

BROADBAND-TO-THE-PREMISE FIBER OPTIC COMPONENTS 2003-2013 GLOBAL MARKET FORECAST SERVICE

*A ten-year forecast of the Fiber-to-the-Premise Fiber Optic Components
in:*

- The Telecom Access Links
- Cable TV/Head Ends
- Internet Service Provider Access Links
- Competitive Access Providers
- Subscriber Premise Interface

This broad scope analysis and forecast also covers the broadband links that compete with and/or augment fiber links:

- Wireless (WLAN, WiFi, WiMAX)
- Satellite-to-Premise
- Free Space Optics
- Microwave Links

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Broadband-To-The-Premise Fiber Optic Components Global Market Forecast Service

Electronicast Consultants announces a study which provides a ten-year forecast of the Global and Regional markets for Fiber Optic Components used in broadband communication between telecommunication central offices (and remote-sites), internet and long haul points of presence and cable TV head ends; business, government agency and other offices plus residential subscribers.

— WHY THIS STUDY —

Communication industry movement into broadband services is accelerating. Multimedia business communication loading on the telecom and internet access links will multiply dramatically over the next decade. New technology such as optical amplifier driven passive optical networks and next generation fiber optic fast packet switches will bring major revisions in network design *in* and *from* the central office and PoP to the subscriber and in interoffice. A wide range of new products will support the building of these new networks. Early versions of these products are now on the market, but design evolution will continue, and cost per function will drop.

This ten-year forecast of the high data rate system demand for electronic, optoelectronic and all optical network (AON) products will provide information of high value to telecom equipment and system manufacturers, fiber optic component vendors, internet service providers, telephone companies and competitive access providers:

- New product markets; timing and price sensitivity
- New product availability, performance and pricing, standards, suppliers
- Constraints placed on manufacturers by telco and data communication cost requirements and growth plans
- Evolution of service providers, which are the future customers for broadband products

— STUDY SCOPE —

This study analyzes last years product, technology, consumption and competitive status of high data rate system products for telecommunications central office (intra-office) interoffice and the local loop, internet and long haul telephony points of presence and cable TV head end fiber optic connection to business and government office and to residential subscribers. It provides a ten-year North American, European, Japan-Pacific Rim and Global market forecast for each type of fiber optic component, and the significant subsets. The forecast is in terms of quantity, average price and total value year-by-year.

Rapidly advancing data throughput from internet servers, distributed networks, massively parallel machines and next generation supercomputers will drive demand for broadband high capacity switching, routing and transport techniques. Next generation switches based on both high speed semiconductor switching and on transparent optical switches have moved into early production. The markets for this advanced equipment and the application of new standards in the local loop, trunk and telecommunications central office are forecasted. Competitive strategies and strategic alliances are outlined.

The Broadband-To-The-Premise (BBTP) Market Forecast is provided in a hardbound report with over 100 figures and tables and the forecast data base spreadsheet printout.

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- 6.3.1 Hybrid Cabling Network Deployment; Net New Subscriber Growth
By Architecture Format
- 6.3.2 Hybrid Cabling Network Deployment; Net Bandwidth Growth
By Architecture Format
- 6.5.1 RF/Microwave Network Deployment; Net New Subscriber Growth
By Architecture Format
- 6.5.2 RF/Microwave Network Deployment; Net Bandwidth Growth
By Architecture Format

Products and components covered in this study:

BBTP Access Network Equipment Data Base Category List

Category Number	Category Name
001000000	BBTP COMPONENT PRODUCTION
610000000	BBTP COMPONENT CONSUMPTION
610100000	CABLE
610110000	FIBER OPTIC CABLE
610111000	SINGLEMODE FIBER OPT CABLE
610111100	SMF CONVENTIONAL (1.3 MICRON)
610111200	NON-ZERO DISPERSION SHIFTED (1.5 MICRON)
610111300	LOW WATER PEAK (1.3-1.6 MICRON)
610111400	OTHER
610112000	MULTIMODE FO CABLE
610120000	OTHER BBTP CABLE
610121000	COPPER CABLE (UTP)
610122000	COAXIAL CABLE
610123000	HYBRID (COMPOSITE) CABLE
610200000	BBTP CONNECTORS
610210000	BBTP FO CONNECTORS
610211000	SINGLEMODE
610211100	SINGLE FIBER (DUPLEX)
610211200	MULTIFIBER
610212000	MULTIMODE
610212100	SINGLE FIBER (DUPLEX)
610212200	MULTIFIBER
610213000	HYBRID
610214000	FO MECHANICAL
610220000	COPPER CONNECTORS
610230000	COAXIAL CONNECTORS
610300000	OPTICAL AMPLIFIERS
610310000	OPTICAL FIBER AMPLIFIERS
610320000	SEMICONDUCTOR AMPLIFIERS
610400000	WDM COMPONENTS/MODULES*
610410000	CWDM COMPONENTS/MODULES
610411000	ACTIVE MODULE TX/RX
610411100	FIXED
610411200	TUNABLE
610412000	PASSIVE MODULE (FILTER)
610412100	FIXED
610412110	Single Wavelengths
610412120	4-32 Wavelengths
610412200	TUNABLE
610413000	INTEGRATED MODULE
610413100	FIXED
610413200	TUNABLE

