



Managing Director's Message



Welcome to Panorama Synergy's latest investor update.

This is a new initiative as part of our commitment to keeping shareholders informed of the Company's progress.

There has been a considerable amount of activity since the beginning of this financial year and below I have outlined some of the key recent highlights.

First product prototype demonstrated

On 1st December we announced that we have successfully built and tested our first prototype of the LumiMEMS™ Reader optical readout system for MEMS sensors. This is in the form of a hydrocarbon detector which is able to measure the presence of substances such as toluene and benzene.

This was independently verified by Dr Matthew Myers from the Hydrocarbon Detection Team at the CSIRO, who confirmed the positive results for detecting gas-phase toluene.

Toluene, or methylbenzene, is a benzene derivative with a similar chemical structure but considerably less toxic than benzene, therefore presented limited risk to the UWA scientists and provided greater scope for setting up appropriate laboratory testing protocols.

By extension, our product is able to measure benzene at considerably greater levels of sensitivity than any existing products are currently able to.

Benzene, a chemical widely used in the hydraulic fracturing (frac'ing) process, is highly toxic and carcinogenic. If it were accidentally released into the atmosphere or water supply of areas surrounding drilling sites, by the time existing technology is able to detect it, damage to surrounding towns, people, crops and livestock is already irreversible.

Our significantly more sensitive and accurate product will enable frac'ing operators, regulators and local communities alike to determine the presence of benzene before it reaches these dangerous levels, allowing for appropriate remedial action.



This is just one example of how the LumiMEMS™ Reader is able to help us better understand our environment, enhance our well-being and improve global health & safety standards.

New Board appointment

In July we announced the appointment of **Dr Jason Chaffey** as Director of Commercialisation and Manufacturing and as a member of the Panorama Synergy Board of Directors. Jason was previously Managing Director and CEO of Bluechiip, which develops technology-based temperature and identification tracking solutions for biosamples in the health and life sciences industry.

His other roles at Bluechiip included Chief Technology Officer and Principal Engineer for MEMS, where he implemented a licensing strategy for its MEMS-based wireless tracking technology. Dr Chaffey's PhD was gained in the study of MEMS at RMIT.

He has extensive experience in industrial design, product concepts and product transfer for MEMS and in managing multi-disciplined development and manufacturing teams and suppliers internationally. His vast knowledge of MEMS and extensive industry contacts, especially with MEMS foundries, will be a vital addition to our company.

Creating an Advisory Board

In November we appointed **Dr Stewart Washer** as a specialist adviser for the Biosciences industry. Dr Washer is the first such advisory appointment and will sit on this new Advisory Board which will be set up to oversee and support our commercialisation plans for the LumiMEMS™ Reader. As we target other markets we will make further similar appointments to enhance our specific industry knowledge. Other members of the Advisory Board will include lead scientist at UWA, Dr Gino Putrino, Dr Jason Chaffey and myself.

Dr Washer has more than 20 years of CEO and board experience in healthcare and medical technology. We will utilise his extensive knowledge and expertise as we look to develop new products, and enhance existing products, which have the potential to revolutionise modern day healthcare. These include hospital bedside patient care pathology, wearable medical devices and environmental monitoring and response.

Funding and outlook

In September we announced the successful raising of \$7 million, which allows us to carry out our commercialisation strategy for the LumiMEMS™ Reader. It gives us working capital for the foreseeable future and opens up options for us to be a vertically integrated manufacturer of unique products. It also allows us to strengthen our management team with new key appointments such as those of Dr Chaffey and Dr Washer.

Our objective now is to bring the LumiMEMS™ Reader to market as quickly as possible through the development of the benzene detector and similar products for other industries.

In addition, we continue to have discussions with various industry representatives about potential licensing agreements. Many existing commercialisation opportunities do not require a prototype. We are in discussions with people who have looked at the laboratory results and the science, and would prefer we went directly to building a product. There will always be ongoing testing of the product and in some cases, working with the organisations who oversee compliance, safety and regulatory matters.

Meanwhile, we have begun discussions for the manufacture of our product on a commercial scale.

