



15 August 2016

Companies Announcement Office  
ASX Limited  
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Level 4, 20 Bridge Street  
Sydney, NSW 2000

**Cortical Dynamics Ltd – Shortlisted as Semifinalist in Australian Technologies  
Competition**

Please find attached an update from BPH Energy Ltd (ASX: BPH) investee company Cortical Dynamics Ltd.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Deborah Ambrosini".

Deborah Ambrosini  
Company Secretary



15 August 2016

BPH Energy Limited  
14 View Street  
North Perth, WA 6006

### **CORTICAL DYNAMICS SHORTLISTED FOR AUSTRALIAN TECHNOLOGIES COMPETITION**

Cortical Dynamics Limited ("**Cortical**") is pleased to advise that it has been shortlisted as a semifinalist in the Australian Technologies Competition (ATC).

The ATC has today shortlisted thirty-eight of Australia's most exciting technology companies for the ATC16 Business Accelerator. These Semi Finalists are industry leading innovators with the capability to become game-changers across the sectors of energy, manufacturing, food & agritech, mining, medical technologies, cyber security and smart cities.

Now in its sixth year, the ATC finds mentors and develops Australia's best technology companies with the Greatest Global Potential. The ATC16 Business Accelerator helps turn good technologies into great businesses.

Cortical has been chosen as one of six semi-finalists in the Medtech and Pharma award and as one of five in the further category for Advanced Manufacturing.

The judging panel features the country's leading experts in commercialisation, finance, intellectual property and technology development from companies such as Deloitte, Bird&Bird and FB Rice. With a focus on building global success stories, the judges are looking for not only the best technologies but also the best managers and the best business plans.

#### **About the Australian Technologies Competition**

The 2016 ATC has established itself as Australia's premier technology accelerator. The competition provides mentoring for innovative SMEs and awards those who are best positioned to become global success stories.

Over the last five years, the competition has generated over \$250 million dollars in investment and project opportunities for Australian SMEs. It has attracted over 700 entries and 125 companies have so far benefitted from the mentoring program.

Australian and international government partners of the ATC include the Australian Department of Industry, Innovation and Science, the City of Melbourne, the NSW Department of Industry, Hong Kong Trade & Development Council and UK Trade & Investment.

Please see attached press release for further details.

Yours sincerely,

David Breeze  
Chairman  
Cortical Dynamics Ltd

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#### **Cortical Dynamics Ltd**

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## About Cortical

Cortical is an Australian based medical device technology company that has developed a next generation Brain Function Monitor (BAR). The core-product the BAR monitor has been developed with the objective of better detecting the effect of anaesthetic agents on brain activity, aiding anaesthetists in keeping patients optimally anaesthetised.

The BAR monitor improves on currently used electroencephalogram (EEG) technologies by incorporating the latest advances in understanding of how the brain's rhythmic electrical activity, the EEG, is produced. The approach used is fundamentally different from all other devices currently available in the market in that its underlying algorithm produces EEG indexes which are directly related to the physiological state of the patient's brain.

The global brain monitoring market in 2012 was valued at \$1.08 billion and is poised to grow at a CAGR of 8.6% to reach \$1.63 billion by 2017. The global brain monitoring devices market is broadly segmented into three categories based on its product, application, and end-user. Fueling market growth is the various technological advancements which are leading to high functionality, lower costs, ease of operation, and miniaturization of devices. Initial marketing will focus on TIVA (Total Intravenous Anaesthesia), a method of inducing and maintaining general anaesthesia without the use of any inhalation agent. This is becoming more widely accepted, particularly in Western Europe.

Cortical's technology has a versatility that goes beyond depth of anaesthesia and may be applied to other EEG based markets, such as Neuro-diagnostic, drug discovery, drug evaluation and the emerging Brain Computer Interface (BCI) market.

There are considerable opportunities offered by subsequent expansion of the company's core technology through developing the product to carry out additional functions including neuro-diagnostics of changes in brain and memory functions to provide early warning of degenerative diseases, pain response and tranquiliser monitoring for trauma patients in intensive care units.

The BAR monitor is protected by five patent families in multiple jurisdictions worldwide consisting 22 granted patents.

