

UNIVERSAL DISPLAY CORP \PA\
Form 10-K
February 28, 2014

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K
(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2013

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-12031

UNIVERSAL DISPLAY CORPORATION
(Exact name of registrant as specified in its charter)
Pennsylvania
(State or other jurisdiction of incorporation or organization)

23-2372688
(I.R.S. Employer Identification No.)

375 Phillips Boulevard, Ewing, New Jersey 08618
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: (609) 671-0980

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, \$0.01 par value	The NASDAQ Stock Market LLC

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes
No

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant computed by reference to the closing sale price of the registrant's common stock on the NASDAQ Global Market as of June 28, 2013, was \$953,262,272. Solely for purposes of this calculation, all executive officers and directors of the registrant and all beneficial owners of more than 10% of the registrant's common stock (and their affiliates) were considered affiliates.

As of February 24, 2014, the registrant had outstanding 46,438,738 shares of common stock.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2014 Annual Meeting of Shareholders, which is to be filed with the Securities and Exchange Commission no later than April 30, 2014, are incorporated by reference into Part III of this report.

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CAUTIONARY STATEMENT
CONCERNING FORWARD-LOOKING STATEMENTS

This report and the documents incorporated by reference in this report contain some “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements concern possible or assumed future events, results and business outcomes. These statements often include words such as “believe,” “expect,” “anticipate,” “intend,” “plan,” “estimate,” “seek,” “will,” “may,” “similar expressions. These statements are based on assumptions that we have made in light of our experience in the industry, as well as our perceptions of historical trends, current conditions, expected future developments and other factors we believe are appropriate under the circumstances.

As you read and consider this report, you should not place undue reliance on any forward-looking statements. You should understand that these statements involve substantial risk and uncertainty and are not guarantees of future performance or results. They depend on many factors that are discussed further under Item 1A (Risk Factors) below, including:

- successful commercialization by organic light emitting diode (OLED) manufacturers of products incorporating our OLED technologies and materials and their continued willingness to utilize our OLED technologies and materials;
- our ability to form and continue strategic relationships with manufacturers of OLED products;
- the payments that we expect to receive under our existing contracts with OLED manufacturers and the terms of contracts that we expect to enter into with OLED manufacturers in the future;
- the adequacy of protections afforded to us by the patents that we own or license and the cost to us of maintaining, enforcing and defending those patents;
- our ability to obtain, expand and maintain patent protection in the future, and to protect our non-patented intellectual property;
- our exposure to and ability to defend third-party claims and challenges to our patents and other intellectual property rights;
- our ability to maintain and improve our competitive position following the expiration of our fundamental phosphorescent organic light-emitting diode (PHOLED) patents;
- the potential commercial applications of and future demand for our OLED technologies and materials, and of OLED products in general;
 - the comparative advantages and disadvantages of our OLED technologies and materials versus competing technologies and materials currently on the market;
- the nature and potential advantages of any competing technologies that may be developed in the future;
- the outcomes of our ongoing and future research and development activities, and those of others, relating to OLED technologies and materials;
- our ability to access future OLED technology developments of our academic and commercial research partners;
- our ability to acquire and supply OLED materials at cost competitive pricing;
- our ability to compete against third parties with resources greater than ours;
- our future capital requirements and our ability to obtain additional financing if and when needed;
- our future OLED technology licensing and OLED material revenues and results of operations, including supply and demand for our OLED materials; and
- general economic and market conditions.

Changes or developments in any of these areas could affect our financial results or results of operations and could cause actual results to differ materially from those contemplated by any forward-looking statements.

All forward-looking statements speak only as of the date of this report or the documents incorporated by reference, as the case may be. We do not undertake any duty to update, correct, modify, or supplement any of these forward-looking statements to reflect events or circumstances after the date of this report or to reflect the occurrence of unanticipated events.

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PART I

ITEM 1. BUSINESS

Our Company

We are a leader in the research, development and commercialization of organic light emitting diode, or OLED, technologies and materials. OLEDs are thin, lightweight and power-efficient solid-state devices that emit light, making them highly suitable for use in full-color displays and as lighting products. OLED displays are capturing a growing share of the flat panel display market. We believe that this is because OLEDs offer potential advantages over competing display technologies with respect to power efficiency, contrast ratio, viewing angle, video response time, form factor and manufacturing cost. We also believe that OLED lighting products have the potential to replace many existing light sources in the future because of their high power efficiency, excellent color rendering index, low operating temperature and novel form factor. Our technology leadership and intellectual property position should enable us to share in the revenues from OLED displays and lighting products as they enter mainstream consumer and other markets.

Our primary business strategy is to (1) further develop and license our proprietary OLED technologies to manufacturers of products for display applications, such as cell phones, portable media devices, tablets, laptop computers and televisions, and specialty and general lighting products; and (2) develop new OLED materials and sell the materials to those product manufacturers. Through our internal research and development efforts, our relationships with world-class partners such as Princeton University (Princeton), the University of Southern California (USC), the University of Michigan (Michigan) and PPG Industries, Inc. (PPG Industries), and acquisitions of patents and patent applications, we have established a significant portfolio of proprietary OLED technologies and materials. We currently own, exclusively license or have the sole right to sublicense more than 3,000 patents issued and pending worldwide.

We sell our proprietary OLED materials to customers for evaluation and use in commercial OLED products. We also enter into agreements with manufacturers of OLED display and lighting products under which we grant them licenses to practice under our patents and to use our proprietary know-how. At the same time, we work with these and other companies who are evaluating our OLED technologies and materials for possible use in commercial OLED display and lighting products.

Market Overview

The Flat Panel Display Market

Flat panel displays are essential for a wide variety of portable consumer electronics products, such as cell phones, portable media devices, digital cameras, tablets and laptop computers. Due to their narrow profile and light weight, flat panel displays have also become the display of choice for larger product applications, such as computer monitors and televisions.

Liquid crystal displays, or LCDs, continue to dominate the flat panel display market. However, we believe that OLED displays are an attractive alternative to LCDs because they offer a number of potential advantages, including:

- higher power efficiencies, thereby reducing energy consumption;
- a thinner profile and lighter weight;
- higher contrast ratios, leading to sharper picture images and graphics;
- wider viewing angles;
- deposition on non-rigid substrates which enables conformable and flexible displays;
- faster response times for video; and
- lower cost manufacturing methods and materials.

Based on these characteristics, product manufacturers have adopted small-area OLED displays for use in portable electronic devices, such as smartphones and tablets. Manufacturers are also working to commercialize OLED displays for use in larger applications, such as computer monitors and televisions. We believe that if these efforts are successful, they could result in sizeable markets for OLED displays.

In addition, due to the inherent transparency of organic materials and through the use of transparent electrode technology, OLEDs eventually may enable the production of transparent displays for use in products such as

automotive windshields and windows with embedded displays. Organic materials also make technically possible the development of flexible displays for use in an entirely new set of product applications. Such applications include display devices that can be conformed to certain shapes for wearable, industrial and ruggedized applications.

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The Solid-State Lighting Market

Traditional incandescent light bulbs are inefficient because they convert only about 5% of the energy they consume into visible light, with the rest emerging as heat. Fluorescent lamps use excited gases, or plasmas, to achieve a higher energy conversion efficiency of about 20%. However, the color rendering index, or CRI, of most fluorescent lamps – in other words, the quality of their color compared to an ideal light source – is inferior to that of an incandescent bulb. Fluorescent lamps also pose environmental concerns because they typically contain mercury.

Solid-state lighting relies on the direct conversion of electricity to visible light using semiconductor materials. By avoiding the heat and plasma-producing processes of incandescent bulbs and fluorescent lamps, solid-state lighting products can have substantially higher energy conversion efficiencies.

There are currently two basic types of solid-state lighting devices: inorganic light emitting diodes, or LEDs, and OLEDs. Current LEDs are very small in size (about one square millimeter) and are extremely bright. Having been developed about 25 years before OLEDs, they are already employed in a variety of lighting products, such as traffic lights, billboards, replacements for incandescent lighting, backlights for computer monitors and televisions, and as border or accent lighting. However, the high operating temperatures and intense brightness of LEDs may make them less desirable for many general illumination and diffuse lighting applications.

OLEDs, on the other hand, are larger in size and can be viewed directly, without using diffusers that are required to temper the intense brightness of LEDs. OLEDs can be added to any suitable surface, including glass, plastic or metal foil, and could be cost-effective to manufacture in high volume. Given these characteristics, product manufacturers are working to develop OLEDs for diffuse specialty lighting applications and ultimately general illumination. If these efforts are successful, we believe that OLED lighting products could begin to be used for applications currently addressed by incandescent bulbs and fluorescent lamps, as well as for new applications that take advantage of the OLED form factor.

Our Competitive Strengths

We believe our position as one of the leading technology developers in the OLED industry is the direct result of our technological innovation. We have built an extensive intellectual property portfolio around our OLED technologies and materials, and are working diligently to enable our manufacturing partners to adopt our OLED technologies and materials for expanding commercial usage. Our key competitive strengths include:

Technology Leadership

We are a recognized technology leader in the OLED industry. Along with our research partners, we have pioneered the development of our UniversalPHOLED® phosphorescent OLED technologies, which can be used to produce OLEDs that are up to four times as efficient as traditional fluorescent OLEDs and significantly more efficient than current LCDs, which are illuminated using backlights. We believe that our phosphorescent OLED technologies and materials are well-suited for industry usage in the commercial production of OLED displays and lighting products. Through our relationships with companies such as PPG Industries and our academic partners, we have also developed other important OLED technologies, as well as novel OLED materials that we believe will facilitate the adoption of our various OLED technologies by product manufacturers.

Broad Portfolio of Intellectual Property

We believe that our extensive portfolio of patents, trade secrets and non-patented know-how provides us with a competitive advantage in the OLED industry. Through our internal development efforts, acquisitions, and our relationships with world-class partners such as Princeton, USC, Michigan and PPG Industries, we own, exclusively license or have the sole right to sublicense more than 3,000 patents issued and pending worldwide. In 2011, we purchased 74 issued U.S. patents from Motorola Solutions, Inc. (f/k/a Motorola, Inc.) (Motorola), together with foreign counterparts in various countries, which patents we had previously licensed from Motorola, and in 2012, we acquired the entire worldwide patent portfolio of more than 1,200 OLED patents and patent applications of Fujifilm Corporation (Fujifilm) for a total cost of \$109.1 million. We also continue to accumulate valuable non-patented technical know-how relating to our OLED technologies and materials.

Focus on Licensing Our OLED Technologies

We are focused on licensing our proprietary OLED technologies to product manufacturers on a non-exclusive basis. Our current business model does not involve the direct manufacture or sale of OLED display or lighting products.

Instead, we seek license fees and royalties from OLED product manufacturers based on their sales of licensed products. We believe this business model allows us to concentrate on our core strengths of technology development and innovation, while at the same time providing significant operating leverage. We also believe that this approach may reduce potential competitive conflicts between us and our customers.

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Licenses with Key Product Manufacturers

We have licensed our OLED technologies and patents to several manufacturers for use in commercial products. In July 2012, Samsung Mobile Display Co. Ltd. (SMD) merged with Samsung Display Co., Ltd. (SDC). Following the merger, all agreements between us and SMD were assigned to SDC, and SDC is obligated to honor all pre-existing agreements made between us and SMD. In 2011, we entered into a new license agreement with SDC for its manufacture of active matrix OLED (AMOLED) display products, which agreement superseded our prior license agreement with SDC. We also have license agreements with Lumiotech, Inc. (Lumiotech), Pioneer Corporation (Pioneer) and Kaneka Corporation (Kaneka) for the manufacture of OLED lighting products, as well as a collaborative arrangement with Moser Baer Technologies, Inc. (Moser Baer) to support its development and manufacture of OLED lighting products. Additionally, we have license agreements with Showa Denko K.K. (Showa Denko) for its manufacture of OLED lighting products by solution processing methods (2009), Konica Minolta Holdings, Inc. (Konica Minolta) for its manufacture of OLED lighting products (2008) and DuPont Displays for its manufacture of solution-processed OLED display products using proprietary OLED materials obtained through us (2002).

Leading Supplier of UniversalPHOLED Emitter Materials

We are the leading supplier of phosphorescent emitter materials to OLED product manufacturers. The emitter material, which is designed to efficiently convert electrical energy to a desired wavelength of light, is the key component in an OLED device. PPG Industries currently manufactures our proprietary emitter materials for us, which we then qualify and resell to OLED product manufacturers. We record revenues based on our sales of these materials to OLED product manufacturers. This allows us to maintain close technical and business relationships with the OLED product manufacturers purchasing our proprietary materials, which in turn further supports our technology licensing business.

Complementary UniversalPHOLED Host Material Business

We supply certain of our proprietary phosphorescent host materials to OLED product manufacturers. In one design, the emitter material is disbursed into a host material, with the resulting mixture consisting of predominantly host material. PPG Industries also currently is responsible for the manufacture of our proprietary host materials for us, which we then qualify and resell to our customers. We believe that host material sales can be complementary to our phosphorescent emitter material sales business; however, our OLED product manufacturing customers are not required to purchase our host materials in order to utilize our phosphorescent emitter materials. In addition, the host material business is more competitive than the phosphorescent emitter material sales business. This means our long-term prospects for host material sales are uncertain.

Established Material Supply Relationships

We have established relationships with well-known manufacturers that are using, or are evaluating, our OLED materials for use in commercial products. In 2013, SDC, LG Display Co., Ltd. (LG Display), Tohoku Pioneer Corporation (Tohoku Pioneer) and Konica Minolta purchased our proprietary OLED materials for use in commercial OLED display and lighting products. We continue to work with many product manufacturers that are evaluating our OLED materials and technologies for use in commercial OLED displays and lighting products, including AU Optronics Corporation (AU Optronics), Innolux Corporation (Innolux) (formerly Chimei Innolux Corporation (CMI)), BOE Technology Group Co., Ltd. (BOE), Kaneka, Philips Technologic GmbH (Philips) and Sony Corporation (Sony).

U.S. Government Program Support

We perform work under research and development contracts with U.S. government agencies, such as the U.S. Department of the Army and the U.S. Department of Energy. Under these contracts, the U.S. Government funds a portion of our efforts to develop next-generation OLED technologies for applications such as flexible displays and solid-state lighting. This enables us to supplement our internal research and development budget with additional funding. As OLED technology continues to prosper in the marketplace, U.S. Government funding will likely decline. Experienced Management and Scientific Advisory Team

Our management team has significant experience in developing business models focused on licensing disruptive technologies in high growth industries. In addition, our management team has assembled a Scientific Advisory Board that includes some of the leading researchers in the OLED industry, such as Professor Stephen R. Forrest of Michigan

(formerly of Princeton) and Professor Mark E. Thompson of USC.

Our Business Strategy

Our current business strategy is to promote and continue to expand our portfolio of OLED technologies and materials for widespread use in OLED displays and lighting products. We generate revenues primarily by licensing our OLED technologies and selling our proprietary OLED materials to display and lighting product manufacturers. We are presently focused on the following steps to implement our business strategy:

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Target Leading Product Manufacturers

We are targeting leading manufacturers of flat panel displays and lighting products as potential commercial licensees of our OLED technologies and purchasers of our OLED materials. We also supply our proprietary OLED materials to manufacturers of OLED displays and lighting products for evaluation and for use in product development and for pre-commercial activities, and we provide technical assistance and support to these manufacturers. We concentrate on working closely with OLED product manufacturers because we believe that the successful incorporation of our technologies and materials into commercial products is critical to their widespread adoption.

Enhance Our Existing Portfolio of PHOLED Technologies and Materials

We believe that a strong portfolio of proprietary OLED technologies and materials for both displays and lighting products is critical to our success. Consequently, we are continually seeking to expand this portfolio through our internal development efforts, our collaborative relationships with academic and other research partners, and other strategic opportunities. One of our primary goals is to develop new and improved phosphorescent OLED technologies and materials with increased efficiencies, enhanced color gamut and extended lifetimes, which are compatible with different manufacturing methods, so that they can be used by various manufacturers in a broad array of OLED display and lighting products.

Develop Next-Generation Organic Technologies

We continue to conduct research and development activities relating to next-generation OLED technologies for both displays and lighting products. Our current research and development initiatives involve flexible OLED displays and lighting, transparent or top-emitting OLED displays and thin-film encapsulation for OLEDs. We also are funding research by our academic partners on the use of organic thin-film technology in other applications. Our focus on next-generation technologies is designed to enable us to maintain our position as a leading provider of OLED and other organic electronics technologies and materials as new markets emerge.

Business and Geographic Markets

We derive revenue from the following:

- sales of OLED materials for evaluation, development and commercial manufacturing;
- intellectual property and technology licensing; and
- technology development and support, including government contract work and support provided to third parties for commercialization of their OLED products.

Most manufacturers of flat panel displays and lighting products who are or might potentially be interested in our OLED technologies and materials are currently located outside of the United States, particularly in the Asia-Pacific region. To provide on-the-ground support to these manufacturers, we have established wholly-owned subsidiaries in Ireland, Korea, Japan and Hong Kong as well as a representative office in Taiwan. Our subsidiary in Hong Kong operates a world-class chemistry laboratory to support our expanding research and development initiatives in OLED materials and technologies. Our subsidiary in Ireland is responsible for all material sales world-wide (excluding the United States) and for licensing and managing intellectual property and undertaking certain other business transactions in all non-U.S. territories.

We receive a majority of our revenues from customers that are domiciled outside of the United States, and our business is heavily dependent on our relationships with these customers. In particular, one of our key customers located in the Asia-Pacific region, SDC, accounted for more than 60% of our consolidated revenues for 2013.

Substantially all revenue derived from our customers is denominated in U.S. dollars.

For more information on our revenues, costs and expenses associated with our business, as well as a breakdown of revenues from North America and foreign sources, please see our Consolidated Financial Statements and the notes thereto, as well as “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” included elsewhere in this report.

