500k to expand sales and marketing, maintain field support and streamline manufacturing.

Our plan is to seek a further $400k in shareholder capital to take the company to a sustainable level of sales.

Bill Currie

Director