



**5N PLUS INC.**

**ANNUAL INFORMATION FORM**

**For the fiscal year ended December 31, 2016**

**February 21, 2017**

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Unless otherwise indicated, all references to “dollars” and the symbol “\$” in this Annual Information Form are to U.S. dollars. Information is at December 31, 2016, unless otherwise noted.

### INFORMATION INCORPORATED BY REFERENCE

The audited consolidated financial statements of 5N Plus Inc. (the “Corporation” or “5N Plus”) for the twelve-month fiscal year ended December 31, 2016 and the notes thereto as well as Management’s Discussion and Analysis of the operating results, cash flow and financial position are specifically incorporated herein by reference.

### CAUTION REGARDING FORWARD-LOOKING INFORMATION

Certain statements in this Annual Information Form may be forward-looking within the meaning of applicable securities laws. Forward-looking information and statements are based on the best estimates available to the Corporation at the time and involve known and unknown risks, uncertainties or other factors that may cause the Corporation’s actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Factors of uncertainty and risk that might result in such differences include the risks associated with our growth strategy, credit, liquidity, interest rates, inventory pricing, commodity pricing, currency fluctuation, fair value, source of supplies, environmental regulations, competition, dependence on key personnel, business interruptions, protection of intellectual property, international operations, international trade regulations, collective agreements and being a public issuer. A description of the risks affecting 5N Plus’ business and activities appears under the heading “Risks and Uncertainties” in 5N Plus’ Management’s Discussion and Analysis for the year ended December 31, 2016, which may be viewed on SEDAR at [www.sedar.com](http://www.sedar.com). Forward-looking statements can generally be identified by the use of terms such as “may”, “should”, “would”, “believe”, “expect”, the negative of these terms, variations of them or any terms of similar terminology. No assurance can be given that any events anticipated by the forward-looking information in this Annual Information Form will transpire or occur, or if any of them do so, what benefits that 5N Plus will derive therefrom. In particular, no assurance can be given as to the future financial performance of 5N Plus. The forward-looking information contained in this Annual Information Form is made as of the date hereof and 5N Plus undertakes no obligation to publicly update such forward-looking information to reflect new information, subsequent or otherwise, unless required by applicable securities laws. The reader is warned against placing undue reliance on these forward-looking statements.

We caution readers that the risks described above are not the only ones that could have an impact on our expectations expressed in or implied by the forward-looking information included in this Annual Information Form. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also have a material adverse effect on our business, financial condition or results of operations.

### CORPORATE STRUCTURE

5N Plus results from the amalgamation on October 1, 2007 of 5NPlus Inc. and 6367909 Canada Inc., two affiliated corporations, under the *Canada Business Corporations Act* (the “CBCA”). On December 18, 2007, our articles of

amalgamation were amended so as to sub-divide our common shares on the basis of 83.3636772 common shares for each issued and outstanding common share.

The first of the amalgamated corporations, 5NPlus Inc., was incorporated under the CBCA on July 12, 1999 under the name 3639398 Canada Inc. Its Articles of Incorporation were amended on February 8, 2000 to change the corporate name to 5NPlus Inc. These articles were again amended on January 21, 2003 to effect certain changes to the authorized share capital.

The second of the amalgamated corporations, 6367909 Canada Inc., was incorporated under the CBCA on March 24, 2005. Its Articles of Incorporation were amended on April 1, 2005 to effect certain changes to the authorized share capital.

Prior to the amalgamation, the shareholders of 5NPlus Inc. and 6367909 Canada Inc. were the same, with the exception that: (i) 6367909 Canada Inc. was a shareholder of 5NPlus Inc.; and (ii) a number of our employees held Class B non-voting shares of 5NPlus Inc.

As of December 31, 2013, 5N Plus amalgamated with 5N Plus Trail Inc., its wholly-owned subsidiary, by way of a short form vertical amalgamation under the CBCA.

Our head and registered office is located at 4385 Garand Street, Montreal, Québec H4R 2B4.

**SUBSIDIARIES**

Our activities are conducted either directly or through subsidiaries. The table below lists our principal subsidiaries, as well as their jurisdiction of incorporation and the percentage of voting shares held directly or indirectly by the Corporation. Certain subsidiaries whose total assets did not represent more than 10% of the Corporation’s consolidated assets as at December 31, 2016 or whose sales and operating revenues did not represent more than 10% of the Corporation’s consolidated sales and operating revenues for the twelve-month period ended December 31, 2016 have been omitted.

5N PV GmbH (Germany)	100%
5N Plus Asia Limited (Hong Kong)	100%
5N Plus UK Limited (England)	100%
5N Plus Belgium SA (Belgium)	100%
5N Plus Lübeck GmbH (Germany)	100%
5N Plus Wisconsin Inc. (Wisconsin, U.S.A.)	100%

Unless the context indicates otherwise, the terms “we”, “our” and “us” as used in this Annual Information Form refer to 5N Plus together with its subsidiaries.

**GENERAL DEVELOPMENT OF THE BUSINESS**

**Three-Year History**

The highlights relating to the development of our business over the past three years are described below.

On February 26, 2014, we announced the appointment of Mr. Richard Perron as Chief Financial Officer of the Corporation, effective March 17, 2014. Mr. Perron has 20 years of international experience as a finance professional. From 2006 to present, Mr. Perron has held progressively senior roles and has gained valuable experience within Arcelor Mittal and more recently as the Chief Financial Officer and Strategy Manager of Long Carbon Americas, one of Arcelor Mittal’s most important business units. In this role, he was responsible for all countries of the Americas generating a total of \$11 billion in annual sales, with 17,900 employees and more than 25 key operations and plants among countries like Canada, USA, Mexico, Costa Rica, Trinidad and Tobago, Brazil and Argentina. From 1999 to 2006, he served as Director, Finance and Control and Chief Information Officer of Danfoss Turbocor Compressors Inc, part of The Danfoss Group. Mr. Perron holds a B.Com. degree in Accounting from Concordia University, a M.Sc. in Administration, Management and Accounting and an

M.B.A. from the University of Sherbrooke and is a Certified Public Accountant (CPA) in the United-States (IL & DE) and Chartered Professional Accountant in the Province of Quebec, Canada.

On April 3, 2014, we announced that the Corporation had acquired the remaining 33.33% percent ownership interest in its subsidiary Sylarus bringing the Corporation's ownership in Sylarus to 100%, and has changed its name to 5N Plus Semiconductors LLC.

On April 17, 2014, we announced the appointment of Mr. Bertrand Lessard as Chief Operating Officer of the Corporation, effective April 28, 2014. Mr. Lessard has nearly 30 years of experience in technical, operational and leadership positions. Prior to joining 5N Plus, Mr. Lessard was General Manager of SEC Bloom Lake Iron Mine of Cliffs Natural Resources. He has worked for over 25 years at Xstrata (formerly Noranda, Falconbridge and now Glencore Xstrata). His career started in 1985 at the Canadian Copper Refinery in Montreal where he held several technical and management positions to eventually take the lead of Operations in 1998. He also served as Director - Recycling, headquartered in Toronto, Ontario, and, in 2008 as Director - Copper, of the Kidd Creek metallurgical site in Timmins, Ontario, until 2010 when he joined the ranks of Cliffs Natural Resources. Mr. Lessard holds a degree in Metallurgical Engineering from the École Polytechnique de Montréal, and graduated from the Western Executive Program at the Richard Ivey School of Business of London, Ontario.

On May 5, 2014, we announced that the Corporation had completed the acquisition of all of the issued and outstanding shares in the capital of AM&M Advanced Machine and Materials Inc. ("AM&M"). AM&M is a Kanata, Ontario-based corporation specialized in the manufacturing of micron size metallic powders which can be used in a variety of electronic markets, including solder powders for increasingly demanding applications, silver-based powders for high thermal conductivity interfaces, and CIGS powders for thin film solar panels. The intellectual property and processing capabilities developed by AM&M allows for the cost-effective and high-yield production of spherical, low oxygen content powders with uniform particle size.

On May 8, 2014, we announced the election of Ms. Jennie S. Hwang, Ms. Nathalie Le Prohon and Mr. James T. Fahey to the Corporation's Board of Directors at the Corporation's Annual and Special Meeting of Shareholders held on May 7, 2014 in replacement of Messrs. Dennis Wood, John Davis and Jean Bazin whom did not stand for re-election at the meeting. Following the meeting, the directors appointed Mr. Jean-Marie Bourassa as Chairman of the Board of Directors of the Corporation in place of Mr. Wood.