In addition to our commercialisation plans, we continue to educate the markets on MEMS and the world of new potential applications provided by the LumiMEMS™ Reader. This will help drive new partnering opportunities, encourage new investors and, most importantly, deliver ongoing value for our shareholders.

I look forward to reporting on further progress over the coming months.

Terry Walsh
Managing Director

Frac'ing market potential

Hydraulic fracturing (frac'ing) involves injecting water, sand and chemicals underground to fracture rock formations and force gas to the surface. The controversial process has fuelled protests from landholders in Australia and the United States, where government tests have detected harmful levels of hydrocarbons, including BTEX (benzene, toluene, ethylbenzene, and xylenes) in drinking water wells in areas where fracking is used.

The US Department of Health and Human Services classifies benzene as a human carcinogen. It is also a notorious cause of bone marrow failure and is linked to plastic anemia and acute leukemia.

The U.S. Occupational Safety and Health Administration has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday. US employers are therefore required to take regular air samples to prove that levels of benzene remain below this threshold.

Ambient air quality objectives set by the Australian Environmental Protection Authority (EPA) to protect human and environmental health are 3 parts per billion (ppb) for benzene, 100 ppb for toluene and up to 200 ppb for xylene on average over the course of a year.

Australian Drinking Water Guidelines (ADWG) specify that benzene should not be present in drinking water at more than 1 ppb.

Panorama's benzene detector would allow frac'ing operators and regulators to more definitively determine the presence of benzene and other hydrocarbons well before they reach dangerous levels, allowing for appropriate remedial action.

While the benzene detector is being designed to detect its presence in the atmosphere, the LumiMEMS™ Reader can also operate in liquids. Therefore the opportunity exists to develop a similar product for providing real time water readings, for which technology currently does not exist.

FAST FACTS

- ➔ Over 2 million wells have been frac'd worldwide, mostly in North America where over 1.2 million wells have been frac'd (APPEA, 2013)
- ➔ More than 90% of all oil and natural gas wells are fracked at some point during their lifespan (US Energy Information Administration, Dec 2011)
- ➔ The global frac'ing market will grow from \$40 billion in 2012 to \$64 billion in 2017, with a CAGR of 10% per annum (MarketsandMarkets, August 2012)

Financial Position

In September, Panorama announced the placement of 19.6 million shares at \$0.36 per share to institutional investors and existing cornerstone shareholders, which was heavily oversubscribed. Following the share issue the Company has a total of 493,403,798 shares in issue.

Panorama now has sufficient capital to implement its commercialisation plans aimed at bringing its LumiMEMS™ Reader to market as quickly as possible. It also provides the Company with working capital for the foreseeable future.

Key areas where the funding will be targeted include:

- Continued development and commercialisation of the benzene detector;
- Develop and commercialise new products targeting other industries;
- Bringing in new key personnel to support the execution of its commercialisation strategy;
- Pursuing sensible commercial partnerships across different industries;
- Upscaling the Company's R&D resources; and
- Funding a number of specific marketing initiatives.

"The strong institutional investor support we received was in recognition of the ever growing awareness in Australia of the size of the MEMS opportunity. It allows us to execute our existing business plan and allows us to become a vertically integrated manufacturer of unique products able to deal with some of the world's most vexing problems."

Terry Walsh, Managing Director

Introducing Dr Jason Chaffey



Dr Jason Chaffey joined the Board of Panorama Synergy on 17 November 2014 as Director of Manufacturing and Commercialisation.

Dr Chaffey has a Bachelor of Advanced Science (Physics) from the University of New South Wales (Sydney) and a PhD from RMIT University (Melbourne) in MEMS. He is a member of the Institute of Physics and a member of the MEMS Industry Group (MIG) Association.

Dr Chaffey was Managing Director and CEO at Bluechiip Limited from July 2014 and acting CEO from January 2014. He was the company's Chief Technology Officer for five and a half years and before that Principal Engineer - MEMS for two years.

Prior to joining Bluechiip, he was involved in a number of key technology laboratories including the Advanced Sensors Laboratory and Microengineering Section at DSTO and the Advanced Engineering Centre for Manufacturing at RMIT, where he led projects for inertial sensors, biosensors and optical modulators.

