

## Optiscan Imaging Limited (ASX: OIL)

### Australia

#### A Confocal Microscope Development Company

Optiscan Imaging Limited (ASX: OIL) is an Australia-based company, which focuses on the development and commercialization of optical imaging technologies used in endoscopes. The company combines its proprietary optical fiber and laser scanning confocal microscopy technologies to develop miniaturized endomicroscopes. These endomicroscopes are the first of their kind and have wide application in diagnostic and surgical procedures. Moreover, Optiscan's technology has an edge over other competing technologies as it provides higher magnification (of 1000 times) and better resolution which allows the operator to examine the surface and subsurface of a tissue specimen in great detail. Consequently, the company's technology can reduce or even potentially eliminate the need for a biopsy.

Optiscan has pioneered confocal endomicroscopy through its flexible endomicroscope ISC-1000 system. The company developed the product in collaboration with Pentax Corporation, a leader in the flexible endoscope market. In 2007, Pentax was acquired by Hoya Corporation (TYO: 7741). Optiscan also launched its first branded product—the Optiscan Fluorescent In Vivo Endomicroscope (FIVE 1). In addition, the company is venturing into high growth areas such as women's healthcare.

- Optiscan currently generates large part of its revenue from ISC-1000 system. In FY07, the company sold 88 control systems with 106 miniaturized scanners. However, sales for the control systems slowed in FY08, as Hoya cleared an inventory build up. Nevertheless, Optiscan expects the growing demand for miniaturized scanners to offset the decrease in sales for control systems.
- We expect the sales for ISC-1000 system to pick up with the acquisition of Pentax by Hoya. Hoya is a leading globally diversified company that produces optical materials and components and has a worldwide manufacturing, marketing and distribution network. In collaboration with Optiscan, Hoya is undertaking various initiatives to support the product, such as setting up training infrastructure. Hoya is also conducting multi centre trials across the globe in order to seek insurance reimbursement for procedures using the endomicroscope. These steps are likely to help in the faster penetration of Optiscan's products in the US\$1.2 billion flexible endoscope market.
- Optiscan is further expanding its revenue stream by jointly developing a rigid endomicroscope with Carl Zeiss AG (FRA: AFX). Carl Zeiss has an extensive worldwide marketing and distribution network. The company has entered into an A\$20 million agreement, which includes milestone payments of A\$4 million and product sales of A\$16 million in the first five years of product launch.
- On a slightly negative note, Optiscan's accumulated losses totaled around A\$31 million at the end of FY 07. The company needs to sell approximately 200 ISC-1000 systems to breakeven. Looking at the marketing strength of its partners and the initiatives mentioned above, we expect the company to report net profits from FY10.



<http://www.optiscan.com>

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**Initiation of Coverage**

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Price (A\$)	
09/10/2008	\$0.22
<b>Price Target *</b>	<b>\$1.39</b>
52 week high	\$0.26
52 week low	\$0.25

Shares Outstanding (millions)	
Basic Shares	117.23
Options & Warrants	5.14
Fully Diluted	122.37

Capitalization (A\$ millions)	
Current Market Cap	25.79
<b>Target Market Cap*</b>	<b>162.43</b>

Key Financial Ratios	
Price/Equity (2009E)	0.59
Price/Sales (2009E)	4.72
Price/Cash flow (2009E)	7.88
Price/Book value (2009E)	3.57

\* Our target price and target market cap are aiming at a 18–36 month investment period. For details, please see financial forecasts and analysis.

## Investment Summary

We are initiating coverage on Optiscan Imaging Limited (ASX: OIL) and expect the company's market capitalization to reach A\$162.43 million over a 18–36 month horizon, with a corresponding target price of A\$1.39 per share.

Currently, Optiscan generates a large part of its revenue by supplying scanners and imaging systems to Pentax, the world's second largest manufacturer of flexible endoscopes. During FY 07, Optiscan sold a total of 88 control systems and 106 miniaturized scanners to Pentax, thereby generating revenue of over A\$5.5 million. However, an inventory build-up by Pentax could dent sales of control systems in the short term. Nevertheless, the company expects the growing sales of miniaturized scanners to not only offset the decrease in sales of control systems but also drive near term revenues.

We expect revenues to increase significantly due to the integration of Pentax with Hoya Corporation (TYO: 7741). Hoya is a leading Japan-based globally diversified company, which produces optical materials and components and has a global manufacturing, marketing and distribution network. As part of its strategy, Hoya intends to utilize cash flows generated from other well established markets to grow the endoscope business. Hoya and Optiscan are focusing on establishing training centers world wide to introduce Optiscan's technology to new users, and obtain insurance reimbursement for endomicroscopy procedures. We expect with these initiatives, Optiscan's products will constitute a significant part of the US\$1.2 billion flexible endoscope market.

Optiscan is leveraging its technology to further broaden its product line. The company is jointly developing rigid endomicroscopes with Carl Zeiss AG (FRA: AFX). Optiscan entered into an A\$20 million agreement with Carl Zeiss (a global leader in the optical and opto-electronic industry) which entitles Optiscan to milestone payments of A\$4 million for developing a rigid endomicroscope and completing clinical studies (for an undisclosed medical application) over a period of three years. Results of the clinical studies are expected in late 2008. The remaining A\$16 million would accrue from the sale of the rigid endomicroscopes over the first five years after launch. We believe Optiscan is likely to benefit from Carl Zeiss's distribution and marketing network, which spans over 30 countries. Globally, the market for rigid endoscopes is estimated at US\$1 billion. Optiscan's rigid endomicroscopes are being designed to have a wide range of applications in orthopaedics, gynaecology, laparoscopy, and ophthalmology. As a result, there is significant revenue potential from this product line.

Currently, Optiscan has identified opportunities in the high growth women's healthcare segment for its rigid endomicroscopes. The company is developing Venuscope, for the diagnosis of a variety of women's diseases such as endometriosis, cervical cancer and ovarian cancer. In October 2007, Optiscan initiated clinical trials (on 20 patients) for endometriosis using the Venuscope. Since the product has been designed to operate with a single use disposable sheath, it is likely to generate recurring revenue. Going forward, Optiscan intends to form partnerships with other firms to develop rigid endomicroscopes for other applications.

While forming product development and marketing partnerships are expected to be the key elements of Optiscan's business model, the company has laid down the foundation for developing and marketing products on its own. In 2007, Optiscan launched its first proprietary branded product, the Optiscan Fluorescence In Vivo Endomicroscope (FIVE 1), which targets the clinical research market. The Optiscan FIVE 1 has been customized for use in pre clinical trials. As this product is developed in-house, the company earns higher margins on sales. To date, Optiscan has sold 17 units. Furthermore, we expect robust sales growth as the company is taking initiatives such as increasing sales force and opening new sales office in the U.S. to enhance market penetration.

Optiscan's accumulated losses aggregated A\$31 million at the end of FY 07. The company is also likely to incur significant R&D expenses related to its product pipeline; this could lead to losses in the near term. Optiscan needs to sell approximately 200 ISC-1000 systems to breakeven. Given the marketing strength of its partners and the initiatives mentioned above, we expect the company to report net profits from FY10 onwards.

We valued Optiscan based on the Discounted Cash Flow (DCF) and comparable method. We arrived at a target price of A\$1.39 per share based on the average of the values derived from the two methods. In addition, the recent acquisitions in the medical device and medical imaging industries indicate significant upside potential for Optiscan. For instance, in 2006, U.K.-based Philips Medical Systems acquired Intermagnetics General Corporation (NASDAQ:IMGC) for US\$1.3 billion; at a price/sales multiple of 4.27, U.S.- based Angiotech Pharmaceuticals, Inc. (NASDAQ: ANPI) acquired American Medical Instrument Co for US\$785 million; at a price/sales multiple of 4.50.

## Company Background & Business Strategy

Optiscan Imaging Limited (ASX: OIL) is an Australian company focused on the development and commercialization of confocal microscopes. The company uses its unique and patented optical fiber and laser technologies to develop miniaturized endomicroscopes that offer unparalleled magnification capability and image resolution quality of biological tissues and cells for the detection and monitoring of various diseases.