Ms. Jennie S. Hwang has over 30 years of experience in materials, electronics, chemicals and coatings through her management and/or ownership of businesses. She currently serves as the president of H-Technologies Group, encompassing international business, worldwide manufacturing services, intellectual property management and global strategy advisory. Ms. Hwang was Chief Executive Officer of International Electronic Materials Corporation, a manufacturing company she founded. Prior to founding these businesses, Ms. Hwang held senior executive positions with Lockheed Martin Corp., Hanson PLC (SCM Corp.) and Sherwin-Williams Company. Ms. Hwang holds a Ph.D. in Materials Science & Engineering and M.S. degrees in liquid crystals and in chemistry. She has served as National President of the Surface Mount Technology Association and in various other global leadership positions and is an international speaker and author of more than 400 publications and several textbooks on leading technologies, advanced manufacturing and global market thrusts. Ms. Hwang has been elected to the National Academy of Engineering and International Hall of Fame (Women in Technology). Ms. Hwang is a board member of Ferro Corporation (a U.S. NYSE-listed global manufacturer) and Case Western Reserve University, and serves on the U.S. National Materials and Manufacturing Board and chairs the Board of Assessment Panels on Army Research Laboratory of the U.S. Department of Defense. Ms. Hwang formerly served on the board of Second Bancorp, Inc. and she attained certificates in corporate governance from Harvard Business School Executive Program and from Columbia University Corporate Governance programs, and is a guest contributor to the AGENDA of Financial Times and Corporate Board Member of NYSE Euronext on corporate governance issues.

Ms. Nathalie Le Prohon is a professional board member with over 30 years of extensive experience in management and consulting including 20 years in senior executive positions at IBM in Montreal, Québec City, Toronto and Paris including her current position as Vice President, Healthcare Industry, IBM Canada Ltd. Ms. Le Prohon was President of Nokia Canada from 2003 and 2004. Ms. Le Prohon is a director for various public and private entities and not-for-profit organizations. She is currently a director of BlackRock Metals, Casavant Frères and Make-A-Wish, Québec Foundation. Ms. Le Prohon was Chair of the Board of Groupe Conseil OSI, a director of Alithya, a director of ACCEO, a director of Bentall Kennedy LP, a director of

Hydro-Québec and a member of the external audit committee of the Department of National Defence (Canada). She has a BCOM (Major in MIS) from McGill University, a MBA from Concordia University and was named Concordia University 'Alumna of the Year' in 2009. She is a member of the Institute of Corporate Directors and has attained corporate governance certification at McGill University in 2009.

Mr. James T. Fahey has over 20 years of experience in the Electronics Industry in various roles including scientist, engineering (manufacturing and product development), marketing and sales and senior management, including 17 years in senior executive positions with Rohm and Haas and The Dow Chemical Company. Mr. Fahey is a dynamic leader with demonstrated strategic and operational strengths across various functions (Operations, Engineering, Research and Development, Sales and Marketing, and Business Leadership), and across various businesses (Microelectronics, Circuit Board Technologies, Optics and Ceramics). Mr. Fahey successfully directed global teams and supported business development in Asia, North America & Europe. Mr. Fahey holds a Bachelor of Science (First Class Honors) from St. Francis Xavier University, a Masters in Science and a PhD in Chemistry (Area of Research: Polymers for Microelectronic Applications) from Cornell University. Mr. Fahey is currently serving on the Semiconductor North American Advisory Board, was a member of the Board of NEMI (National Electronics Manufacturing Initiative) and has produced numerous technical publications and patents in the semiconductor industry related to both materials and semiconductor processing.

On May 27, 2014, we announced that the Corporation had entered into new supply agreements with First Solar, Inc. ("First Solar") the world's leading thin-film solar module manufacturer, covering First Solar's compound semiconductor needs until March 31<sup>st</sup>, 2019. The Corporation has renewed its existing cadmium telluride (CdTe) supply agreement and CdTe by-products recycling agreement with First Solar up to March 31, 2019. In addition, a new supply agreement broadly covering First Solar's other compound semiconductor needs up to March 31, 2019, has also been concluded. Under the new agreements, First Solar has agreed to exclusively purchase from 5N Plus all the CdTe required by First Solar on a worldwide basis for the manufacturing of solar photovoltaic modules.

On June 18, 2014, we announced that the Corporation had completed its previously-announced bought-deal offering, under a short form prospectus, of convertible unsecured subordinated debentures in an aggregate principal amount of CA\$60 million (the "Offering"). The debentures were offered at a price of CA\$1,000 per debenture in each of the provinces of Canada. For the short term, 5N Plus used the net proceeds of the offering to reduce indebtedness under its senior revolving credit facility.

The debentures bear interest at a rate of 5.75% per annum, payable semi-annually on June 30 and December 31 each year, commencing on December 31, 2014. The debentures are convertible at the holder's option into 5N Plus common shares at a conversion price of CA\$6.75 per share, representing a conversion rate of 148.1481 5N Plus shares per CA\$1,000 principal amount of debentures. The debentures will mature on June 30, 2019 and may be redeemed by 5N Plus, in certain circumstances, after June 30, 2017.

5N Plus has granted an over-allotment option to the underwriters of the Offering, entitling them to purchase, for a period of 30 days from June 18, 2014, up to CA\$6.0 million principal amount of additional debentures at the offering price of CA\$1,000 per debenture, to cover over-allotments, if any.

On June 26, 2014, we announced that, in connection with the Offering referred to above, the underwriters had purchased an additional CA\$6,000,000 aggregate principal amount of debentures at a price of CA\$1,000 per debenture upon the exercise of their over-allotment option.

On August 7, 2014, we announced the signing of a new \$125 million senior secured multi-currency revolving syndicated credit facility which replaced the existing \$100 million senior secured revolving facility. This new credit facility is more correlated with the Corporation's balance sheet and will be used to refinance existing indebtedness and for other corporate purposes, including capital expenditures and growth opportunities. The new credit facility is on a revolving basis, has a four-year term and carries interest at either prime rate, U.S. base rate, HK base rate or Libor plus a margin based on 5N Plus' senior consolidated debt to EBITDA ratio.

At any time, 5N Plus has the option to request that the new credit facility be expanded to \$150 million through the exercise of an additional \$25 million accordion feature, subject to review and approval by the lenders. In connection with the new

credit facility, HSBC Bank acted as lead arranger and book runner, and the syndicate of lenders, led by HSBC Bank, as administrative agent, comprises six other banks and financial institutions.

On November 17, 2014, we announced that the Toronto Stock Exchange (“TSX”) had approved 5N Plus’ normal course issuer bid (“NCIB”). Under the NCIB, 5N Plus has the right to purchase for cancellation, from November 19, 2014 to November 18, 2015, a maximum of 4,691,230 common shares, representing 10% of the 46,912,306 shares forming 5N Plus’ public float. As of November 14, 2014, 5N Plus had 83,979,657 common shares issued and outstanding. 5N Plus did not repurchase any of its common shares under the NCIB which expired on November 18, 2015.

On May 7, 2015, we announced the election of Messrs. Serge Vézina and Maarten de Leeuw to the Corporation’s Board of Directors at the Corporation’s Annual and Special Meeting of Shareholders held on May 6, 2015 in replacement of Mr. Pierre Shoiry whom did not stand for re-election at the meeting.

On December 10, 2015, we announced the appointment of Mr. Arjang J. (AJ) Roshan as the Corporation’s new President and Chief Executive Officer effective February 15, 2016. Mr. Roshan replaced Mr. Jacques L’Ecuyer whom informed the Board of Directors of the Corporation of his desire to step aside from his position of President and Chief Executive Officer as indicated in the Corporation’s press release issued on November 3, 2015. Mr. Roshan brings 25 years of international and executive experience, closely related to 5N Plus’ line of businesses having worked for Umicore, a global materials technology and recycling group for 18 years. During his tenure at Umicore, Mr. Roshan held a number of senior executive positions, including leading the Automotive Catalysts business in Asia Pacific as Senior Vice President for the division and later, as Senior Vice President of Umicore’s Electro-Optic Materials Business Unit, widely recognized as the global leader in development, production, recycling and refining of semiconductor and electro-optic materials along with high purity chemicals and metals.

On January 11, 2016, we announced the appointment of Mr. Luc Bertrand as the Company’s new Chairman of the Board effective immediately. He succeeded Mr. Jean-Marie Bourassa, who continues to serve on the board and as Chair of the Audit & Risk Management Committee, a position he already held.