Our Technology and its Relation to OLED Technology and Structure

OLED devices are solid-state semiconductor devices made from thin films of organic material that emit light of various wavelengths when electricity is selectively applied to the emissive layer of the device. OLED devices are typically referred to as incorporating an “OLED stack.” OLED stacks vary in specific structure but those commonly used today may include a cathode, an electron injection layer, an electron transport layer, an emissive layer, a hole

transport layer, a hole injection layer and an anode, all of which are placed on a substrate which may be made of a number of different materials, including glass, plastic and metal.

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Our technology and materials are most commonly utilized in the emissive layer; the materials in the emissive layer are the light-generating component of the OLED stack. Many of our key technologies relate primarily to phosphorescent emitter materials, which we believe are more energy efficient than fluorescent emitter materials that can also be used to generate light within the emissive layer of the OLED device. We began selling emitter materials commercially in 2003. A manufacturer will use a small amount of emitter material for each device through a process called “doping” into a host material. The emitter material(s) and the host material(s) together form an emissive layer system. Depending on the nature of the OLED device, the emissive materials and emissive layer system may be designed to emit different colors. We have commercially produced and sold phosphorescent emitter materials that produce red, yellow, green and light-blue light, which are combined in various ways for the flat panel display and the lighting market.

Our current materials business, conducted outside the United States by our Irish subsidiary, is focused primarily on the delivery of such emissive materials. We have also developed host materials for the emissive layer and began selling them commercially in 2011. In addition to our materials, which are protected by patents covering various molecular structures, we also have fundamental and important patents that cover various aspects of the OLED device, including the use of phosphorescent emission in an OLED device, flexible OLEDs, lighting, encapsulation, and methods of manufacturing OLEDs. These patents are important to our licensing business because they enable us to provide our business partners important OLED related technology.

Our Phosphorescent OLED Technologies

Phosphorescent OLEDs utilize specialized materials and device structures that allow OLEDs to emit light through a process known as phosphorescence. Traditional fluorescent OLEDs emit light through an inherently less efficient process. Theory and experiment show that phosphorescent OLEDs exhibit device efficiencies up to four times higher than those exhibited by fluorescent OLEDs. Phosphorescence substantially reduces the power requirements of an OLED and is useful in displays for hand-held devices, such as smartphones, where battery power is often a limiting factor.

Phosphorescence is also important for large-area displays such as televisions, where higher device efficiency and lower heat generation may enable longer product lifetimes and increased energy efficiency.

We have a strong intellectual property portfolio surrounding our existing PHOLED phosphorescent OLED technologies and materials for both displays and lighting products which we market under the UniversalPHOLED® brand. We devote a substantial portion of our efforts to developing new and improved proprietary PHOLED materials and device architectures for red, green, yellow, blue and white OLED devices. In 2013, we continued our commercial supply relationships with companies such as SDC and LG Display to use our UniversalPHOLED® materials for their manufacture of OLED displays. In addition, we continued to work closely with customers evaluating and qualifying our proprietary PHOLED materials for commercial usage in both displays and lighting products, and with other material suppliers to match our PHOLED emitters with their phosphorescent hosts and other OLED materials.

Our Additional Proprietary OLED Technologies

Our research, development and commercialization efforts also encompass a number of other OLED device and manufacturing technologies, including the following:

FOLED™ Flexible OLEDs

We are working on a number of technologies required for the fabrication of OLEDs on flexible substrates. Most OLED and other flat panel displays are built on rigid substrates such as glass. In contrast, FOLEDs are OLEDs built on non-rigid substrates such as plastic or metal foil. This has the potential to enhance durability and enable conformation to certain shapes or repeated bending or flexing. Eventually, FOLEDs may be capable of being rolled into a cylinder, similar to a window shade. These features create the possibility of new flat panel display product applications that do not exist today, such as a portable, roll-up Internet connectivity and communications device as well as enhancing the usefulness of such devices in ruggedized, industrial and wearable computing systems. Manufacturers also may be able to produce FOLEDs using more efficient continuous, or roll-to-roll, processing methods. We currently are conducting research and development on FOLED technologies internally, under several of our U.S. government programs and in connection with the government-sponsored Flexible Display Center at Arizona State University (ASU).

Thin-Film Encapsulation

We have developed proprietary, patented encapsulation technology for the packaging of flexible OLEDs and other thin-film devices, as well as for use as a barrier film for plastic substrates. Addressing a major roadblock to the successful commercialization of flexible OLEDs, our hybrid, single-layer approach provides barrier performance useful for OLEDs using a potentially cost-effective process. In addition to accelerating the commercial viability of flexible OLEDs, our thin-film encapsulation technology has the potential to provide benefits for a variety of other flexible thin-film devices, including photovoltaics and thin-film batteries.

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UniversalP²OLED[®] Printable Phosphorescent OLEDs

The standard approach for manufacturing a small molecule OLED, including a PHOLED, is based on a vacuum thermal evaporation, or VTE, process. With a VTE process, the thin layers of organic material in an OLED are deposited in a high-vacuum environment. An alternate approach for manufacturing a small molecule OLED involves solution processing of the various organic materials in an OLED using techniques such as spin coating or inkjet printing onto the substrate. Solution-processing methods, and inkjet printing in particular, have the potential to be lower cost approaches to OLED manufacturing and scalable to large area displays. For several years, we worked on P²OLEDs under joint development agreements with Seiko Epson Corporation. We are continuing to develop novel P²OLED materials and device architectures for evaluation by OLED manufacturers, and to collaborate with other material manufacturers who are working on host, and other OLED materials, to match our P²OLED emitters.

OVJP[®] Organic Vapor Jet Printing

OLEDs can be manufactured using other processes as well, including OVJP. As a direct printing technique, OVJP technology has the potential to offer high deposition rates for any size or shaped OLED. In addition, OVJP technology reduces OLED material waste associated with use of a shadow mask (i.e., the waste of material that deposits on the shadow mask itself when fabricating an OLED). By comparison to inkjet printing, an OVJP process does not use solvents and therefore the OLED materials utilized are not limited by their viscosity or solvent solubility. OVJP also avoids generation of solvent wastes and eliminates the additional step of removing residual solvent from the OLED device. We have installed a prototype OVJP tool at our Ewing, New Jersey facility, and we continue to collaborate on OVJP technology development with Professor Forrest of Michigan.

OVPD[®] Organic Vapor Phase Deposition

Another approach for manufacturing a small molecule OLED is based on OVPD. The OVPD process utilizes a carrier gas, such as nitrogen, in a hot walled reactor in a low pressure environment to deposit the layers of organic material in an OLED. The OVPD process may offer advantages over the VTE process or solution processing methods through more efficient materials utilization and enhanced deposition control. We have licensed Aixtron AG, a leading manufacturer of metal-organic chemical vapor deposition equipment, to develop and qualify equipment for the fabrication of OLED displays utilizing the OVPD process.

TOLED Transparent OLEDs

We have developed a technology for the fabrication of OLEDs that have transparent cathodes. Conventional OLEDs use a reflective metal cathode and a transparent anode. In contrast, TOLEDs use a transparent cathode and either a transparent, reflective or opaque metal anode. TOLEDs utilizing transparent cathodes and reflective metal anodes are known as “top-emission” OLEDs. In a “top-emission” AMOLED, light is emitted without having to travel through much of the device electronics where a significant portion of the usable light is lost. This results in OLED displays having image qualities and lifetimes superior to those of conventional AMOLEDs. TOLEDs utilizing transparent cathodes and transparent anodes may also be useful in novel flat panel display applications requiring semi-transparency or transparency, such as graphical displays in automotive windshields.

Our Strategic Relationships with Product Manufacturers

We have established early-stage evaluation programs, development and pre-commercial programs, and commercial arrangements with a substantial number of manufacturers or potential manufacturers of OLED display and lighting products. Many of these relationships are directed towards tailoring our proprietary OLED technologies and materials for use by individual manufacturers. Our ultimate objective is to license our OLED technologies and sell our OLED materials to these manufacturers for their commercial production of OLED products. Our publicly announced relationships with product manufacturers include the following:

SDC

We have been working with SDC and providing our next generation PHOLED materials to SDC for evaluation since 2001. In 2011, we entered into a patent license agreement with SDC for its manufacture and sale of AMOLED display products which has a term that extends through December 31, 2017. We also supply our proprietary PHOLED materials to SDC for its use in manufacturing licensed products. Under a separate supplemental agreement, SDC has agreed to purchase a minimum amount of phosphorescent emitter material from us for the manufacture of licensed products. This minimum purchase commitment is subject to SDC’s requirements for phosphorescent emitter materials

and our ability to meet these requirements over the term of the supplemental agreement, which is concurrent with the term of the license agreement.

LG Display

We have been providing our proprietary PHOLED materials to LG Display for evaluation, and we have been supporting LG Display in its OLED product development activities for several years. In 2007, we entered into an agreement to supply LG Display with our proprietary PHOLED materials for use in AMOLED display products. This agreement, which automatically renews for one year periods, unless either party provides notice of its intent to terminate the agreement, generates commercial chemical sales and license fee revenues from our supply of materials to LG Display.

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AU Optronics

We have a longstanding collaborative relationship with AU Optronics dating back to 2001. We are providing our proprietary PHOLED materials to AU Optronics for evaluation, and we are working with AU Optronics to help accelerate its introduction of commercial OLED products into the market. In September 2012, we entered into an agreement to supply AU Optronics with certain of our UniversalPHOLED materials for commercial sale.

Sony

We have been supporting Sony in its development of AMOLED display products for many years. We continue to supply our proprietary PHOLED materials to Sony for evaluation, and in January 2013, we extended our current Evaluation Agreement. Also, in April 2013, we entered into a new Joint Development Agreement with Sony to work together on certain display products.

Innolux

We have been working with Innolux and its predecessor companies since 2007, when we entered into an agreement to supply our proprietary PHOLED materials and technologies to Chi Mei EL Corporation (CMEL) for use in its manufacture of commercial AMOLED display products. In May 2012, we entered into a Commercial Material Supply Agreement, and in August 2013, we extended our current Evaluation Agreement. We continue to supply our proprietary PHOLED materials to Innolux in support of their OLED development efforts.

Pioneer

We have been supplying our proprietary PHOLED materials to Tohoku Pioneer, a subsidiary of Pioneer, for the commercial production of passive matrix OLED (PMOLED) display products since 2003. In 2011, we entered into a separate license agreement with Pioneer for its manufacture and sale of OLED lighting products.

Kaneka

In 2013, we entered into a license agreement with Kaneka for the manufacture and sale of OLED lighting products.

Philips

In 2013, we entered into an evaluation agreement with Philips for the evaluation of our materials and technology for use in the manufacture of OLED lighting products.

Moser Baer Technologies

In 2011, we signed a Memorandum of Agreement with Moser Baer for technology licensing, material supply and technology assistance to support Moser Baer's initiatives in white OLED lighting. During 2013, we worked with Moser Baer on U.S. Department of Energy programs to improve OLED manufacturing yield and for Moser Baer to design and build the first white OLED lighting pilot manufacturing facility in the United States. The program ended as of December 31, 2013.

Konica Minolta

We have been supplying our proprietary PHOLED materials to Konica Minolta for evaluation, and we have been supporting Konica Minolta in its efforts to develop OLED lighting products for several years. In 2008, we entered into a technology license agreement with Konica Minolta for its manufacture and sale of OLED lighting products that utilize our phosphorescent and other OLED technologies.

Lumiotec

In January 2012, we entered into a technology license agreement with Lumiotec for its manufacture and sale of OLED lighting products utilizing our phosphorescent and other OLED technologies.

LG Chem

We have entered into an evaluation agreement to supply LG Chem, Ltd. (LG Chem) with our proprietary PHOLED materials for use in the development of OLED products. We have also entered into short-term commercial sales agreements with LG Chem, as needed, for their OLED manufacturing needs, which generates commercial chemical sales and license fee revenues from our supply of materials to LG Chem.

NEC Lighting

We have been supplying our proprietary PHOLED materials to NEC Lighting, Ltd. (NEC Lighting) for the manufacture of sample OLED lighting products. NEC Lighting has publicly exhibited OLED lighting panels that utilize our proprietary PHOLED materials and technology.

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Our OLED Materials Supply Business

In support of our OLED licensing business, we supply our proprietary UniversalPHOLED materials to display manufacturers and others. We qualify our materials in OLED devices before shipment in order to ensure that they meet required specifications. We believe that our inventory-carrying practices, along with the terms under which we sell our OLED materials (including payment terms), are typical for the markets in which we operate. In 2012, our OLED materials business received recertification in accordance with ISO 9001:2008 Quality Management Systems standards and guidelines.

PPG Industries

We have maintained a close working relationship with PPG Industries since 2000. In 2011, we entered into an agreement with PPG Industries, the term of which continues through December 31, 2015 and shall be automatically renewed for additional one year terms, unless terminated by us with prior notice of one year or terminated by PPG Industries with prior notice of two years. Under that agreement, PPG Industries is responsible, under our direction, for manufacturing scale-up of our proprietary OLED materials, and for supplying us with those materials for research and development, and for resale to our customers, both for their evaluation and for use in commercial OLED products. Through our collaboration with PPG Industries, key raw materials are sourced from multiple suppliers to ensure that we are able to meet the needs of our customers on a timely basis. The raw materials we require for our emitter and host materials are available from multiple sources and historically, we have not had any issues with obtaining access to adequate amounts of any key raw materials.

Our OLED Material Customers

Throughout 2013, we continued supplying our proprietary UniversalPHOLED materials to SDC for use in its commercial AMOLED display products and for its development efforts. SDC is currently the largest manufacturer of AMOLED displays for handset and other personal electronic devices. SDC's customers for these products have included many well-known consumer electronics companies throughout the world.

In 2013, we also supplied our proprietary UniversalPHOLED materials to LG Display for use in its commercial AMOLED display products, to Tohoku Pioneer for use in its commercial PMOLED display products, and Konica Minolta for its manufacture of commercial OLED lighting products. During the year, we also supplied our proprietary OLED materials to these and various other product manufacturers for evaluation and for purposes of development, manufacturing qualification and product testing.

Collaborations with Other OLED Material Manufacturers

We continued our non-exclusive collaborative relationships with other manufacturers of OLED materials during 2013, including Nippon Steel and Sumikin Chemical Co., Ltd. (NSSCC), Idemitsu Kosan and LG Chem. Most of these relationships are focused on matching our proprietary PHOLED emitters with the host and other OLED materials of these companies. In 2012 we also entered into an agreement with Duksan Hi-Metal Company Limited (Duksan) to provide us host sublimation services in Korea. We believe that collaborative relationships such as these are important for ensuring success of the OLED industry and broader adoption of our PHOLED and other OLED technologies.

Research and Development

Our research and development activities are focused on the advancement of our OLED technologies and materials for displays, lighting and other applications. We conduct this research and development both internally and through various relationships with our commercial business partners and academic institutions. In the years 2013, 2012 and 2011, we incurred expenses of \$34.2 million, \$30.0 million and \$24.1 million, respectively, on both internal and third-party sponsored research and development activities with respect to our various OLED technologies and materials.

Internal Development Efforts

We conduct a substantial portion of our OLED development activities at our state-of-the-art development and testing facility in Ewing, New Jersey. At this newly expanded facility, which now exceeds 50,000 square feet, we perform technology development, including device and process optimization, prototype fabrication, manufacturing scale-up studies, process and product testing, characterization and reliability studies, and technology transfer with our business partners.

Our Ewing facility houses multiple OLED deposition systems, including a full-color flexible OLED system, a system for fabricating solution-processible OLEDs, and an OVJP organic vapor jet printing system. In addition, the facility contains equipment for substrate patterning, organic material deposition, display packaging, module assembly and extensive testing in Class 100 and 100,000 clean rooms and opto-electronic test laboratories. Our facility also includes state-of-the-art synthetic and analytical chemistry laboratories in which we conduct OLED materials research and make small quantities of new materials that we then test in OLED devices.

As of December 31, 2013, we employed a team of 76 research scientists, engineers and laboratory technicians in both our Ewing and Hong Kong facilities. This team includes chemists, physicists, engineers and technicians with physics, electrical engineering, mechanical engineering and organic/inorganic chemistry backgrounds, and highly-trained theoreticians and experimentalists.

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University Sponsored Research

We have long-standing relationships with Princeton University and USC, dating back to 1994, for the conduct of research relating to our OLED and other organic thin-film technologies and materials for applications such as displays and lighting. This research has been performed at Princeton under the direction of Professor Forrest and at USC under the direction of Professor Thompson. In 2006, Professor Forrest transferred to the University of Michigan, where we continue to fund his research.

We funded research at Princeton under a research agreement executed in 1997 (the 1997 Research Agreement). The 1997 Research Agreement was allowed to expire in 2007, after Professor Forrest had transferred to Michigan. We have exclusive license rights to all OLED and other thin-film organic electronic patents (other than for organic photovoltaic solar cells) arising out of research conducted under that agreement.

In connection with Professor Forrest's transfer to Michigan, in 2006 we entered into a new sponsored research agreement with USC under which we are funding organic electronics research being conducted by Drs. Forrest and Thompson (the 2006 Research Agreement). Work by Professor Forrest is being funded through a subcontract between USC and Michigan. As with the 1997 Research Agreement, we have exclusive license rights to all OLED and thin-film organic electronic patents (other than for organic photovoltaic solar cells) arising out of this research. Effective June 1, 2013, we amended the 2006 Research Agreement again to extend the term of the agreement for an additional four years. As of December 31, 2013, we are obligated to reimburse the universities for up to approximately \$7.9 million in actual costs to be incurred for research conducted under the remaining term of the agreement, which expires April 30, 2017.

In 2005, we entered into a separate sponsored research agreement with Princeton to fund research under the direction of Professor Sigurd Wagner on thin-film encapsulation and fabrication of OLED devices. This research was completed as of December 31, 2013. Like our other relationships with Princeton, we have exclusive license rights to all patents arising out of the research.

We entered into a sponsored research agreement with the Yuen Tjing Ling Industrial Research Institute of National Taiwan University in 2004. Under that agreement, we funded a research program under the direction of Professor Ken-Tsung Wong relating to new OLED materials. We have exclusive rights to all intellectual property developed under that program, which was extended through February 2016.