In 1988, Mr. Martin Harris (co-founder of Optiscan) made significant breakthroughs in the design of confocal microscopes. This resulted in the subsequent design and manufacture of the HBH desktop confocal microscope, which won a prestigious R&D100 award in 1991. Consequently, the company was formed in 1994 in order to further advance research and development activities. Optiscan was listed on the Australian Stock Exchange in August 1997 under the symbol OIL. Listing helped the company raise A\$3 million and provided necessary working capital to pursue a High Magnification Endomicroscope Project. In 1998, Optiscan was awarded an A\$1.9 million grant from the Australian Government's R&D Start Grant program to pursue R&D activities.

In February 2002, Optiscan entered into a A\$20 million development and commercialization agreement with Pentax Corporation, now Hoya Corporation (TYO: 7741) for flexible endomicroscopes. Four years later the product was launched. In 2007, the company launched its first branded product—Optiscan FIVE 1 for the preclinical research market. Continuous research and development activities have helped the company expand the applicability of its technology and develop new products for different medical needs. Currently, Optiscan is developing a rigid endomicroscope with Carl Zeiss AG. Moreover, the company is also developing the Venuscope, a rigid microscope for the women's health segment and the Roboscope, for robotic surgery, the first procedure under investigation is minimally invasive prostatectomies.

Optiscan has a strong and experienced management team. Recently, the company appointed Ms. Vicki Tutungi as CEO. She has years of experience in the scientific and technological field. Ms. Tutungi has successfully commercialized a number of manufacturing technologies and has carried out multi-million dollar licensing and sale agreements in her previous jobs. Her expertise is likely to help Optiscan grow as a leading provider of microscopic imaging technologies in the medical device market.

Key features of the company's business strategy are:

- Optiscan's strategy is to be a leading player in the development and application of microscopic imaging technologies in the healthcare area. This is likely to help the company increase its value, thereby benefitting its partners, customers and shareholders.
- Optiscan's strategy is to commercialize more advanced clinical diagnostic and imaging systems that can be used to detect cancers and several autoimmune and inflammatory diseases. For this purpose, the company is closely working with leading medical institutes and is continuing research to identify other potential indications of its products.
- Optiscan strategically identifies key growth markets to further exploit its products. For instance, the company has identified the women's healthcare segment as well as robotic surgery as potential markets for its products.
- Optiscan strategically pursues the commercialization of its intellectual property in the form of different optical imaging devices through tie ups with leading companies in the endoscope market. These companies have global marketing and distribution networks. Optiscan has entered into agreements with Hoya and Carl Zeiss AG. Simultaneously, the company aims to establish its own brand, with its first product—the Optiscan FIVE 1.

## Corporate Events and Actions

- June 19, 2008 – Optiscan announced the appointment of Dr. Jim Fox and Mr. Paul Wright on the company’s Board of Directors.
- June 17, 2008 – Optiscan announced the completion of a placement of 13.04 million shares at A\$0.23 per share, and raised A\$3 million. Proceeds from this placement are likely to strengthen the company’s cash position and help in it launch two new medical products in the market.
- June 10, 2008 – Optiscan established a global sales and distribution network for its FIVE1 endomicroscope used in preclinical research. The company opened a sales office in the U.S. and expanded its distribution network to extend coverage in Europe, Japan, North China, South China, Taiwan, India, South Korea and Malaysia.
- June 02, 2008 – Optiscan showcased its technology at 15 sessions at the annual Digestive Diseases Week Conference, the largest international meeting attended by gastroenterologists. The company received positive reviews for its endomicroscopy products.
- May 13, 2008 – Optiscan announced its plans to host a one-day seminar on confocal endoscopy on May 16, 2008.
- April 30, 2008 – Optiscan announced the commencement of the European multi-centre trial for endomicroscope. The trial, supported by Pentax Europe, is expected to draw 200 cases from hospitals in Germany, Italy and England. This multi-centre trial focuses on Ulcerative Colitis, for which a single centre trial has already been conducted at Mainz University Hospital, Germany and is expected to be completed in early 2009.
- April 29, 2008– Optiscan’s endomicroscope was showcased by the world’s leading gastroenterologists at the first ever Endomicroscopy Conference in Milan, Italy.
- February 12, 2008 – Optiscan announced the appointment of its CEO, Mrs. Vicki Tutungi, as a Director of the company.
- December 11, 2007 – Optiscan announced the appointment of Mrs. Vicki Tutungi as CEO, following the resignation of Mr. Matthew Barnett.
- October 02, 2007 – The company initiated a pilot clinical trial to study the use of its rigid endomicroscopes in endometriosis, a health condition found in women. The trial, which involves 20 patients, would assess the ability to predict relevant histopathology results in patients with either known or suspected endometriosis.
- September 05, 2007 – Optiscan announced that Pentax has reaffirmed its commitment to making efforts to increase sales of endomicroscopes, particularly in the U.S.
- August 13, 2007 – The company announced the resignation of its CEO, Mr. Matthew Barnett. However, he will continue as CEO for few months to ensure smooth development of Optiscan’s business.
- August 08, 2007 – Pentax Corporation, Optiscan’s partner in flexible endomicroscopes, was acquired by Hoya Corporation. Pentax is expected to become a Hoya subsidiary company, effective August 14, 2007.
- August 02, 2007 – Pentax Corporation announced a stock build up of excess inventory of ISC-1000 control boxes due to lower-than-expected sales.

## Management

### Board of Directors and Officers

#### Grant F. Latta, Chairman and Non-executive Officer AM, CPA, FAICD, B.Bus, MBA, FAIM, AAMI

Grant Latta is Executive Chairman of GCMCorp Pty Ltd, Director of Ricegrowers Limited (NSX: RGWB), Biota Holdings Limited (ASX: BTA) and Venture Capital Partners Trustee Board. In 1998, Mr Latta was appointed to the Federal Court as a Member of the Australian Competition Tribunal.

From 1985–1991, he was employed by Pacific Dunlop Limited as Managing Director of their Industrial Foam & Fibre Group and from 1991–1995, as Managing Director of their Food Operations. Mr. Latta was Chief Executive of the Camerlin Consortium from 1995–1998, Deputy Chairman of the Export Finance & Insurance Corporation (EFIC) 1995–2002, Director of Austrade 1994–2000, Past President of the Australian Chamber of Manufactures 1994–1996, Chairman of the Grains Research and Development Corporation (GRDC) from 1999–2002, Deputy Chairman of the National Dryland Salinity Program from 1999–2002 and Deputy Chairman of Food Science Australia 1996–2004.

Mr Latta was appointed a Non-executive Director and Chairman of Optiscan in August, 2002. He is also Chairman of the Remuneration Committee and the Nomination Committee.

#### Vicki Tutungi, Chief Executive Officer, BSc, LLB, MBA, GAICD

Vicki Tutungi holds a Science Degree and Law Degree from Monash University, an MBA from Melbourne University and a Diploma from the Australian Institute of Company Directors.

Ms. Tutungi joined Optiscan in February 2008 as Chief Executive Officer after a career with CSIRO, where she was Director of the newly established Niche Manufacturing Flagship. In this role, Ms. Tutungi was responsible for investing \$36.2M in research directed to assist the Australian Manufacturing Industry.

Prior to taking up this role, she was Chief of CSIRO's division of Manufacturing and Materials Technology and was responsible for running a \$50 million business unit. During her 13 years at CSIRO, Ms. Tutungi was involved in commercializing a number of manufacturing technologies, including establishing spin-off companies and negotiating multi-million dollar licensing and sale agreements. She has also served on the board of a number of companies including CAST and VCAMM.

She holds degrees in Science and Law from Monash University, an MBA from Melbourne University and a Diploma from the Australian Institute of Company Directors.

#### Keith Daniel, Non-executive Director, FTSE, FIEAust, CPEng

Keith Daniel is a Non-executive Director with extensive experience in the commercialisation of medical instruments. He has spent the last 39 years in the medical device industry largely taking innovative Australian technology to world markets. During that time Mr. Daniel held senior general management and technology management roles in various global subsidiaries of Nucleus Ltd. including the role of CEO and Chairman of Nucleus before his retirement in 1999. Nucleus has been the nurturer of many of Australia's leading healthcare companies including Cochlear Limited, the world's leading manufacturer of implantable prosthetic devices for the hearing impaired; the Telectronics group, developing and marketing implantable cardiac pacemakers and defibrillators, and AMBRI Pty Ltd, the developer of a breakthrough technology in the field of membrane biosensors.

Mr Daniel was a founder and director of Milvella Pty Ltd, a start up since 1999, which has developed and marketed devices worldwide, used in cataract and refractive surgery.