Mr. Luc Bertrand is Vice-Chairman of National Bank of Canada, a position he has assumed since February 2011, where he is responsible for developing and maintaining relations with corporate, institutional and government clients in Canada. He also acts as strategic advisor to management, particularly on matters pertaining to government relations and capital market regulations. During his illustrious career, Mr. Bertrand has held various management positions in the financial services industry. From 2000 to 2009, he was President and Chief Executive Officer of Montreal Exchange Inc. and held the position of Vice-President and Managing Director of Institutional Equity Sales at National Bank Financial from 1998 to 2000.

Aside from his professional duties, Mr. Bertrand is an active member of boards of directors and industry committees. He currently serves on the Board of the International Finance Centre of Montréal, is also Chairman of the Board of the Montreal Canadiens/CH Group Inc. Mr. Bertrand also serves on the Board of TMX Group and previously held the position of Chief Executive Officer of Maple Group Acquisition Corporation. In recent years, he has been a director of the Canadian Derivatives Clearing Corporation, Vice-Chairman of the Board of the Boston Options Exchange, Chairman of the Board of the Montréal Climate Exchange, and a director of the Natural Gas Exchange.

On May 5, 2016, following the Corporation’s Annual and Special Meeting of Shareholders, we announced the resignation of Messrs. Serge Vézina and Maarten de Leeuw from the Corporation’s Board of Directors as they did not stand for re-election at the meeting.

On September 12, 2016, we released the highlights of a five-year strategic plan (5N21 Plan) aimed at improving the Corporation’s profitability along with reducing the Corporation’s volatility exposure. The 5N21 Plan is based on three main pillars, namely: a) Optimizing balance of contribution between upstream and downstream activities b) Extracting more value from core businesses, existing assets and capabilities c) Delivering quality growth from existing growth initiatives including future M&A activities. The 5N21 Plan has been posted online on the Corporation’s newly refurbished website and may be reviewed under the “Investors” section at [www.5nplus.com](http://www.5nplus.com).

On September 29, 2016, we announced the consolidation of the Corporation's operations at Wellingborough, U.K. with other sites within the Group. In addition, the Corporation will consolidate the operations of DeForest-Wisconsin, U.S.A. and Fairfield-Connecticut, U.S.A. during the first half of 2017 into a newly updated and scaled facility, located in the state of Connecticut. Over the next few quarters, the Corporation will transfer a number of product lines from Wellingborough to other manufacturing facilities within the Group. During this time, the Corporation expects a seamless transition while serving its client base. Operational synergy, cost competitiveness and client proximity are the primary drivers in determining future locations of the affected product lines. The restructuring fees associated with these two initiatives are expected to be around \$3.5 million with expected payback of less than two years. The positive impact from these initiatives will be progressive reaching full potential starting in 2018.

On October 5, 2016, we announced that the Toronto Stock Exchange ("TSX") had approved 5N Plus' normal course issuer bid ("NCIB"). Under the NCIB, 5N Plus has the right to purchase for cancellation, from October 11, 2016 to October 10, 2017, a maximum of 600,000 common shares, representing 1.35% of the 44,416,731 shares forming 5N Plus' public float as at October 3, 2016. As of October 3, 2016, 5N Plus had 83,979,657 common shares issued and outstanding. During the NCIB period, subject to TSX and other regulatory authorities' approval, the Corporation may consider purchasing for cancellation more than 600,000 common shares up to a maximum of 4,441,673 common shares, representing 10% of the Corporation's public float.

## **DESCRIPTION OF THE BUSINESS**

### **Overview**

We are a leading producer of specialty metal and chemical products used in a number of advanced chemical, pharmaceutical, industrial, electronic and electro-optics applications. We deploy a range of proprietary and proven technologies to manufacture our products. Typical products include purified metals such as bismuth, gallium, germanium, indium, selenium and tellurium, inorganic chemicals based on such metals and compound semiconductor wafers. Many of these are critical precursors and key enablers in markets such as solar, light-emitting diodes and eco-friendly materials.

We are an integrated supplier having both primary and secondary refining capabilities. Our primary refining capabilities allow us to treat very low-grade metal concentrates, and extract and refine the metals of interest so that they can be fed to our secondary refining operations, where we attain the highest level of purity. Once purified, our metals can be sold to customers in the form of pure metals, alloys or chemicals. Because we can perform extensive refining functions, allowing us to go from one end of the purity spectrum to the other, and we can manufacture chemicals and alloys, we consider ourselves a supplier with integrated refining capabilities. In addition, our primary refining capabilities enable us to treat complex feeds and very low-grade concentrates containing only small amounts of the metals of interest, playing an important role in the recycling of the specialty metals that we produce.

Purification and manufacturing activities are carried out using a variety of metallurgical and chemical processes. Our raw materials or "feedstock" are generally in the form of concentrates or recyclable materials containing the metals of interest. Given the nature of our activities and the metals that we purify, we operate under, and comply with, stringent environmental, health and safety conditions. Several of our operations are either certified (ISO 9001, ISO 14001, ISO 50001 and OHSAS 18001) or have approval from the United States Food and Drug Administration ("FDA") or have Good Manufacturing Practices (GMP) requirements, reinforcing our commitment to best practices in terms of operations, quality and health and safety.

### **Description of Segments**

We have two reportable business segments, namely Electronic Materials and Eco-Friendly Materials. Corresponding operations and activities are managed accordingly by key decision makers. Segmented operating and financial information, and labelled key-performance indicators, are available and used to manage these business segments, review performance and allocate resources. Financial performance of our two segments is evaluated primarily in terms of revenues and Adjusted EBITDA<sup>(1)</sup>, which is reconciled to consolidated numbers by taking into account corporate income and expenses. For

the twelve-month fiscal year ended December 31, 2016, 34% of our revenues were derived from the Electronic Materials segment and 66% from the Eco-Friendly Materials segment.

(1) Net earnings (loss) before interest expenses (income), income taxes, depreciation, amortization, impairment of inventories, allowance for doubtful receivable from a related party, litigation and restructuring costs, gain on disposal of property, plant and equipment, change in fair value of debenture conversion option, foreign exchange and derivatives loss (gain).

## **Electronic Materials Segment**

The Electronic Materials segment is managed by the Electronic Materials executive team that oversees locally-managed operations in North America, Europe and Asia. The Electronic Materials segment manufactures and sells refined metals, compounds and alloys which are primarily used in a number of electronic applications. Typical end-markets include photovoltaics (solar energy), medical imaging, light emitting diodes (LED), displays, high-frequency electronics and thermoelectrics. Main products are associated with the following metals: cadmium, gallium, germanium, indium and tellurium. These are sold either in elemental or alloyed form as well as in the form of chemicals and compounds. Revenues and earnings associated with recycling services and activities provided to customers of the Electronic Materials segment are also included in the Electronic Materials segment. Management of such activities is also the responsibility of the Electronic Materials executive team.

### Main Products, Markets & Demand

Cadmium is primarily used in rechargeable batteries and in low melting-point alloys. It is also extensively used in association with tellurium and sold by us in the form of CdTe for solar module, infrared imaging and medical imaging applications.

Gallium is extensively used in electronic applications. Gallium arsenide (GaAs), for example, is the semiconductor of choice for wireless devices and high-frequency electronics, whereas gallium nitride (GaN) is preferred for light-emitting diodes (LED) and display applications. We generally sell gallium as a high purity metal or as a gallium chemical.

Germanium has unique properties for infrared optical applications and is also being used as a substrate for solar cells. We produce germanium semiconductor material and engineered substrates for solar arrays utilized in the space industry. Other applications for germanium in the form of oxide or chloride include catalysts and optical fibers.

Indium is used primarily in display applications in the form of indium tin oxide (ITO). When indium is oxidized and alloyed with tin oxide, it forms a transparent oxide which is used to manufacture flat panel displays. Approximately 75% of the worldwide production of indium is used in this way with other applications, including low melting-point alloys and copper indium gallium selenide (CIGS) solar cells. We generally sell indium in the form of pure metal or as a chemical. We also sell engineered substrates and semiconductor material containing Indium as a critical component of high-end sensing and imaging applications.

Tellurium is used in the solar industry, electronics, imaging and metallurgical applications. We are active in all market segments selling CdTe to solar cell manufacturers, engineered material for imaging and sensing applications, metals to bismuth telluride producers and tellurium alloys for metallurgical applications.

The following table sets out the products manufactured by our Electronic Materials segment and their primary applications as well as total annual worldwide production.