We entered into a contract research agreement with the Chitose Institute of Science and Technology of Japan (CIST) in 2004. Under that agreement, we funded a research program headed by Professor Chihaya Adachi relating to high-efficiency OLED materials and devices. We were granted exclusive rights to all intellectual property developed under this program. Our relationship with CIST ended in 2006 when Professor Adachi transferred to Kyushu University. However, we have continued our relationship with Professor Adachi under a separate consulting arrangement.

In 2006 and 2007, we entered into one-year research agreements with Kyung Hee University to sponsor research programs on flexible, amorphous silicon thin-film transistor (TFT) backplane technology. The programs were directed by Professor Jin Jang. In 2008 and 2009, we entered into contract research agreements with Silicon Display Technology, Ltd. (SDT), a company founded by Professor Jang, and in 2013, we entered into another one-year agreement with SDT. We continue to maintain a good working relationship with Professor Jang.

Aixtron

In 2000, we entered into a development and license agreement with Aixtron AG of Aachen, Germany to develop and commercialize equipment used in the manufacture of OLEDs using the OVPD process. Under this agreement, we granted Aixtron an exclusive license to produce and sell its equipment for the manufacture of OLEDs and other devices using our proprietary OVPD process. Aixtron is required to pay us royalties on its sales of this equipment. Purchasers of the equipment also must obtain rights to use our proprietary OVPD process to manufacture OLEDs and other devices using the equipment, which they may do through us or Aixtron. If these rights are granted through Aixtron, Aixtron is required to make additional payments to us under our agreement.

Aixtron has reported to us the delivery of nine OVPD systems since 2002. These include two second-generation systems, one of which was sold to the Fraunhofer Institute for Photonic Microsystems in Dresden, Germany in 2007, and the other of which was sold to RiTdisplay Corporation of Taiwan in 2003. We record royalty income from

Aixtron's sales of these various systems in the quarters in which Aixtron notifies us of the sale and the related royalties are due.

U.S. Government-Funded Research

We have entered into several U.S. government contracts and subcontracts to fund a portion of our efforts to develop next-generation OLED technologies. On contracts for which we are the prime contractor, we subcontract portions of the work to various entities and institutions, including Acuity Brands, Inc. (Acuity), IDD Aerospace and Moser Baer. We also serve as a subcontractor under certain of our government contracts, such as with PPG Industries and Moser Baer. All of our government contracts and subcontracts are subject to termination at the election of the contracting governmental agency.

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Our government-funded programs are concentrated primarily in two areas: flexible OLEDs and OLEDs for lighting. We have received support for our work on flexible OLED technology through various U.S. Department of Defense (DOD) agencies, including the Army Research Laboratory (ARL), the Air Force Research Laboratory (AFRL), the Army Communications-Electronics Research Development and Engineering Center (CERDEC) and the National Science Foundation (NSF). The U.S. Department of Energy (DOE) supports our work on white OLEDs for lighting, including through its Solid State Lighting (SSL) initiative. Several of our key U.S. government program initiatives in 2013 were as follows:

Technology Development for OLED Lighting

During 2013, we continued working to develop technical approaches for using our proprietary PHOLED and other OLED technologies for high-efficiency white lighting applications. We received funding from the DOE to work with IDD Aerospace to apply our technology for aircraft interior lighting.

Prototype Commercial OLED Lighting System

In 2013, we successfully completed work with Acuity under a DOE contract to demonstrate a prototype PHOLED lighting system for commercial application. Under this program, Acuity was responsible for designing and fabricating OLED lighting prototypes that can be tuned across a range of color temperatures by using our proprietary architecture and high-efficiency PHOLED panels. These prototypes were targeted for high-end commercial spaces, such as office, retail and health-care buildings, to take advantage of several key attributes of OLEDs including a thin, sleek form factor and high quality of light.

Novel Low Cost Single Layer Outcoupling Solution for OLED Lighting

During 2013, we worked with the DOE and University of Southern Mississippi on a program to develop a novel low cost single layer outcoupling solution for OLED Lighting.

Highly Efficient and Smart Power Supplies to Drive Phosphorescent OLED Lighting Panels

During 2013, we worked with InnoSys, Inc. to interact and collaborate on specifying, designing and building OLED power supplies to drive phosphorescent OLED lighting panels and associated innovative lighting and luminaire applications.

The Army Flexible Display Center

We have been a Member of The Army Flexible Display Center (FDC) since its establishment in 2004. The FDC is being supported through a cooperative agreement between ASU and ARL. The goal of the FDC is to develop flexible, low power, light-weight, information displays for future usage by soldiers and for other military and commercial applications.

We believe our involvement with the FDC enhances our flexible OLED display technology development efforts. In 2012, we continued to work with the FDC on flexible AMOLED displays using our proprietary PHOLED technology and materials and the FDC's proprietary bond-debond manufacturing technology.

The FlexTech Alliance

We are a member of the FlexTech Alliance, Inc. (formerly the United States Display Consortium), an organization devoted to fostering the growth, profitability and success of the electronic display and the flexible, printed electronics supply chain. The role of the FlexTech Alliance is to offer expanded collaboration between and among industry, academia, government and research organizations for advancing displays and flexible, printed electronics from R&D to commercialization. The FlexTech Alliance has approximately 74 members, as well as additional development partners, including companies, universities and R&D organizations.

OLED Association

We are a charter member of the OLED Association (OLED-A). OLED-A is a trade association whose mission involves serving as an OLED information resource, driving OLED technology development, and promoting interest in OLED products. We are one of 18 members of OLED-A, and we actively participate on its marketing and technology committees. Janice K. Mahon, our Vice President of Technology Commercialization and General Manager of our PHOLED Material Sales Business, serves as a member of the Board of Directors of OLED-A.

Next Generation Lighting Industry Alliance

We joined the Next Generation Lighting Industry Alliance (NGLIA) in 2009. NGLIA was formed in 2003 to foster industry-government partnership to accelerate the technical foundation, and ultimate commercialization, of solid state

lighting systems. NGLIA was designated in 2005 as the “industry partner” by DOE for its SSL program. The SSL program is being undertaken to research, develop and conduct demonstration activities on advanced solid state white lighting technologies based on LEDs and OLEDs. We are one of 15 members of NGLIA.

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Intellectual Property

Along with our personnel, our primary and most fundamental assets are patents and other intellectual property. This includes numerous U.S. and foreign patents and patent applications that we own, exclusively license or have the sole right to sublicense. It also includes a substantial body of non-patented technical know-how that we have accumulated over time.

Our Patents

Our research and development activities, conducted both internally and through collaborative programs with our partners, have resulted in the filing of a substantial number of patent applications relating to our OLED technologies and materials. As of December 31, 2013, we owned, through assignment to us alone or jointly with others, 329 pending U.S. applications (active U.S. cases and international applications designated in the U.S.) and 449 U.S. patents, together with counterparts filed in various foreign countries. These owned patents will start expiring in the U.S. in 2020.

Patents We License from Princeton, USC and Michigan

We exclusively license many of our patent rights, including certain of our key PHOLED technology patents, under the 1997 Amended License Agreement. In 2006, based on Professor Forrest's transfer to Michigan that year, Michigan was added as a party to this agreement. As of December 31, 2013, the patent rights we license from these universities included 196 issued U.S. patents, 61 pending U.S. patent applications, together with counterparts filed in various foreign countries. The earliest of these patents will expire in the U.S. in 2014, while our key PHOLED technology patents licensed from these universities will start expiring in the U.S. in 2017.

Under the 1997 Amended License Agreement, Princeton, USC and Michigan granted us worldwide, exclusive license rights to specified patents and patent applications relating to OLED technologies and materials (including our PHOLED technology and materials). Our license rights also extend to any patent rights arising out of the research conducted by Princeton, USC or Michigan under our various research agreements with these entities. We are free to sublicense to third parties all or any portion of our patent rights under the 1997 Amended License Agreement. The term of the 1997 Amended License Agreement continues for the lifetime of the licensed patents, though it is subject to termination for an uncured material breach or default by us, or if we become bankrupt or insolvent.

Princeton is primarily responsible for the filing, prosecution and maintenance of all patent rights licensed to us under the 1997 Amended License Agreement pursuant to an inter-institutional agreement between Princeton, USC and Michigan. However, we manage this process and have the right to instruct patent counsel on specific matters to be covered in any patent applications filed by Princeton. We are required to bear all costs associated with the filing, prosecution and maintenance of these patent rights.

We are required under the 1997 Amended License Agreement to pay Princeton royalties for licensed products sold by us or our sublicensees. These royalties amount to 3% of the net sales price for licensed products sold by us and 3% of the revenues we receive for licensed products sold by our sublicensees. These royalty rates are subject to renegotiation for products not reasonably conceivable as arising out of the research agreements if Princeton reasonably determines that the royalty rates payable with respect to these products are not fair and competitive. Princeton shares portions of these royalties with USC and Michigan under their inter-institutional agreement.

We have a minimum royalty obligation of \$100,000 per year during the term of the 1997 Amended License Agreement. We paid royalties under the 1997 Amended License Agreement with Princeton of \$3.2 million for 2013. We also are required under the 1997 Amended License Agreement to use commercially reasonable efforts to bring the licensed OLED technology to market. However, this requirement is deemed satisfied if we invest a minimum of \$800,000 per year in research, development, commercialization or patenting efforts respecting the patent rights licensed to us under the 1997 Amended License Agreement.

Patents We Acquired from Motorola

In 2000, we entered into a license agreement with Motorola whereby Motorola granted us perpetual license rights to what are now 74 issued U.S. patents relating to Motorola's OLED technologies, together with foreign counterparts in various countries. These patents will expire in the U.S. between 2014 and 2018.

In March 2011, we purchased these patents from Motorola, including all existing and future claims and causes of action for any infringement of the patents. This effectively terminated our license agreement with Motorola, including

any obligation to make royalty payments to Motorola. In consideration for Motorola assigning and transferring the patents to us, we made a one-time cash payment to Motorola of \$440,000, and we granted Motorola a royalty-free, non-exclusive and non-sublicensable license under the patents for use by Motorola and its affiliates in their respective businesses.

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Patents We Acquired from Fujifilm Corporation

In July 2012, we entered into a Patent Sale Agreement (the Agreement) with Fujifilm. Under the Agreement, Fujifilm sold more than 1,200 OLED-related patents and patent applications for a total cost of \$109.1 million. The Agreement contains customary representations and warranties and covenants, including respective covenants not to sue by both parties thereto. The Agreement permitted us to assign all of our rights and obligations under the Agreement to our affiliates, and we assigned, prior to the consummation of the transactions contemplated by the Agreement, our rights and obligations to UDC Ireland Limited (UDC Ireland), a wholly-owned subsidiary formed under the laws of the Republic of Ireland. The transactions contemplated by the Agreement were consummated on July 26, 2012.

Intellectual Property Developed under Our Government Contracts

We and our subcontractors have developed and may continue to develop patentable OLED technology inventions under our various U.S. government contracts and subcontracts. Under these arrangements, we or our subcontractors generally can elect to take title to any patents on these inventions, and to control the manner in which these patents are licensed to third parties. However, the U.S. government reserves rights to these inventions and associated technical data that could restrict our ability to market them to the government for military and other applications, or to third parties for commercial applications. In addition, if the U.S. government determines that we or our subcontractors have not taken effective steps to achieve practical application of these inventions in any field of use in a reasonable time, the government may require that we or our subcontractors license these inventions to third parties in that field of use.

Non-patented Technical Know-How

We have accumulated, and continue to accumulate, a substantial amount of non-patented technical know-how relating to OLED technologies and materials. Where practicable, we share portions of this information with display manufacturers and other business partners on a confidential basis. We also employ various methods to protect this information from unauthorized use or disclosure, although no such methods can afford complete protection. Moreover, because we derive some of this information and know-how from academic institutions such as Princeton, USC and Michigan, there is an increased potential for public disclosure. We also cannot prevent the actual independent development of the same or similar information and know-how by third parties.

Competition

The industry in which we operate is highly competitive. We compete against alternative flat panel display technologies, in particular LCDs, as well as other OLED technologies. We also compete in the lighting market against incumbent technologies, such as incandescent bulbs, fluorescent lamps, inorganic LEDs and emerging technologies, such as other OLED technologies.

Flat Panel Display Industry Competitors

Numerous domestic and foreign companies have developed or are developing and improving LCD, plasma and other flat panel display technologies that compete with our OLED display technologies. We believe that OLED display technologies ultimately can compete with LCDs and other display technologies for many product applications on the basis of lower power consumption, better contrast ratios, faster video rates, form factor and lower manufacturing cost. However, other companies may succeed in continuing to improve these competing display technologies, or in developing new display technologies, that are superior to OLED display technologies in various respects. We cannot predict the timing or extent to which such improvements or developments may occur.

Lighting Industry Competitors

Although there has been a movement to phase out traditional incandescent bulbs throughout many countries, traditional incandescent bulbs and fluorescent lamps remain well-entrenched products in the lighting industry. In addition, compact fluorescent lamps and solid-state LEDs have recently been introduced into the market and would compete with OLED lighting products. Having attributes different than fluorescent lamps and LEDs, OLEDs may compete directly with these products for certain lighting applications. However, manufacturers of LEDs and compact fluorescent lamps may succeed in more broadly adapting their products to various lighting applications, or others may develop competing solid-state lighting technologies that are superior to OLEDs. Again, we cannot predict whether or when this might occur.

OLED Technology and Materials Competitors

Eastman Kodak Company (Kodak) developed and patented the original fluorescent OLED technology in 1987. Cambridge Display Technology, Ltd. (CDT), which was acquired by Sumitomo Chemical Company (Sumitomo) in 2007, developed and patented polymer OLED technology in 1989. Display and lighting manufacturers, including customers of ours, are engaged in their own OLED research, development and commercialization activities, and have developed and may continue to develop proprietary OLED technologies that are necessary or useful for commercial OLED devices. In addition, other material manufacturers, such as Sumitomo, Idemitsu Kosan Co., Ltd. (Idemitsu Kosan), Merck KGaA and BASF Corporation, are selling or sampling competing OLED materials to customers, including companies to which we sell our proprietary PHOLED materials.

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Our licensing business is based on our control of a broad portfolio of OLED-related device patents and technology. We believe this portfolio includes fundamental patents in the field of phosphorescent OLED materials and devices, as well as certain additional complementary OLED technologies. As discussed above, alternative technologies, such as fluorescent OLED emitter materials, exist and could be competitive to our phosphorescent OLED material solutions. However, fluorescent materials have characteristics that we believe many market participants consider less desirable than those of phosphorescent materials. Suppliers of fluorescent emitter materials include Dow Chemical (previously Gracel Display), Doosan Electronics, SFC Co. Ltd. and Idemitsu Kosan. Fluorescent materials may also be viewed as complementary in that they can be used in the same OLED stack as phosphorescent materials, especially for use as emitters for generating deep blue pixels in display modules until such time as the OLED industry improves the properties of currently available deep blue phosphorescent materials.

The competitive landscape with respect to our host materials business is characterized by a larger number of established chemical material suppliers who have long-term relationships with many of our existing customers and licensees. We have elected to partner with certain of these companies to manufacture and deliver our host solutions to our customers, as well as selling our host materials directly to device manufacturers. We believe our competitive advantage stems, in part, from our deep knowledge of our phosphorescent emitter materials, which are complementary with the host solutions. We believe that our understanding of the phosphorescent emitter materials enables us to create host material solutions that are especially well suited for use with a certain class of emitter materials that are implemented commercially today. However, we note that many of our technology partners have their own host solutions and the competitive landscape includes many well-established companies such as Dow Chemical, Idemitsu Kosan, NSSCC, Doosan Electronics, Merck KGaA, Cheil Industries and Duksan, which have significant resources and may aggressively pursue such business in the future.

Our existing business relationships with SDC and other product manufacturers suggest that our OLED technologies and materials, particularly our PHOLED technologies and materials, may achieve a significant level of market penetration in the flat panel display and lighting industries. However, others may succeed in developing new OLED technologies and materials that may supplement or be utilized in place of ours. We cannot be sure of the extent to which product manufacturers will adopt and continue to utilize our OLED technologies and materials for the production of commercial flat panel displays and lighting products.

Employees

As of December 31, 2013, we had 122 active full-time employees and two part-time employees, none of whom are unionized. We believe that relations with our employees are good.

Our Company History

Our corporation was organized under the laws of the Commonwealth of Pennsylvania in 1985. Our business was commenced in 1994 by a company then known as Universal Display Corporation, which had been incorporated under the laws of the State of New Jersey. In 1995, a wholly-owned subsidiary of ours merged into this New Jersey corporation. The surviving corporation in this merger became a wholly-owned subsidiary of ours and changed its name to UDC, Inc. Simultaneously with the consummation of this merger, we changed our name to Universal Display Corporation. UDC, Inc. functions as an operating subsidiary of ours and has certain overlapping officers and directors. We have also formed other wholly-owned subsidiaries, including Universal Display Corporation Hong Kong, Ltd. (2008), Universal Display Corporation Korea, Y.H. (2010), Universal Display Corporation Japan, G.K. (2011) and UDC Ireland Limited (2012), and we established a representative office in Taiwan (2011).

Our Compliance with Environmental Protection Laws

We are not aware of any material effects that compliance with Federal, State or local environmental protection laws or regulations will have on our business. We have not incurred substantial costs to comply with any environmental protection laws or regulations, and we do not anticipate having to do so in the foreseeable future.

Our Internet Site

Our Internet address is www.udcoled.com. We make available through our Internet website, free of charge, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable after we file such material with the Securities and Exchange Commission (the SEC). In addition, we have

made available on our Internet website under the heading “Corporate Governance” the charter for the Audit Committee of our Board of Directors, the charter for the Compensation Committee of our Board of Directors, our Code of Ethics and Code of Conduct for Employees, and our Code of Conduct for Directors. We intend to make available on our website any future amendments or waivers to our Code of Ethics and Code of Conduct for Employees and our Code of Conduct for Directors. The information on our Internet site is not part of this report.

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ITEM 1A. RISK FACTORS

You should carefully consider the following risks and uncertainties when reading this Annual Report on Form 10-K. The following factors, as well as other factors affecting our operating results and financial condition, could cause our actual future results and financial condition to differ materially from those projected.