He is an avid Wallabies and Melbourne Demons supporter and in his spare time loves to swim and go kayaking. He lives in Melbourne and is married with two sons.

Commenting on joining the Company, Dr Chaffey said:

"I am very excited to be part of the Panorama Synergy team. I have spent a considerable amount of my academic and professional life working with MEMS, and one of the things that attracted me most to the role was the enormous potential of Panorama's technology.

"It also provides me with the right platform to leverage my commercialisation experience introducing a technology that I believe has global opportunities across many markets. Coincidentally, my strong relationship with UWA and Professor Faraone will be further strengthened through Panorama's exclusive partnership with the university, which also opens up a range of other opportunities."

Gino's 2 minute thesis



See the video on YouTube at: <https://www.youtube.com/watch?v=2thPLCpyyB0>

44,370
hits to date

Dr Gino Putrino did his PHD on MEMS sensors at the University of Western Australia. This was condensed into a two minute animation which explains the science behind Panorama Synergy's LumiMEMS™ Reader.

THE AIR WE BREATHE IS PACKED FULL OF INVISIBLE CHEMICALS
...that carry a huge amount of information.

A sensitive enough **ARTIFICIAL NOSE** could decipher this information...

MAKING POSSIBLE:
Biopsy-less CANCER Diagnostics
Detecting EXPLOSIVES at an airport
Telling if vegetables in the supermarket are FRESH
Gino Putrino U, Western Australia

MEMS
MICRO ELECTRO MECHANICAL SYSTEMS
...are a new class of device shown to be sensitive enough to do all these things.

2 Minute Thesis Contest!

By bringing all these things together, then we can build such a device.

The way in which they work is like this:

- 1 You make a suspended mechanical beam, clamped at one end.
- 2 Coat it with a substance that sticks to the specific chemical you want to sense
- 3 If you hit this beam it will start vibrating at a speed called its natural frequency.
- 4 If the chemicals that you are trying to sense stick to the beam, that speed will change.

By fabricating a similar nanostructure underneath our beam, and aiming a laser through it, the amount of light that reaches the other side will depend on the height of the mechanical beam.

The shimmering colours of these wings are not created by pigments, but rather by nanostructured shingles which create an effect called diffraction, where different colors of light are bent in different directions. If nature can do it, then so can we.

To explain how my PhD solves this problem, I'd quickly like to talk to you about the optical properties of the wings of the green Hairstreak Butterfly.

THE PROBLEM IS THAT THESE BEAMS NEED TO BE TINY.

Humans are just too big and slow to see them. So we need to find a way to see what these sensors are doing.

20KHz
0.1 mm

JORGE CHAM © 2013
WWW.PHDCOMICS.COM

Q&A with Gino Putrino



Q. So in essence, Gino, what are MEMS sensors?

GP: The technology behind MEMS – very tiny moving mechanical structures – is not new. Neither is chemical nanotechnology, which allows us to sense what’s going on around the world, which has developed over time.

What we haven’t known to date is how those MEMS are moving, because the movements they make are so small. So what is new, is that we have invented a technique to measure those movements – the final piece in the puzzle. As a result we can now finally make a device which is small, mobile, can absorb the chemicals we’re trying to detect and measure their movement.

Q. And what was the major breakthrough that allowed you to measure their movement?

GP: The big difference is that we integrated something called silicon photonics into regular MEMS. Silicon photonics is the use of lasers and light to measure the properties of MEMS and where they’re moving, how fast they’re moving, and if they’ve changed their shape. And by using those properties, we can tell quite a lot about the greater environment. So we can sense all sorts of things such as whether you have lung cancer from your breath, or whether groceries in a supermarket have gone rotten.

Q. So in effect it empowers the consumer to know, for example, that they may have skin cancer prior to seeing their doctor, or whether fruit of vegetables were packed a year ago – it could virtually change our everyday lives?

GP: Well that’s the whole driving force behind sensing, sensors and the Internet of Things. It’s that people want to know more about their environment. People are limited by the number of senses they have and we want devices everywhere telling us about our environment and whether something is toxic or hazardous... or whether it’s safe or fresh.