	<b>Cadmium</b>	<b>Gallium and gallium chemicals</b>	<b>Germanium</b>	<b>Indium and indium chemicals and alloys</b>	<b>Tellurium and tellurium chemicals</b>
<b>Applications</b>	Battery industry CdTe solar cells Alloys and metallurgical additives	LED lights Flat-panel displays Integrated circuits Optoelectronic devices Specialty alloys Energy storage Biomedical CIGS solar cells	Infrared optics Optical fibers Catalysts Solar cell substrates	Flat panel displays (ITO) Solders Thin-film coating CIGS solar cells Battery manufacturing Catalysts Ceramics Fuel cells	CdTe solar cells Medical imaging Thermoelectric devices Infrared detectors Optical storage
<b>Annual worldwide production<sup>(1)</sup></b>	>20,000 metric tons (“MT”)	300 MT	110 MT	900 MT	550 MT

<sup>(1)</sup> Based on management estimates.

### Supply of Raw Materials

Several starting materials and supplies are used to produce and manufacture products of the Electronic Materials segment. Key raw materials include specialty metal concentrates which are procured from a number of non-ferrous metal suppliers with whom we have had long-term commercial relationships. Cadmium and indium are generally by-products of zinc refining and are generally purchased from zinc producers in various forms. Gallium is also purchased in various forms from other sources of operations. Germanium, a by-product of zinc or coal, is typically procured in the form of concentrates. Tellurium is a by-product of copper, zinc or gold refining. It is procured from several sources worldwide. Our upstream capabilities enable us to valorize metal from complex concentrates in addition to outright purchase of metal from metal markets.

### Competition

We have a limited number of competitors, few of which are as fully integrated or have a similar range of products and capabilities as we do. Accordingly, they are not in a position to provide the same comprehensive set of services and products as we do. Main competitors depending on the market and metal considered include Indium Corporation in the United States, PPM Pure Metals GmbH in Germany, Neo Performance Materials in Canada and Vital Chemicals Co., Ltd. in China.

We continue to expect the competitive landscape to change as our markets develop and attract more interest. More specifically, we may face competition from our current customers, who choose to backward integrate in order to protect an essential component of their product line. The basis for competition in this instance will be security of supply, price, environment, health and safety, and recycling. We believe that we are well positioned to compete effectively on these issues. We may also face competition from certain suppliers, who are for the most part large non-ferrous mining, refining and metal processing companies. The basis for competition in this instance will be capturing margins, security of supply of feedstock, price and adaptation to change in the industry. We believe that our strong focus and greater flexibility will enable us to compete effectively.

### **Eco-Friendly Materials Segment**

The Eco-Friendly Materials segment is closely associated with bismuth. Bismuth is one of the very few heavy metals which has no detrimental effect on either human health or the environment. As a result, bismuth is being increasingly used in a number of applications as a replacement for more harmful metals and chemicals. The Eco-Friendly Materials segment is managed by the Eco-Friendly Materials executive team that oversees locally-managed operations in Europe and Asia. The Eco-Friendly Materials segment mainly manufactures and sells refined bismuth and bismuth chemicals, low melting-point

alloys as well as refined selenium and selenium chemicals. In this segment, a number of base metal containing products are also included. All of these principal products are used in the pharmaceutical and animal-feed industry as well as in a number of industrial applications, including coatings, pigments, metallurgical alloys and electronics.

Main Products, Markets and Demand

Bismuth is used as a replacement for lead in a number of industrial applications, including coatings, pigments, electronics, optics and glass. Bismuth is also used in the pharmaceutical industry and is the active ingredient in a number of drugs for treating stomach ulcers and other discomforts associated with the gastrointestinal tract. We sell bismuth in various forms, including chemicals and pure metals.

Selenium is used primarily in the metallurgical industry. Other applications for selenium include fertilizers, animal feed, optical glasses and electronics. We sell selenium in various forms, including powder, high-purity metal and chemicals.

The following table sets out products manufactured by our Eco-Friendly Materials segment and their primary applications as well as total annual worldwide production.

	<b>Bismuth and bismuth chemicals and alloys</b>	<b>Selenium and selenium chemicals</b>
Applications	Pharmaceutical industry Electronics Cosmetics Magnets Non-toxic substitute for lead Alloys for soldering Lubricating greases Pigments Alloys and metallurgical additives	Glass industry Animal feeds Additive for production of electrolytic manganese Metallurgic additive CIGS solar cells Infrared optics Thermoelectric devices
Annual worldwide production <sup>(1)</sup>	12,000 MT	4,000 MT

<sup>(1)</sup> Based on management estimates.

Low melting alloys are also part of the product portfolio of the Eco-Friendly Materials segment. These are often used in the optics industry where dimensional stability and low temperature are important.

Supply of Raw Materials

Key raw materials used by the Eco-Friendly Materials segment are comprised primarily of bismuth and selenium feedstocks. Bismuth is often associated with lead, tin and tungsten and recovered as a by-product. We are a very sizeable refiner of bismuth and have dealings with most producers of primary bismuth worldwide. Selenium, much like tellurium, is primarily a by-product of copper refining and we purchase suitable feedstocks from several copper suppliers.

Competition

We have a notable presence and a breadth of services and products which we believe is unique in the bismuth market. We continue to expect the competitive landscape to change as the bismuth market continues to develop and attract more interest. We believe that our ability to leverage both the supply chain and our value proposition in end products will enable us to continue to compete effectively. As we promote commercial selectivity and focus on profitability, we expect that certain Asian competitors could gain limited market share in the low-value add segments of the market (commodity products) where pricing is the key decision driver for the end-users.

## **Sales and Marketing**

We sell and market our products directly via our own sales and marketing team, which includes multiple offices worldwide. We also rely on several agents. Together with our sales network, we have extensive local representation in all major markets including Asia, North America and Europe. We regularly attend trade shows and conferences to promote our products. Our web site ([www.5nplus.com](http://www.5nplus.com)) provides our customers with quick access to relevant information about us and our products. Some of our products are also subject to extensive qualification periods. We work very closely with our customers during this qualification period, by providing sample products, and adapting our products and processes to best meet the customers' needs.

## **Intangible Assets**

We rely almost exclusively on a combination of trade secrets and employee confidentiality agreements to safeguard our intellectual property. We hold two patents, obtained in Canada and the United States, which are valid until 2029. We have not applied for patents in other countries with respect to the process for which we hold the foregoing patents. We have deliberately chosen to limit our patent position as most of our intellectual property and know-how is process related.

We acquired know-how, customer relationships, trade names and technology following the acquisition of Firebird Technologies Inc. in 2009 and MCP Group SA in 2011. We also developed know-how through internal research and development activities. Key components of our process are documented and all of our employees have entered into confidentiality agreements with us. We have not been subject to any material intellectual property claims.

## **Environment, Health and Safety**

Our operations include the use, handling, storage, transportation, generation and disposal of hazardous substances. As a result, we are subject to various local, state, federal and foreign laws and regulations relating to the use of these hazardous substances, their associated occupational health and safety and the protection of the environment. Our facilities are regularly audited by third parties on behalf of our customers and governmental authorities to ensure that we conform at all times with all applicable laws and regulations including meeting ISO practices at all ISO-certified plants and FDA and Good Manufacturing Practices (GMP) requirements at our facility in Lübeck, Germany.

An internal team is involved in environment, health and safety matters under the leadership of the Corporation's Chief Operating Officer. To date, we have not experienced problems of a material nature regarding such matters. Biological monitoring for heavy metals is carried out on production workers via blood and/or urine samples. We also use the services of public health authorities and independent industrial hygienists to validate exposure levels in our facilities and to recommend appropriate action plans to reduce them, if needed, and advise our employees and management on the biological monitoring results.

## **Insurance**

We carry all-risk and business interruption insurance, designed to protect our assets and business in the event that we are unable to carry out our production activities due to serious disturbances. We also carry insurance against pollution, which covers clean-up costs in an amount deemed appropriate for us. We also hold general liability insurance and directors' and officers' liability insurance for members of our Board of Directors and our executive officers.

## **Employees (by segment)**

As at December 31, 2016, we employed 666 persons on a full and part-time basis. Of these, an aggregate of 98 employees at the Tilly, Belgium facility and Lübeck, Germany facility are covered by collective bargaining agreements. Most of our employees are not unionized. Many of our employees hold university degrees in engineering or physical sciences and actively participate in our continuous improvement and development activities or are part of our senior management team. We consider our relationship with our employees to be very good.