If our OLED technologies and materials are not feasible for broad-based product applications, we may not be able to continue to generate revenues sufficient to support ongoing operations.

Our main business strategy is to license our OLED technologies and sell our OLED materials to manufacturers for incorporation into the flat panel display and lighting products that they sell. Consequently, our success depends on the ability and willingness of these manufacturers to develop, manufacture and sell commercial products integrating our technologies and materials.

Before product manufacturers will agree to expand the use of our OLED technologies and materials for wider scale commercial production, they will likely require us to demonstrate to their satisfaction that our OLED technologies and materials are feasible for broad-based product applications beyond current commercial application, such as smartphone displays. This, in turn, may require additional advances in our technologies and materials, as well as those of others, for applications in a number of areas, including, without limitation, advances with respect to the development of:

- OLED materials with improved lifetimes, efficiencies and color coordinates for larger area full-color OLED displays and general lighting products;

- more robust OLED materials for use in more demanding large-scale manufacturing environments; and

- scalable and cost-effective methods and technologies for the fabrication of large volume OLED materials and products.

We cannot be certain that these advances will occur, and hence our OLED technologies and materials may not be feasible for additional broad-based product applications and expansion.

Even if our OLED technologies are technically feasible, they may not be adopted by product manufacturers.

The potential size, timing and viability of market opportunities targeted by us are uncertain at this time. Market acceptance of our OLED technologies beyond current product offerings will depend, in part, upon these technologies providing benefits comparable or superior to current display and lighting technologies at an advantageous cost to manufacturers, and the adoption of products incorporating these technologies by consumers. Many current and potential licensees of our OLED technologies utilize and have invested significant resources in competing technologies, and may, therefore, be reluctant to redesign their products or manufacturing processes to incorporate our OLED technologies.

During the entire product development process for a new product, we face the risk that our technology will fail to meet the manufacturer's technical, performance or cost requirements or will be replaced by a competing product or alternative technology. Even if we offer technologies that are satisfactory to a product manufacturer, the manufacturer may choose to delay or terminate its product development efforts for reasons unrelated to our technologies. In addition, our license agreements do not require our customers to purchase our host materials in order to utilize our phosphorescent emitter materials, and those customers may elect not to purchase our host materials.

Mass production of new mass market OLED products will require the availability of suitable manufacturing equipment, components and materials, many of which are available only from a limited number of suppliers. In addition, there may be a number of other technologies that manufacturers need to utilize in conjunction with our OLED technologies in order to bring these new OLED products to the market. Thus, even if our OLED technologies are a viable alternative to competing approaches, if product manufacturers are unable to obtain access to this equipment and these components, materials and other technologies, they may not utilize our OLED technologies.

There are numerous potential alternatives to OLEDs, which may limit our ability to commercialize our OLED technologies and materials.

The flat panel display market is currently, and will likely continue to be for some time, dominated by displays based on LCD technology. Numerous companies are making substantial investments in, and conducting research to improve characteristics of, LCDs; additionally, other competing flat panel display technologies have been, or are being, developed. A similar situation exists in the solid-state lighting market, which is currently dominated by LED

products. Advances in any of these various technologies may overcome their current limitations and permit them to become the leading technologies in their field, either of which could limit the potential market for products utilizing our OLED technologies and materials. This, in turn, would cause product manufacturers to avoid entering into commercial relationships with us, or to terminate or not renew their existing relationships with us.

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Other OLED technologies may be more successful or cost-effective than ours, which may limit the commercial adoption of our OLED technologies and materials.

Our competitors have developed OLED technologies that differ from or compete with our OLED technologies. In particular, competing fluorescent OLED technology, which entered the marketplace prior to ours, may become a viable alternative to our phosphorescent OLED technology. Moreover, our competitors may succeed in developing new OLED technologies that are more cost-effective or have fewer limitations than our OLED technologies. If our OLED technologies, and particularly our phosphorescent OLED technology, are unable to capture a substantial portion of the OLED product market, our business strategy may fail.

If we cannot form and maintain lasting business relationships with OLED product manufacturers, our business strategy will fail.

Our business strategy ultimately depends upon our development and maintenance of commercial licensing and material supply relationships with high-volume manufacturers of OLED products. We have entered into only a limited number of such relationships from which most of our material sales and licensing revenue are generated. Our other relationships with product manufacturers currently are limited to technology development and the evaluation of our OLED technologies and materials for possible use in commercial products. Some or all of these relationships may not succeed or, even if they are successful, may not result in the product manufacturers entering into commercial licensing and material supply relationships with us.

Many of our agreements with product manufacturers last for only limited periods of time, such that our relationships with these manufacturers will expire unless they are renewed. These product manufacturers may not agree to renew their relationships with us on a continuing basis or may agree to do so on terms that are less favorable to us. In addition, we regularly continue working with product manufacturers after our existing agreements with them have expired while we are attempting to negotiate contract extensions or new agreements with them. Should our relationships with the various product manufacturers not continue or be renewed on less favorable terms, or if we are not able to identify other product manufacturers and enter into contracts with them, our business may materially suffer.

Our ability to enter into additional commercial licensing and material supply relationships, or to maintain our existing technology development and evaluation relationships, may require us to make financial or other commitments. We might not be able, for financial or other reasons, to enter into or continue these relationships on commercially acceptable terms, or at all. Failure to do so may cause our business strategy to fail.

We or our licensees may incur substantial costs or lose important rights as a result of litigation or other proceedings relating to our patent and other intellectual property rights or with respect to our OLED materials business.

There are a number of other companies and organizations that have been issued patents and are filing patent applications relating to OLED technologies and materials, including, without limitation, Kodak (substantially all of whose OLED assets were sold to a group of LG companies in 2009), CDT (acquired by Sumitomo in 2007), Canon, Inc., Semiconductor Energy Laboratories Co., Idemitsu Kosan and Mitsubishi Chemical Corporation. As a result, there may be issued patents or pending patent applications of third parties that would be infringed by the use of our OLED technologies or materials, thus subjecting our licensees to possible suits for patent infringement in the future. Such lawsuits could result in our licensees being liable for damages or require our licensees to obtain additional licenses that could increase the cost of their products. This, in turn, could have an adverse effect on our licensees' sales and thus our royalties, or cause our licensees to seek to renegotiate our royalty rates. In addition, we have agreed to indemnify customers purchasing our OLED materials for commercial usage against certain claims of patent infringement by third parties, as a result of which we may incur substantial legal costs in connection with defending these customers from such claims.

Our licensees may also seek to avoid paying future royalties by attempting to have our patents declared invalid and unenforceable by a court. Our licensees may be more likely to file such declaratory actions in light of the U.S. Supreme Court's decision in *MedImmune, Inc. v. Genentech, Inc.* (2007), in which the Court found that a licensee need not refuse to pay royalties and commit material breach of the license agreement before bringing an action to declare a licensed U. S. patent invalid and unenforceable.

In addition, we may be required, from time-to-time, to assert our intellectual property rights by instituting legal proceedings against others. We cannot be assured that we will be successful in enforcing our patents in any lawsuits we may commence. Defendants in any litigation we may commence to enforce our patents may attempt to establish that our patents are invalid or are unenforceable. Thus, any patent litigation we commence could lead to a determination that one or more of our patents are invalid or unenforceable. If a third party succeeds in invalidating one or more of our patents, that party and others could compete more effectively against us. Our ability to derive licensing revenues from products or technologies covered by these patents would also be adversely affected.

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Whether our licensees are defending the assertion of third-party intellectual property rights against their businesses arising as a result of the use of our technology, or we are asserting our own intellectual property rights against others, such litigation can be complex, costly, protracted and highly disruptive to our or our licensees' business operations by diverting the attention and energies of management and key technical personnel. As a result, the pendency or adverse outcome of any intellectual property litigation to which we or our licensees are subject could disrupt business operations, require the incurrence of substantial costs and subject us or our licensees to significant liabilities, each of which could severely harm our business. Costs associated with these actions are likely to increase as AMOLED products using our PHOLED and other OLED technologies and materials enter the consumer marketplace. Plaintiffs in intellectual property cases often seek injunctive relief in addition to money damages. Any intellectual property litigation commenced against our licensees may force them to take actions that could be harmful to their businesses and thus to our royalties, including the halting of sales of products that incorporate or otherwise use our technology or materials.

Furthermore, the measure of damages in intellectual property litigation can be complex, and is often subjective or uncertain. If our licensees were to be found liable for infringement of proprietary rights of a third party, the amount of damages they might have to pay could be substantial and is difficult to predict. Decreased sales of our licensees' products incorporating our technology or materials would have an adverse effect on our royalty revenues under existing licenses and material sales under our existing sales agreements. Were this to occur, it would likely harm our ability to (i) obtain new licensees which would have an adverse effect on the terms of the royalty arrangements we could enter into with any new licensees, and (ii) sell our UniversalPHOLED materials to existing and new customers. Moreover, to the extent any third party claims are directed specifically to materials supplied by us to our customers, we may be required to incur significant costs associated with the defense of such claims and potential damages associated with such claims that may be awarded against our customers.

As is commonplace in technology companies, we employ individuals who were previously employed at other technology companies. To the extent our employees are involved in research areas that are similar to those areas in which they were involved at their former employers, we may be subject to claims that such employees or we have, inadvertently or otherwise, used or disclosed the alleged trade secrets or other proprietary information of the former employers. Litigation may be necessary to defend against such claims. The costs associated with these actions or the loss of rights critical to our or our licensees' businesses could negatively impact our revenues or cause our business to fail.

If we cannot obtain and maintain appropriate patent and other intellectual property protection for our OLED technologies and materials, our business will suffer.

The value of our OLED technologies and materials is dependent on our ability to secure and maintain appropriate patent and other intellectual property rights protection. Although we own or license many patents respecting our OLED technologies and materials that have already been issued, there can be no assurance that additional patents applied for will be obtained, or that any of these patents, once issued, will afford commercially significant protection for our OLED technologies and materials, or will be found valid if challenged. Also, there is no assurance that we will be successful in defending the validity of our current or future patents in pending and future patent oppositions, invalidation trials, interferences, reexaminations, reissues, or other administrative or court proceedings. Moreover, we have not obtained patent protection for some of our OLED technologies and materials in all foreign countries in which OLED products or materials might be manufactured or sold.

We believe that the strength of our current intellectual property position results primarily from the essential nature of our fundamental patents covering phosphorescent OLED devices and certain materials utilized in these devices. Our existing fundamental phosphorescent OLED patents expire in the United States in 2017 and 2019, and in other countries of the world in 2018 and 2020. While we hold a wide range of additional patents and patent applications whose expiration dates extend (and in the case of patent applications, will extend) beyond 2020, many of which are also of importance in the OLED industry, none are of an equally essential nature as our fundamental patents, and therefore our competitive position may be less certain as these patents expire.

We may become engaged in litigation to protect or enforce our patent and other intellectual property rights, or in International Trade Commission proceedings to abate the importation of goods that would compete unfairly with those

of our licensees. In addition, we are participating in or have participated in, and in the future will likely have to participate in, interference, reissue, or reexamination proceedings before the U.S. Patent and Trademark Office, and opposition, nullity or other proceedings before foreign patent offices, with respect to some of our patents or patent applications. All of these actions place our patents and other intellectual property rights at risk and may result in substantial costs to us as well as a diversion of management attention from our business and operations. Moreover, if successful, these actions could result in the loss of patent or other intellectual property rights protection for the key OLED technologies and materials on which our business depends.

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We rely, in part, on several non-patented proprietary technologies to operate our business. Others may independently develop the same or similar technologies or otherwise obtain access to our unpatented technologies. Furthermore, these parties may obtain patent protection for such technology, inhibiting or preventing us from practicing the technology. To protect our trade secrets, know-how and other non-patented proprietary information, we require employees, consultants, financial advisors and strategic partners to enter into confidentiality agreements. These agreements may not ultimately provide meaningful protection for our trade secrets, know-how or other non-patented proprietary information. In particular, we may not be able to fully or adequately protect our proprietary information as we conduct discussions with potential strategic partners. Additionally, although we take many measures to prevent theft and misuse of our proprietary information, we may face attempts by others to gain unauthorized access through the Internet to our information technology systems or to our intellectual property, which might be the result of industrial or other espionage or actions by hackers seeking to harm our company or its products. If we are unable to protect the proprietary nature of our technologies, it will harm our business.

Recent court decisions in various patent cases may make it more difficult for us obtain future patents, enforce our patents against third parties or obtain favorable judgments in cases where the patents are enforced.

Recent case law may make it more difficult for patent holders to secure future patents and/or enforce existing patents. For example, in *KSR International Co. vs. Teleflex, Inc.* (2007), the U.S. Supreme Court mandated a more expansive and flexible approach to determine whether a patent is obvious and invalid. As a result of the less rigid approach to assessing obviousness, defending the validity of or obtaining patents may be more difficult.

Recent court decisions may also impact the enforcement of our patents. For example, we may not be able to enjoin certain third party uses of products or methods covered by our patents following the initial authorized sale, even where those uses are expressly proscribed in an agreement with the buyer. Also, we may face increased difficulty enjoining infringement of our patents. The U.S. Supreme Court has held that an injunction should not automatically issue based on a finding of patent infringement, but should be determined based on a test balancing considerations of the patentee's interest, the infringer's interest, and the public's interest. Obtaining enhanced damages for willful infringement of our patents may also be more difficult even in those cases where we successfully prove a third party has infringed our patents, as a recent case set a more stringent standard for proving willful infringement.

Therefore, as a result of such rulings, it may be more difficult for us to defend our currently issued patents, obtain additional patents in the future or achieve the desired competitive effect even when our patents are enforced. If we are unable to so defend our currently issued patents, or to obtain new patents for any reason, our business would suffer. Conflicts or other problems may arise with our licensees or joint development partners, resulting in renegotiation, breach or termination of, or litigation related to, our agreements with them. This would adversely affect our revenues. Conflicts or other problems could arise between us and our licensees or joint development partners, some of which we have made strategic investments in, as to royalty rates, milestone payments or other commercial terms. Similarly, we may disagree with our licensees or joint development partners as to which party owns or has the right to commercialize intellectual property that is developed during the course of the relationship or as to other non-commercial terms. If such a conflict were to arise, a licensee or joint development partner might attempt to compel renegotiation of certain terms of their agreement or terminate their agreement entirely, and we might lose the royalty revenues and other benefits of the agreement. Either we or the licensee or joint development partner might initiate litigation to determine commercial obligations, establish intellectual property rights or resolve other disputes under the agreement. Such litigation could be costly to us and require substantial attention of management. If we were unsuccessful in such litigation, we could lose the commercial benefits of the agreement, be liable for other financial damages and suffer losses of intellectual property or other rights that are the subject of dispute. Additionally, we have made strategic investments in certain of our smaller joint development partners such as Plextronics, Inc. (Plextronics), who because of the size of their company, have limited financial, legal, or personnel resources, or technology risks may be more readily impacted by any number of negative factors. If any of these smaller joint development partners were to become negatively impacted in any of the foregoing areas or were to become insolvent, it could significantly impair our investment in such company. Any of these adverse outcomes could cause our business strategy to fail.

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The consumer electronics industry experiences significant downturns from time to time, any of which may adversely affect the demand for and pricing of our OLED technologies and materials.

Our success depends upon the ability and continuing willingness of our licensees to manufacture and sell products utilizing our technologies and materials, specifically our phosphorescent emitters and host materials, and the widespread acceptance of our licensees' products in the consumer marketplace. Any slowdown in the demand for our licensees' products or a decrease in licensees' use of or demand for our materials would adversely affect our material sales and royalty revenues and thus our business. Our licensees' decrease in the use of or demand for our materials may depend on several factors, including pricing, availability, continued technical improvements and competitive product offerings. The markets for flat panel displays and lighting products are highly competitive. Success in the market for end-user products that may integrate our OLED technologies and materials also depends on factors beyond the control of our licensees and us, including the cyclical and seasonal nature of the end-user markets that our licensees serve, as well as industry and general economic conditions.

The markets that we hope to penetrate have experienced significant periodic downturns, often in connection with, or in anticipation of, declines in general economic conditions. These downturns have been characterized by lower product demand, production overcapacity and erosion of average selling prices. Our business strategy is dependent on manufacturers building and selling products that incorporate our OLED technologies and materials. Industry-wide fluctuations and downturns in the demand for flat panel displays and solid-state lighting products could cause significant harm to our business.

Any downturn in U.S. or global economic conditions may have a significant adverse effect on our business.

There have been significant and sustained economic downturns in the U.S. and globally in recent years. This has placed pressure on consumer demand, and the resulting impact on consumer spending has had a material adverse effect on the demand for consumer electronic products. Similar downturns in the future may have a significant adverse effect on one or more of our licensees as an enterprise, which could result in those licensees reducing their efforts to commercialize products that incorporate our OLED technologies and materials. Consumer demand and the condition of the flat panel display and lighting industries may also be impacted by other external factors such as war, terrorism, geopolitical uncertainties and other business interruptions. The impact of these external factors is difficult to predict, and one or more of these factors could adversely impact the demand for our licensees' products, and thus our business. Many of our competitors have greater resources, which may make it difficult for us to compete successfully against them.

The flat panel display and solid-state lighting industries are characterized by intense competition. Many of our competitors have better name recognition and greater financial, technical, marketing, personnel and research capabilities than us. Because of these differences, we may never be able to compete successfully in these markets or maintain any competitive advantages we are able to achieve over time.

If we fail to make advances in our OLED research and development activities, we might not succeed in commercializing our OLED technologies and materials.

Further advances in our OLED technologies and materials depend, in part, on the success of the research and development work we conduct, both alone and with our research partners. We cannot be certain that this work will yield additional advances in the research and development of these technologies and materials.

Our research and development efforts remain subject to all of the risks associated with the development of new products based on emerging and innovative technologies, including, without limitation, unanticipated technical or other problems and the possible insufficiency of funds for completing development of these products. Technical problems may result in delays and cause us to incur additional expenses that would increase our losses. If we cannot complete research and development of our OLED technologies and materials successfully, or if we experience delays in completing research and development of our OLED technologies and materials for use in potential commercial applications, particularly after incurring significant expenditures, our business may fail.