Q. And in terms of practical application, what are the limitations of these devices or can they be used in almost any situation?

GP: These sensors are small enough that you can place them pretty much everywhere and use such small amounts of power that they can run for ages without needing to be recharged. So you could spread them over large, wide areas to act as an early warning system for bush fires, for example, through a network of tiny carbon monoxide sensors.

Being able to detect smoke up to 40km away, you could notify people more quickly that there is a bush fire coming. That kind of early warning system is also applicable to lung cancer or early detection of a leak in a gas pipe or dangerous levels of benzene around a drill site. It’s all about early detection and prevention.

Q. How do you communicate with such a small device?

GP: The LumiMEMS™ differentiates itself from other such cantilever approaches by the novel use of its patented optical interface to the MEMS cantilever, using tiny light ports that can be connected to either optical fibres or solid state lasers and detectors depending on the application. The laser light is used to carry information about the cantilever devices which is then decoded to give concentration measurements or other useful information. The versatility of how the sensors can be connected gives rise to many applications ranging from wearable sensors, to hand-held sensing tools, to wide-area, optical fibre driven sensor networks deployed over several kilometres.

Q. If these sensors are so small, can you make many of them on the same chip?

GP: This goes to the heart of the MEMS technology behind the LumiMEMS™ Reader. As the sensors are so small (shorter than the thickness of a hair), and can be manufactured at the same time using the same processes (batch manufacturing), many sensing devices can be manufactured on the same chip at the same time. Each of the cantilever beams can then be selectively modified such that each cantilever is made sensitive to different gases or molecules, enabling the device to be a smart nose for complex organic compounds or solutions. This is one of the most exciting aspects of the technology and the applications it will enable in the future.

The winner of the shareholder prize draw is Mr Bernie Moloney of St Ives who will receive a bottle of fine Scotch Whisky.

Any shareholders that have not already submitted their email addresses and would like to receive important company announcements and newsletters via email can do so by registering for email alerts on our website www.panoramasynergy.com

CORPORATE
SNAPSHOT

DIRECTORS AND SENIOR MANAGEMENT

Aidan Montague Chairman	25 years' experience in sales, marketing and technology. Formerly held senior management positions at Cisco Systems including Director of Strategic Alliances, Cisco Asia Pacific. A professional engineer by background.
Terry Walsh B.Bus Managing Director	28 years' experience in the technology industry. Formerly CEO of Cisco Canada and prior to that held other senior management positions with Cisco including Managing Director of Australia/New Zealand.
Dr Jason Chaffey B.Sc, Ph.D Director of Commercialisation & Manufacturing	15 years' experience in MEMS technology, product development and engineering. Formerly Managing Director and CEO of Bluechiip (ASX-listed MEMS manufacturer). PHD in MEMS at RMIT.
Jeff Braysich MBA, B.Com Non-Executive Director	30 years' experience in financial and commercial markets including as a fund manager, corporate advisor and stock broker.
Anthony Karam LLB, B.Com In-house Counsel & Company Secretary	15 years' experience as a corporate and commercial lawyer and company secretary.

FAST FACTS

ASX code	PSY
Last Sale Price (as at 17 Dec 2014)	26.5c
High/Low (6 Month Rolling)	54.5c/4.0c
Ordinary Shares	~493.4 million
Market Capitalisation @ Last Sale Price	~\$131 million
Cash at Bank (no debt)	~\$7.0 million

RECENT COMPANY ANNOUNCEMENTS

1 December 2014	Panorama Synergy Successfully Tests Hydrocarbon Detector Prototype
10 November 2014	Panorama Synergy Appoints Specialist Biosciences Adviser
21 October 2014	Panorama Synergy Appoints Leading MEMS Expert to its Board
12 September 2014	Panorama Synergy Raises \$7 million in Share Placement
4 September 2014	Panorama Synergy Achieves Significant Breakthrough in Optical Readout Technology for MEMS Devices
31 July 2014	Panorama Synergy Proves Optical MEMS Reader Technology; Developing Prototypes for New Market Applications

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