610420000	DWDM COMPONENTS/MODULES
610421000	ACTIVE MODULE TX/RX
610421100	FIXED
610421200	TUNABLE
610422000	PASSIVE MODULE
610422100	FIXED
610422110	4-16 Wavelengths
610422120	32-64 Wavelengths
610422130	>64 Wavelengths
610422200	TUNABLE
610423000	INTEGRATED MODULE
610423100	FIXED
610423200	TUNABLE
610500000	FREE SPACE OPTICS
610510000	TRANSMITTER
610520000	RECEIVER
610600000	MICROWAVE RELAY EQUIPMENT
610610000	TRANSMITTER
610620000	RECEIVER
610700000	OPTICAL TRANSMIT/RECEIVERS
610710000	≤OC-3
610711000	BiDi
610712000	Tri-plex
610713000	CONVENTIONAL T/R (Uni-di)
610720000	OC-12
610721000	BiDi
610722000	Tri-plex
610723000	CONVENTIONAL T/R(Uni-di)
610730000	OC-24
610731000	BiDi
610732000	Tri-plex
610733000	CONVENTIONAL T/R(Uni-di)
610740000	OC-48
610741000	BiDi
610742000	Tri-plex
610743000	CONVENTIONAL T/R(Uni-di)
610750000	OC-192
610751000	BiDi
610752000	Tri-plex
610753000	CONVENTIONAL T/R(Uni-di)
610760000	OC-768
610761000	BiDi
610762000	Tri-plex
610763000	CONVENTIONAL T/R(Uni-di)
610770000	OTHER DATA RATES
610771000	BiDi
610772000	Tri-plex
610773000	CONVENTIONAL T/R

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610780000	GbE
610781000	≤1 GbE
610782000	10 GbE
610790000	Analog
610800000	PASSIVE OPTICAL COMPONENTS
610810000	FIBER OPTIC SPLITTERS
610811000	TAP
610812000	STAR/TREE
610820000	OPTICAL SWITCHES
610820000	1x2, 2x2
610821000	1xN (N>2)
610822000	NxN Crossconnect
610830000	OPTICAL FIBER ATTENUATORS
610831000	VARIABLE
610832000	FIXED VALUE
	WDM FILTER MODULES (SEE CATEGORY 6104000000)
610840000	OTHER PASSIVE COMPONENTS
610900000	OTHER BBTP FO COMPONENTS

— METHODOLOGY —

Electronicast Consultants' Forecasts are based on an analysis and forecast of the basic driving forces: technology, economics and government action. The knowledge and experience of the analysts are critical factors in the final results of the programs. Research techniques include:

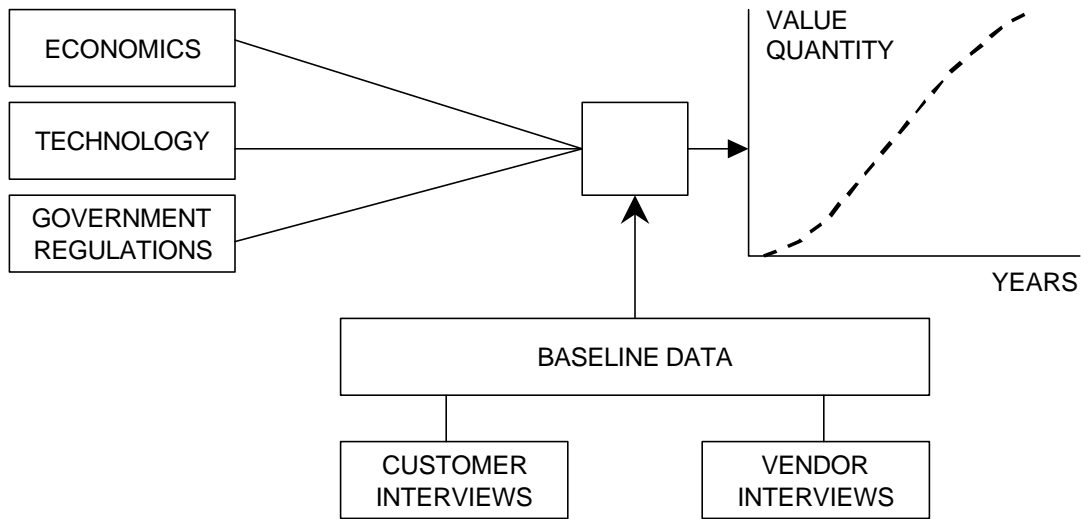
- Interviews with dense WDM, amplifier, laser diode, photodiode, fiber, DWDM filters, photonic switch, OADM and related product providers, fiber optic based SYSTEM and EQUIPMENT designers, advanced photonics researchers, management, marketing and purchasing: in person and by telephone.
- Industry data review: technical publications and conference proceedings; trade association data; governmental statistics; financial reports; product literature and contract awards.
- Input/output trend analysis, relating demand and technology trends to user and supplier industries.
- Electronicast Consultants' data bases in supporting research areas.