If we cannot keep our key employees or hire other talented persons as we grow, our business might not succeed.

Our performance is substantially dependent on the continued services of our executive officers and other key technical and managerial personnel, and on our ability to offer competitive salaries and benefits to these and our other employees. We do not have employment agreements with any of our executive officers or other key technical or

managerial personnel. Additionally, competition for highly skilled technical and managerial personnel is intense. We might not be able to attract, hire, train, retain and motivate the highly skilled employees we need to be successful. If we fail to attract and retain the necessary technical and managerial personnel, our business will suffer and might fail.

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We rely solely on PPG Industries to manufacture the OLED materials we use and sell to product manufacturers. Our business prospects depend significantly on our ability to obtain proprietary OLED materials for our own use and for sale to product manufacturers. Our agreement with PPG Industries provides us with a source for these materials for development and evaluation purposes and commercial purposes. Our agreement with PPG Industries currently runs through the end of 2015 and shall be automatically renewed for additional one year terms, unless terminated by us with prior notice of one year or terminated by PPG with prior notice of two years. Our inability to continue obtaining these OLED materials from PPG Industries or another source at cost-competitive prices and to continue obtaining these OLED materials in sufficient quantities to meet our product manufacturer's current and future demands and timetables would have a material adverse effect on our revenues and cost of goods sold relating to sales of these materials to OLED product manufacturers, as well as on our ability to perform future development work.

Inventory management relating to our material sales is complex, and excess inventory may harm our business and cause it to suffer.

Inventory management remains an area of focus as we balance the need to maintain strategic inventory levels of our OLED materials to ensure competitive lead times against the risk of inventory obsolescence because of rapidly changing technology and customer requirements. Our manufacturers may increase orders during periods of product shortages, cancel orders if their inventory is too high, or delay orders in anticipation of new products. They also may adjust their orders in response to the supply and demand of their products by end-users, our products and the products of our competitors that are available to them. Excess inventory of our OLED materials is subject to the risk of inventory obsolescence. In the event that a substantial portion of our inventory becomes obsolete, it could have a material adverse effect on earnings due to the resulting costs associated with the inventory impairment charges and inventory write downs.

We may require additional funding in the future in order to continue our business.

Our capital requirements have been and will continue to be significant. We may require additional funding in the future for the research, development and commercialization of our OLED technologies and materials, to obtain and maintain patents and other intellectual property rights in these technologies and materials, and for working capital and other purposes, the timing and amount of which are difficult to ascertain. Our cash on hand may not be sufficient to meet all of our future needs. When we need additional funds, such funds may not be available on commercially reasonable terms or at all. If we cannot obtain more money when needed, our business might fail. Additionally, if we attempt to raise money in an offering of shares of our common stock, preferred stock, warrants or depositary shares, or if we engage in acquisitions involving the issuance of such securities, the issuance of these shares will dilute our then-existing shareholders.

Because the vast majority of OLED product manufacturers are located in the Asia-Pacific region, we are subject to international operational, financial, legal and political risks which may negatively impact our operations.

Many of our licensees and prospective licensees have a majority of their operations in countries other than the United States, particularly in the Asia-Pacific region. Risks associated with our doing business outside of the United States include, without limitation:

- compliance with a wide variety of foreign laws and regulations;
- legal uncertainties regarding taxes, tariffs, quotas, export controls, export licenses and other trade barriers;
- economic instability in the countries of our licensees, causing delays or reductions in orders for their products and therefore our royalties;
- political instability in the countries in which our licensees operate, particularly in South Korea relating to its disputes with North Korea and in Taiwan relating to its disputes with China;
- difficulties in collecting accounts receivable and longer accounts receivable payment cycles; and
- potentially adverse tax and tariff consequences.

Any of these factors could impair our ability to license our OLED technologies and sell our OLED materials, thereby harming our business.

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The U.S. government has rights to intellectual property derived from our government-funded work that might prevent us from realizing the full benefits of our intellectual property portfolio.

The U.S. government, through various government agencies, has provided and continues to provide funding to us, Princeton, USC and Michigan for work related to certain aspects of our OLED technologies. Because we have been provided with this funding, the government has rights to any intellectual property derived from this work that could restrict our ability to market OLED products to the government for military and other applications, or to license this intellectual property to third parties for commercial applications. Moreover, if the government determines that we have not taken effective steps to achieve practical application of this intellectual property in any field of use in a reasonable time, the government could require us to license this intellectual property to other parties in that field of use. Any of these occurrences would limit our ability to obtain maximum value from our intellectual property portfolio.

The market price of our common stock may be highly volatile.

The market price of our common stock may be highly volatile, as has been the case with our common stock in the past as well as the securities of many companies, particularly other emerging-growth companies in the technology industry. We have included in the section of this report entitled "Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities," a table indicating the high and low closing prices of our common stock as reported on the NASDAQ Global Market for the past two years. Factors such as the following may have a significant impact on the market price of our common stock in the future:

- our revenues, expenses and operating results;
- announcements by us or our competitors of technological developments, new product applications or license arrangements; and
- other factors affecting the flat panel display and solid-state lighting industries in general.

Our operating results may have significant period-to-period fluctuations, which would make it difficult to predict our future performance.

Due to the current stage of commercialization of our OLED technologies and materials; the limited number of commercially successful consumer products utilizing our OLED technologies, that licensees have introduced in the marketplace; the relatively short product lifetimes of these consumer products; and the significant development and manufacturing objectives that we and our licensees must achieve for the widespread inclusion of our OLED technologies in new classes of consumer products such as tablets, television displays and lighting products, our quarterly operating results are difficult to predict and may vary significantly from quarter to quarter.

We believe that period-to-period comparisons of our operating results are not a reliable indicator of our future performance at this time. Among other factors affecting our period-to-period results, our license and technology development fees often consist of large one-time, annual or semi-annual payments, which may result in significant fluctuations in our revenues. In addition, our reliance on a small number of licensees with large volumes of consumer product sales makes our quarterly operating results subject to our licensees' specific plans and the success of their specific product offerings. If, in some future period, our operating results or business outlook fall below the expectations of securities analysts or investors, our stock price would be likely to decline and investors in our common stock may not be able to resell their shares at or above their purchase price. Broad market, industry and global economic factors may also materially reduce the market price of our common stock, regardless of our operating performance.

The issuance of additional shares of our common stock could drive down the price of our stock.

The price of our common stock could decrease if:

- shares of our common stock that are currently subject to restriction on sale become freely salable, whether through an effective registration statement or based on Rule 144 under the Securities Act of 1933, as amended; or
- we issue additional shares of our common stock that might be or become freely salable, including shares that would be issued upon conversion of our preferred stock or the exercise of outstanding stock options.

We can issue shares of preferred stock that may adversely affect the rights of shareholders of our common stock.

Our Articles of Incorporation authorize us to issue up to 5,000,000 shares of preferred stock with designations, rights and preferences determined from time-to-time by our Board of Directors. Accordingly, our Board of Directors is

empowered, without shareholder approval, to issue preferred stock with dividend, liquidation, conversion, voting or other rights superior to those of shareholders of our common stock. For example, an issuance of shares of preferred stock could:

adversely affect the voting power of the shareholders of our common stock;

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make it more difficult for a third party to gain control of us;
discourage bids for our common stock at a premium; or
otherwise adversely affect the market price of our common stock.

As of February 24, 2014, we have issued and outstanding 200,000 shares of Series A Nonconvertible Preferred Stock, all of which are held by an entity controlled by members of the family of Sherwin I. Seligsohn, our Founder and Chairman of the Board of Directors. Our Board of Directors has authorized and issued other shares of preferred stock in the past, none of which are currently outstanding, and may do so again at any time in the future.

Because we do not currently intend to pay dividends, shareholders will benefit from an investment in our common stock only if it appreciates in value.

We have never declared or paid any cash dividends on our common stock. We currently intend to retain our future earnings, if any, to finance further research and development and do not expect to pay any cash dividends in the foreseeable future. As a result, the success of an investment in our common stock will depend upon any future appreciation in its value. There is no guarantee that our common stock will appreciate in value or even maintain the price at which current shareholders purchased their shares.

Our executive officers and directors own a significant percentage of our common stock and could exert significant influence over matters requiring shareholder approval, including takeover attempts.

Our executive officers and directors, their respective affiliates and the adult children of Sherwin Seligsohn, our Founder and Chairman of the Board of Directors, beneficially own, as of February 24, 2014, approximately 12.5% of the outstanding shares of our common stock. Accordingly, these individuals may, as a practical matter, be able to exert significant influence over matters requiring approval by our shareholders, including the election of directors and the approval of mergers or other business combinations. This concentration also could have the effect of delaying or preventing a change in control of us.

Natural disasters or other unforeseen catastrophic events could unfavorably affect our business.

Natural disasters, such as hurricanes, tsunamis, or earthquakes, particularly in Asia-Pacific region, where many of our licensees are located, or the occurrence of other unforeseen catastrophic events, such a fire or flood, could unfavorably affect our business and financial performance. Such events could unfavorably affect our licensees in many ways, such as causing physical damage to one or more of their properties, the temporary or permanent closure of one or more plants, the disruption or cessation of manufacturing of product lines, and the temporary or long-term disruption in the supply or demand for their products. A resulting by-product of such natural disasters or other unforeseen catastrophic events could be a temporary or long-term disruption in the supply of or demand for our products.

Our effective tax rate may increase or decrease.

We are subject to income taxes in the U.S. and numerous foreign jurisdictions. Significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are subject to audit by tax authorities where we do business. Although we believe that our tax estimates and tax positions are reasonable, they could be materially affected by many factors including the final outcome of tax audits and related litigation, the introduction of new tax accounting standards, legislation, regulations, and related interpretations, our global mix of earnings and the realizability of deferred tax assets. An increase or decrease in our effective tax rate could have a material adverse impact on our financial condition and results of operations.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our corporate offices and research and development laboratories are located at 375 Phillips Boulevard in Ewing, New Jersey. In 2004, we acquired the building and property at which this facility is located. During 2005, we conducted a two-stage expansion of our laboratory and office space in the building, as well as a recent expansion in 2013. We currently occupy the entire newly expanded facility.

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ITEM 3. LEGAL PROCEEDINGS

Patent Related Challenges and Oppositions

Each major jurisdiction in the world that issues patents provides both third parties and applicants an opportunity to seek a further review of an issued patent. The specific process for requesting and considering such reviews are specific to the jurisdiction that issued the patent in question, and generally do not include claims for monetary damages or specific claims of infringement. The conclusions made by the reviewing administrative bodies tend to be appealable and generally are limited in scope and applicability to the specific claims and jurisdiction in question.

We believe that opposition proceedings are frequently commenced in the ordinary course of business by third parties who may believe that a specific patent or claims in the patent do not comply with the technical or legal requirements of the specific jurisdiction in which the patent was issued. We view these proceedings as reflective of our goal of obtaining the broadest legally permissible patent coverage permitted in each jurisdiction. Once a proceeding is initiated, the issued patent continues to be presumed valid until the jurisdiction's applicable administrative body issues a final non-appealable decision. Depending on the jurisdiction, the outcome of these proceedings could include affirmation, denial or modification of some or all of the originally issued claims. We believe that as our portfolio increases in size, so will the number of these proceedings.

Below are summaries of proceedings that have been commenced against certain issued patents that are either exclusively licensed to us or which are now assigned to us. We do not believe that the confirmation, loss or modification of our rights in any individual claim or set of claims that are the subject of the following legal proceedings would have a material impact on our material sales or licensing business or on our consolidated financial statements, including our consolidated statements of income, as a whole. However, as noted within the descriptions, some of the following proceedings involve issued patents that relate to our fundamental phosphorescent OLED technologies and we intend to vigorously defend against claims that, in our opinion, seek to restrict or reduce the scope of the originally issued claim, which may require the expenditure of significant amounts of our resources. In certain circumstances, when permitted, we may also utilize the proceedings to request modification of the claims to better distinguish the patented invention from any newly identified prior art and/or improve the claim scope of the patent relative to commercially important categories of the invention. The entries marked with an "*" relate to our UniversalPHOLED phosphorescent OLED technology, some of which may be commercialized by us.

Opposition to European Patent No. 0946958

On December 8, 2006, Cambridge Display Technology Ltd. (CDT), which was acquired in 2007 by Sumitomo, filed a Notice of Opposition to European Patent No. 0946958 (EP '958 patent), which relates to our FOLED™ flexible OLED technology. The EP '958 patent, which was issued on March 8, 2006, is a European counterpart patent to U.S. patents 5,844,363; 6,602,540; 6,888,306; and 7,247,073. These patents are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

On November 26, 2009 the European Patent Office (the EPO) issued its written decision to reject the opposition and to maintain the patent as granted. On April 12, 2010, CDT filed an appeal to the EPO panel decision. On August 19, 2010, we filed a timely response to the EPO panel decision.

At this time, based on our current knowledge, we believe that the EPO panel decision will be upheld on appeal.

However, we cannot make any assurances of this result.

Opposition to European Patent No. 1449238*

In 2007, Sumation Company Limited (Sumation), a joint venture between Sumitomo and CDT, Merck Patent GmbH, of Darmstadt, Germany, and BASF Aktiengesellschaft, of Mannheim, Germany, filed Notices of Opposition to European Patent No 1449238 (EP '238 patent). The EP '238 patent, which was issued on November 2, 2006, is a European counterpart patent, in part, to U.S. patents 6,830,828; 6,902,830; 7,001,536; 7,291,406; 7,537,844; and 7,883,787; and to pending U.S. patent applications 13/009,001, filed on January 19, 2011, and 13/205,290, filed on August 9, 2011 (hereinafter the "U.S. '828 Patent Family"). They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

On January 13, 2012, the EPO issued a decision to maintain the patent with claims directed to OLEDs comprising phosphorescent organometallic iridium compounds.

All the parties appealed the EPO's panel decision. An Oral Hearing was held in the EPO on November 22, 2013, in which the EPO Appellate Board reversed the decision of the prior panel and revoked the patent in its entirety. We received a final written decision on February 21, 2014. We are currently evaluating whether to proceed with an appeal of the decision to the Enlarged Board of Appeals, or simply continue prosecuting claims directed to the invention in additional related pending divisional applications in the EPO which claim priority from the same original priority application.

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Opposition to European Patent No. 1394870*

On April 20, 2010, Merck Patent GmbH; BASF Schweitz AG of Basel, Switzerland; Osram GmbH of Munich, Germany; Siemens Aktiengesellschaft of Munich, Germany; and Koninklijke Philips Electronics N.V., of Eindhoven, The Netherlands filed Notices of Opposition to European Patent No. 1394870 (the EP '870 patent). The EP '870 patent, which was issued on July 22, 2009, is a European counterpart patent, in part, to U.S. patents 6,303,238; 6,579,632; 6,872,477; 7,279,235; 7,279,237; 7,488,542; 7,563,519; and 7,901,795; and to pending U.S. patent application 13/035,051, filed on February 25, 2011 (hereinafter the "U.S. '238 Patent Family"). They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding. The matter has been briefed and an oral hearing has been scheduled by the EPO in the second quarter of 2014. At this time, based on our current knowledge, we believe there is a substantial likelihood that the patent being challenged will be declared valid and that all or a significant portion of our claims will be upheld. However, we cannot make any assurances of this result.

Invalidation Trials in Japan for Japan Patent Nos. 4357781 and 4358168*

On May 24, 2010, we received Notices of Invalidation Trials against Japan Patent Nos. 4357781 (the JP '781 patent) and 4358168 (the JP '168 patent), which were both issued on August 14, 2009. The requests were filed by Semiconductor Energy Laboratory Co., Ltd. (SEL). The JP '781 and JP '168 patents are Japanese counterpart patents, in part, to the above-noted U.S. '828 Patent Family. They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

On March 31, 2011, we learned that the Japanese Patent Office (JPO) had issued decisions finding all claims in the JP '781 and JP '168 patents invalid.

Both parties appealed this matter to the Japanese IP High Court. On November 7, 2012, we were notified that the Japanese IP High Court had reversed the JPO's finding of invalidity and remanded the case back to the JPO for further consideration.

In a decision reported to us on April 15, 2013, all claims in our JP '781 and JP '168 patents were upheld as valid by the JPO. Our opponent appealed this decision.

At this time, based on our current knowledge, we believe that the claims on the patents should be upheld. However, we cannot make any assurances of this result.

Invalidation Trial in Japan for Japan Patent No. 4511024*

On June 16, 2011, we learned that a Request for an Invalidation Trial was filed in Japan for our Japanese Patent No. JP-4511024 (the JP '024 patent), which issued on May 14, 2010. The Request was filed by SEL, the same opponent as in the above-noted Japanese Invalidation Trials for the JP '781 and JP '168 patents. The JP '024 patent is a counterpart patent, in part, to the U.S. '238 Patent Family, which relate to the EP '870 patent, which is subject to one of the above-noted European oppositions and which relates to our UniversalPHOLED phosphorescent OLED technology. They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

On May 10, 2012, we learned that the JPO issued a decision upholding the validity of certain claimed inventions in the JP '024 Patent but invalidating the broadest claims in the patent. We appealed the JPO's decision to the Japanese IP High Court. On October 31, 2013, the Japanese IP High Court ruled that the prior art references relied on by the JPO did not support the JPO's findings, reversed the JPO's decision with respect to the previously invalidated broad claims in the JP '024 patent and remanded the matter back to the JPO for further consideration consistent with its decision.

At this time, based on our current knowledge, we believe that the patent being challenged should be declared valid and that all or a significant portion of our claims should be upheld. However, we cannot make any assurances of this result.

Opposition to European Patent No. 1252803*

On July 12 and 13, 2011, Sumitomo, Merck Patent GmbH and BASF SE, of Ludwigshaven, Germany filed oppositions to our European Patent No. 1252803 (the EP '803 patent). The EP '803 patent, which was issued on October 13, 2010, is a European counterpart patent, in part, to the U.S. '828 Patent Family. They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

On December 7, 2012 the EPO rendered a decision at an Oral Hearing wherein it upheld the broadest claim of the granted patent. All three opponents filed an appeal.

At this time, based on our current knowledge, we believe there is a substantial likelihood that the patent being challenged will be declared valid and that all or a significant portion of our claims will be further upheld on appeal. However, we cannot make any assurances of this result.