### **Peter Delaney, Director of Technology, BSc (Pharm) (Hons.)**

Peter Delaney, Director of Technology, completed a Science degree with honours in Pharmacology at Monash University in 1989. Mr. Delaney has played a major role in the refinement of the fibre optic approach to produce a commercial instrument which received an R&D 100 Award in 1991. In 1993, he received the Victorian Young Achiever Award (Science and Technology) for his development of the company's strategy and infrastructure. Mr Delaney was appointed Director of Optiscan Pty Ltd in March 1994, and was Managing Director until December 2002, at which time he assumed the role of Director of Technology.

### **Antony (Tony) Rogers, Non-Executive Director, CPA, MAICD**

Tony Rogers is a Director of Australian Securities Limited and Monash University Commercialisation and Intellectual Property Committee.

From 1963 to 1993, Mr Rogers was employed by I.C.I. Australia Limited holding a variety of management roles. In 1987, he was appointed General Manager, Industrial Chemicals Group. In 1989, he became General Manager of Plastics Group, and in 1991, General Manager, Chemicals & Plastics Group. During this period Mr. Rogers also served as a Director of I.C.I. Finance, Vinindex/Tubemakers, I.A.C.C. Thailand and was National President of the Plastics Institute of Australia for four years. He also served on the Federal Government's Waterfront Commission.

From 1993 to 1997, Mr Rogers was CEO of Smorgon ARC and served on the Smorgon Steel board and Smorgon Group Operations Executive.

He was appointed a Non-executive Director of Optiscan in August 2002, and is Chairman of the Audit Committee.

### **Dr. James (Jim) Fox, Non-Executive Director, BE, M.Eng.Sci, PhD**

Dr Fox has more than 25 years of experience as a public company Director across a range of internationally based businesses. His particular track record is in the building of innovative, technology based companies in competitive international markets. After eight years of working around the world with a large international management consulting company, Dr. Fox started his own technology based product and service company in 1987. Following the merger of his company with the then listed Vision Systems Limited in 1993, Dr. Fox took over as CEO of the combined group. In December 2006, he retired as the CEO of Vision Systems Limited following a heavily competed takeover of the company by a large U.S.-based corporate, which resulted in significant returns (close to \$1 billion) to shareholders. Dr Fox is also a Director of Air New Zealand Limited, Futuris Limited and TTP Group (UK).

Dr Fox was appointed a Non-executive director of Optiscan on 1 July, 2008.

## **Other Personnel**

### **Dr. John Allen, Licensing and Intellectual Property Manager**

Dr. Allen joined Optiscan in July 2001. He started his career as a veterinarian in rural Victoria. Thereafter, he spent time in developing countries in South East Asia and the Middle East as a veterinarian on rural technology transfer projects and as a consultant to the International Food and Agriculture Organization of the United Nations. He then returned to Australia and worked as Assistant Director in the Victorian Institute of Animal Science.

In 1995, Mr. Allen was appointed Director of Research at Victoria University, where he was responsible for securing R&D funding and patenting and licensing the university's Intellectual Property (IP). In 1999, he moved to the Pig Research Development Corporation (PRDC) in Canberra as Commercial Program Manager. Mr. Allen left PRDC at the end of his contract to take up his current position at Optiscan.

He has an MBA, a Graduate Diploma in IP Law, an Honors degree in Veterinary Science, and a PhD in Biochemistry.

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**Bruce Andrew, Chief Financial Officer**

During the 1980s, Mr. Andrew held a number of corporate accounting and finance positions. These included General Manager Finance of a multi-national Australian manufacturing and construction group, National Administration Manager of a division of Mayne Nicholas, and Group Accounting Manager of AMEV Australia, a multinational financial services group.

During the 1990s, he was mainly engaged in his family business in the tourism and leisure industry, and was responsible for commercial and financial management. Mr. Andrew also did various part-time accounting jobs in a number of listed and private businesses, in a range of industries, including publishing, restaurants, manufacturing and legal services. Throughout this period, he was constantly engaged in the accounting and reporting activities of listed companies.

In 1997, when Optiscan was listed on the ASX, he served as Company Secretary on a part time basis. In 2002, Mr. Andrew assumed the full-time role of a Chief Financial Officer.

**Robert Pattie, Research and Development Manager**

Mr. Pattie joined Optiscan in August 2001. He started his career at Telstra Research Laboratories as a photonics researcher. He conducted research in the fields of miniature bulk optic devices, fabrication of new photonic integrated circuit components, and exploitation of novel optical glasses. His work has led to several Australian and international patents being awarded to Optiscan. He joined the company as an optical engineer. Later, Mr. Pattie was appointed Optical Core Competency Manager before being promoted to the position of R&D Manager. Restructuring at Optiscan saw Mr Pattie move into the areas of company strategy formulation and business modeling for some time.

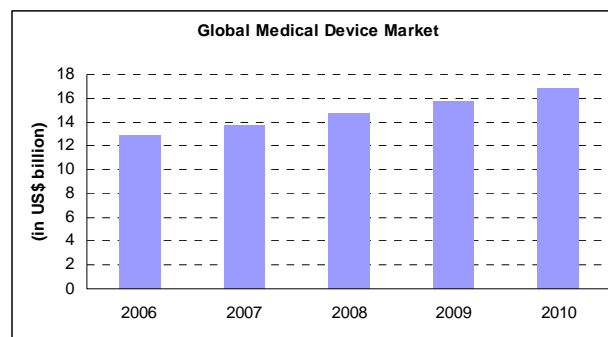
Mr. Pattie holds a Bachelor of Engineering in Electronics and a PhD in Photonics.

## Industry Overview

The global medical equipment market is witnessing rapid growth as a result of modernization of healthcare standards, increase in life expectancy, and most importantly continuous technological innovations. In order to improve the quality of their lives patients prefer to use medical equipment that is safe, efficient and minimally invasive. These factors have led to the emergence of minimally invasive techniques that are employed during performing various diagnosis and surgeries using miniaturized medical devices such as endoscopes, colonoscopes, catheters and robotic systems. The use of these minimally invasive instruments is highly economical, less painful and therefore, the patient has fewer chances of developing any complications post diagnosis or surgery.

According to BCC research, the global market for Minimally Invasive Surgery (MIS) devices was estimated to be US\$12 billion in 2005, of which the U.S. held 60%. The global MIS market is expected to reach US\$18.5 billion by 2011.

**Chart 1: Growth in Medical Device Market**



Source: BCC research

### Endoscopes

Lately, endoscopes have gained considerable importance in the MIS market as they enable diagnosis and various surgeries with the smallest artificial openings using remote controlled instruments and micro viewing systems. An endoscope consists of various micro-components- lenses, an image transfer element such as confocal microscopes and a light transfer element such as optical fibers. These components help endoscopes to provide high magnification and high quality images of the biological specimens that are being examined. Although endoscopes are widely used in medicine and technology, their main areas of application are gastroenterology, gynecology, urology, neurosurgery, ear, nose and throat (ENT) and orthopedics. The advantage of using endoscopes is that they cause minimal scarring, prevent nerve damage, bleeding, bruising and swelling and ensure speedy recovery. Moreover, one can also avoid or minimize the need for biopsy (removal of a cell or tissue for examination) if the cell or tissue is examined using endoscopes with high magnification.

### Types of Endoscopes

Flexible endoscopes are tube like instruments that enter the body through a natural orifice (lips, jaws etc.) and enable physicians to view the interior of a body organ and carry out screening, diagnostic and therapeutic procedures. Flexible endoscopes generally utilize various channels such as fiberoptic bundles, confocal microscopes or video camera technology for image production. Flexible endoscopes are generally used in bronchoscopes (examination of lung tissue), sigmoidoscope (examination of the rectum and colon). According to Optiscan, currently the global flexible endoscope market is estimated to be US\$1.2 billion.

Rigid endoscopes generally utilize a stainless steel tube, which covers a series of high resolution lenses in order to transmit the optical image. Most rigid endoscopes do not have the channels that are characteristic of flexible endoscopes. Rigid endoscopes are largely used for surgical procedures such as arthroscopy, laparoscopy, and gynecology.

### Market Scenario for endoscopes

The endoscope market is largely dominated by few major players from Europe (particularly Germany), the U.S. and Japan. The Millennium Research Group estimates the European endoscopy market to be worth US\$1.6 billion by 2008. According to Global Analysts, Inc, the European market is dominated by Germany, which is expected to reach US\$184 million in 2010.