## About the BAR Monitor

The BAR monitoring system measures a patient's brain electrical activity, the electroencephalogram (EEG), in order to indicate how deeply anaesthetised a patient is during an operation via an adhesive sensor applied to the forehead. The BAR monitor is designed to assist anaesthetists and intensive care staff in ensuring patients do not wake unexpectedly, as well as reducing the incidence of side effects associated with the anaesthetic. Cortical believes that the BAR monitoring system will offer many significant sustainable competitive advantages to key stakeholders including the patients, the anaesthetists, and the hospitals/day clinics. These advantages may reduce the risks associated with surgical procedures, increase levels of patient care, optimize the use of anaesthetic agents, increase efficiencies and reduce costs through a reduction in drug usage and a faster bed turnaround in the theatre and post-operative recovery rooms around the globe.

The electrical activity recorded from the scalp, the EEG, is amongst the most important quantifiable measures of brain function. Unsurprisingly, EEG is used to monitor brain function in a variety of clinical situations such as neurological diagnosis, where the EEG is analysed for early signs of degenerative diseases, or within the operating room, where the EEG is used to indicate the depth of anaesthesia within the surgical patient.

Such monitoring is now gaining significant use during surgery, however even with the use of EEG monitors, it is not uncommon for there to be a critical imbalance between the patient's anaesthetic requirements and the anaesthetic drugs administered. While a number of EEG monitors are commercially available, one that is reliably able to quantify the patient's anaesthetic state is still desperately needed.

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Prior to the development of the BAR monitor, all of the existing EEG based depth of anaesthesia monitors operate in the context of a number of well documented limitations:

- \_ Inability to monitor the analgesic effects; and
- \_ Not all hypnotic agents are reliably measured.

The above limitations highlight the inadequacies in existing EEG based depth of anaesthesia monitors, particularly given surgical anaesthesia requires both hypnotic and analgesic agents.



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## BRAINWAVES, AIR-CONDITIONERS, 3D PRINTING AND LONG PIPES ALL FEATURE AS AUSTRALIA'S BEST TECHNOLOGIES ANNOUNCED

- 38 of Australia's leading technology companies short listed into the Australian Technologies Competition (ATC) Business Accelerator
- Exceptional quality of entrants taking world leading innovation to global markets
- Industry leading innovators in the sectors of energy, manufacturing, food & agritech, mining, medtech & pharma, cyber security and smart cities

The Australian Technologies Competition (ATC) has today shortlisted thirty-eight of Australia's most exciting technology companies for the ATC16 Business Accelerator. These Semi Finalists are industry leading innovators with the capability to become game-changers across the sectors of energy, manufacturing, food & agritech, mining, medical technologies, cyber security and smart cities.

Now in its sixth year, the ATC finds, mentors and develops Australia's best technology companies with the *Greatest Global Potential*. The ATC16 Business Accelerator helps turn good technologies into great businesses.

The judging panel features the country's leading experts in commercialisation, finance, intellectual property and technology development from companies such as Deloitte, Bird&Bird and FB Rice. With a focus on building global success stories, the judges are looking for not only the best technologies but also the best managers and the best business plans.

This year's 146 entries have jointly spent \$190 million to date developing their technologies and have over 600 employees. Whilst many of the Semi Finalists are already selling solutions, they are jointly seeking an additional \$80m to bring all the solutions to market.

The companies are developing a range of incredible innovations that address the big growth opportunities and challenges of the future. Solutions for food, agriculture, energy, mining, cities, medicine and cyber security will create new knowledge and skills intensive industries that will be Australia's future. This year's Semi Finalists includes a brain monitor that assesses anaesthetic effectiveness, energy efficient air-conditioners, 3D printing to create high efficiency heat exchanger and continuous, composite pipelines.

*"This year we have partnered with the Federal Government's Industry Growth Centres to identify and work with technologies from the Government's priority sectors", explained John O'Brien, the competition organiser. "The Semi Finalists will have unmatched profiling opportunities with industry that will help them get to market and realise their potential in Australia and globally."*

Other supporters and partners on the 2016 program include the NSW Department of Industry, National Energy and Resources Australia (NERA) and industry associations including AustMine, AusBiotech, AMTIL and the Facilities Management Association. In addition, export opportunities are provided through the support of UK Trade & Investment and the Hong Kong Trade and Development Council.