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Opposition to European Patent No. 1390962

On November 16, 2011, Osram AG and BASF SE each filed a Notice of Opposition to European Patent No. 1390962 (EP '962 patent), which relates to our white phosphorescent OLED technology. The EP '962 patent, which was issued on February 16, 2011, is a European counterpart patent to U.S. patents 7,009,338 and 7,285,907. They are exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

The EPO combined the oppositions into a single opposition proceeding. We expect the EPO to schedule a hearing on this matter in the first half of 2014.

At this time, based on our current knowledge, we believe there is a substantial likelihood that the patent being challenged will be declared valid, and that all or a significant portion of our claims will be upheld. However, we cannot make any assurances of this result.

Opposition to European Patent No. 1933395*

On February 24 and 27, 2012, Sumitomo, Merck Patent GmbH and BASF SE filed oppositions to our European Patent No. 1933395 (the EP '395 patent). The EP '395 patent is a counterpart patent to the above-noted JP '168 patent, and, in part, to the U.S. '828 Patent Family. This patent is exclusively licensed to us by Princeton, and we are required to pay all legal costs and fees associated with this proceeding.

At an Oral Hearing on October 14, 2013, the EPO panel issued a decision that affirmed the basic invention and broad patent coverage in the EP '395 patent, but narrowed the scope of the original claims.

We intend to appeal the ruling to reinstate a broader set of claims. This patent, as originally granted by the EPO, would be deemed valid during the pendency of an appeals process.

In addition to the above proceedings, from time to time, we may have other proceedings that are pending which relate to patents we acquired as part of the Fuji Patent acquisition or which to relate to technologies that are not currently widely utilized in the marketplace.

EXECUTIVE OFFICERS OF THE REGISTRANT

The following table sets forth certain information with respect to our executive officers as of February 24, 2014:

Name	Age	Position
Sherwin I. Seligsohn	78	Founder and Chairman of the Board of Directors
Steven V. Abramson	62	President, Chief Executive Officer and Director
Sidney D. Rosenblatt	66	Executive Vice President, Chief Financial Officer, Treasurer, Secretary and Director
Julia J. Brown	52	Senior Vice President and Chief Technical Officer
Michael G. Hack	57	Vice President of Strategic Product Development and General Manager, OLED Lighting & Custom Displays
Janice K. Mahon	56	Vice President of Technology Commercialization and General Manager, PHOLED Material Sales Business
Mauro Premutico	48	Vice President, Legal and General Manager, Patents and Licensing

Our Board of Directors has appointed these executive officers to hold office until their successors are duly appointed. Sherwin I. Seligsohn is our Founder and has been the Chairman of our Board of Directors since June 1995. He also served as our Chief Executive Officer from June 1995 through December 2007, and as our President from June 1995 through May 1996. Mr. Seligsohn serves as the sole Director, President and Secretary of American Biomimetics Corporation, International Multi-Media Corporation, and Wireless Unified Network Systems Corporation. He was also previously the Chairman of the Board of Directors, President and Chief Executive Officer of Global Photonic Energy Corporation (GPEC) since its inception until April 2012, when he resigned from his positions at GPEC. Since that time, the only relationship Mr. Seligsohn has had with GPEC is as a shareholder and option holder. From June 1990 to October 1991, Mr. Seligsohn was Chairman Emeritus of InterDigital Communications, Inc. (InterDigital), formerly International Mobile Machines Corporation. He founded InterDigital and from August 1972 to June 1990 served as its Chairman of the Board of Directors. Mr. Seligsohn is a member of the Industrial Advisory Board of the Princeton Institute for the Science and Technology of Materials (PRISM) at Princeton.

Steven V. Abramson is our President and Chief Executive Officer, and has been a member of our Board of Directors since May 1996. Mr. Abramson served as our President and Chief Operating Officer from May 1996 through December 2007. From March 1992 to May 1996, Mr. Abramson was Vice President, General Counsel, Secretary and Treasurer of Roy F. Weston, Inc., a worldwide environmental consulting and engineering firm. From December 1982 to December 1991, Mr. Abramson held various positions at InterDigital, including General Counsel, Executive Vice President and General Manager of the Technology Licensing Division.

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Sidney D. Rosenblatt is an Executive Vice President and has been our Chief Financial Officer, Treasurer and Secretary since June 1995. He also has been a member of our Board of Directors since May 1996. Mr. Rosenblatt was the owner of S. Zitner Company from August 1990 through August 2010 and served as its President from August 1990 through December 1998. From May 1982 to August 1990, Mr. Rosenblatt served as the Senior Vice President, Chief Financial Officer and Treasurer of InterDigital.

Julia J. Brown, Ph.D. is a Senior Vice President and has been our Chief Technical Officer since June 2002. She joined us in June 1998 as our Vice President of Technology Development. From November 1991 to June 1998, Dr. Brown was a Research Department Manager at Hughes Research Laboratories where she directed the pilot line production of high-speed Indium Phosphide-based integrated circuits for insertion into advanced airborne radar and satellite communication systems. Dr. Brown received an M.S. and Ph.D. in Electrical Engineering/Electrophysics at USC under the advisement of Professor Stephen R. Forrest. Dr. Brown has served as an Associate Editor of the Journal of Electronic Materials and as an elected member of the Electron Device Society Technical Board. She co-founded an international engineering mentoring program sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and is a Fellow of the IEEE. Dr. Brown has served on numerous technical conference committees and is presently a member of the Society of Information Display.

Michael G. Hack, Ph.D. has been our Vice President of Strategic Product Development since October 1999, and became the General Manager of OLED Lighting & Custom Displays in January 2010. Prior to joining us, Dr. Hack was associated with dpiX, a Xerox Company, where from 1996 to 1999 he was responsible for manufacturing flat panel displays and digital medical imaging products based on amorphous silicon TFT technology. Previously, Dr. Hack was a Principal Scientist with Xerox PARC, engaged in the research of material and device aspects of amorphous- and poly-silicon as related to flat panel displays. Dr. Hack received his Ph.D. degree from Cambridge University, England in 1981, and in 2007 he was elected a Fellow of the Society for Information Display.

Janice K. Mahon has been our Vice President of Technology Commercialization since January 1997, and became the General Manager of our PHOLED Material Sales Business in January 2007. From 1992 to 1996, Ms. Mahon was Vice President of SAGE Electrochromics, Inc., a thin-film electrochromic technology company, where she oversaw a variety of business development, marketing and finance and administrative activities. From 1984 to 1989, Ms. Mahon was a Vice President and General Manager for Chronar Corporation, a leading developer and manufacturer of amorphous silicon photovoltaic (PV) panels. Prior to that, Ms. Mahon worked as Senior Engineer for the Industrial Chemicals Division of FMC Corporation. Ms. Mahon received her B.S. in Chemical Engineering from Rensselaer Polytechnic Institute in 1979, and an M.B.A. from Harvard University in 1984. Ms. Mahon was a member of the Technical Council of the FlexTech Alliance from 1997 through 2010, and a member of its Governing Board from 2008 through 2010. Ms. Mahon has also served as chairperson of the Marketing Committee for the OLED Association since the beginning of 2009. Ms. Mahon has also been a member of the Board of Directors of the OLED Association since 2013.

Mauro Premutico has been our Vice President of Legal and General Manager of Patents and Licensing since April 2012. Prior to joining us, Mr. Premutico was the Managing Vice President and Chief Patent Counsel for The Walt Disney Company from 2009 to 2012, and Vice President of Intellectual Property and Associate General Counsel for Lenovo Group Ltd. from 2005 to 2009. Mr. Premutico was also Special Counsel at the international law firm of Cleary, Gottlieb, Steen & Hamilton from 2002 until 2005 where he served as the co-head of the New York's office Intellectual Property and Technology Law practice. Mr. Premutico received his law degree from Boston University School of Law and a BSEE from Worcester Polytechnic Institute.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our Common Stock

Our common stock is quoted on the NASDAQ Global Market under the symbol "OLED." The following table sets forth, for the periods indicated, the high and low closing prices of our common stock as reported on the NASDAQ Global Market.

	High Close	Low Close
2013		
Fourth Quarter	\$38.20	\$29.15
Third Quarter	37.93	27.16
Second Quarter	33.35	26.02
First Quarter	34.55	25.20
2012		
Fourth Quarter	\$34.91	\$22.52
Third Quarter	43.58	30.76
Second Quarter	45.16	27.24
First Quarter	47.83	32.48

As of February 24, 2014, there were approximately 299 holders of record of our common stock.

We have never declared or paid cash dividends on our common stock. We currently intend to retain any future earnings for the operation and expansion of our business. We do not anticipate declaring or paying cash dividends on our common stock in the foreseeable future. Any future payment of cash dividends on our common stock will be at the discretion of our Board of Directors and will depend upon our results of operations, earnings, capital requirements, contractual restrictions and other factors deemed relevant by our Board of Directors.

Share Repurchases

During the quarter ended December 31, 2012, we announced that the Board of Directors had approved a program to repurchase up to \$50 million of our outstanding shares of common stock from time to time over the next twelve months (the Repurchase Program). The amount and timing of repurchases depended on a number of factors, including the price, availability of shares of our common stock, trading volume and general market conditions. The repurchases could be made on the open market, in block trades or otherwise. The Repurchase Program ended during the quarter ended December 31, 2013.

Additionally, during the quarter ended December 31, 2013, we acquired 98 shares of common stock through transactions related to the vesting of restricted share awards previously granted to employees of ours. Upon vesting, the employees turned in shares of common stock in amounts sufficient to pay the minimum statutory tax withholding at rates required by the relevant tax authorities.

The following table provides information relating to the shares we received and repurchased during the fourth quarter of 2013 (dollar amounts in thousands, other than per share amounts):

Period	Total Number of Shares Purchased	Weighted Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program
October 1 – October 31	98	\$30.86	n/a	\$—
November 1 – November 30	—	—	n/a	—
December 1 – December 31	—	—	n/a	—
Total	98	—	—	—

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Performance Graph

The performance graph below compares the change in the cumulative shareholder return of our common stock from December 31, 2008 to December 31, 2013, with the percentage change in the cumulative total return over the same period on (i) the Russell 2000 Index, and (ii) the Nasdaq Electronics Components Index. This performance graph assumes an initial investment of \$100 on December 31, 2008 in each of our common stock, the Russell 2000 Index and the Nasdaq Electronics Components Index.

	Cumulative Total Return					
	12/08	12/09	12/10	12/11	12/12	12/13
Universal Display Corp.	100.00	130.79	324.34	388.25	271.11	363.60
Russell 2000	100.00	127.17	161.32	154.59	179.86	249.69
NASDAQ Electronic Components	100.00	156.84	178.93	170.31	175.62	235.40

Securities Authorized for Issuance under Equity Compensation Plans

The information required by this item with respect to our equity compensation plans will be set forth in our Proxy Statement, and is incorporated herein by reference.

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ITEM 6. SELECTED FINANCIAL DATA

The following selected consolidated financial data has been derived from, and should be read in conjunction with, our Consolidated Financial Statements and the notes thereto, and with “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” included elsewhere in this report.

(in thousands, except share and per share data)	Year Ended December 31,				
	2013	2012	2011	2010	2009
Operating Results:					
Total revenue	\$146,639	\$83,244	\$61,289	\$30,545	\$15,787
Cost of material sales	28,889	4,528	3,731	888	374
Research and development expense	34,215	30,032	24,129	21,695	21,122
Selling, general and administrative expense	24,745	19,550	18,940	13,041	10,922
Patent costs and amortization of acquired technology	17,273	13,385	7,442	4,271	3,240
Interest income	811	1,240	994	279	670
Income tax benefit (expense) ⁽¹⁾	35,044	(5,208)	714	134	130
Net income (loss)	74,052	9,660	3,155	(19,917)	(20,505)
Net income (loss) per common share, basic	\$1.61	\$0.21	\$0.07	\$(0.53)	\$(0.56)
Net income (loss) per common share, diluted	\$1.59	\$0.21	\$0.07	\$(0.53)	\$(0.56)
Unaudited non-GAAP Measures:					
Adjusted net income (loss)*	32,634	** 9,660	3,155	(19,917)	(20,505)
Adjusted net income (loss) per common share, basic*	\$0.71	** \$0.21	\$0.07	\$(0.53)	\$(0.56)
Adjusted net income (loss) per common share, diluted*	\$0.70	** \$0.21	\$0.07	\$(0.53)	\$(0.56)
Balance Sheet Data:					
Total assets	\$462,754	\$385,524	\$373,878	\$92,327	\$80,140
Current liabilities	23,229	22,299	19,517	25,045	13,966
Shareholders’ equity	427,686	350,235	342,227	57,430	59,628
Other Financial Data:					
Working capital	\$303,819	\$245,246	\$342,787	\$57,355	\$53,664
Capital expenditures	4,710	2,737	2,624	369	259
Additions to intangibles	359	109,102	440	—	—
Weighted average shares used in computing basic net income (loss) per common share	45,898,019	45,951,276	43,737,968	37,567,374	36,479,331
Weighted average shares used in computing diluted net income (loss) per common share	46,543,605	46,883,602	45,140,394	37,567,374	36,479,331
Shares of common stock outstanding, end of period	46,423,667	46,355,535	46,113,296	38,936,571	36,818,440

(1) During the year ended December 31, 2013, we released income tax valuation allowances of \$59.4 million.

* The unaudited adjusted presentation is a non-GAAP measure which reflects our operating results excluding the impact of the release of certain income tax valuation allowances (including the impact of recording a deferred income tax provision subsequent to the release) for the year ended December 31, 2013. The adjusted presentation is intended to present our net income and net income per common share information for the year ended December 31, 2013 as if the income tax valuation allowances were not reversed, consistent with prior years.

** Refer to the reconciliation of non-GAAP measures below for more detail.

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Reconciliation of non-GAAP measures

The following table details our reconciliation of non-GAAP measures to the most directly comparable GAAP measures:

(in thousands, except per share data)	Year Ended December 31,				
	2013	2012	2011	2010	2009
	(Unaudited)				
Operating Results:					
Net income (loss)	\$74,052	\$9,660	\$3,155	\$(19,917)	\$(20,505)
Non-GAAP Reconciling Items:					
Deferred income tax expense	17,934	—	—	—	—
Release of income tax valuation allowances	(59,352)	—	—	—	—
Total non-GAAP reconciling items	(41,418)	—	—	—	—
Non-GAAP Measures:					
Adjusted net income (loss)	\$32,634	\$9,660	\$3,155	\$(19,917)	\$(20,505)
Adjusted net income (loss) per common share, basic *	\$0.71	\$0.21	\$0.07	\$(0.53)	\$(0.56)
Adjusted net income (loss) per common share, diluted **	\$0.70	\$0.21	\$0.07	\$(0.53)	\$(0.56)

* The adjusted net income (loss) per common share, basic is derived from dividing adjusted net income by the number of weighted average shares used in computing basic net income (loss) per common share.

**The adjusted net income per common share, diluted for the year ended December 31, 2013, is derived from dividing adjusted net income by adjusted weighted average shares of 46,582,347, which excludes the amount of any excess tax benefits in assumed proceeds in calculating the weighted average shares using the treasury stock method. The exclusion is intended to present our diluted net income per common share for the year ended December 31, 2013 as if our assessment of the future realizability of our deferred tax assets did not change and the income tax valuation allowances were not reversed, consistent with prior periods. For the years ended December 31, 2009 to 2012, there is no difference between net income (loss) per common share and adjusted net income (loss) per common share.

Non-GAAP Measures

To supplement our selected financial data presented in accordance with U.S. generally accepted accounting principles (GAAP), we are providing certain non-GAAP measures. These non-GAAP measures include adjusted net income (loss), adjusted net income (loss) per common share, basic and adjusted income (loss) per common share, diluted. Reconciliation to the most directly comparable GAAP measures of all non-GAAP measures included in the presentation can be found within the table detailing the reconciliation of non-GAAP measures to GAAP measures above.

We have provided these non-GAAP measures to enhance investors' overall understanding of our current financial performance, and as a means to evaluate period-to-period comparisons. We believe that these non-GAAP measures provide meaningful supplemental information regarding our financial performance by excluding the effect of the release of income tax valuation allowances that may not be indicative of recurring core business operating results. We believe that the non-GAAP measures that exclude the impact of the release of income tax valuation allowances including recording a deferred income tax provision subsequent to the release of the allowances, when viewed with GAAP results, enhance the comparability or results against prior periods and allow for greater transparency of financial results. The presentation of non-GAAP measures is not intended to be considered in isolation or as a substitute for, or superior to, the financial information prepared and presented in accordance with GAAP.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with the section entitled "Selected Financial Data" in this report and our Consolidated Financial Statements and related notes to this report. This discussion and analysis contains forward-looking statements based on our current

expectations, assumptions, estimates and projections. These forward-looking statements involve risks and uncertainties. Our actual results could differ materially from those indicated in these forward-looking statements as a result of certain factors, as more fully discussed in Item 1A of this report, entitled “Risk Factors.”

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OVERVIEW

We are a leader in the research, development and commercialization of organic light emitting diode, or OLED, technologies and materials for use in displays for smartphones, tablets and televisions as well as solid-state lighting applications. Since 1994, we have been exclusively engaged, and expect to continue to be primarily engaged, in funding and performing research and development activities relating to OLED technologies and materials, and commercializing these technologies and materials. We derive our revenue from the following:

- sales of OLED materials for evaluation, development and commercial manufacturing;
- intellectual property and technology licensing; and
- technology development and support, including government contract work and support provided to third parties for commercialization of their OLED products.

Material sales relate to our sale of OLED materials for incorporation into our customers' commercial OLED products or for their OLED development and evaluation activities. Material sales are recognized at the time of shipment or at time of delivery, and passage of title, depending upon the contractual agreement between the parties.