According to Frost & Sullivan, the total U.S. endoscopes market in 2005 stood at US\$449.9 million, which is expected to reach US\$513.5 million by 2012, expanding at a compound annual growth rate (CAGR) of 1.9%.

The rigid endoscopes segment is largely dominated by German companies such as KARL STORZ GmbH & Co., AESCULAP AG & Co. KG and Richard Wolf GmbH of which Karl Storz is the largest marketing broad range of endoscopes for all possible applications. On the other hand, the flexible endoscope market is dominated by several leading companies such as Olympus Corporation (TYO: 7733), with 70% of the market share, followed by Hoya Corporation and Smith and Nephew plc (ADR) (NYSE: SNN).

### Developments

There have been numerous developments in the field of endoscopy to make it patient friendly and less painful. For instance, several companies including Olympus Corporation manufactures capsule endoscopes, which can be used in all parts of the gastrointestinal tract, including the esophagus, the stomach and the colon. These endoscopes are patient friendly as they do not involve tube insertions, instead they are capsules which can easily be swallowed and do not require topical anesthesia in the throat. Interestingly, capsule endoscopy is the fastest growing segment of the GI devices market and is valued over US\$70 million. However, these devices do not offer the high level of magnification similar to Optiscan's flexible endomicroscope. Moreover, the company is also developing an endoscope for robotic prostatectomy procedures. There are also ultra-slim video-endoscopes manufactured by various companies, which are predominantly used in the gastro-intestinal tract.

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### Picture 1: Capsule Endoscope

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*Source: Olympus Corporation*

In addition to modernizing endoscopes, studies are also being carried out for new imaging technologies. For instance, the Government of Germany announced an industry-government program worth US\$1.43 billion in molecular imaging technologies for the early detection of cancer, neurodegenerative conditions and cardiovascular diseases. This program would be carried out by companies such as Bayer Schering Pharma AG (AG (FRA: SCH), Boehringer Ingelheim Pharmaceuticals, Inc., Siemens Medical Solutions, Karl Storz and Carl Zeiss AG.

### Challenges faced by the endoscopy market

Although endoscopes are considered a major breakthrough in the medical field they pose a number of health risks and problems for both patients and medical personnel. Since endoscopes are used repetitively, they constantly come in contact with the patient's blood, tissue or stool. Therefore, they need to be cleaned and disinfected manually after each procedure. Moreover, in the case of flexible endoscopes their complex design, which contains various channels makes cleaning a time consuming and expensive process. Endoscopes also face a few constraints in terms of their usability. Given the complex design of endoscopes, some surgeries may take much longer when an endoscope is used. Although, endoscopes are considered cost effective as they eliminate the need for sedation as well as patient monitoring, surgeon and equipment fees for endoscopy is still higher compared to open surgeries.

## Technology

### Confocal Microscopes and Optiscan Technology

Confocal microscopy is an optical imaging technique used to increase micrograph contrast and to recreate three-dimensional images for thick specimens. There are three types of confocal microscopes—Confocal laser scanning microscopes, spinning-disk (Nipkow disk) confocal microscopes and Programmable Array Microscopes (PAM). Of the three, Confocal laser scanning microscopes provides the best image quality. They magnify images by more than 1000 times compared to conventional endoscopes that magnify images by 10 to 20 times.

These Confocal microscopes are widely used in scientific and industrial fields particularly in semiconductor inspections and life sciences. Lately, Confocal microscopes have emerged as one of the fastest growing biological research techniques. When used to examine biological specimens, the principle of confocality allows these powerful microscopes to obtain images from beneath the surface of the specimens. A laser is projected on an identified target in a specimen, either on or below the surface of the object, which needs to be magnified. The target area is checked rapidly across a few cells at a time, and special optics are employed to ensure that only light returned from the identified target at the specified depth is captured and measured. This signal is then displayed in real time in the form of an image on a computer screen. Confocal microscopes are considered essential for live cell microscopy and are widely used with endoscopes for live cell investigation.

Optiscan's patented technology used for in vivo confocal imaging consists of a flexible optical fiber to transmit the laser from its source to focus light on a specimen. The same optical fiber can then be used to carry the light back to an image acquisition system. Thus, the unique feature of the technology is that it uses a single optical fiber, which separates the large laser and control systems from the microscope's scanning head. Moreover, it also miniaturizes the microscope's scanning head, making it so small that it could easily fit inside the body. Once the miniaturized scanner integrates into an endoscope, it enables the operator to efficiently scan suspect areas of the tissue and gets high quality images of the tissue (with a magnification of 1000 times) at a cellular level. This helps doctors or examiners to instantly see cellular level details of a living tissue with a highly magnified view.

The salient features of the technology are described below:

- Optiscan's scanning system produces a lateral resolution of 0.7 unit of measurement (um) and an axial resolution of 7 um, in an image field of view of 475 um x 475 um. It has a scan speed of 0.7 frames/sec at 1024 x 1024 pixel mode and a speed of 1.2 frames/sec at 1024 x 512 pixel mode. The system also has a dynamic Z depth adjustment, which is controlled by the operator, across a range from surface to 250 um into the tissue.
- It is a technology with multiple applications within clinical research and disease diagnosis.
- The technology helps in the production of small, mobile clinical equipment used to diagnose diseases such as gastrointestinal tracts and cancers in humans, as well as research applications. It also has the potential to modernize current pathology and histology examinations.
- The technology is able to produce sharper and higher resolution images for diagnostic uses, eliminating the need for removing the tissue through invasive procedure such as biopsy. These images also assist in the early identification of treatment options and enable improved patient outcomes. This in turn helps save on the high cost of therapeutic medication.

### Comparative Analysis

There are also other technologies used in vivo confocal imagings. Mauna Kea Technologies (MKT)'s cell-vizio fibered confocal imaging system uses optical fiber bundles as the endomicroscope probe. In the MKT system, the scanning occurs only across the proximal end of the bundle inside the processor unit as there are no moving parts in the tip of the endomicroscope. Since each bundle can only be packed with fibers to a certain finite density, the image quality as well as the resolution is highly reduced compared to the Optiscan's point scanning system. For instance, a 1.1 millimetre (mm) diameter bundle contains around 30,000 fibers, and each fiber contains a small core and surrounding cladding. Consequently, an image from this bundle is 0.03 mega pixel compared to 1.0 mega pixel for Optiscan's system. Moreover, the imaging gaps between each of the fiber cores is around 3.5 um, while Optiscan's technology does not have any gaps in the cores, thereby providing better quality images.

However, the MKT system offers a faster scan frame rate, 12 frames/sec compared to Optiscan's scanner which offers 1.2 frames/sec. Moreover, Olympus Corporation also markets endoscopes manufactured using its confocal technology. However, this technology only magnifies the cells at surface levels.

### **New Developments**

In addition to the above mentioned technology, the company is developing a couple of technologies that could provide images from deeper parts of the tissues. One technology is the near infrared technology, which is likely to have a longer wavelength of 770 nano-metres (nm). Optiscan is developing this technology with the Mainz University Hospital, Germany.

Multiphoton is another technology which is useful for noninvasive three-dimensional (3-D), high-resolution imaging of tissue of internal organs. The already available multiphoton microscopes come in bulky, benchtop configurations. Optiscan's fiber scanner would enable the multiphoton technology to be taken from the benchtop and reconfigured into a miniaturized, handheld microscope probe. Optiscan in collaboration with the Swinburne University of Technology, Australia is developing this technology.

### **Patents**

The company has many patents protecting its intellectual property with respect to optical fiber based confocal microscope systems and miniaturized confocal microscope scanners. Most of its patents are granted in countries including the U.S., the U.K, Canada, Australia and Japan. Optiscan's original confocal microscope patent families will expire in June/July 2009 and August/November 2009 for Australia, Canada, Japan, European designated countries and the U.S. These patents contain claims over the use of optical fibers to create the confocal pinhole and scanning the light at the tissue end of the fiber, thereby building up a confocal image of the tissue. Currently, Optiscan receives annual and once-off royalties from these patents from a number of confocal microscope manufacturers.

However, once the patents expire other competitors could also use an optical fiber to create a confocal endomicroscope. Nevertheless, Optiscan has patented several technical issues with respect to the confocal endomicroscope, which are difficult to overcome, making it difficult as well as costly for another manufacturer to produce an equally high performing confocal endomicroscope. Furthermore, the company has a large portfolio of other patents and patent applications that include claims covering new miniaturised scanner technologies and associated small lens assemblies, end tip designs, connectorisation, which enable the scope to be optically and electrically disconnected from the laser processor module.