The conclusions of this study are based mainly on primary market research; approximately 200 interviews of executives who influence future network product trends, including:

- Carrier equipment planners, specifiers and buyers
- Procurement directors
- Network planning managers (telecom, cable, wireless, satellite, FSO)
- Network design managers
- Carrier standards/specifications committee
- Service product development managers
- Fiber optic component vendor product marketing managers
- Fiber optic component vendor product planning managers
- Corporate communication and investment relation managers

Interviews of each RBOC-based and leading independent telcos (ILECs), major competitive LECs, CAPs (including utilities); Cable TV, Internet Service Providers (ISPs), wireless, satellite, and FSO service providers and major corporate communication managers. Interviews with the significant dense WDM transmitter, receiver, filter, laser diode and photodiode, coupler, cable, connector, apparatus, other components and optical amplifier vendors plus switch and transport terminal, DWDM link and optical add/drop MUX vendors.

Market Research & Forecasting Methodology



———— CONTINUING COMMITMENT ————

Electronicast Consultants is committed to continuing research and forecasting in broadband networks and products, photonics and fiber optics technologies, and their markets, as well as research in related areas. Other related programs include:

- LAN Products Forecast
- Photonic Switch Technology and Market Forecast
- Massively Parallel Optical Interconnect Components Forecast
- Optical Amplifier and Components Forecast
- Dense WDM Components Global Market Forecast
- Fiber-to-the-Office
- Broadband-to-the-Home Market Forecast
- WDM, TDM & Fiber Global Markets & Technology Forecast
- Photonic Switch & Matrix Global Technology & Market Forecast

———— PRINCIPAL PROGRAM TEAM ————

Jeff D. Montgomery, BSEE. Illinois Institute of technology, MBA Santa Clara University; Chairman and founder of Electronicast Consultants. Mr. Montgomery has over 44 years of professional experience in the RF/Microwave/Lightwave industries. Through the most recent 36 years, he has worked full time in electronic industry forecasting and planning with 30 years experience in communication fiber optics. His work experience, prior to founding ElectroniCast in 1981, includes: Gnostic Concepts, Inc., 9 years, co-founder and President; Quantum Science Corp., 2 years, Director, Electronic Component Market Analysis Group; Varian Associates, 8

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years, Director, Long Range Product Planning; Andrew California Corp., President, 10 years. He is a Life Member of IEEE and Member, SPIE and OSA.

Stephen Montgomery, BA, MBA/Technology Management, Senior Associate. Mr. Montgomery has specialized in communication network products and services demand forecasting since 1990. Mr. Montgomery is the Director of the Fiber Optics Components group and the Network Communication Products group at Electronicast Consultants. He also is the Director of several conferences. He has given numerous presentations and published a number of articles on optical fiber markets, technology, applications and installations. He is a member of the Editorial Advisory Board of *Lightwave* magazine and he is on the Advisory Board of the Gigabit Ethernet Conference (GEC). Mr. Montgomery is a member of the OSA, the IEEE and the Fiber Optic Association, Inc. (FOA).

—— DELIVERABLES ——

Market Forecast Report: CD Rom or e-mail in Adobe Portable Document Format (PDF).

Consulting and strategic support services: Specifically, we encourage our clients to make use of our inquiry services as a basis for ongoing dialogue with our analysts at no additional charge.

Software: Electronicast Consultants provides full report and data on the product market forecast on CD Rom in Adobe Portable Document Format (PDF). You will need a copy of Adobe Acrobat Reader to view the PDF files.

Debriefing Session: A day's debriefing by ElectroniCast staff is included in the subscription fee, except travel expenses. The debriefing will provide analysis of the data, and provide a basis for assuring that clients receive maximum benefits from the study.

