

WINTERGREEN RESEARCH, INC.

**CWDM Market Opportunities, Strategies, and Forecasts,
2003 to 2008**

CWDM



Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

**WinterGreen Research, Inc.
Lexington, Massachusetts**

www.wintergreenresearch.com

REPORT # SH29821308

255 PAGES

71 TABLES AND FIGURES

2003

\$2,800

CHECK OUT THESE KEY TOPICS

CWDM MARKET SHARES
CWDM MARKET FORECASTS
WHY CWDM?

Transparent Metro DWDM Equipment

CWDM Market Conditions
Optical-to-Electrical Conversion
DWDM SYSTEM COMPONENTS

CARRIER GRADE DWDM

CWDM vs DWDM

TYPICAL DEPLOYMENT OF CWDM/DWDM SYSTEMS

CWDM MARKET DESCRIPTION

MARKET CHALLENGES

BROADBAND OPTICAL SERVICES

RAPID INCREASE IN BANDWIDTH DEMAND

REDUCED PROVISIONING TIME

ENABLING ETHERNET NETWORK COMPUTING PROTOCOLS

OPPORTUNITY ABOUNDS

WinterGreen Research, Inc.

Lexington, Massachusetts

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CWDM Market Opportunities, Strategies, and Forecasts, 2003 to 2008

Coarse CWDM systems are positioned as offering less expensive transport than dense DWDM technology and sufficient capacity for many edge network and enterprise network applications. CWDM systems deliver enough bandwidth for multiple metro applications DWDM systems deliver more bandwidth than CDWM but are more expensive than CWDM. DWDM systems cost \$32,000 per port per node. CWDM systems cost 30 to 40 percent lower than DWDM at \$12,000 per port per node.

Metro applications do not require the capacity that DWDM systems do. They require more space and power than CWDM. CWDM systems are available with relatively small numbers of channels and low cost. Space and price are key differentiators. 80-watt power is lower than a light bulb.

CWDM growth opportunities relate to implementing storage solutions, backup solutions, and CWDM metro transport. CWDM transport solutions platforms are expanding functionality to include access capability. In this manner access and transport markets are merging for the metro markets.

With the growth of the Internet, demand for high bandwidth continues to increase. The ability to increase transport capacity is needed universally. High bandwidth is needed to improve productivity and increase supply chain efficiency. Metro markets are shifting as the prices for laser components come down. Optical micro components promise to include more integrated functionality, at less cost per component, increasing the efficiency of DWDM systems.

CWDM brings innovative technologies to the broadband market. Platforms are evolving that extend transmission systems into access, supporting the engagement of multiple value added services on CWDM platforms. There is a convergence of transmission and digital loop carrier platform technology.

In metropolitan areas, in New York City, D.C. and any of the other major trading areas, real estate is the biggest expense. Small physical size, low heat consumption are big issues in metro deployments. CWDM markets at \$51 million in 2002 are expected to reach \$271.6 million by 2008.

Companies Profiled

Market Leaders

Nortel Networks
Alcatel
Ciena
Lucent Technologies
Siemens

Other Market Participants

ADVA Optical	Huawei
Agilent Technologies	Lightbit
Avici Systems	Lumentis
Avonex	Manticom Networks
Cisco	Marconi
Corning	NEC
ECI Telecom	Optical Micro-Machines
Ericsson	PacketLight
Fujitsu Optical Transport Solutions	Sorrento
Hewlett Packard	Sycamore Networks
JDS Uniphase	Telect
	Tellabs

CWDM Market Strategies and Forecasts, 2003-2008

REPORT METHODOLOGY

THIS IS THE *TWO-HUNDRED AND FIRST* REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, AND TELEPHONE EQUIPMENT. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT.

YOU MUST HAVE THIS STUDY

CWDM Market Opportunities, Strategies, and Forecasts, 2003 to 2008

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ABOUT THE COMPANY

WINTERGREEN RESEARCH, FOUNDED IN 1985, PROVIDES STRATEGIC MARKET ASSESSMENTS IN TELECOMMUNICATIONS, COMMUNICATIONS EQUIPMENT, HEALTH CARE, AND ADVANCED COMPUTER TECHNOLOGY. INDUSTRY REPORTS FOCUS ON OPPORTUNITIES THAT WILL EXPAND EXISTING MARKETS OR DEVELOP MAJOR NEW MARKETS. THE REPORTS ASSESS NEW PRODUCT AND SERVICE POSITIONING STRATEGIES, NEW AND EVOLVING TECHNOLOGIES, AND TECHNOLOGICAL IMPACT ON PRODUCTS, SERVICES, AND MARKETS. MARKET SHARES ARE PROVIDED. LEADING MARKET PARTICIPANTS ARE PROFILED, AND THEIR MARKETING STRATEGIES, ACQUISITIONS, AND STRATEGIC ALLIANCES ARE DISCUSSED. THE PRINCIPALS OF WINTERGREEN RESEARCH HAVE BEEN INVOLVED IN ANALYSIS AND FORECASTING OF INTERNATIONAL BUSINESS OPPORTUNITIES IN TELECOMMUNICATIONS AND ADVANCED COMPUTER TECHNOLOGY MARKETS FOR OVER 30 YEARS.

ABOUT THE PRINCIPAL AUTHORS

ELLEN T. CURTISS, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

SUSAN EUSTIS, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULTIPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF THE REGIONAL BELL OPERATING COMPANIES' MARKETING STRATEGIES, INTERNET EQUIPMENT, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

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