*"We are thrilled to see so many amazing companies with their eyes firmly set on global markets. We receive incredible feedback on the value of this program and it is always a privilege to work with so many talented entrepreneurs," O'Brien added.*

Winners will be announced at a Gala Awards Dinner in Sydney on 2 November. For further information on the Australian Technologies Competition visit [www.austechcomp.com](http://www.austechcomp.com)

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# ATC16 SEMI-FINALISTS



| Company                                | State | Technology   |
|--|-------|--|
| Advanced Fertigation Systems           | WA    | Advanced Fertigation Systems provides a cost-effective water and nutrient management platform, SWAN (Scheduling Water And Nutrients), that helps to manage water resources, allocations and nutrient inputs precisely and to plan.   |
| Aeration Control Australia             | WA    | Aeration Control Australia provides unmatched management of grain in storage by providing of aeration at the right temperature and humidity in order to improve the grain condition.   |
| Aglive                                 | VIC   | Aglive has developed a system and method for digital supply chain traceability that has significantly enhanced tracking of red meat from farmer to end consumer.   |
| Airtopia                               | VIC   | Airtopia is an air conditioning controller that integrates seamlessly with any IR (infra-red) controlled split systems allowing Building Management Systems to fully mimic the original remote control and transforming the process of air conditioning automation.                      |
| Aquamation Equipment                   | VIC   | Aquamation's Water Cremation technology uses water instead of propane gas fired incineration to cremate bodies that reduces energy use, emissions, toxic fumes and airborne mercury pollution.   |
| Axis Energy Group                      | QLD   | Axis Energy Group's vertical axis wind turbine is particularly suited to the low and turbulent flows encountered urban environments and features novel slanting blades that enhance its start-up capabilities, minimise vibrations levels and eliminate power fluctuation.               |
| Conflux Technology                     | VIC   | Conflux Technology uses metal Additive Manufacturing (3D printing) to produce a smaller, lighter and more efficient heat exchanger with intricate geometry and a high surface area density.  |
| Conveyor Manufacturers Australia (CMA) | NSW   | Conveyor Manufacturers Australia's REDLINE Conveyor System is a mono-rail mounted conveyor system that can be advanced and retracted into position via a pneumatic/hydraulic drive system.   |
| Core Resources                         | QLD   | Core Resources' Toowong Process is a novel technology enabling the removal of toxic contaminants from mineral concentrates produced by mines and fix them in an environmentally stable and non-toxic form.   |
| Cortical Dynamics                      | WA    | Cortical Dynamics has developed a disruptive Brain function monitor, the Brain Anaesthesia Response (BAR) monitor, that better detects the effect of anaesthetic agents on brain activity and aids optimal anaesthetisation.   |
| CryptoPhoto                            | QLD   | CryptoPhoto provides better authentication and makes it fast and easy for ordinary people to login and use the internet safely, protecting against phishing scams, social engineers, fake web sites and similar attacks, even if the user is unsophisticated or unmotivated.             |
| Cubic QED                              | NSW   | Cubic QED's process captures and transforms mineral salts from the discharge water of reverse osmosis desalination into mineral carbonates that become valuable commercial minerals.   |
| Elexon Mining                          | QLD   | Elexon Mining's Cave Tracker System provides underground mine operators with the ability to measure movement in the underground ore body in near-real time to improve mine safety and productivity.  |
| Energy Made Clean                      | WA    | Energy Made Clean's Solar Construction offers integrated solutions to complex energy challenges including off grid power, utility and commercial scale solar, water pumping systems and lithium battery storage system.  |
| Fulcrum 3D                             | NSW   | Fulcrum 3D's CloudCAM is an advanced sky imaging system which utilises a ground-mounted fisheye camera together with advanced image processing to identify, categorize, track and predict cloud movement over solar photovoltaic power plants.   |
| Gamechanger Technologies               | VIC   | Gamechanger Technologies VForce® Compound Motion technology for wind turbines and other airfoils provides variable angle of deflection and extension (morphing) that other systems cannot achieve.   |
| Greenland Systems                      | VIC   | Greenland Systems' Evacuated Tube Solar Thermal collector is capable of efficiently raising the temperature of a Heat Transfer Fluid to 200C for direct applications for industry.   |
| Heat Trap Solar                        | WA    | Heat Trap's Emergency Safety Shower Chiller cools unsafe incoming hot water making safety shower and/or eye baths safe to use.   |
| HMS Group of Companies Australia       | NSW   | HMS Group's remote controlled mini loader for open cut mines or underground mines is designed to safely collect the coal that drops from the conveyor belt whilst the belt is still operating.   |
| Imunexus                               | VIC   | Imunexus improves the cancer killing ability of existing antibody drugs by quickly and easily creating bispecific biobetter versions using small antibody-like modules called "Imunexins" that can be engineered to bind to any specific target.   |
| Independent Products                   | VIC   | Independent Products' uses the waste-water created by air conditioners to improve energy efficiency by up to 40% and can be retrofitted to most of the world's split system air conditioning and refrigeration units.  |
| Long Pipes                             | WA    | Long Pipes' Fluid Highway is a continuous joint-free pipe, produced at 20kms/day using composite pipe technology cured onsite to provide the lightest, strongest, toughest, fastest to install, longest lasting, cheapest solution for long distance transportation of gases and fluids. |
| MAKO Turbines                          | NSW   | MAKO Turbines' tidal technology has been designed to produce predictable/baseload renewable electricity from free-flowing water in tides, rivers, canals, inter-island channels or tailraces of hydro dams around the world.   |
| Medical Safety Systems                 | NSW   | Medical Safety Systems' RiskMx continuously monitors pathology and other patient-level data using pre-defined algorithms that provide the basis for automated, real-time, healthcare practitioner-friendly Risk Management Plan implementation.  |