—— COST OF SERVICE ——

Standard Subscriber Fee: US \$15,000.

This fee includes the Market Forecast report, analyst inquiry service, CD Rom or e-mail in Adobe Portable Document Format (PDF) of the report, and debriefing as outlined above. The reports are in Adobe Portable Document Format (PDF). You will need a copy of Adobe Acrobat Reader to view the PDF files. The text (only) is available for US\$8,995. and the database (only) is available for US\$8,495.

———— QUALIFICATIONS OF ELECTRONICAST CONSULTANTS ————

ElectroniCast Consultants is uniquely qualified to undertake this project. Its years of experience in analyzing the technologies, end markets and applications for fiber optic and wireless communications in regional, national, and global telecommunications and data communications have given it unparalleled data bases. Its detailed and diligent research have provided the basis for projects of unusual complexity.

Electronicast Consultants' fiber optics analysis and telecom network forecasts are widely utilized in strategic planning at the world's major telecommunications and data communications companies with significant investments in lightwave technology. Its fiber optics forecasts and analyses are often cited by leading business publications and by specialized communications and fiber optics trade press.

———— ABOUT ELECTRONICAST CONSULTANTS ————

Electronicast Consultants specializes in forecasting for the communication network, fiber optic, optoelectronic and photonic industries. This includes technology forecasting, markets and applications forecasting, strategic planning and consulting. ElectroniCast conducts both multiclient studies and custom, focused single-client studies.

Electronicast Consultants , as a technology-based independent forecasting firm, serves industrial companies, trade associations, government agencies, telecommunications companies and the financial community. Reduction of the risk of major investment decisions is the main benefit provided. Electronicast Consultants' goal is to understand the challenges and opportunities facing clients and to provide timely, accurate information for strategic planning.

———— RESEARCH AREAS ————

Electronicast Consultants covers all areas of the data and communication industries and fields impacted by communications, including:

- Systems and Networks
- Equipment and subsystems
- Components and devices
- Materials and parts/devices

Most of the Electronicast Consultants projects are in the data communication, telecommunication networks and services, fiber optics, and photonics fields.

Why Electronicast Consultants Leads

MATURITY

A base of over a quarter century of forecasting technology, application and market trends of leading-edge photonic and electronic products.

ADVANCED PHOTONICS

The first to provide detailed, in-depth analyses and forecasts of:

- * **Dense Wavelength Division Multiplexing (DWDM)**
- * **Optical Fiber Amplifiers (OFAs)**
- * **Optoelectronic Integrated Circuits (OEICs)**
- * **Massively Parallel Optical Interconnect (Masspar)**
- * **Vertical Cavity Surface Emitting Laser (VCSEL) Transceivers**
- * **Optical Crossconnect (OXC) Matrix Switches**
- * **Optical Add/Drop Multiplexers (OADMs)**
- * **Optical Backplanes (OBPs) and Motherboards**
- * **Internal Optical Interconnect**

BOTTOM-UP ANALYSIS

The forecasted product is divided into its subsets (and sub-subsets). The significant applications are identified. For each product subset, in each application, the base year consumed quantity and its average per-unit price is estimated, based on in-depth interviews of both customers and suppliers. This is repeated for each succeeding year of the forecasts. Quantity is multiplied to obtain the value forecasts, at these lowest levels. The quantity and value forecasts are then summed to obtain the total forecast. All of this bottom-up quantity, price and value data is provided in spreadsheets with each report.

EXTRAORDINARY DATA BASES

The bottom-up forecast numbers are managed within extremely detailed spreadsheets which support accurate forecasting of over 20 fiber optic component categories plus end applications (equipment) and subsidiary piece parts. These forecast spreadsheets, in printout format, on CD, are provided to each client.

The consumption quantities of various components are related to each other, as well as to the quantities of consuming equipment and the quantities of supporting parts. This permits cross-referencing of forecasts, to improve accuracy.

CONSULTANT RELATIONSHIP

Clients have access to forecast report authors and support staff for extended exploration and clarification.

INDEPENDENCE

Its founder, free from influence by outside ownership, owns Electronicast Consultants . Excellence in forecasting and client service are the guiding principles.

BROADBAND TO THE PREMISES COMPONENTS FORECAST SERVICE

SERVICE AGREEMENT

The undersigned hereby authorizes and directs ELECTRONICAST CORPORATION to furnish research and consulting service necessary to prepare the multiclient services, BROADBAND-THE-THE-PREMISES COMPONENTS GLOBAL MARKET FORECAST for the fee of US \$15,000.

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