

**Testimony of**  
**Dr. Jong Kim, LG Electronics, Inc.**  
**before the**  
**Subcommittee on Telecommunications and the Internet**  
**House Energy and Commerce Committee**  
**February 17, 2005**

Mr. Chairman and members of the Subcommittee, my name is Jong Kim and I welcome the opportunity to appear before you today. I am Vice President of Research for LG Electronics Inc. (LG), a \$30 billion global leader in consumer electronics, information technology and communications products. I also serve as Senior Vice President for LG's Zenith subsidiary, where I have been working on digital television (DTV) technologies for the past 13 years.

As a long-time participant in digital television, I am pleased to appear before you today on behalf of LG Electronics U.S.A., Inc., which is the North American subsidiary of LG. A leading supplier of digital high-definition television (HDTV) integrated receivers, set-top boxes (STBs) and displays, LG already is developing its sixth-generation DTV reception chipset. LG is the parent company of Zenith Electronics Corporation, a long-time leader in consumer electronics generally and digital HDTV specifically. Zenith is the inventor of the digital modulation technology at the heart of the DTV Standard adopted by the Federal Communications Commission (FCC) and has been a wholly owned subsidiary of LG Electronics since 1999.

The Committee is focused today on the specific issue of the relationship of converter boxes to the digital transition. Mr. Chairman, LG shares your view that this transition is of critical importance. This Committee has been instrumental in advancing DTV's deployment, and we are seeing exciting marketplace developments involving digital technologies. Digital transmission offers incredible high-resolution video, and anyone who has experienced HDTV becomes a believer in this technology. In addition to these benefits, the digital transition provides an opportunity to return spectrum for important governmental objectives (including public safety and homeland security needs) and to deploy new commercial technologies for consumers. There are many issues associated with the transition, including potential government subsidies to help consumers purchase boxes capable of converting free, over-the-air DTV broadcast signals for viewing on their existing analog TV sets. These are exciting times for all involved in digital technologies.

LG has been asked to comment today on the pricing and timetable for deployment of converter boxes. Several factors influence any estimate of converter box costs, including the level of technology, unit sales volume, and licensing fees. Please permit me to address each of these topics briefly.

The level of technology necessary for a basic digital-to-analog converter box is much less than is required for today's more full-featured STBs that output high-definition signals and retail for \$200 to \$400. We contemplate the manufacture of converter boxes that will receive and demodulate all 18 formats of the ATSC DTV Standard, but will output only low-resolution analog signals via a simple radio frequency (RF) connector – like DVD players and VCRs connect to analog TVs today.

This is sufficient for the average consumer to enjoy the DTV experience. In fact, consumers who have been watching snowy analog TV pictures will love the crisp, studio-quality digital pictures even on their older, low-definition televisions sets using one of these simple digital-to-analog converters. While analog TVs will not display full high-definition resolution, these boxes will allow consumers to take advantage of the increased number of channels available through digital multicast terrestrial DTV broadcasts.

With regard to the price of converter boxes, we think it is useful to compare the technology of DVD players to the technology of these simple digital-to-analog converter boxes. Even today's most affordable DVD players (in the \$40-\$60 range) contain a disc-handling mechanism, along with a microprocessor, memory, MPEG decoding chipset, as well as the standard power supply, enclosure hardware and remote control. A digital-to-analog converter box will have essentially the same components, with a low-cost DTV tuner replacing the disc-playing mechanism; this similarity suggests comparable pricing between these two devices.

In considering the impact of unit sales volume relative to digital-to-analog converter box prices, the DVD example is instructive again. Prices for DVD players plummeted within five years from more than \$500 to less than \$100, based almost solely on their explosive sales growth. As you know, the FCC has adopted DTV tuner regulations requiring the phased-in inclusion of DTV tuners in all television receivers 13 inches and larger by mid-2007. This requirement is expected to have an effect similar to the DVD experience, exponentially driving down the costs of ATSC chipsets. As a result, a digital tuner three years from now should cost about the same as an analog TV tuner today.

In addition, LG believes that we can achieve the economies of scale required to ensure that a very low-cost converter box is available. Estimates point to 70 million-plus analog television receivers in the United States today that rely upon over-the-air service (i.e., are not connected to a cable or satellite provider). We expect that, while many consumers will replace these analog TVs with new, integrated DTV sets, many others will continue to use their analog sets, thereby providing a viable market to drive the production of a very large volume of low-cost converter boxes.

Another consideration in the overall STB pricing equation relates to licensing fees for patents held by the companies that invested in bringing STB technologies to market. Even the lowest-priced, bargain-basement DVD player has royalties in the \$10-\$15 range. This is essentially comparable to the royalty range for any basic digital-to-analog converter box.

Based on our DTV experience and expertise in the design and manufacture of DTV set-top boxes, LG estimates that the retail price of a simple digital-to-analog converter box such as I have described will be under \$100 by 2006, accounting for technology levels and licensing fees, and assuming production volumes in the millions of units. These three key factors affecting future STB pricing (technology level, unit sales volume and licensing fees) suggest to us that that digital-to-analog TV converter prices may be as low as \$50 by 2008, assuming industry-wide demand of tens of millions of units by then.

Of course, by 2008 there will be a range of options, including very affordable integrated DTV receivers. Those who want high definition reception and other features will pay more, just as they do today for progressive-scan DVD players. For consumers who want a very low-cost

standard definition solution, a target retail price of \$50-\$70 should be attainable in a little over three years from now, assuming annual sales volume in the tens of millions of units.

There are other factors, of course, that affect the digital transition. Manufacturers such as LG Electronics are doing our part to offer consumers a wide array of quality DTV products at affordable prices. Product prices will continue to decline, as they have done since DTV's introduction in 1998, and this will speed the transition. Other remaining issues that must be addressed to bring the DTV transition to completion include the provision of additional compelling digital content, consumer education efforts, and final resolution of digital cable carriage and digital copyright concerns. Progress has been made on the issue of compatibility between cable equipment and consumer electronics products as a result of cooperative effort by these industries, and work continues on two-way compatibility.

LG Electronics commends this Committee for having the foresight now to examine the end of the transition and to consider a framework for minimizing the potential disruption to consumers when the final switch-over to digital broadcasting occurs. We look forward to continuing to work with you to ensure that all Americans are able to enjoy the tremendous benefits of digital television.

I am, of course, pleased to respond to any questions you may have, and I appreciate the opportunity to appear before you today.