We receive license and royalty payments under certain commercial, development and technology evaluation agreements, some of which are non-refundable advances. These payments may include royalty and license fees made pursuant to license agreements and also license fees included as part of certain commercial supply agreements. Certain of the payments under development and technology evaluation agreements are creditable against future amounts payable under commercial license agreements that the parties may subsequently enter into and, as such, are deferred until such commercial license agreements are executed or negotiations have ceased and our management determines that there is no appreciable likelihood of executing a commercial license agreement with the other party. Revenue would then be recognized over the term of the agreement or the expected useful life of the relevant licensed technology, for perpetual licenses, if there is an effective commercial license agreement or amounts are not creditable against future commercial license fees, or at the time our management determines that there is no appreciable likelihood of an executable commercial license agreement. For arrangements with extended payment terms where the fee is not fixed and determinable, we recognize revenue when the payment is due and payable. Royalty revenue and license fees included as part of commercial supply agreements are recognized when earned and the amount is fixed and determinable.

Currently, our most significant commercial license agreement, which runs through the end of 2017, is with SDC and covers the manufacture and sale of specified OLED display products. Under this agreement, we are being paid a license fee, payable in semi-annual installments over the agreement term of 6.4 years. The installments, which are due in the second and fourth quarter of each year, increase on an annual basis over the term of the agreement. The agreement conveys to SDC the non-exclusive right to use certain of our intellectual property assets for a limited period of time that is less than the estimated life of the assets. Ratable recognition of revenue is impacted by the agreement's extended increasing payment terms in light of our limited history with similar agreements. As a result revenue is recognized at the lesser of the proportional performance approach (ratable) and the amount of due and payable fees from SDC. Given the increasing contractual payment schedule, license fees under the agreement are recognized as revenue when they become due and payable, which is currently scheduled to be in the second and fourth quarter of each year.

At the same time we entered into the current patent license agreement with SDC, we also entered into a new supplemental material purchase agreement with SDC. Under the current supplemental material purchase agreement, SDC agrees to purchase from us a minimum dollar amount of phosphorescent emitter materials for use in the manufacture of licensed products. This minimum purchase commitment is subject to SDC's requirements for phosphorescent emitter materials and our ability to meet these requirements over the term of the supplemental agreement. The minimum purchase amounts increase on an annual basis over the term of the supplemental agreement. These amounts were determined through negotiation based on a number of factors, including, without limitation, estimates of SDC's OLED business growth as a percentage of published OLED market forecasts and SDC's projected minimum usage of red and green phosphorescent emitter materials over the term of the agreement. Technology development and support revenue is revenue earned from government contracts, development and technology evaluation agreements and commercialization assistance fees, which includes reimbursements by

government entities for all or a portion of the research and development costs we incur in relation to our government contracts. Revenues are recognized proportionally as research and development costs are incurred, or as defined milestones are achieved.

While we have made significant progress over the past few years developing and commercializing our family of OLED technologies (including our PHOLED, TOLED, FOLED technologies) and materials, and have generated net income over the past three years, we incurred significant losses prior to this period, resulting in an accumulated deficit of \$130.2 million as of December 31, 2013.

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We anticipate fluctuations in our annual and quarterly results of operations due to uncertainty regarding, among other factors:

- the timing, cost and volume of sales of our OLED materials;
- the timing of our receipt of license fees and royalties, as well as fees for future technology development and evaluation;
- the timing and magnitude of expenditures we may incur in connection with our ongoing research and development and patent-related activities; and
- the timing and financial consequences of our formation of new business relationships and alliances.

Critical Accounting Policies and Estimates

The discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make estimates and judgments that affect our reported assets and liabilities, revenues and expenses, and other financial information. Actual results may differ significantly from our estimates under other assumptions and conditions.

We believe that our accounting policies related to revenue recognition and deferred revenue, the valuation of certain investments, the valuation and recoverability of acquired technology, stock-based compensation, income taxes and our Supplemental Executive Retirement Plan, as described below, are our “critical accounting policies” as contemplated by the SEC. These policies, which have been reviewed with our Audit Committee, are discussed in greater detail below.

Revenue Recognition and Deferred Revenue

Technology development and support revenue is revenue earned from government contracts, development and technology evaluation agreements and commercialization assistance fees, which includes reimbursements by the U.S. government for all or a portion of the research and development expenses we incur related to our government contracts. Revenue is recognized proportionally as research and development expenses are incurred or as defined milestones are achieved. In order to ascertain the revenue associated with these contracts for a period, we estimate the proportion of related research and development expenses incurred and whether defined milestones have been achieved. Different estimates would result in different revenues for the period.

We receive non-refundable advance license and royalty payments under certain commercial, development and technology evaluation agreements with our customers. These payments are generally recognized as revenue over the term of the agreement. On occasion, however, certain of the payments under development and evaluation agreements are creditable against future amounts payable under commercial license agreements that the parties may subsequently enter into and, as such, are classified as deferred revenue, and are recorded as liabilities in the consolidated balance sheet until such time as revenue can be recognized. Revenue is deferred until such commercial license agreements are executed or negotiations have ceased and our management determines that there is no appreciable likelihood of executing a commercial license agreement with the other party. If a commercial license agreement is executed, payments are recorded as revenue over the term of the agreement or the estimated useful life of the licensed technology, for perpetual licenses. Otherwise, payments deferred pending a commercial license are recorded as revenue at the time our management determines that negotiations with the customer show that there is no appreciable likelihood of executing a commercial license agreement. For arrangements with extended payment terms where the fee is not fixed and determinable, we recognize revenue when the payment is due and payable. If we used different estimates for the useful life of the licensed technology, or formed a different judgment on the likelihood of executing a commercial license agreement or if fees are fixed and determinable, reported revenue during the relevant period would differ. As of December 31, 2013, \$4.3 million was recorded as deferred revenue. For the years ended December 31, 2013 and 2012, approximately \$1.5 million and \$1.9 million of revenue was recognized, respectively, relating to cash payments received that were creditable against license fees and/or royalties for which we determined there was no appreciable likelihood of executing a license agreement with the customer.

Short-term and Long-term Investments

We have invested in convertible promissory notes issued by two private companies, both of which are early-stage companies still defining their strategic direction and business models. The carrying value of our convertible promissory note investment portfolio totaled \$4.3 million as of December 31, 2013. For additional information, see

Note 2 in Notes to Consolidated Financial Statements.

Our convertible promissory note investments are currently classified within long-term investments on the consolidated balance sheet.

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These convertible promissory note investments are inherently risky as the notes lack a ready market for resale, and the note issuer's success is dependent on product development, market acceptance, operational efficiency, the ability of the investee companies to raise additional funds in financial markets that can be volatile, and other key business factors.

The companies we have invested in could fail or not be able to raise additional funds when needed. These events could cause our investments to significantly decrease in value. In addition, financial market volatility could negatively affect our ability to realize value in our investments through liquidity events such as mergers and private sales.

We determine the fair value of our convertible promissory note investments portfolio quarterly. The fair value of our convertible promissory note investments is determined through the consideration of whether the investee is experiencing financial difficulty, overall trends in interest rates and other factors. Management also performs an evaluation of the probability that the borrower will be in payment default on any of its debt in the foreseeable future. The evaluation requires significant judgment and includes quantitative and qualitative analysis of identified events or circumstances affecting the investee, which may impact the fair value of the investment, such as:

- the investee's revenue and earnings trends relative to pre-defined milestones and overall business prospects;
- the technological feasibility of the investee's products and technologies;
- the general market conditions in the investee's industry or geographic area, including adverse regulatory or economic changes;
- factors related to the investee's ability to remain in business, such as the investee's liquidity, debt ratios, and the rate at which the investee is using its cash; and
- the investee's receipt of additional funding at a lower valuation.

Changes in fair value of the investments are recorded as unrealized gains and losses in other comprehensive income (loss). If a decline in fair value of a convertible promissory note investment below our carrying value is deemed to be other than temporary, the amortized cost basis of our investment will be written down by the amount of the other-than-temporary impairment with a resulting charge to net income. There were no other-than-temporary impairments of convertible promissory note investments as of December 31, 2013. On January 16, 2014, one of the companies that issued us a convertible promissory note, for an original principal amount of \$4.0 million, filed a voluntary petition for relief under Chapter 11 of the Bankruptcy Code in the United States Bankruptcy Court of the District of Delaware (Bankruptcy Court). The debtor company is seeking an Order authorizing the sale of substantially all of its assets. On February 14, 2014, the Bankruptcy Court approved the bidding procedures in connection with the sale of substantially all of the debtor company's assets, including approval of a minimum stalking horse bid under which our investment would be satisfied in full. If any qualified bids are received under the approved bidding procedures, which are required to be superior to the current stalking horse bid, then on March 5, 2014, an auction for the sale of the debtor's assets is scheduled to be held. A sale hearing is currently scheduled for March 6, 2014. Based upon our expectation of full payment resulting from the sale of the debtor company's assets and the bankruptcy process, no impairment has been recorded as of December 31, 2013. If the sale and bankruptcy process does not occur as expected, a full or partial impairment of the investment may be necessary.

Valuation and Recoverability of Acquired Technology

During the year ended December 31, 2012, we acquired a portfolio of patent and patent applications for \$109.1 million including related costs and expenses. For additional information, see Note 5 in the Notes to Consolidated Financial Statements.

The net book value of all our acquired technology was \$94.0 million as of December 31, 2013. Acquired technology assets are subject to amortization. These assets are currently being amortized on a straight-line basis over a period of 7.5 to 10 years which are their estimated economic lives. Changes in technology or in our intended use of these assets, as well as changes in economic or industry factors or in our business or prospects, may cause the estimated period of use or the value of these assets to change.

We periodically review our acquired technology assets to confirm the appropriateness of the lives. Our assessment takes into account actual usage, our anticipated future use of the technology, and assumptions about technology evolution. If these factors indicate that the useful life is different from the previous assessment, we would amortize the remaining net book values prospectively over the adjusted remaining estimated useful life.

We also regularly review our acquired OLED technologies for events or changes in circumstances that might indicate the value of these technologies is impaired. Factors considered that could cause impairment include, among others, significant changes in our anticipated future use of these technologies, expected revenue streams resulting from the technologies, and our overall business strategy as it pertains to these technologies, particularly in light of patents owned by others in the same field of use. When factors indicate that long-lived assets should be evaluated for possible impairment, we use an estimate of the related undiscounted cash flows in measuring whether the long-lived asset should be written down to fair value as well as if the remaining useful life is still appropriate. Measurement of the amount of impairment would be based on generally accepted valuation methodologies, as deemed appropriate.

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Valuation of Stock-Based Compensation

We recognize in the statement of income the grant-date fair value of equity-based compensation issued to employees and directors (see Notes 2 and 11 of the Notes to Consolidated Financial Statements). We also record an expense for equity-based compensation grants to non-employees, in exchange for goods or services, and stock appreciation rights (SARs) issued to employees, based on the fair value, which is remeasured over the vesting period of such awards. The performance unit awards we grant are subject to either a performance-based or market-based vesting requirement. For performance-based vesting, the grant-date fair value of the award, based on fair value of the Company's common stock, is recognized over the service period, based on an assessment of the likelihood that the applicable performance goals will be achieved and compensation expense is periodically adjusted based on actual and expected performance. Compensation expense for performance unit awards with market-based vesting is calculated based on the estimated fair value as of the grant date utilizing a Monte Carlo simulation model and is recognized over the service period on a straight-line basis.

We use the Black-Scholes option-pricing model to estimate the fair value of SARs, options and warrants we have granted for purposes of recording charges to the statement of income. In order to calculate the fair value of the SARs, options and warrants, assumptions are made for certain components of the model, including expected volatility, expected dividend yield rate and expected life. Expected volatilities utilized in the model are based on the historical volatility of our stock price over a period commensurate with the expected life of the award. The risk-free interest rate is derived from the U.S. Treasury yield curve in effect at the time of grant. In the case of stock options granted to employees, we estimate the expected term of options granted based on our historical experience with our employees' exercise of stock options. In the case of stock options and warrants granted to non-employees, the contractual life is used. Although we use our best estimates when setting these assumptions, changes to the assumptions could cause significant adjustments to the valuation of future grants or the remeasurement of awards.

Accounting for Income Taxes

We are subject to income taxes in both the U.S. and foreign jurisdictions. Significant judgments and estimates are required in evaluating our tax positions for future realization and determining our provision for income taxes. Our income tax expense, deferred tax assets and liabilities, and reserves for unrecognized tax benefits reflect management's best assessment of estimated future taxes to be paid.

Our income tax benefit during the year ended December 31, 2013 was the result of the release of valuation allowances offset by foreign withholding taxes. The foreign taxes are primarily related to foreign taxes withheld on royalty and license fees paid to the U.S. operating entity. SDC has been required to withhold tax upon payment of royalty and license fees to the U.S. operating entity at a rate of 16.5%. In assessing the realizability of deferred tax assets, we consider whether it is more likely than not that some portion or all of our deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent on our ability to generate future taxable income to obtain benefit from the reversal of temporary differences, net operating loss carryforwards and tax credits. As part of our assessment we consider the scheduled reversal of deferred tax liabilities, projected future taxable income, and tax planning strategies. During the year ended December 31, 2013, based on previous earnings history, a current evaluation of expected future taxable income and other evidence, we determined it is more likely than not that our federal and the majority of our state deferred tax assets will be realized. Therefore, we released all valuation allowances except the portion that relates to UDC Ireland, New Jersey research and development credits and a portion of foreign tax credits.

Actual results could differ from our assessments if adequate taxable income is not generated in future periods. To the extent in the future we no longer believe that recovery is more likely than not, we would be required to re-establish a valuation allowance to reduce deferred tax assets to the amount considered realizable. To the extent we establish a new valuation allowance or change a previously established valuation allowance in a future period, income tax expense will be impacted. In addition, our ability to use our federal net operating loss carryforwards could be subject to limitation because of certain ownership changes. Net deferred tax assets totaled \$40.7 million, representing, 8.8% of total assets, as of December 31, 2013.

Although we generated income before income taxes during the years ended December 31, 2012 and 2011, there was no provision for United States federal or state income taxes, excluding certain estimated alternative minimum taxes

and refunds due to the utilization of net operating loss carryforwards which were offset by a full valuation allowance.

Retirement Plan

We have recorded a significant retirement plan benefit liability that is developed from actuarial valuations. The determination of our retirement plan benefit liability requires key assumptions regarding discount rates, as well as rates of compensation increases, retirement dates and life expectancies used to determine the present value of future benefit payments. We determine these assumptions in consultation with, and after input from, our actuaries and considering our experience and expectations for the future. Actual results for a given period will often differ from assumed amounts because of economic and other factors.

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The discount rate reflects the estimated rate at which the benefit liabilities could be settled at the end of the year. The discount rate is determined by selecting a single rate that produces a result equivalent to discounting expected benefit payments from the plan using the Citigroup Above-Median Pension Discount Curve (the Curve). Based upon this analysis using the Curve, we used a discount rate to measure our retirement plan benefit liability of 4.51% at December 31, 2013. A change of 25 basis points in the discount rate would increase or decrease the expense on an annual basis by approximately \$13,000.

RESULTS OF OPERATIONS

Year Ended December 31, 2013 Compared to Year Ended December 31, 2012

We had operating income of \$38.2 million for the year ended December 31, 2013, compared to operating income of \$13.7 million for the year ended December 31, 2012. The increase in operating income was due to the following: an increase in revenue of \$63.4 million, which includes increases in both material sales and royalty and license fees, partially offset by a \$3.2 million decrease in technology development and support revenue; offset by an increase in operating expenses of \$38.8 million, which includes a \$24.4 million increase in the cost of material sales, a \$3.9 million increase in patent costs and amortization of acquired technology, a \$5.2 million increase in selling, general and administrative expenses and a \$4.2 million increase in research and development expenses, all of which are described below.

We had net income of \$74.1 million (or \$1.61 per basic share and \$1.59 per diluted share) for the year ended December 31, 2013, compared to net income of \$9.7 million (or \$0.21 per basic and diluted share) for the year ended December 31, 2012. The increase in net income was primarily due to:

the increase in operating income of \$24.6 million; and

a tax benefit of \$35.0 million resulting primarily from the release of income tax valuation allowances.

We had adjusted net income of \$32.6 million (or \$0.71 per adjusted basic share and \$0.70 per adjusted diluted share) for the year ended December 31, 2013. This non-GAAP measure excludes the effect of the tax valuation allowance releases. See the discussion of non-GAAP measures in Item 6 (Selected Financial Data) of this report.

Revenue

The following table details our revenues for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December		Increase (Decrease)		
	2013	2012	\$	%	
REVENUE:					
Material sales	\$95,713	\$44,472	\$51,241	115	%
Royalty and license fees	47,006	31,698	15,308	48	%
Technology development and support revenue	3,920	7,074	(3,154)	(45))%
Total revenue	\$146,639	\$83,244	\$63,395	76	%

Total revenue for the year ended December 31, 2013 increased by \$63.4 million compared to the year ended December 31, 2012. The increase in revenue was primarily the result of increased commercial chemical sales due to the increased adoption of our technology and materials in the marketplace by display manufacturers.

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Material sales

The following table details our revenues derived from material sales for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December 31,		Increase (Decrease)		
	2013	2012	\$	%	
Material Sales:					
Commercial material sales	\$88,131	\$27,350	\$60,781	222	%
Developmental material sales	7,582	17,122	(9,540)	(56))%
Total Material Sales	\$95,713	\$44,472	\$51,241	115	%

Commercial material sales for the year ended December 31, 2013 increased by \$60.8 million compared to the year ended December 31, 2012, primarily reflecting increased commercial chemical sales resulting from the adoption of our technology and materials in the marketplace by display manufacturers. Commercial materials are materials that have been validated by us for use in commercial OLED products.

Developmental material sales for the year ended December 31, 2013 decreased by \$9.5 million compared to the year ended December 31, 2012. The decrease in our development material sales was primarily due to a change in sales mix. Developmental material sales are materials that have not yet been validated by us for use in commercial OLED products.

Material sales included sales of both phosphorescent emitter and host materials which were comprised of the following for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December 31,		Increase		
	2013	2012	\$	%	
Material Sales:					
Phosphorescent emitter sales	\$61,552	\$38,424	\$23,128	60	%
Host material sales	34,161	6,048	28,113	465	%
Total Material Sales	\$95,713	\$44,472	\$51,241	115	%

Phosphorescent emitter sales for the year ended December 31, 2013 increased by \$23.1 million compared to the year ended December 31, 2012. The increase in our phosphorescent emitter sales was primarily due to an increase in commercial phosphorescent emitter sales, offset by a decrease in development phosphorescent emitter sales.