The following table sets out the breakdown of our current personnel by category

Electronic Materials	Eco-Friendly Materials	Corporate	Total
310	306	50	666

## Properties

Besides the properties listed below, we own a 25,000 square foot building in Montreal, Québec, which houses our head office as well as manufacturing facilities. We also occupy (i) a 33,000 square foot adjoining manufacturing facility under a lease expiring on September 30, 2021, for which we have one five-year renewal option and (ii) a 44,000 square foot adjoining manufacturing facility under a lease expiring on September 30, 2021, for which we have one five-year renewal option. We acquired 118,000 square feet of land in Eisenhüttenstadt, Germany in May 2007 where we built a manufacturing facility (43,000 square feet), which became operational on July 29, 2008. We also own and operate a 66,000 square foot facility dedicated to recycling cadmium telluride bearing residues in Kulim, Malaysia. We acquired the building in January 2012, and the facility became operational in September 2012.

The following table sets out information regarding certain of the production facilities as of December 31, 2016, setting out, in each case, the name of the subsidiary, location of the facility and products manufactured:

Owned	
<b>5N Plus Lübeck GmbH</b> Lübeck, Germany  Bismuth and bismuth chemicals	<b>5N Plus UK Ltd.</b> Wellingborough, Northants, England  Bismuth, gallium, indium, selenium, tellurium, tin, alloys and chemicals
<b>5N Plus Shangyu Co. Ltd</b> Shangyu, Zhejiang, China  Bismuth and bismuth chemicals	<b>5N Plus Lao Industrial Resources Co. Ltd.<sup>(1)</sup></b> Vientiane, Laos  Bismuth and tellurium
<b>5N Plus Belgium SA</b> Tilly, Belgium  Bismuth and bismuth alloys	

(1) Such property is leased, not owned.

We have sales offices at all of the foregoing locations and sales offices in Fairfield, Connecticut, U.S.A.; Hong Kong, China and Shenzhen, China and Santiago, Chile.

## RISK FACTORS

A description of the risks affecting our business and activities appears under the heading “Risks and Uncertainties” of our Management’s Discussion and Analysis for the twelve-month fiscal year ended December 31, 2016, which are incorporated by reference into this Annual Information Form. The Management’s Discussion and Analysis is available on SEDAR ([www.sedar.com](http://www.sedar.com)).

## DIVIDENDS AND DIVIDEND POLICY

Our policy is to reinvest our earnings in order to finance the growth of our business. As a result, we have not declared a dividend in the last three financial years, and we do not intend to pay dividends in the foreseeable future. Any future

determination to pay cash dividends will be at the discretion of our Board of Directors and will depend on our financial condition, operating results and capital requirements and such other factors as the Board of Directors deems relevant.

## **DESCRIPTION OF CAPITAL STRUCTURE**

### ***Common Shares***

We are authorized to issue an unlimited number of common shares, all without nominal or par value. The holders of our common shares are entitled to: (a) vote at all meetings of shareholders, except meetings at which only holders of a specified class of shares are entitled to vote; (b) receive any dividend declared by us on the common shares; and (c) subject to the rights, privileges, restrictions and conditions attaching to any other class of our shares, receive our remaining property upon our dissolution, liquidation or winding-up.

As at February 21, 2017 there were 83,534,489 common shares issued and outstanding.

### ***Preferred Shares***

We are also authorized to issue an unlimited number of preferred shares, all without nominal or par value, and none of which are currently issued and outstanding. The preferred shares may be issued in one or more series, with such rights and conditions as may be determined by the Board of Directors. There are no voting rights attached to the preferred shares except as prescribed by law. The preferred shares will rank ahead of the common shares with respect to the payment of dividends and return of capital in the event of our liquidation, dissolution or other distribution of assets for the purpose of winding-up our affairs.

### ***Class B Shares***

We are also authorized to issue an unlimited number of Class B shares, all without nominal or par value, and none of which are currently issued and outstanding. There are no voting rights attached to the Class B shares except as prescribed by law. The Class B shares will rank ahead of the common shares, but after the preferred shares, with respect to the amount payable on return of capital in the event of our liquidation, dissolution or other distribution of assets for the purpose of winding-up our affairs. The Class B shares are redeemable and may also be purchased for cancellation by us.

## MARKET FOR SECURITIES

Our common shares have been listed and posted for trading on the Toronto Stock Exchange under the trading symbol “VNP” since December 20, 2007. The following table sets out the price range and trading volume of the common shares as reported by the Toronto Stock Exchange for the twelve-month fiscal year ended December 31, 2016.

Year	Month	Price range		Volume
		High	Low	
2016	January	CDN\$ 1.61	CDN\$ 1.10	1,201,664
	February	1.80	1.26	728,818
	March	1.95	1.58	1,921,720
	April	2.23	1.76	827,412
	May	2.15	1.85	1,725,207
	June	2.35	1.89	1,326,735
	July	2.10	1.94	352,973
	August	2.05	1.77	555,124
	September	1.91	1.38	2,424,198
	October	1.79	1.61	374,343
	November	1.86	1.65	686,557
	December	1.85	1.58	1,409,148

## ESCROWED SECURITIES OR SECURITIES SUBJECT TO CONTRACTUAL RESTRICTION ON TRANSFER

None of our shares are held in escrow or subject to contractual restrictions on transfer.

## DIRECTORS AND EXECUTIVE OFFICERS

### Name, Occupation and Security Holding

The following table sets out the name, municipality of residence, position with us and principal occupation of our directors and executive officers and, in the case of the directors, the date first elected or appointed, if applicable. Directors are elected until the next annual meeting of shareholders, unless a director resigns or his office becomes vacant by removal, death or other cause.

Name, municipality of residence and position held within the Corporation	Director since	Principal occupation	Shares beneficially owned, or controlled or directed, directly or indirectly as at February 21, 2017	Percentage of total outstanding shares as at February 21, 2017
Arjang J. (AJ) Roshan..... Lexington, MA, USA President, Chief Executive Officer and Director	February 2016	President and Chief Executive Officer 5N Plus Inc.	100,000	0.12%
Jean-Marie Bourassa <sup>(1)</sup> ..... Montreal, Québec, Canada Director	January 2008	President Bourassa Boyer Inc. (chartered accountants)	681,200	0.81%
Jennie S. Hwang <sup>(1)(2)</sup> ..... New York, NY, USA Director	May 2014	President H-Technologies Group (global strategy advisory firm)	343,600	0.41%

<b>Name, municipality of residence and position held within the Corporation</b>	<b>Director since</b>	<b>Principal occupation</b>	<b>Shares beneficially owned, or controlled or directed, directly or indirectly as at February 21, 2017</b>	<b>Percentage of total outstanding shares as at February 21, 2017</b>
Nathalie Le Prohon <sup>(1)(2)</sup> ..... Westmount, Québec, Canada Director	May 2014	Vice President, Healthcare Industry IBM Canada	100,000	0.12%
James T. Fahey <sup>(1)(2)</sup> ..... Berlin, MA, USA Director	May 2014	Global General Manager The Dow Chemical Company	164,500	0.20%
Luc Bertrand..... Baie d'Urfé, Québec, Canada Chairman of the Board of Directors	January 2016	Vice-Chairman National Bank of Canada	25,000	0.03%
Richard Perron ..... Boucherville, Québec, Canada Chief Financial Officer	--	Chief Financial Officer 5N Plus Inc.	—	—
Nicholas Audet..... Montreal, Québec, Canada Executive Vice President, Electronic Materials	--	Executive Vice President, Electronic Materials 5N Plus Inc.	75,000	0.09%
Paul Tancell ..... Sebring, United Kingdom Executive Vice President, Eco-Friendly Materials	--	Executive Vice President, Eco-Friendly Materials 5N Plus Inc.	—	—

(1) Member of the Audit & Risk Management Committee.

(2) Member of the Governance & Compensation Committee.

During the last five years, our directors and executive officers have been engaged in their current principal occupations or in other executive capacities with the companies indicated opposite their names or with related or affiliated companies, except for:

- Arjang J. (AJ) Roshan, who from 2012 to February 2016 was Senior Vice President, Electro-Optic Business Unit at Umicore;
- Nathalie Le Prohon, who from 2007 to July 2016 was a full time corporate director for various public and private entities and not-for-profit organizations;
- Richard Perron, who from 2006 to March 2014 has held progressively senior roles and has gained valuable experience within Arcelor Mittal, his latest role being the Chief Financial Officer and Strategy Manager of Long Carbon Americas, one of Arcelor Mittal's most important business units; and
- Paul Tancell, who from January 2013 to January 2017 was Global General Manager at Umicore Electro-Optic Materials and who from July 2009 to December 2012 was Director, Asia Pacific of Umicore Automotive Catalysts Business Unit.