Optiscan has also been conducting various innovations for some years in order to design new patents. The company been developing designs and working prototypes for improved smaller scanners to enable them to fit into smaller endomicroscope probes to access a wider range of medical and research imaging applications. In FY 2007, both the U.S. and UK patents were granted with claims covering one of the designs. All these efforts have helped the company expand its IP portfolio through the filing of several new patent applications including smaller scanner systems and a patent covering combination-imaging involving fluorescent macroscopic imaging to identify cancer biomarkers followed by confocal endomicroscopic imaging of the tagged cells to achieve a high sensitivity and specificity for early cancer detection.

## Products

Optiscan's product portfolio consists of a wide range of microscope imaging devices developed using its novel laser and optical fiber technology. Its main product is the flexible endoscope, the world's first confocal endomicroscope, which the company develops and sells in collaboration with Pentax Corporation, now acquired by Hoya Corporation (TYO: 7741). Hoya is a leading Japanese globally diversified company, which produces optical materials and components. The other product launched by the company is the Optiscan FIVE 1, which is used in pre clinical trials. Apart from these marketed products, the company is developing a rigid endomicroscope with Carl Zeiss AG (FRA: AFX) the Venuscope, a rigid endomicroscope used in women's healthcare for diagnosing various diseases such as endometriosis, cervical and ovarian cancer and the Roboscope, another rigid endomicroscope used in robotic surgeries, particularly prostatectomy.

### Flexible Endomicroscope- ISC-1000 system

Optiscan's flexible endoscope is a diagnostic medical instrument predominantly used in the gastrointestinal tract. It is a miniaturized version of the company's earlier hand held probe, the Stratum. It is designed in such a way that it can be deployed in the body for detecting and monitoring diseases of the upper and lower GI tract such as colon cancer, ulcerative colitis and Barrett's oesophagus.

Optiscan has jointly developed this product with Pentax as part of a collaborative development and commercialization agreement. According to the agreement, Optiscan supplies scanner and a Confocal Imaging System (CIS), to Pentax. The CIS system consists of two personal computer sized boxes containing the system's laser, filters, light detector, scan drive and image acquisition electronics. These components are manufactured in Optiscan's Melbourne manufacturing facility. Pentax then assembles the scanner into a flexible endoscope and incorporates standard endoscope components such as the miniaturized video camera, light sources for camera, working channel and air and suction ports. These finished endomicroscopes are then combined with a CIS sub-system and a standard Pentax video processor unit. Pentax exclusively markets and distributes these endoscopes worldwide.

### Picture 2: ISC-1000 system



Source: Company

The agreement with Pentax included A\$20 million as up-front payments. In addition to revenues from the supply of scanners and imaging systems, Optiscan also receives royalties on the sale of end products—flexible endoscopes.

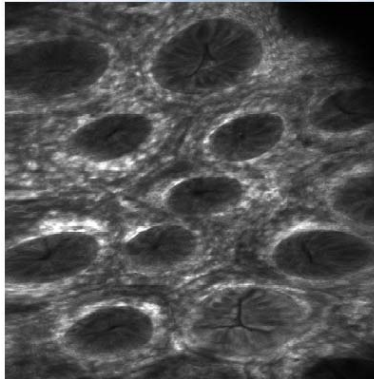
According to the agreement with Pentax, Optiscan and the company established the usefulness of flexible endomicroscopes by conducting a global trial program in 2003. Two human clinical trials at Mainz University Hospital in Germany were carried out using flexible endomicroscopes. These endomicroscopes accurately detected colon cancers and neoplasias (very early cancers). These positive results demonstrated that the company's flexible endomicroscopes can be used to improve standard diagnosis procedures in order to detect various diseases. In addition, the results indicated that Optiscan's technology can be used in gastroenterology. Subsequently in 2004, the company received regulatory clearance from the US Food and Drug

Administration (FDA) for the Pentax/Optiscan flexible endomicroscope, ISC-1000 system to be sold in the U.S. The company also received regulatory approval for Europe, Canada, Australia and other countries.

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### Picture 3: Images of Tissue from Endomicroscope

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*Source: Company*

In 2005, Pentax introduced the product at the annual meeting for Digestive Diseases Week (DDW) in Chicago, attended by the world's gastroenterologists. Pentax hosted an endomicroscopy symposium at the meeting. The symposium featured presentations on techniques for effectively using the ISC-1000 and the diagnostic information contained in endomicroscope images. A panel of doctors from the U.S., Europe and Asia presented key findings of using endomicroscopes for various clinical applications such as gastric Intestinal Metaplasia, Celiac's Disease, Non-erosive reflux disease (NERD) and Collagenous Colitis.

In 2006, Pentax commenced the commercial sales of its endomicroscopes in leading research centers and hospitals in Europe, the U.S., Asia and the Middle East. The U.S. market for this product received a significant boost when Johns Hopkins hospital, the most prestigious teaching hospital in the U.S., announced its plans to use endomicroscopes for research and teaching purposes aimed at improving early cancer diagnosis.

Optiscan sold a total of 47 control systems and 71 miniaturized scanners during FY 06. As the product's market penetration increased, the company received more orders from Pentax and supplied 88 control systems and 106 miniaturized scanner sets during FY 07. However, beyond this period, Pentax's orders for control systems decreased on account of an inventory build up which is likely to be cleared by FY08. Nevertheless, the demand for miniaturized scanners has remained strong, which is likely to drive the near term revenues from this product.

Moreover, the acquisition of Pentax by Hoya is also likely to be beneficial for the company. Hoya has identified the life care segment of Pentax, which consists of endoscopes, intraocular lenses and other medical devices as a strategic growth area. As a result, Hoya is expected to utilize revenues generated from its information technology and eye care areas for expanding its life care business. Moreover, Hoya's well established manufacturing, marketing and distribution network would also lead to increased sales. Optiscan and Hoya are also expediting efforts to expand its product sales in Asia and Australasia. For this purpose, the companies are establishing various clinical trial sites in these countries.

Optiscan is also keen on obtaining reimbursement from the health insurers for medical procedures using the endomicroscopes. Multicentre trial programs are being conducted by Hoya in Europe to achieve proof of efficacy and to assist in obtaining reimbursement by insurers. Under a US\$7 million agreement signed in 2007, Hoya is likely to spend approximately US\$5 million for these programs in Europe and the U.S. and around US\$2 million for the development of new instruments.

Optiscan is also laying emphasis on developing a better training infrastructure for the use of endomicroscopes as the company considers appropriate training to be a major driver for the growth of its product. Moreover, Optiscan is likely to benefit from several initiatives undertaken by various hospitals in this direction. Mainz University hospital and Royal Hallamshire Hospital in the UK have launched a formal training program in both adult and paediatric endomicroscope procedures. Furthermore, a website, [www.endomicroscopy](http://www.endomicroscopy) has been upgraded to include an introduction to endomicroscopy with emphasis on clinical practice and techniques.

The table below provides the number of indications where endomicroscopy has proved to be advantageous based on different studies undertaken across the globe.

**Table 1: Different Applications of Endomicroscopy**

Organ	Indication
Oesophagus	Barrett's esophagus and Barrett's Cancer
	Oesophageal squamous cell carcinoma
	Non-erosive reflux disease
	Reflux esophagitis
Stomach	H.pylori
	Gastritis
	Gastric intestinal metaplasia
	Gastric Cancer
Small Bowel	Ceoliac disease
Colon	Ulcerative Colitis
	Colorectal Cancer surveillance
	Microscopic colitis
	Graft Versus Host Disease (GVHD)
	Pouchitis (in colectomy patients)
All	Paediatrics

Source: Company

### Rigid Endo-microscope Zeiss Product

Optiscan is developing a rigid endomicroscope with Carl Zeiss AG, a leading company in high precision optical instruments. According to the agreement, the company would manufacture endomicroscopes (for an undisclosed application) in its Australian manufacturing facility using its platform technology. The instruments would then be sold exclusively under the Carl Zeiss brand in its core market segments through its distribution and marketing network, which spans across 30 countries. Carl Zeiss would bear the costs associated with endomicroscope integration into their existing product platform, as well as marketing and distribution of instruments. The A\$20 million agreement includes milestone payments of A\$4 million to Optiscan for successfully completing design and development activities and clinical trials over the first three years in order to bring the product to the market. The remaining A\$16 million would be received from the sale of rigid endomicroscopes in the first five years.