Host material sales for the year ended December 31, 2013 increased by \$28.1 million compared to the year ended December 31, 2012. The increase in our host material sales was primarily due to an increase in the number of grams sold, offset by a decrease in the average price per gram sold. We believe we can participate in the host materials business due to our long experience in developing emitter materials, which are used together with host materials in the emissive layer of an OLED. However, our customers are not required to purchase our host materials in order to utilize our phosphorescent emitter materials, and the host material sales business is more competitive than the phosphorescent emitter material sales business. Thus, our long-term prospects for host material sales are uncertain.

Royalty and license fees

Royalty and license fees were as follows for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December 31,		Increase		
	2013	2012	\$	%	
Royalty and license fees	\$47,006	\$31,698	\$15,308	48	%

Royalty and license fees for the year ended December 31, 2013 increased by \$15.3 million compared to the year ended December 31, 2012. The increase in our royalty and license fees mostly related to SDC, which are not dependent on material sales. Our license fees from SDC increased \$10.0 million, and our license fees based on commercial chemical sales increased \$3.8 million. During the year ended December 31, 2013, we also recognized as revenue \$1.5 million, which was previously deferred because the payment was creditable against the license fee under a commercial license agreement in the event we entered into one with the customer. During the year ended December

31, 2013, we determined that the likelihood of us entering into such an agreement with this customer was remote. As a result of this determination, we recorded the \$1.5 million payment as revenue in the fourth quarter of 2013.

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Technology development and support revenue

Technology development and support revenue were as follows for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December 31,		(Decrease)	
	2013	2012	\$	%
Technology development and support revenue	\$3,920	\$7,074	\$(3,154)	(45)%

Technology development and support revenue is revenue earned from government contracts, development and technology evaluation agreements and commercialization assistance fees, which includes reimbursements by the U.S. government for all or a portion of the research and development expenses we incur related to our government contracts.

Technology development and support revenue for the year ended December 31, 2013 decreased by \$3.2 million compared to the year ended December 31, 2012. The decrease is primarily related to the smaller number of government contracts and due to the timing of revenue recognition for certain customers.

Cost of material sales

Cost of commercial material sales were as follows for the years ended December 31, 2013 and 2012 (amounts in thousands):

	Year Ended December 31,	
	2013	2012
Commercial material sales	\$88,131	\$27,350
Cost of commercial material sales	28,635	4,250
% of commercial material sales	32	% 16

Cost of commercial material sales for the year ended December 31, 2013 increased by \$24.4 million compared to the year ended December 31, 2012. The increase in our cost of commercial material sales was primarily due to the aforementioned 222% increase in commercial material sales as well as the product mix of materials sold. Depending on the amounts, timing and stage of materials being classified as commercial, we expect cost of materials sales to fluctuate from quarter to quarter. As a result of these fluctuations, and due to increased sales of commercial materials, cost of material sales increased for the year ended December 31, 2013, compared to the same period in 2012.

Cost of commercial material sales includes the cost of producing materials that have been classified as commercial and shipping costs for such materials, but excludes the cost of producing certain materials, which have already been included in research and development expense. Commercial materials are materials that have been validated by us for use in commercial OLED products.

Research and development

We incurred research and development expenses of \$34.2 million for the year ended December 31, 2013, compared to \$30.0 million for the year ended December 31, 2012. The increase was primarily due to:

- increased costs of \$2.8 million associated with bonus and stock-based compensation for certain executive officers as well as increased salaries and salary-related expenses associated with new and existing employees;
- increased costs of \$1.2 million related to sponsored research and development contracts; and
- increased costs of \$1.3 million incurred under our agreement with PPG Industries; offset by decreased consulting and contract costs of \$1.2 million due to decreased outsourced research and development efforts, fewer government contracts outstanding when compared to the prior year, as well as the timing of costs incurred.

Selling, general and administrative

Selling, general and administrative expenses were \$24.7 million for the year ended December 31, 2013, compared to \$19.6 million for the year ended December 31, 2012. The increase was primarily due to increased costs associated with bonus and stock-based compensation for certain executive officers as well as increased salaries and salary-related expenses associated with new and existing employees.

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Patent costs and amortization of acquired technology

Patent costs and amortization of acquired technology increased to \$17.3 million for the year ended December 31, 2013, compared to \$13.4 million for the year ended December 31, 2012. The increase relates to an increase in the duration of the year for amortization on patents purchased from Fujifilm in July 2012 (see Note 5 in Notes to Consolidated Financial Statements for further discussion), offset by a decrease in patent costs mainly due to the timing of legal expenses as well as an effort to reduce legal expenses.

Royalty and license expense

Royalty and license expense increased to \$3.3 million for the year ended December 31, 2013, compared to \$2.1 million for the year ended December 31, 2012. The increase was mainly due to increased royalties incurred under our amended license agreement with Princeton, USC, and Michigan, resulting from higher material sales and increased royalty and license fees. See Note 3 in Notes to Consolidated Financial Statements for further discussion.

Interest income

Interest income decreased to \$811,000 for the year ended December 31, 2013, compared to \$1.2 million for the year ended December 31, 2012. The increase is primarily due to the timing of purchases of investments and an overall lower average balance of cash held in 2013.

Income taxes

We recorded an income tax benefit of \$35.0 million for the year ended December 31, 2013 compared to an income tax expense of \$5.2 million for the year ended December 31, 2012.

Our income tax benefit during the year ended December 31, 2013 was primarily the result of the release of valuation allowances offset by foreign withholding taxes. The foreign taxes are primarily related to foreign taxes withheld on royalty and license fees paid to the U.S. operating entity. SDC has been required to withhold tax upon payment of royalty and license fees to the U.S. operating entity at a rate of 16.5%. During the year ended December 31, 2013, we paid South Korea withholding taxes of \$6.6 million, and received a federal refund of \$226,000 related to alternative minimum taxes.

Year Ended December 31, 2012 Compared to Year Ended December 31, 2011

We had operating income of \$13.7 million for the year ended December 31, 2012, compared to operating income of \$5.7 million for the year ended December 31, 2011. The increase in operating income was due to:

- an increase in revenue of \$22.0 million, which includes increases in both material sales and royalty and license fees; offset by
 - an increase in operating expenses of \$14.0 million, which includes a \$5.9 million increase in research and development expenses and a \$5.9 million increase in patent costs and amortization of acquired technology, all of which are described below.

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We had net income of \$9.7 million (or \$0.21 per basic and diluted share) for the year ended December 31, 2012, compared to a net income of \$3.2 million (or \$0.07 per basic and diluted share) for the year ended December 31, 2011. The increase in net income was primarily due to:

- an increase of operating income of \$8.0 million; and
- a decrease in loss on stock warrant liability of \$4.2 million; offset by
- an increase in income tax expense of \$5.9 million

Revenue

The following table details our revenues for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December		Increase (Decrease)		
	31, 2012	2011	\$	%	
REVENUE:					
Material sales	\$44,472	\$37,444	\$7,028	19	%
Royalty and license fees	31,698	15,345	16,353	107	%
Technology development and support revenue	7,074	8,500	(1,426)	(17))%
Total revenue	\$83,244	\$61,289	\$21,955	36	%

Total revenue for the year ended December 31, 2012 increased by \$22.0 million compared to the year ended December 31, 2011. The increase in our total revenue was primarily due to additional licensing revenues and OLED material sales from the expanded adoption of our technology and materials in the marketplace by display manufacturers, particularly SDC, the successor-in-interest to SMD.

Material sales

The following table details our revenues derived from material sales for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December		Increase		
	31, 2012	2011	\$	%	
Material Sales:					
Commercial material sales	\$27,350	\$25,339	\$2,011	8	%
Developmental material sales	17,122	12,105	5,017	41	%
Total Material Sales	\$44,472	\$37,444	\$7,028	19	%

Commercial material sales for the year ended December 31, 2012 increased by \$2.0 million compared to the year ended December 31, 2011. The increase in our commercial material sales was primarily due to the increased adoption of our technology and materials in the marketplace by display manufacturers, particularly SDC. Commercial materials are materials that have been validated by us for use in commercial OLED products.

Developmental material sales for the year ended December 31, 2012 increased by \$5.0 million compared to the year ended December 31, 2011. The increase in our development material sales was primarily due to a change in sales mix. Developmental material sales are materials that have not yet been validated by us for use in commercial OLED products.

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Material sales included sales of both phosphorescent emitter and host materials. Material sales were comprised of the following for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December 31,		Increase (Decrease)		
	2012	2011	\$	%	
Material Sales:					
Phosphorescent emitter sales	\$38,424	\$26,211	\$12,213	47	%
Host material sales	6,048	11,233	(5,185)	(46))%
Total Material Sales	\$44,472	\$37,444	\$7,028	19	%

Phosphorescent emitter sales for the year ended December 31, 2012 increased by approximately \$12.2 million compared to the year ended December 31, 2011. The increase in our commercial material sales was primarily due to the increased adoption of our technology and materials in the marketplace by display manufacturers, particularly SDC. Host material sales for the year ended December 31, 2012 decreased by \$5.2 million compared to the year ended December 31, 2011. The decrease in our host material sales was primarily due to a large order of host material in 2011 for a specific product that was not repeated by our customer.

Royalty and license fees

Royalty and license fees were as follows for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December 31,		Increase		
	2012	2011	\$	%	
Royalty and license fees	\$31,698	\$15,345	\$16,353	107	%

Royalty and license fees for the year ended December 31, 2012 increased by \$16.4 million compared to the year ended December 31, 2011. A substantial portion of the increase was due to an increase in royalty and license fees received under our patent license agreement with SDC, in the year ended December 31, 2012, as compared to the year ended December 31, 2011.

Technology development and support revenue

Technology development and support revenue were as follows for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December 31,		(Decrease)		
	2012	2011	\$	%	
Technology development and support revenue	\$7,074	\$8,500	\$(1,426)	(17))%

Cost of material sales

Cost of commercial material sales were as follows for the years ended December 31, 2012 and 2011 (amounts in thousands):

	Year Ended December 31,			
	2012	2011		
Commercial material sales	\$27,350	\$25,339		
Cost of commercial material sales	4,250	2,818		
% of commercial material sales	16	% 11		%

Cost of commercial material sales for the year ended December 31, 2012 increased \$1.4 million from the year ended December 31, 2011. The increase in our cost of commercial material sales was due primarily to the aforementioned 8% increase in commercial material sales as well as the product mix of materials sold. Cost of commercial material sales includes the cost of producing materials that have been classified as commercial and shipping costs for such materials, but excludes the cost of producing certain materials, which have already been included in research and development expense. Commercial materials are materials that have been validated by us for use in commercial OLED products.

Depending on the amounts, timing and stage of materials being classified as commercial, we expect cost of materials sales to fluctuate from quarter to quarter. As a result of these fluctuations, and due to increased sales of commercial

materials, cost of material sales increased for the year ended December 31, 2012, compared to the same period in 2011.

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Research and development

We incurred research and development expenses of \$30.0 million for the year ended December 31, 2012, compared to \$24.1 million for the year ended December 31, 2011. The increase was primarily due to:

- increased costs of \$2.6 million incurred under our agreement with PPG Industries;
- increased costs of \$1.7 million related to outsourced research and development efforts; and
- increased costs of \$1.6 million related to sponsored research and development contracts.

Selling, general and administrative

Selling, general and administrative expenses were \$19.6 million for the year ended December 31, 2012, compared to \$18.9 million for the year ended December 31, 2011. The increase was mainly due to increased employee costs related to salaries and expenses for new employees as well as costs associated with retirement benefits for certain executive officers, offset by decreased marketing and advertising expenses.

Patent costs and amortization of acquired technology

Patent costs and amortization of acquired technology increased to \$13.4 million for the year ended December 31, 2012, compared to \$7.4 million for the year ended December 31, 2011. The increase was mainly due to increased amortization costs of \$4.8 million due to the amortization expense associated with technology acquired from Fujifilm in July 2012. Additionally, the increase was due to increased costs associated with our defense of certain ongoing and new challenges to our issued patents, as well as the timing of prosecution and maintenance costs associated with a number of patents and patent applications.

Royalty and license expense

Royalty and license expense increased to \$2.1 million for the year ended December 31, 2012, compared to \$1.4 million for the year ended December 31, 2011. The increase consisted mainly of royalties incurred under our amended license agreement with Princeton, USC, and Michigan, resulting from higher material sales and increased royalty and license fees.

Interest income

Interest income increased to \$1.2 million for the year ended December 31, 2012, compared to \$1.0 million for the year ended December 31, 2011.

Stock warrant liability

On January 1, 2009, we adopted certain revised provisions of Accounting Standards Codification (ASC) 815, Derivatives and Hedging. These provisions apply to freestanding financial instruments or embedded features that have the characteristics of a derivative and to freestanding financial instruments that are potentially settled in an entity's own common stock. As a result, certain stock purchase warrants that we issued, but which are no longer outstanding, were considered to be derivatives since they contained "down-round" provisions requiring remeasurement at fair value at the end of each period as they were recorded as liabilities.

The fair value of the stock warrant liability was determined using the Black-Scholes option pricing model using assumptions for certain components of the model, including expected volatility and expected annual dividend yield. The change in fair value of the stock warrant liability was recorded as a gain or loss on the statement of income, until all warrants were exercised.

In 2011, all remaining outstanding stock warrants to purchase shares of our common stock were exercised. The change in fair value of these warrants during 2011 prior to the exercise date resulted in a \$4.2 million non-cash loss on our statement of income for the year ended December 31, 2011.

Income taxes

For the years ended December 31, 2012 and 2011, the provision for income taxes primarily consisted of foreign taxes on South Korean royalty and license fee income. In addition, during the year ended December 31, 2011, we sold approximately \$45.2 million of our state-related income tax net operating losses (NOLs) and \$232,000 of our research and development tax credits under the New Jersey Technology Tax Certificate Transfer Program. We recorded the amount of the completed sale as an income tax benefit for the year ended December 31, 2011 and received the proceeds of \$2.7 million in January 2012.

For the years ended December 31, 2012 and 2011 income tax expense (benefit) was, \$5.2 million and (\$714,000), respectively.

Although we generated income before income taxes during the years ended December 31, 2012 and 2011, there was no provision for United States federal or state income taxes, due to the utilization of net operating loss carryforwards which were offset by a full valuation allowance.

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Liquidity and Capital Resources

Our principle sources of liquidity are our cash and cash equivalents and our short-term investments. As of December 31, 2013, we had cash and cash equivalents of \$70.6 million and short-term investments of \$202.0 million, for a total of \$272.6 million. This compares to cash and cash equivalents of \$85.9 million and short-term investments of \$158.0 million, for a total of \$243.9 million, as of December 31, 2012. The decrease in cash and cash equivalents of \$15.3 million was primarily due to cash used in investing activities for the purchase of short-term investments. The increase in short-term investments of \$44.0 million was primarily due to the increased cash provided by operating activities.

Cash provided by operating activities was \$45.0 million for the year ended December 31, 2013, compared to \$17.8 million for for the year ended December 31, 2012. The increase in cash provided by operating activities was primarily due to the following:

- an increase in net income of \$30.8 million, which amount excludes the impact of non-cash items;

- the impact of the timing of net inventory purchases of \$7.6 million based on future customer needs; primarily offset by

- the impact of the timing of accounts receivable collections of \$9.1 million.

Cash used in investing activities was \$54.8 million for the year ended December 31, 2013, compared to \$36.1 million for the year ended December 31, 2012. The increase in cash used in investing activities was mainly due to the timing of maturities and purchases of investments, increased property and equipment purchases of \$2.0 million, partially offset by decreased intangible asset additions during the year ended December 31, 2013. This decrease was due to the large portfolio of patents we purchased from Fujifilm during the year ended December 31, 2012.

Cash used in financing activities was \$5.5 million for the year ended December 31, 2013, compared to cash used of \$7.5 million for the year ended December 31, 2012. The decrease in cash used in financing activities was primarily due to proceeds of \$2.8 million from the exercise of options in the year ended December 31, 2013, compared to proceeds of \$1.5 million from the exercise of options and warrants to purchase shares of our common stock in the year ended December 31, 2012. Additionally, in connection with stock-based employee compensation and option exercises for the years ended December 31, 2013 and 2012, we made payments of \$3.3 million and \$4.1 million, respectively, in withholding taxes, corresponding to the value of shares surrendered by the individuals for whom such payments were made.

Working capital was \$303.8 million as of December 31, 2013, compared to \$245.2 million as of December 31, 2012. The increase in working capital is primarily due to the increase in short-term investments as well as an increase in deferred tax assets as a result of the release of certain income tax valuation allowances.

We anticipate, based on our internal forecasts and assumptions relating to our operations (including, among others, assumptions regarding our working capital requirements, the progress of our research and development efforts, the availability of sources of funding for our research and development work, and the timing and costs associated with the preparation, filing, prosecution, maintenance, defense and enforcement of our patents and patent applications), that we have sufficient cash, cash equivalents and short-term investments to meet our obligations for at least the next twelve months.

We believe that potential additional financing sources for us include long-term and short-term borrowings, public and private sales of our equity and debt securities and the receipt of cash upon the exercise of outstanding stock options. It should be noted, however, that additional funding may be required in the future for research, development and commercialization of our OLED technologies and materials, to obtain, maintain and enforce patents respecting these technologies and materials, and for working capital and other purposes, the timing and amount of which are difficult to ascertain. There can be no assurance that additional funds will be available to us when needed, on commercially reasonable terms or at all, particularly in the current economic environment.

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Contractual Obligations

As of December 31, 2013, we had the following contractual commitments:

Contractual Obligations	Payments due by period (in thousands)				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Estimated retirement plan benefit payments	\$22,102	\$—	\$739	\$1,669	\$19,694
Research related obligations	7,939	2,819	4,373	747	—
Minimum royalty obligation ⁽¹⁾	500	100	200	200	\$100/year
Total ⁽²⁾	\$30,541	\$2,919	\$5,312	\$	