As at February 21, 2017, to the best of our knowledge, our directors and executive officers owned, directly or indirectly, or exercised control or direction over an aggregate of 1,489,300 common shares, representing 1.78% of all issued and outstanding common shares.

## Cease-Trade Orders, Bankruptcies, Penalties or Sanctions

To our knowledge, none of the persons whose names appear in the table set out above:

- (a) is, or within the last ten years has been, a director, chief executive officer or chief financial officer of any company that:
  - (i) was subject to a cease-trade order, an order similar to a cease-trade order, or an order that denied the relevant company access to any exemption under applicable securities legislation, and which in all cases was in effect for a period of more than 30 consecutive days (an “Order”), which Order was issued while the director or executive officer was acting in the capacity as director, chief executive officer or chief financial officer of such company; or
  - (ii) was subject to an Order that was issued after the director or executive officer ceased to be a director, chief executive officer or chief financial officer and which resulted from an event that occurred while that person was acting in the capacity as director, chief executive officer or chief financial officer of such company; or
- (b) is, or within the last ten years has been, a director or executive officer of any company that, while that person was acting in that capacity, or within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets; or
- (c) has, within the last ten years, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or become subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold his assets.

None of the persons whose names appear in the table set out above has been subject to:

- (a) any penalties or sanctions imposed by a court relating to securities legislation or by a securities regulatory authority or has entered into a settlement agreement with a securities regulatory authority; or
- (b) any other penalties or sanctions imposed by a court or regulatory body that would likely be considered important to a reasonable investor in making an investment decision.

## Conflicts of Interest

There are no existing or potential material conflicts of interest between us or our subsidiaries and any of our officers or directors or those of our subsidiaries.

## LEGAL PROCEEDINGS AND REGULATORY ACTIONS

During the twelve-month fiscal year ended December 31, 2016, we were not party to, and none of our property was the subject of, any legal proceedings, which are material to our operations. To our knowledge, no such legal proceedings are currently contemplated.

During the twelve-month fiscal year ended December 31, 2016: (i) we were not subject to any penalty or sanction imposed by a court relating to securities legislation or by a securities regulatory authority; (ii) we did not enter into any settlement agreements with a court relating to securities legislation or with a securities regulatory authority; and (iii) there were no other penalties or sanctions imposed by a court or regulatory body against us that would likely be considered important to a reasonable investor in making an investment decision.



## **INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS**

During the twelve-month fiscal year ended December 31, 2014, the twelve-month fiscal year ended December 31, 2015, the twelve-month fiscal year ended December 31, 2016, and since the beginning of the current fiscal year, we did not complete any transaction that has materially affected or will materially affect us in which any: (i) of our directors or executive officers; (ii) person or company that is the direct or beneficial owner of, or who exercises control or direction over, more than 10% of our outstanding voting securities; or (iii) associate or affiliate of the persons referred to in (i) or (ii) above, had any material interest, direct or indirect.

## **TRANSFER AGENT AND REGISTRAR**

The transfer agent and registrar for our common shares is Computershare Investor Services Inc. at its principal offices in Montreal and Toronto.

## **MATERIAL CONTRACTS**

Since January 1, 2016, other than in the ordinary course of business, we have not entered into any contracts that are material to us.

## **NAMES AND INTEREST OF EXPERTS**

Our auditors are PricewaterhouseCoopers LLP, Chartered Accountants, located at 1250 René-Lévesque Boulevard West, Montreal, Québec H3B 4W2, who reported on the consolidated annual financial statements for the twelve-month fiscal year ended December 31, 2016, which have been filed under National Instrument 51-102 *Continuous Disclosure Obligations*. PricewaterhouseCoopers LLP is independent in accordance with the auditors' rules of professional conduct in Québec.

## **INFORMATION ON THE AUDIT COMMITTEE**

### **Audit & Risk Management Committee Charter**

The Audit & Risk Management Committee Charter sets out the roles and responsibilities of the Audit & Risk Management Committee of our Board of Directors. A copy of the charter is annexed hereto as Schedule A.

The Audit & Risk Management Committee oversees our financial reporting process and internal controls, and consults with management, our accounting department and our independent auditors on matters related to our annual audit and internal controls, published financial statements, accounting principles and auditing procedures. The Audit & Risk Management Committee also reviews management's evaluation of the auditors' independence and submits to the Board of Directors its recommendations on the appointment of auditors. The members of the Audit & Risk Management Committee are Jean-Marie Bourassa (Chairman), Jennie S. Hwang and James T. Fahey, all of whom are "independent" and financially literate within the meaning of applicable Canadian securities laws. Jean-Marie Bourassa is the President of Bourassa Boyer Inc., who were the auditors of 5NPlus Inc. and 6367909 Canada Inc. until May 18, 2007.

The relevant experience of each member of the Audit & Risk Management Committee is described below:

**Jean-Marie Bourassa** is the founding President and Chief Executive Officer of Bourassa Boyer Inc., an accounting firm. He also serves on the Board of Directors of Savaria Corporation, which is listed on the Toronto Stock Exchange, and is involved with various private companies as a shareholder and a director and he is President of the Palliative Care Residence of Vaudreuil-Soulanges Foundation. Mr. Bourassa has been a Chartered Accountant since 1976 and attained corporate governance certification at Université Laval in 2009.

**Jennie S. Hwang** is a seasoned director and experienced CEO with over 30 years of experience in materials, metals, electronics, chemicals and coatings through her management and/or ownership of businesses. Ms. Hwang is currently President of H-Technologies Group, encompassing international business, global market assessment, manufacturing

services, and business strategy advisory services. She was the CEO of International Electronic Materials Corporation and has held senior executive positions with Lockheed Martin Corp., Hanson, PLC and Sherwin-Williams Company. She holds four academic degrees (Ph.D., M.S., M.A., B.S.) in metallurgical engineering, material sciences, liquid crystals and chemistry. She has served as Global President of the Surface Mount Technology Association and in other global leadership positions and is an international speaker and author of more than 450 publications and several textbooks on leading technologies, advanced manufacturing and global market thrusts. Among her awards/honors are the U.S. Congressional Certificate of Achievements, induction into the International Hall of Fame (Women in Technology) and the National Academy of Engineering, and YWCA Women of Achievement Award. She is a board member of Ferro Corporation (NYSE-listed global manufacturer) and formerly served on the board of Second Bancorp, Inc. She also serves on the U.S. National Materials and Manufacturing Board, Board of Army Science and Technology of U.S. Defense Department and Board of National Laboratory Assessment. She is the Chairman of the Board of Assessment Panels on Army Research Laboratory. She has attained certificates in corporate governance from Harvard Business School Executive Program and from Columbia University Corporate Governance programs, and is a guest contributor to the *AGENDA of Financial Times* and *Corporate Board Member* of NYSE Euronext on corporate governance issues.

**James T. Fahey** is an accomplished senior executive with more than 20 years of experience in the Electronics Industry in various roles including scientist, engineering (manufacturing and product development), marketing and sales and senior management, including 17 years in senior executive positions with Rohm and Haas and The Dow Chemical Company. Mr. Fahey is a dynamic leader with demonstrated strategic and operational strengths across various functions (Operations, Engineering, Research and Development, Sales and Marketing, and Business Leadership), and across various businesses (Microelectronics, Circuit Board Technologies, Optics and Ceramics). Mr. Fahey successfully directed global teams and supported business development in Asia, North America & Europe. Mr. Fahey holds a Bachelor of Science (First Class Honors) from St. Francis Xavier University, a Masters in Science and a PhD in Chemistry (Area of Research: Polymers for Microelectronic Applications) from Cornell University. Mr. Fahey is currently serving on the Semiconductor North American Advisory Board, was a member of the Board of NEMI (National Electronics Manufacturing Initiative) and has produced numerous technical publications and patents in the semiconductor industry related to both materials and semiconductor processing.

#### ***Reliance on Certain Exemptions***

Since December 20, 2007, we have not relied on any of the exemptions regarding the Audit & Risk Management Committee provided in *National Instrument 52-110 Audit Committees* of the Canadian Securities Administrators.