In December 2007, the company successfully carried out animal trials using the endomicroscopes. Currently, Optiscan is conducting human trials the results of which are expected in late 2008. The company estimates the global rigid endomicroscope to be worth US\$1 billion. Moreover, Optiscan's rigid endomicroscopes have potential applications in areas such as orthopaedics, gynaecology, laparoscopy, and ophthalmology, thus representing a huge opportunity to Optiscan. As a result, Optiscan is seeking more agreements for the development of the rigid endomicroscopes.

### Optiscan Fluorescent In Vivo Endomicroscope (FIVE) 1

The Optiscan FIVE 1, a research confocal microscope, enables in vivo tissue imaging at cellular level in real time. The product is a minor variation of the ISC-1000 system and results in significant cost savings and high margins on unit sales. The instrument has the same miniaturized scanner which Optiscan supplies for flexible endoscopes in the form of a small rigid endoscope style probe. This instrument is connected to a CIS sub-system which has a different configuration and software from the system currently supplied to Hoya. Since strict regulatory requirements prevent it from being used in human clinical trials, it has been customized to meet the requirements of research markets for pre clinical studies. The product can be used for a range of pre-clinical applications in the areas of stem cell research, tissue regeneration, arthroscopy, gene therapy and the development of cancer therapies.

Optiscan FIVE 1 is a turn key system that is pre-calibrated and ready for immediate use. Its salient features are described below:

- The highest resolution in vivo microscopy is available in the product.
- Its usage does not require a microscopy experience.
- It has a dynamic imaging depth adjustment and hence there is no need to change probes for different depths.
- The product comprises an easy to use software and image capture.
- It has a fully integrated instrument software consisting of image acquisition and image management database and is simple to use.

The Optiscan FIVE 1 was developed and launched in early 2007. Initially, Optiscan FIVE 1 was largely exhibited in a small number of exhibitions and conventions. The product also had a limited and low cost marketing network. However, the product was well received on account of its unique capability of in vivo imaging. As a result, a detailed business plan was executed in order to expand its target market, which included the opening up of U.S. sales office and expansion of its sales and marketing team in the U.S. and Australia to service Australian and the Asia Pacific region. Optiscan has also appointed distributors in Europe, Japan, North China (Beijing), South China (Shanghai), Taiwan, India, South Korea and Malaysia.

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#### Picture 4: Optiscan FIVE 1 with LCD Monitor

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Source: Company

Optiscan is also focusing on establishing awareness for the use of Optiscan FIVE 1 through the publication of research papers. Off late, several research papers have been published by leading research institutes in Australia, U.S., Singapore and Europe using the product as a key tool for research. Recently, according to an article published in the Gastroenterology journal, Optiscan FIVE 1 with its very high sub-cellular resolution successfully imaged (in vivo) the gaps in the gut lining that result from the dislodgement of surface cells in the intestinal lining.

Optiscan has sold 17 systems of the Optiscan Five 1 till date. Since the product is a research device, it often requires a process of grant application, justification, and budget approval for researchers to purchase the product. Consequently, the sales are likely to grow gradually. However, the company expects growth in sales once the long sales lead time convert into actual sales. Moreover, since the product is a minor variation of the ISC-1000 system it results in significant cost savings and high margins on unit sales.

#### Venuscope

Optiscan is leveraging its platform technology to develop a new rigid microscope for women's healthcare- the Venuscope. The Venuscope has been designed for the detection of various women's health conditions including endometriosis, cervical cancer and ovarian cancer. The product has been designed to operate with a single use disposable sheath. This disposable sheath is also expected to help Optiscan create a new consumable product line.

Endometriosis is a common medical condition characterized by growth of endometrial tissue outside the uterus. It causes painful periods, pelvic pain and infertility. This condition is known to affect up to 10% of women in the childbearing age group in Australia and over 5 million women in the U.S. It was estimated in 2007, that over 2 million exploratory laparoscopies were performed for suspected endometriosis in the U.S.

Endometriosis can be diagnosed and treated through minimally invasive surgery (MIS) or keyhole surgery. However, in many cases it is difficult to identify if endometriosis is present using the currently available laparoscopes. Optiscan's rigid endomicroscope can help overcome this difficulty through its ability to facilitate histopathology (microscopic examination of tissue). The company initiated clinical trails for rigid endomicroscopes in October 2007, recruiting 20 patients for the study.

The study was aimed at assessing the ability of Venuscope to predict results which are similar to the histopathology results in patients who either suffer or are susceptible to endometriosis. Moreover, another trial is expected to commence in Q408.

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**Picture 5: Venuscope**

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*Source: Company*

Optiscan is also keen on establishing the Venuscope's efficacy for the use in detection and diagnosis of early stage cervical cancer. Cervical cancer is an early abnormal change in the cells of the cervical epithelium. Currently, patients who have a positive screening test for cervical cancer undergo a colposcopy where biopsies of suspect tissue are taken. Optiscan's Venuscope can be used in combination with the colposcope. This would lead to enhanced visualization enabling more precise biopsies, thereby increasing the accuracy of the colposcopy procedure. Currently, Optiscan is seeking partners to develop the Venuscope.

**Roboscope**

Optiscan is developing a robotic endomicroscope—the Roboscope. The robotic endomicroscope is likely to have high usability in robotic surgeries, particularly prostatectomies. A prostatectomy is a delicate procedure involving the removal of the prostate gland. In order to improve patient outcome and preserve the patient function the surgeon is required to cut connective tissue and not the nerve tissue. Optiscan's Roboscope helps to differentiate between nerve tissue and connective tissue, thus ensuring a better outcome for the patient. The company is co-developing this product with a manufacturer of surgical robots. In 2007, Optiscan conducted a lab trial and is also preparing for clinical trials expected to commence in Q308.

**Royalty Income**

In addition to the above products, Optiscan earns revenues through licenses of its fiber confocal technology to various leading producers of desktop confocal microscopes such as Carl Zeiss, Olympus Corporation (TYO: 7733), Nikon Corporation (TYO: 7731) and PerkinElmer, Inc., (NYSE: PKI). This helps Optiscan earn a reasonable amount of royalties.

## Financial Forecast and Analysis

### SUMMARY

We valued Optiscan Imaging Limited (ASX: OIL) using the Discounted Cash Flow and Comparable methods. This returned a 18–36 month average price target of A\$1.39 per share, which is more than six times the current stock price of A\$0.22 per share.

### DCF Approach

Currently, Optiscan earns revenues from the sale of ISC-1000 systems (flexible endomicroscopes) and Optiscan Fluorescent in Vivo Endomicroscope (FIVE) 1. The company also earns revenues from royalties by licensing its patented technology. In addition to the current stream of products, we expect Optiscan to be able to earn future revenues by successfully launching other advanced stage products. We have forecasted revenues from 2009–2018.

We have also made the following assumptions for the DCF model:

- We expect revenues from ISC-1000 systems to start picking up from 2009, considering the keen interest shown by Hoya Corporation (TYO: 7741) in developing the endoscope segment. However, beyond 2012, we expect the growth momentum to gradually slow down as competition increases. We expect sales of the Optiscan FIVE 1 to follow a similar trend.
- For rigid endomicroscope, we have assumed that the company would start receiving milestone payments (totaling A\$4 million) from Carl Zeiss from 2009 for the next three years. We expect the product would be commercialized in 2011. Optiscan would receive sales revenue from Carl Zeiss including A\$16 million for the first five years. However, as the product is still in the pipeline, we have assigned a probability of 60% for successfully achieving the milestones for the product launch. Furthermore, revenues have been adjusted accordingly.
- In case of Venuscope, we have assumed that the product will be launched in 2012 targeting only one disease-endometriosis, since the product is currently being tested for the same. Our revenue forecast for the Venuscope is on a conservative side and hence we have assigned a probability of 55% for the successful launch of the product.
- The model does not include revenue forecast for the Roboscope as the product is in the research and development phase.
- Going forward, as the company strengthens its operating efficiency; we expect R&D expenses and other operating expenses to grow at a declining rate.