| Company                      | State | Technology   |
|------------------------------|-------|--|
| Micronised Mineral Solutions | NT    | Micronised Mineral Solutions has developed a solution that enables faster and more efficient decontamination of toxic mine water through the removal of 99.8% of dissolved metals and the re-balancing of water pH to meet environmental requirements.                                   |
| Ozius Spatial                | QLD   | Ozius Spatial's Naxia Land Management Tools are a suite of spatial information tools derived from remote sensing analytics and used for environmental monitoring and land management.  |
| Reservoir Rock Technologies  | WA    | Reservoir Rock Technologies has developed a highly efficient automated imaging, computer based process for analysis of core samples in the oil and gas industry.   |
| SCT Operations               | NSW   | SCT Operations' ANZI cell is a device that measures the three dimensional in situ stresses in rock, a key parameter in mining, tunnelling, and related industries.   |
| Secure Code Warrior          | NSW   | Secure Code Warrior is a web-based gamified skills development and assessment platform that mimics real-life security vulnerabilities in software code, provides instant learning opportunities for developers to locate, identify and fix these vulnerabilities.                        |
| StabilCo                     | NSW   | StabilCo's MatrixMaterials provide an innovative roadbase-and-rail infrastructure solution from waste by capitalising on scientifically designed and engineered material properties to deliver improved performance and cost benefits to both infrastructure owners and the environment. |
| Stochastic Simulation        | WA    | Stochastic Simulation's ResAssure is a revolutionary reservoir simulation tool for the upstream oil and gas industry that enables the industry to confidently make development decisions with previously unmatched confidence and speed.   |
| SunSHIFT                     | NSW   | SunSHIFT is a pre-engineered, pre-fabricated, moveable turnkey solar-PV solution specifically designed to overcome the limitations of traditional solar-PV and enable new users, such as miners, to adopt alternative energy.  |
| SupraG Energy                | VIC   | SupraG Energy is a graphene technology commercialization company which develops next-generation high-energy-density energy storage devices, including supercapacitors, for power management and transportation applications.   |
| Taggle Systems               | NSW   | Taggle Systems builds and operates a low power wide area radio network enabling the highly efficient collection of vast amounts of data from connected devices such as water meters.   |
| V2H International            | QLD   | V2H International has developed innovative lateral drilling technology using high pressure water jetting for the global oil and natural gas industry that radically enhances the hydrocarbon production of new and existing wells.   |
| Vectus Biosystems            | NSW   | Vectus Biosystems has developed a platform technology that allows the production of small molecules that mimic the activity of the vasoactive intestinal peptide (VIP), allowing construction of more than 70 compounds with anti-hypertensive and/or anti-fibrotic properties.          |
| Wattwatchers                 | NSW   | Wattwatchers has developed the ultra-compact Auditor series of internet appliances for energy that deliver accurate, real-time energy management over the internet independently of regulated billing meters and equipment manufacturers' monitoring systems.                            |
| Worldpoly                    | VIC   | Worldpoly's Australian PolyForce technology provides automated, safe and consistent welding of HDPE pipe systems using current hydraulics and electronic controls and designed for remote and rugged use.  |