#### ***Audit & Risk Management Committee Oversight***

Since December 20, 2007, our Board of Directors has not failed to adopt a recommendation of the Audit & Risk Management Committee to nominate or compensate an external auditor.

#### ***Pre-Approval Policies and Procedures***

The policies and procedures of the Audit & Risk Management Committee regarding the engagement of non-audit services are set out in the Audit & Risk Management Committee Charter, which is annexed hereto as Schedule A.

### **External Auditor Service Fees**

The following table lists the fees invoiced by PricewaterhouseCoopers LLP, Chartered Accountants during the twelve-month fiscal year ended December 31, 2016 and the twelve-month fiscal year ended December 31, 2015, in Canadian dollars, for various services rendered to us:

(In Canadian dollars)	Twelve-month fiscal year ended December 31, 2016	Twelve-month fiscal year ended December 31, 2015
Audit fees	\$810,710	\$727,999
Audit-related fees	\$0	\$1,575
Tax fees	\$115,237	\$65,128
All other fees	\$0	\$0

Tax fees included mainly Canadian tax compliance and international tax consulting work.

### **ADDITIONAL INFORMATION**

Additional information, including directors' and officers' compensation and indebtedness (if any), principal holders of our securities and securities authorized for issuance under equity compensation plans, that is not included herein, will be contained in our management proxy circular prepared in connection with our annual meeting of shareholders to be held on May 3, 2017. Additional information relating to us may be found on SEDAR, at [www.sedar.com](http://www.sedar.com).

Additional financial information may be found in our financial statements and management's discussion and analysis for the twelve-month fiscal year ended December 31, 2016.

**SCHEDULE A**  
**CHARTER OF THE AUDIT & RISK MANAGEMENT COMMITTEE**

**1. INTERPRETATION**

"**Committee**" means the Audit and Risk Management Committee of the Board of Directors of the Company.

"**Financially Literate**" means the ability to read and understand a set of financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and complexity of the issues that can reasonably be expected to be raised by the Company's financial statements.

"**Independent Director**" means a director who is independent within the meaning of sections 1.4 and 1.5 of *Regulation 52-110 Respecting Audit Committees*.

**2. OBJECTIVES**

The Committee will assist the Board of Directors in fulfilling its oversight responsibilities. In performing its duties, the Committee will maintain effective working relationships with the Board of Directors, management, the internal auditors and the external auditors.

**3. COMPOSITION**

3.1 The Committee shall consist solely of Independent Directors, all of whom shall be Financially Literate and at least one of whom shall be a financial expert as defined in the applicable corporate governance rules imposed by regulatory bodies.

3.2 Following each annual meeting of shareholders, the Board of Directors shall elect three or more directors, who shall meet the independence and experience requirements of the Toronto Stock Exchange as well as the other similar requirements under applicable securities regulations, to serve on the Committee until the close of the next annual meeting of shareholders of the Company or until the member ceases to be a director, resigns or is replaced, whichever first occurs. Any member may be removed from office or replaced at any time by the Board of Directors.

3.3 The Board of Directors shall appoint one of the members of the Committee as the Chair of the Committee. If the Chair is absent from a meeting, the members shall select a Chair from those in attendance to act as Chair of the meeting.

**4. MEETINGS AND RESOURCES**

4.1 Regular meetings of the Committee shall be held quarterly. Special meetings of the Committee may be called by the Chair of the Committee, the external auditors, the Chairman of the Board, the Chief Executive Officer or the Chief Financial Officer of the Company.

4.2 The powers of the Committee shall be exercisable by a meeting at which a quorum is present. A quorum shall be not less than a majority of members of the Committee from time to time. Subject to the foregoing requirement, unless otherwise determined by the Board of Directors, the Committee shall have the power to fix its quorum and to regulate its procedure. Matters decided by the Committee shall be decided by majority vote.

4.3 Notice of each meeting shall be given to each member, the external auditors, the Chairman of the Board, the Chief Executive Officer and the Chief Financial Officer of the Company, any or all of whom shall be entitled to attend. Notice of each meeting shall also be given, as the case may be, to the internal auditor who shall also attend whenever requested to do so by the Chair of the Committee or the Corporate Secretary.

- 4.4 Notice of meeting may be given orally or by letter, telephone, facsimile transmission, or electronic device not less than 24 hours before the time fixed for the meeting. Members may waive notice of any meeting. The notice need not state the purpose or purposes for which the meeting is being held.
- 4.5 Opportunities should be afforded periodically to the external auditors and, as the case may be, to the internal auditor and the senior management to meet separately with the Committee. In addition, the Committee may meet in camera, with only members of the Committee present, whenever the Committee determines that it is appropriate to do so.
- 4.6 The Committee shall have the authority to retain special legal counselling, accounting or other consultants as it may see fit to attend its meetings and to take part in discussion and consideration of the affairs of the Committee at the Company's expense.
- 4.7 The Corporate Secretary of the Company or designate of the Corporate Secretary shall be the Secretary of all meetings of the Committee and shall maintain minutes of all meetings and deliberations of the Committee.

## 5. RESPONSIBILITIES AND DUTIES

### 5.1 Role and responsibilities of the Committee Chair:

#### 5.1.1 The Chair of the Committee:

##### 5.1.1.1 Provides leadership for the Committee by ensuring that:

- (a) The responsibilities of the Committee are well understood by Committee members and management.
- (b) The Committee works as a cohesive team.
- (c) Adequate resources and timely and relevant information are available to the Committee to support its work.
- (d) The effectiveness of the Committee is assessed on a regular basis.
- (e) The Committee's structure and mandate is appropriate and adequate to support the discharge of the Committee's responsibilities.
- (f) The scheduling, organization and procedures of Committee meetings provide adequate time for the consideration and discussion of relevant issues.

5.1.1.2 Works with the Chief Executive Officer, the Chief Financial Officer and the Corporate Secretary to set the calendar of the committee's regular meetings.

5.1.1.3 Has the authority to convene special meetings as required.

5.1.1.4 Sets the agenda in collaboration with the Chief Executive Officer, the Chief Financial Officer and the Corporate Secretary.

5.1.1.5 Presides at meetings.

5.1.1.6 Acts as liaison with management with regard to the work of the Committee.

5.1.1.7 Reports to the Board concerning the work of the Committee.

5.1.1.8 Exercises the authority specifically delegated to the Chair by the Committee, if any.

## 5.2 General Responsibilities

While the Committee has the responsibilities and powers set forth below, it is not the duty of the Committee to plan or conduct audits or to determine that the Company's financial statements are complete and accurate. This is the responsibility of management and the external auditors. Nor is it the duty of the Committee to conduct investigations, or to assure compliance with laws and regulations. The Committee shall review disagreements, if any, between management and the external auditors and shall make recommendations to resolve such disagreements. In the event that any such disagreement persists, the matter will be referred by the Committee to the Board of Directors for a final determination.

## 5.3 Review of Mandate of the Committee

The Board of Directors and the Committee shall review and reassess the adequacy of this mandate on an annual basis.

## 5.4 Publicly Disclosed Financial Information

5.4.1 The Committee shall review and recommend for approval by the Board of Directors, before release to the public:

5.4.1.1 interim unaudited financial statements and related management's discussion & analysis;

5.4.1.2 audited annual financial statements, in conjunction with the report of the external auditors, and related management's discussion & analysis;

5.4.1.3 all public disclosure documents containing audited or unaudited financial information, including any prospectus, the annual information form and management's discussion and analysis of financial condition and results of operations, as well as related press releases, including earnings guidance; and

5.4.1.4 the compliance of management certification of financial reports with applicable legislation and attestation of the Company's disclosure controls and procedures.

5.4.2 The Committee shall review any report which accompanies published financial statements (to the extent such a report discusses financial condition or operating results) for consistency of disclosure with the financial statements themselves.

5.4.3 In its review of financial statements, the Committee should obtain an explanation from management of all significant variances between comparative reporting periods and an explanation from management for items which vary from expected or budgeted amounts as well as from previous reporting periods.

5.4.4 In its review of financial statements, the Committee should review unusual or extraordinary items, transactions with related parties, and adequacy of disclosures, asset and liability carrying values, income tax status and related reserves, qualifications, if any, contained in letters of representation and business risks, uncertainties, commitments and contingent liabilities.

5.4.5 In its review of financial statements, the Committee shall review the appropriateness of the Company's significant accounting principles and practices, including acceptable alternatives, and the appropriateness of any significant changes in accounting principles and practices.