Based on these assumptions, we projected the annual revenues and costs to arrive at Optiscan's net income over the explicit forecast period. We determined the free cash flows accruing to Optiscan during the forecast period. Beyond this period, projections were made by assuming a terminal growth rate of 1%. We then discounted the free cash flows and terminal value by 13.83% or the cost of equity. Our cost of equity was based on a risk-free rate of 4.5%, risk premium of 8.48% and beta of 1.1. We then added the discounted free cash flows, terminal value, and cash balances to arrive at the company's enterprise value. As of the date of valuation, Optiscan had approximately 117.23 million outstanding shares. By dividing the enterprise value with the total number of outstanding shares, we arrived at a target price of A\$1.52 per share.

### Comparable Approach

We calculated the price/sales ratio multiple for Optiscan by taking the average price/sales multiple of the comparable companies operating in the medical device and imaging technology field. We then multiplied the company's discounted revenue of 2012 (we expect Optiscan to be a fairly established company by this year as all its advanced stage products would be launched) with the average price/sales multiple and arrived at a market capitalization of A\$ 147.02 million. By dividing the market capitalization with the total number of outstanding shares, we arrived at a fair price of A\$1.25 per share.

The table below depicts acquisitions in the medical device and medical imaging industries; which indicate towards the upside potential for Optiscan.

**Table 2: Acquisitions in the Medical Device and Medical Imaging Industries**

Acquirer Company	Target Company	Industry/Products	Value of Acquisition (in million US\$)	Price/ Sales Multiple	Year
Philips Medical Systems	Witt Biomedical Corporation	Hemodynamic monitoring and clinical reporting systems	165	–	2006
Angiotech Pharmaceuticals, Inc	American Medical Instrument Co	Medical Device	785	4.50	2006
Philips Medical Systems	Intermagnetics General Corporation	molecular imaging	1300	4.27	2006
Moog Inc.	Curlin Medical Inc.	Medical device/ precision control components and systems	75	4.70	2006

Source: *Medical Product Outsourcing (MPO) and Medical Device & Diagnostic Industry magazine (MD&DI)*

## Conclusion

Optiscan is an attractive investment opportunity for investors interested in benefiting from the growth in the optical imaging technologies as well as the medical device market. Since its inception, Optiscan has leveraged its technology for the development of optical imaging technologies to be used in endoscopes. The company's initiatives to enhance the market for its commercialized products as well as advance its product pipeline encourage us to have a bullish outlook on the company's growth prospects. We expect Optiscan's stock to reach a target of A\$1.39 per share at a corresponding market cap of A\$162.43 million over a 18-36 month investment horizon.

## Exhibit 1: Income Statement

CONSOLIDATED INCOME STATEMENT- Optiscan														
Particulars	2005A	2006A	2007A	2008A	2009E	2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E
<i>All figures are in 000's A\$ except per share data all assumptions are marked in yellow</i>														
<b>Revenues</b>														
Sale of Goods	1,019	3,188	5,648	1,385	4,781	10,348	24,125	60,544	112,367	172,618	243,981	331,178	430,974	549,551
Rendering of Services	45	44	59	42	59	80	108	146	197	265	358	483	653	881
Other revenue	1,226	1,982	2,837	1,398	619	626	616	633	662	813	1,342	1,766	2,453	3,088
<b>Revenue</b>	<b>2,290</b>	<b>5,214</b>	<b>8,545</b>	<b>2,825</b>	<b>5,459</b>	<b>11,054</b>	<b>24,849</b>	<b>61,323</b>	<b>113,226</b>	<b>173,696</b>	<b>245,681</b>	<b>333,427</b>	<b>434,080</b>	<b>553,519</b>
<b>Cost of Sales</b>	<b>789</b>	<b>2,455</b>	<b>3,951</b>	<b>1,172</b>	<b>2,194</b>	<b>4,371</b>	<b>9,520</b>	<b>23,531</b>	<b>43,750</b>	<b>67,496</b>	<b>95,966</b>	<b>130,880</b>	<b>170,927</b>	<b>218,406</b>
Gross Profit	1,501	2,759	4,594	1,653	3,265	6,683	15,329	37,792	69,476	106,200	149,715	202,548	263,153	335,114
Other Income	562	420	898	1,082	-	-	-	-	-	-	-	-	-	-
Marketing expenses	174	182	399	808	553	1,112	2,493	5,544	9,139	12,325	17,488	22,138	26,711	34,110
Research & development expenses	3,308	3,122	3,678	3,622	1,737	2,856	6,331	13,229	20,362	24,875	28,578	28,098	39,579	45,622
Administrative expenses	3317.196	3,357	3,304	3,147	1,797	2,931	5,939	14,074	27,649	43,977	63,592	88,112	120,067	158,593
Other expenses	450	340	180	91	109	208	441	1,022	1,762	2,512	3,307	4,489	5,844	7,452
as a % of revenue		6.51%	2.11%	2.11%	2.00%	1.89%	1.78%	1.67%	1.56%	1.45%	1.35%	1.35%	1.35%	1.35%
Fair value change in derivatives		2,325	(2,874)	-	-	-	-	-	-	-	-	-	-	-
FX Gain (loss)				-	-	-	-	-	-	-	-	-	-	-
<b>Income/ loss before interest and tax</b>	<b>(5,186)</b>	<b>(3,824)</b>	<b>(2,066)</b>	<b>(4,932)</b>	<b>(931)</b>	<b>(425)</b>	<b>125</b>	<b>3,923</b>	<b>10,565</b>	<b>22,511</b>	<b>36,749</b>	<b>59,711</b>	<b>70,952</b>	<b>89,337</b>
Income Tax Rebate/ Expense	79	113	73	52	-	-	-	(0)	-	-	5,800	17,913	21,286	26,801
<b>Profit/ (Loss) attributable to members of the parent</b>	<b>(5,265)</b>	<b>(3,937)</b>	<b>(2,139)</b>	<b>(4,984)</b>	<b>(931)</b>	<b>(425)</b>	<b>125</b>	<b>3,923</b>	<b>10,565</b>	<b>22,511</b>	<b>30,949</b>	<b>41,797</b>	<b>49,667</b>	<b>62,536</b>
Weighted average number of shares for Basic and Diluted earnings per share	86,017,554	100,144,765	100,448,035	104,332,044	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531	117,233,531
Basic Profit/ (Loss) per share (in cents)	(6.10)	(3.90)	(2.13)	(4.78)	(0.79)	-0.36	0.11	3.35	9.01	19.20	26.40	35.65	42.37	53.34
Diluted Profit/ (Loss) per share ((in cents)	(6.10)	(3.90)	(2.13)	(4.78)	(0.79)	-0.36	0.11	3.35	9.01	19.20	26.40	35.65	42.37	53.34

