Programmable Logic
in the Next Millenium

I expect that within the first ten years of the next millennium we will see programmable logic devices inside every piece of electronic equipment, because hardware will become just as programmable as software.

by Wim Roelandts, President and CEO, Xilinx

Wall Street market analysts expect the programmable logic industry to grow another 25-35% in the year 2000, following a 25% increase in 1999. This increase is being driven, in part, by a worldwide economic recovery; we are seeing dramatic increases in Southeast Asia, and Japan is also beginning to improve. However, the recovering world economy is just one of many reasons for the dramatic growth in programmable logic.

The primary reason for this phenomenal growth is the tremendous technological advances that have taken place over the last two years. In 1996, our largest FPGA contained just 50,000 gates, and no BlockRAM™. Today, the Xilinx Virtex-E family offers up to 3.2 million system gates, with 832 kbits of BlockRAM. This means that FPGAs are large enough and fast enough to interest designers who once relied on gate array or standard cell technology. Using FPGAs, designers can now get the performance and density of gate arrays, and something gate arrays never offered—fast time-to-market and affordable pricing.

Xilinx will soon introduce a new Spartan family which will offer 100,000 system gates for less than $10.00. This downward pricing trend is expected to continue, and 500,000 system gates will be available for under $10.00 by the year 2003. These dramatic improvements will further expand the influence of programmable logic in new, fast growing, high volume equipment such as cable and DSL modems, cell phones, hand-held electronic games, and DVD players.

The total cost of ownership for an FPGA has also stayed flat, as compared to substantial increases in the cost of ownership for standard cell and gate-array technology. FPGAs eliminate the need for expensive NRE (Non Recurring Engineering), development, system integration, and field deployment costs. However, NRE charges for standard cell and gate array ASICs have risen sharply as feature sizes have dropped below 0.5 micron. In addition, for gate array and standard cell chip development, the required board debugging, system integration, and field trial costs have also gone up sharply.

Another significant attraction of programmable logic is field upgradability. Because FPGAs can be reprogrammed an infinite number of times, equipment can easily be upgraded over a network after it has been installed at a customer's premises. This allows forward-thinking manufacturers to quickly get their new products to market and then add new features, comply with evolving standards, or fix bugs, remotely, without physically replacing any hardware.

The year 2000 is clearly a turning point for the programmable logic industry, as we quickly expand into new high-volume markets with advanced high-density, low-cost technologies. ∑