5.4.6 The Committee shall satisfy itself that adequate procedures are in place for the review of the Company's public disclosure of financial information extracted or derived from the Company's financial statements, and shall periodically assess the adequacy of those procedures.

## 5.5 Financial Reporting and Accounting Trends

5.5.1 The Committee shall:

5.5.1.1 Review and assess the effectiveness of accounting policies and practices concerning financial reporting;

5.5.1.2 Review with management and with the external auditors any proposed changes in major accounting policies, the presentation and impact of significant risks and uncertainties, and key estimates and judgments of management that may be material to financial reporting;

5.5.1.3 Question management and the external auditors regarding significant financial reporting issues discussed and the method of resolution; and

5.5.1.4 Review general accounting trends and issues of accounting policy, standards and practices which affect or may affect the Company.

## 5.6 Internal Controls

5.6.1 The Committee shall review and monitor the Company's internal control procedures, programs and policies, and assess the adequacy and effectiveness of internal controls over the accounting and financial reporting systems, with particular emphasis on controls over computerized systems.

5.6.2 The Committee shall review:

5.6.2.1 The evaluation of internal controls by the external auditors, together with management's response;

5.6.2.2 The working relationship between management and external auditors;

5.6.2.3 The appointments of the Chief Financial Officer and any key financial executives involved in the financial reporting process;

5.6.2.4 The review and approval of the Company's hiring policies regarding partners, employees and former partners and employees of the present and former external auditor of the Company;

5.6.2.5 Any decisions related to the need for internal auditing, including whether this function should be outsourced and, in such case, approving the supplier which shall not be the external auditors; and

5.6.2.6 Internal control procedures to ensure compliance with the law and avoidance of conflicts of interest.

5.6.3 The Committee shall undertake private discussions with staff of the internal audit function to establish internal audit independence, the level of co-operation received from management, the degree of interaction with the external auditors, and any unresolved material differences of opinion or disputes.

## 5.7 Internal Auditor

5.7.1 The Committee shall:

5.7.1.1 Review the mandate and annual objectives of the internal auditor, if the appointment of an internal auditor is deemed appropriate;

5.7.1.2 Review the adequacy of the Company's internal audit resources;

5.7.1.3 Ensure the internal auditor has ongoing access to the Chair of the Committee as well as all officers of the Company, particularly the Chief Executive Officer; and

5.7.1.4 Review the audit plans, performance and summaries of the reports of the internal audit function as well as management's response including follow-up to any identified weakness.

## 5.8 External Auditors

5.8.1 The Committee shall recommend to the Board of Directors the appointment and compensation of the external auditors, which firm is ultimately accountable to the Committee and the Board of Directors.

5.8.2 The Committee shall be responsible for overseeing the work of the external auditors.

5.8.3 The Committee shall i) receive periodic reports from the external auditors regarding the auditors' independence, the performance of the auditors, the qualifications of the key audit partner and audit managers, a periodic review of the auditors' quality control procedures, material issues arising from the periodic quality control review and the steps taken by the auditors to address such findings, ii) discuss such reports with the auditors, and if so determined by the Committee, iii) recommend that the Board of Directors take appropriate action to satisfy itself as to the independence of the auditors and the quality of their performance.

5.8.4 The Committee shall take appropriate steps to assure itself that the external auditors are satisfied with the quality of the Company's accounting principles and that the accounting estimates and judgments made by management reflect an appropriate application of generally accepted accounting principles.

5.8.5 The Committee shall undertake private discussions on a regular basis with the external auditors to review, among other matters, the quality of financial personnel, the level of co-operation received from management, any unresolved material differences of opinion or disputes with management regarding financial reporting and the effectiveness of the work of the internal audit function.

5.8.6 The Committee shall review the terms of the external auditors' engagement and the appropriateness and reasonableness of the proposed audit fees as well as the compensation of any advisors retained by the Committee.

5.8.7 The Committee shall review and pre-approve any engagements for non-audit services provided by the external auditors or their affiliates to the Company or its subsidiaries, together with the fees



for such services, and consider the impact of this on the independence of the external auditors. The Committee shall determine which non-audit services the external auditors are prohibited from providing.

5.8.8 When a change of auditors is proposed, the Committee shall review all issues related to the change, including the information required to be disclosed by regulations and the planned steps for an orderly transition.

5.8.9 The Committee shall review all reportable events, including disagreements, unresolved issues and consultations on a routine basis whether or not there is to be a change of auditors.

5.8.10 When discussing auditor independence, the Committee will consider both rotating the lead audit partner or audit partner responsible for reviewing the audit after a number of years and establishing hiring policies for employees or former employees of its external auditor.

## 5.9 Audit Procedures

5.9.1 The Committee shall review the audit plans of the internal and external audits, including the degree of co-ordination in those plans, and shall inquire as to the extent to which the planned audit scope can be relied upon to detect weaknesses in internal control or fraud or other illegal acts. The audit plans should be reviewed with the external auditors and with management, and the Committee should recommend to the Board of Directors the scope of the external audit as stated in the audit plan.

5.9.2 The Committee shall review any problems experienced by the external auditors in performing the audit, including any restrictions imposed by management or significant accounting issues on which there was a disagreement with management.

5.9.3 The Committee shall review the post-audit or management letter containing the recommendations of the external auditors, and management's response and subsequent follow-up to any identified weakness.

## 5.10 Risk Management and Other Responsibilities

5.10.1 The Committee shall put in place procedures to receive and handle complaints or concerns received by the Company about accounting or audit matters including the anonymous submission by employees of concerns respecting accounting or auditing matters.

5.10.2 The Committee shall review such litigation, claims, transactions or other contingencies as the internal auditor, external auditors or any officer of the Company may bring to its attention, and shall periodically review the Company's risk management programs. In that regard the Committee shall review the Company's major risk exposures and the steps taken by management to monitor, control and report such exposures.

5.10.3 The Committee shall review the policy on use of derivatives and monitor the risk.

5.10.4 The Committee shall review the related party transactions in line with the Toronto Stock Exchange rules and regulations and those of any other applicable exchange or regulator.

5.10.5 The Committee shall review assurances of compliance with covenants in trust deeds or loan agreements.

5.10.6 The Committee shall review business risks that could affect the ability of the Company to achieve its business plan.

5.10.7 The Committee shall review uncertainties, commitments, and contingent liabilities material to financial reporting.

5.10.8 The Committee shall review the effectiveness of control and control systems utilized by the Company in connection with financial reporting and other identified business risks.

5.10.9 The Committee shall review incidents of fraud, illegal acts, conflicts of interest and related-party transactions.

5.10.10 The Committee shall review material valuation issues.

5.10.11 The Committee shall review the quality and accuracy of computerized accounting systems, the adequacy of the protections against damage and disruption, and security of confidential information through information systems reporting.

5.10.12 The Committee shall review material matters relating to audits of subsidiaries.

5.10.13 The Committee shall review cases where management has sought accounting advice on a specific issue from an accounting firm other than the one appointed as auditor.

5.10.14 The Committee shall review any legal matters that could have a significant impact on the financial statements.

5.10.15 The Committee shall consider other matters of a financial nature it feels are important to its mandate or as directed by the Board of Directors.

5.10.16 The Committee shall report regularly to the Board of Directors on its proceedings, reviews undertaken and any associated recommendations.

5.10.17 The Committee shall have the right, for the purpose of discharging the powers and responsibilities of the Committee, to inspect any relevant records of the Company and its subsidiaries.

#### 5.11 Compensation

Members of the Committee shall be entitled to receive such remuneration for acting as members of the Committee as the Board of Directors may determine from time to time.

Nothing contained in this mandate is intended to expand applicable standards of conduct under statutory or regulatory requirements for the directors of the Corporation or the members of the Audit & Risk Management Committee. Even though the Audit & Risk Management Committee has a specific mandate and its members may have financial experience, they do not have the obligation to act as auditors or to perform auditing, or to determine that the Corporation's financial statements are complete and accurate. Members of the Audit & Risk Management Committee are entitled to rely, absent knowledge to the contrary, on (i) the integrity of the persons and organizations from whom they receive information, (ii) the accuracy and completeness of the information provided, and (iii) representations made by management as to the non-audit services provided to the Corporation by the external auditors. The Audit & Risk Management Committee's oversight responsibilities are not established to provide an independent basis to determine that (i) management has maintained appropriate accounting and financial reporting principles or appropriate internal controls and procedures, or (ii) the Corporation's financial statements have been prepared and, if applicable, audited in accordance with generally accepted accounting principles.

Approved by the Board of Directors on May 7, 2014