Source: Khandaker Research

**Exhibit 2: Balance Sheet**

CONSOLIDATED BALANCE SHEET- Optiscan														
Particulars	2005A	2006A	2007A	2008A	2009E	2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E
<i>All figures are in 000's A\$ except per share data</i>														
<b>Current Assets</b>														
Cash and cash equivalents	11,717	6,651	5,937	3,991	3,272	2,137	1,431	885	2,696	12,028	19,101	31,366	42,388	59,613
Trade and other receivables	228	1,337	1,588	482	748	1,363	3,064	7,560	13,959	21,415	30,289	41,107	53,517	68,242
Inventories	672	1,541	1,358	1,885	1,883	2,442	2,461	3,731	5,186	8,001	11,376	13,088	17,093	21,841
Prepayments	42	32	45	46	27	47	97	227	425	650	936	1,273	1,695	2,225
Derivatives			3	-	-	-	-	-	-	-	-	-	-	-
<b>Total Current Assets</b>	<b>12,658</b>	<b>9,561</b>	<b>8,931</b>	<b>6,404</b>	<b>5,930</b>	<b>5,988</b>	<b>7,054</b>	<b>12,402</b>	<b>22,266</b>	<b>42,094</b>	<b>61,704</b>	<b>86,835</b>	<b>114,692</b>	<b>151,921</b>
<b>Non-Current Assets</b>														
Plant and equipment	429	396	616	795	622	580	740	2,196	6,960	14,340	25,064	40,161	57,462	77,571
Intangible assets	25	40	77	49	56	75	108	224	427	700	1,043	1,465	4,312	6,819
Goodwill	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981	1,981
<b>Total Non Current Assets</b>	<b>2,435</b>	<b>2,417</b>	<b>2,674</b>	<b>2,826</b>	<b>2,660</b>	<b>2,636</b>	<b>2,830</b>	<b>4,401</b>	<b>9,368</b>	<b>17,022</b>	<b>28,088</b>	<b>43,607</b>	<b>63,756</b>	<b>86,372</b>
<b>Total Assets</b>	<b>15,094</b>	<b>11,978</b>	<b>11,604</b>	<b>9,230.0820</b>	<b>8,590</b>	<b>8,625</b>	<b>9,883</b>	<b>16,804</b>	<b>31,634</b>	<b>59,116</b>	<b>89,792</b>	<b>130,442</b>	<b>178,448</b>	<b>238,293</b>
<b>Current Liabilities</b>														
Trade and other payables	622,501	971	758	608	449	909	2,042	5,040	9,306	14,276	20,193	27,405	35,678	45,495
Provisions	235,716	371	821	870	870	870	870	870	870	870	870	870	870	870
Derivatives		2	-	-	-	-	-	-	-	-	-	-	-	-
Unearned Income		10	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total current liabilities</b>	<b>858</b>	<b>1,354</b>	<b>1,579</b>	<b>1,478</b>	<b>1,319</b>	<b>1,779</b>	<b>2,913</b>	<b>5,910</b>	<b>10,176</b>	<b>15,147</b>	<b>21,063</b>	<b>28,275</b>	<b>36,548</b>	<b>46,365</b>
<b>Non Current Liabilities</b>														
Provision	179,471	311	92	48	48	48	48	48	48	48	48	48	48	48
<b>Total non current liabilities</b>	<b>179,471</b>	<b>311</b>	<b>92</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>
<b>Total Liabilities</b>	<b>1,038</b>	<b>1,664</b>	<b>1,671</b>	<b>1,527</b>	<b>1,367</b>	<b>1,827</b>	<b>2,961</b>	<b>5,959</b>	<b>10,225</b>	<b>15,195</b>	<b>21,111</b>	<b>28,323</b>	<b>36,596</b>	<b>46,413</b>
<b>Shareholder's Equity</b>														
Contributed Equity	39,137	39,143	40,773	43,428	43,879	43,879	43,879	43,879	43,879	43,879	43,879	43,879	43,879	43,879
Share options Issued														
Accumulated losses/Retained Earnings	(25,280)	(29,217)	(31,357)	(36,341)	(37,272)	(37,697)	(37,572)	(33,650)	(23,085)	(574)	24,186	57,624	97,357	147,386
Reserves/Share options issued	200	388	517	616.16	616	616	616	616	616	616	616	616	616	616
<b>Total Equity</b>	<b>14,056</b>	<b>10,313</b>	<b>9,933</b>	<b>7,704</b>	<b>7,223</b>	<b>6,798</b>	<b>6,922</b>	<b>10,845</b>	<b>21,410</b>	<b>43,921</b>	<b>68,681</b>	<b>102,118</b>	<b>141,852</b>	<b>191,880</b>
<b>Total Equity and Liabilities</b>	<b>15,094</b>	<b>11,978</b>	<b>11,604</b>	<b>9,230.0820</b>	<b>8,590</b>	<b>8,625</b>	<b>9,883</b>	<b>16,804</b>	<b>31,634</b>	<b>59,116</b>	<b>89,792</b>	<b>130,442</b>	<b>178,448</b>	<b>238,293</b>

Source: Khandaker Research

### Exhibit 3: Cash Flow Statement

CONSOLIDATED CASH FLOW STATEMENT- Optiscan														
Particulars	2005A	2006A	2007A	2008A	2009E	2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E
<i>All figures are in 000' A\$</i>														
<b>Cash Flow from Operating activities</b>														
Profit/(Loss) before interest and tax	(5,265)	(3,937)	(2,139)	(4,984)	(931)	(425)	125	3,923	10,565	22,511	30,949	41,797	49,667	62,536
(Profit)/loss on sale of non-current assets														
Depreciation & Amortization of non-current assets	355	293	306	403	330	327	428	1,188	3,525	7,110	12,273	19,491	29,771	41,038
Net (profit) on disposal of plant and equipment	(1)	(0)												
Net fair value change on derivatives	2		(3)	-	-	-	-	-	-	-	-	-	-	-
Net exchange differences	(14)	(14)	(100)	(50)	-	-	-	-	-	-	-	-	-	-
Share options expensed	109	188	128	101	-	-	-	-	-	-	-	-	-	-
Exchange differences recognised in equity				(0.93)										
<b>Changes in assets and liabilities</b>														
(Increase)/decrease in trade and other receivables	187	(1,109)	(251)	1,106	(265)	(615)	(1,701)	(4,497)	(6,399)	(7,455)	(8,875)	(10,818)	(12,409)	(14,725)
(Increase)/decrease in inventories	132	(869)	182	(527)	2	(558)	(20)	(1,269)	(1,456)	(2,815)	(3,375)	(1,712)	(4,005)	(4,748)
(Increase)/decrease in prepayments	273	10	(12)	(1)	19	(20)	(51)	(129)	(198)	(225)	(286)	(337)	(422)	(530)
(Decrease)/increase in derivatives			(2)	3	-	-	-	-	-	-	-	-	-	-
(Decrease)/increase in trade and other payables	245	348,036	(212)	(150)	(159)	460	1,134	2,998	4,266	4,970	5,917	7,212	8,273	9,817
(Decrease)/increase in unearned income		10	(10)	-	-	-	-	-	-	-	-	-	-	-
(Decrease)/increase in provisions	(22)	267	231	5	-	-	-	-	-	-	-	-	-	-
<b>Net cash used in operating activities</b>	<b>(4,001)</b>	<b>(4,811)</b>	<b>(1,882)</b>	<b>(4,095)</b>	<b>(1,005)</b>	<b>(831)</b>	<b>(85)</b>	<b>2,213</b>	<b>10,303</b>	<b>24,096</b>	<b>36,603</b>	<b>55,634</b>	<b>70,874</b>	<b>93,387</b>
<b>Cash Flows from Investing activities</b>														
Proceeds from sale of plant and equipment	0.975	0.315	-	-	-	-	-	-	-	-	-	-	-	-
Purchase of plant and equipment	(286)	(242)	(497)	(541)	(109)	(221)	(497)	(2,453)	(7,926)	(13,896)	(22,111)	(33,343)	(43,408)	(55,352)
Purchase of intangible assets - software	(28)	(32)	(66)	(15)	(55)	(83)	(124)	(307)	(566)	(868)	(1,228)	(1,667)	(6,511)	(8,303)
Loans to controlled entity														
<b>Net Cash from Investing Activities</b>	<b>(313)</b>	<b>(274)</b>	<b>(563)</b>	<b>(556)</b>	<b>(164)</b>	<b>(304)</b>	<b>(621)</b>	<b>(2,760)</b>	<b>(8,492)</b>	<b>(14,764)</b>	<b>(23,340)</b>	<b>(35,010)</b>	<b>(49,919)</b>	<b>(63,655)</b>
<b>Cash Flow from Financing activities</b>														
Proceeds from issue of shares	6,575	6	1,699	2,663	450	-	-	-	-	-	-	-	-	-
Transaction costs associated with issue of shares	(0.3)		(69)	(8)	-	-	-	-	-	-	-	-	-	-
Proceeds from borrowings											6190	8359	9933	12507
Dividend paid														
<b>Net Cash from Financing Activities</b>	<b>6,575</b>	<b>6</b>	<b>1,631</b>	<b>2,655</b>	<b>450</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(6,190)</b>	<b>(8,359)</b>	<b>(9,933)</b>	<b>(12,507)</b>
<b>Net Increase/(Decrease) in cash</b>	<b>1,998</b>	<b>(5,079)</b>	<b>(815)</b>	<b>(1,996)</b>	<b>(718)</b>	<b>(1,135)</b>	<b>(706)</b>	<b>(547)</b>	<b>1,811</b>	<b>9,332</b>	<b>7,074</b>	<b>12,265</b>	<b>11,022</b>	<b>17,225</b>
Net foreign exchange differences	14	14	100	50	-	-	-	-	-	-	-	-	-	-
Cash & cash equivalents at the beginning of year	9,706	11,717	6,651	5,937	3,991	3,272	2,137	1,431	885	2,696	12,028	19,101	31,366	42,388
<b>Cash &amp; cash equivalents at the end of year</b>	<b>11,717</b>	<b>6,651</b>	<b>5,937</b>	<b>3,991</b>	<b>3,272</b>	<b>2,137</b>	<b>1,431</b>	<b>885</b>	<b>2,696</b>	<b>12,028</b>	<b>19,101</b>	<b>31,366</b>	<b>42,388</b>	<b>59,613</b>

Source: Khandaker Research

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