In addition to fixed license payments listed above that we are obligated to make under certain technology license agreements, we also have continuing obligations to make cash royalty payments under our technology license agreements, the amount of which are generally determined based on a percentage of sales of our TFT-LCD products.

Expenses relating to our license fees and royalty payments under existing license agreements were (Won)31 billion in 2009, (Won)33 billion in 2010 and (Won)35 billion (US$30 million) in 2011, representing 7.6% of our research and development expenses in 2009, 4.9% in 2010 and 5.1% in 2011. We expect to make additional license fee payments as we enter into new technology license agreements from time to time with third parties.

Taxation

The effective statutory corporate income tax rate applicable to us is 22.0% (including local income surtax) for the first (Won)200 million of our taxable income and 24.2% (including local income surtax) for our taxable income in excess of (Won)200 million in 2011.

Tax Credits

We are entitled to tax credits relating to certain investment and technology and human resources development under the Special Tax Treatment Control Law. Specifically, we are entitled to a tax credit of 10% for our capital investments made on or before June 30, 2003, 15% for our capital investments made on or before December 31, 2004, 10% for our capital investments made on or before December 31, 2005, 7% for our capital investments made on or before December 31, 2008, 10% for our capital investments made on or before December 31, 2009, 7% for our capital investments made on or before December 31, 2010 and 5% for our capital investments made on or before December 31, 2011, each in proportion to the percentage of equity investment in us other than foreign direct equity investment.

In addition, pursuant to the Special Tax Treatment Control Law, we were entitled to a separate additional tax credit of 10% on the positive difference between the total amount of capital investments we made in 2009 and the average of the amount of capital investments we made in the three preceding fiscal years. 2010 was the last taxable year for companies, including us, to benefit from this tax credit, which has expired and is no longer available from 2011.

We are entitled to a tax credit of up to 40% of the increase in certain expenses incurred in connection with technology and human resources development over the average of such expenses during the previous four years.

Tax credits not utilized in the fiscal year during which the relevant investment was made may be carried forward over the next five years in the case of capital investments and five years in the case of investments relating to technology and human resources development. As of December 31, 2011, we had available deferred tax assets related to these credits of (Won)829 billion (US$716 million), which may be utilized against future income tax liabilities through 2016. In addition, we also had unused tax credit carryforwards of (Won)209 billion (US$180 million) for which no deferred tax asset was recognized.

Item 5.C. ***Research and Development, Patents and Licenses, etc.***

Research and Development

The display panel industry is subject to rapid technological changes. We believe that effective research and development is essential to maintaining our position as one of the industry’s leading technology innovators. Our research and development expenses amounted to (Won)408 billion in 2009, (Won)675 billion in 2010 and (Won)681 billion (US$588 million) in 2011, representing 2.0% of our revenue in 2009, 2.6% in 2010 and 2.8% in 2011.

We believe that the future trends for display products will include the widespread use of affordable large-sized flat panel products with higher performance qualities and the use of different types of display products for a variety of purposes, such as using flexible display panels in a range of products, using large-sized display panels for public display or advertising, and using small-sized panels for mobile devices. To meet the demands of the future trends, we have formulated a long-term research and development strategy aimed at enhancing the process, device and design aspects of the existing products and diversifying the use of display panels as new opportunities arise with the development of communication systems and information technology. The following are examples of products and technologies that have been developed through our research and development activities in recent years:

- In 2009, we developed an 11.5-inch flexible electronic paper display with in cell touch screen function for use in e-books. In addition, we also developed a 19-inch electronic paper display, the world’s largest at the time.

- In 2010, we developed a 47-inch full high-definition TFT-LCD panel that utilized FPR 3D and IPS technologies and polarized glasses for use in televisions. We received the Gold Award from the Society for Information Display, a display panel industry trade group, in recognition of the panel's high quality 3D display imagery. In addition, we developed 47-inch and 55-inch full high-definition TFT-LCD panels that utilized TruMotion 480Hz driving technology for use in televisions. TruMotion 480Hz driving technology decreases motion blur by quadrupling the speed of the prior conventional frame rate of 120Hz.
- In 2011, we developed a 4.5-inch high-definition TFT-LCD panel that utilized AH-IPS technology, which allows for wide viewing angles and high resolution imagery for use in 4G smartphones. In addition, we became the first display panel manufacturer to develop a 55-inch OLED display panel that utilized WOLED technology. We also developed a 55-inch full high-definition TFT-LCD panel with a super narrow bezel of just 5.3 mm for use in public displays. The super narrow bezel allows the public displays to be displayed alongside each other to create a large 165-inch multi-screen public display capable of producing large near seamless imagery. Furthermore, we developed a 3.9-inch wide VGA OLED panel that utilized On-Cell Touch technology. On-Cell Touch technology eliminates the need for a touch sensor overlay on the OLED panel by integrating the touch sensor directly into the OLED panel, which allows for a very thin and light touch sensitive display for use in products such as smartphones.

As the product lifecycle of display panels using certain of the existing TFT-LCD technology is approaching maturity, we plan to further focus on developing a next generation flat panel display technology, such as OLED, that can replace panels using such maturing technology, while also exploring new growth opportunities in the application of display panels, such as in tablet personal computers, smartphones, public displays and electronic paper displays.

In order to maintain our position as one of the industry's technology leaders, we believe it is important not only to increase direct spending on research and development, but also to manage our research and development capability effectively in order to successfully implement our long-term strategy. Therefore, we complement our in-house research and development capability with collaborations with universities and other third parties. For example, we provide project-based funding to both domestic and overseas universities as a means to recruit promising engineering students and to research and develop new technologies. We also enter into joint research and development agreements from time to time with third parties for the development of technologies in specific fields. In addition, we belong to several display industry consortia, and we receive annual government funding to support our research and development efforts. In addition to these collaborations, we may form strategic technology alliances with the research arms of LG Electronics, as well as suppliers and equipment makers in "cluster" industries, that is, industries related to the TFT-LCD industry, in order to enhance our capability to develop new technology.

We have developed a research and development management system whereby we encourage our engineers to propose new projects freely and to implement rigorous evaluation criteria for each stage of project development. We select our projects primarily based on their feasibility and alignment with our research and development strategy, and we review the progress of all ongoing projects on a quarterly basis. As of December 31, 2011, we employed approximately 4,099 engineers, researchers, designers, technicians and support personnel in connection with our research and development activities.

While we primarily rely on our own capacity for the development of new technologies in the TFT-LCD design and manufacturing process, we rely on third parties for certain key technologies to enhance our technology leadership, as further described in "— Intellectual Property" below.

Intellectual Property

Overview

Our business has benefited from our patent portfolio, which includes patents for TFT-LCD manufacturing processes, products and applications. We hold a large number of patents in Korea and in other countries, including in the United States, China, Japan Germany, France, Great Britain and Taiwan. These patents will expire at various dates upon the expiration of their respective terms ranging from 2012 to 2030.

As part of our ongoing efforts to prevent infringements on our intellectual property rights and to keep abreast of critical technology developments by our competitors, we closely monitor patent applications in Korea, Japan and the United States. We also plan to initiate monitoring activities in China. We intend to continue to file patent applications, where appropriate, to protect our proprietary technologies.